

**TAXONOMY OF RHYNCHOPHORINAE  
(COLEOPTERA: DRYOPHTHORIDAE) OF KERALA**

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**(2014-11-210)**

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**KERALA, INDIA**

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**TAXONOMY OF RHYNCHOPHORHINAE (COLEOPTERA:  
DRYOPHTHORIDAE) OF KERALA**

*by*

**Arun Kumar Singh**

**(2014 - 11 - 210)**

**THESIS**

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**DEPARTMENT OF AGRICULTURAL ENTOMOLOGY**

**COLLEGE OF AGRICULTURE**

**PADANNAKKAD, KASARAGOD – 671314**

**KERALA, INDIA**

**2016**

**DECLARATION**

I, hereby declare that this thesis entitled **“TAXONOMY OF RHYNCHOPHORINAE (COLEOPTERA: DRYOPHTHORIDAE) OF KERALA”** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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**CERTIFICATE**

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## ABBREVIATIONS

%	Percentage
[NA=BMI]	Based on misidentified type genus (Arts. 41 and 65(b))
[NA=L]	Lapsus; either an incorrect original spelling (usually followed by comment on first revisor) or an incorrect subsequent spelling
[NA=ND]	No description
[NA=NI]	No indication
[NA=NT]	No type species designation
[NA=S]	Name suppressed by ICZN
[NA=SG]	Based on suppressed genus
[NA=SYN]	Published as synonym and not subsequently validated
BRS	Banana Research Station
CABI	The Centre for Agriculture and Bioscience International
cm	Centimetre
CoA	College of Agriculture
CPCRI	Central Plantation Crop Research Institute
ICAR	Indian Council of Agricultural Research
ICZN	International Code of Zoological Nomenclature
i.e.	<b>Id est</b> (that is)
KOH	Potassium hydroxide
LAS	Leica Application Suite
MIR	Malabar Insect Repository
ml	Millilitre
ml trap-1	Millilitre per trap
mm	Millimetre
ORARS	Onattukara Regional Agricultural Research Station
PCR	polymerase chain reaction
PD	Present designation (to be credited to both authors unless otherwise stated)
RARS	Regional Agricultural Research Station



RN	Replacement name
RPW	Red palm weevil ( <i>Rhynchophorus ferrugineus</i> )
S. No.	Serial number
SD	Subsequent designation followed by its author, year and page
UE	Unjustified emendation
URN	Unjustified replacement name
viz.,	Videlicet (it is permitted to see)

# *Introduction*

## 1. INTRODUCTION

The word 'weevil' is derived from the old Anglo-Saxon *wifel*, meaning, a beetle (Zimmerman, 1994a). They are included under the superfamily Curculionoidea which is the largest among all in animal kingdom (Kuschel, 1995). Weevils inhabiting from moist tropics to dry dessert, but the tropical area is rich in weevil fauna (Anderson, 1993). The most speciose among Coleoptera are weevils and their species diversity is well documented, particularly in the tropics (Anderson, 1993; 1995; Farrell, 1998). The number of described species in Coleoptera is about 400,000 (Hammond, 1992), with 62,000 weevils comprising 15.5%. Recent comprehensive tally of Curculionoidea as on 1998, is around 5087 described genera and 56920 species (Kuschel, 1995). The recent comprehensive world catalogue of weevil genera by Alonso-Zarazaga and Lyal (1999 & 2002); Lyal and Alonso-Zarazaga (2006) recognizes 5468 valid genera as on 2006, including fossils but excluding Scolytinae and Platypodinae.

The family Dryophthoridae was earlier included under subfamily Rhynchophorinae (=Rhynchophoridae) (Anderson and Marvaldi, 2014). The family Dryophthoridae were linked with Cossonidae in classification because of its convergent characters in earlier classification, due to their association with the living habitat in decaying wood as occurring in typical cossonines and Dryophthorinae (Anderson and Marvaldi, 2014). In modern classification it is considered as the separate family (Morimoto, 1962a; Morimoto, 1962b; Morimoto, 1976; Thompson, 1992; Zimmerman, 1993; Morrone, 1998). The family Dryophthoridae includes the following subfamilies: Dryophthorinae, Stromboscerinae, Cryptodermatinae, Orthognathinae, and Rhynchophorinae (Alonzo-Zarazaga and Lyal, 1999; Anderson, 2015; Anderson and Marvaldi, 2014), which contains a total of 158 genera comprising approximately 1200 species and 9 tribes (Alonzo-Zarazaga and Lyal, 1999; Anderson, 2002; Morrone and Cuevas, 2009).

The subfamily Rhynchophorinae was erected by Schoenherr in 1833 (Alonzo-Zarazaga and Lyal, 1999). The subfamily Rhynchophorinae is the most

speciose among the Dryophthoridae, which contains about 955 species distributed under 124 genera and 6 tribes (Alonzo-Zarazaga and Lyal, 1999; Alonzo-Zarazaga and Lyal, 2002; Anderson, 2002). Except to Arctic and Subantarctic Regions, Rhynchophorinae are distributed worldwide in all the faunistic regions i.e. Oriental, Palearctic, Oceanic, Ethiopian, Neotropical and Nearctic Regions (Zimmerman, 1968a; Alonzo-Zarazaga and Lyal, 1999). The greatest number of genera are known from the Indo-Pacific region, followed by Ethiopian region (Zimmerman, 1968a; 1993).

One of the main external identifying characters of the subfamily Rhynchophorinae is: strongly exposed pygidium (Zimmerman, 1968a; Morrone, 2000). Like the basal curculionids such as brachycerines and erirhinines, Rhynchophorinae are predominantly associated with the monocotyledonous angiosperms (Reid, 1995), especially the grasses, bananas, lilies, *Pandanus* and palms (Zimmerman, 1993). The rhynchophorines are among the most important pest of economically important crops like species of *Cyrtotrachelus* (*C. longimanus*, *C. dux*, and *C. buqueti*) and *Myocalandra* (*M. exarata*) are serious pests of bamboo (Chen *et al.*, 1920); many members are pests on banana, viz., *Odoiporus longicollis*, *Cosmopolites sordidus*, *Polytus mellerborgii*, *Metamasius hemipterus*, etc. (Nardon *et al.*, 1985; Graaf, 2006; Shukla, 2010; Ayri, 2013); while species of genera *Rhynchophorus* and *Dynamis* are serious pests of palms, sugarcane and distributed to all commercially palm cultivating areas (Wattanapongsiri, 1966). Members of the genera *Nassophasis* and *Metamasius* are serious pests of orchids (Xiao-Yu *et al.*, 2010; Cooper *et al.*, 2011). The genera *Sitophilus* includes one of the most notorious and widespread weevils that have been a plague to stored grains, cereals and seeds (Zimmerman, 1993).

Among these, the genera *Rhynchophorus*, *Sitophilus*, *Cosmopolites*, *Odoiporus* and *Diocalandra* are serious pests of economically important crops in Kerala. In Kerala, the coconut red palm weevil, banana rhizome and pseudostem weevils, rice weevil and bark weevils are major pest of crops (Nair and Visalakshi, 1999). The damage level range from 12-34 percent yield loss of coconut by red

palm weevil (Jose *et. al.*, 2008); 100 percent yield loss of banana by rhizome weevil (Gold *et. al.*, 2002); and 10-90 percent yield loss of banana due to pseudostem weevil (Shukla, 2010).

A review work done on the taxonomy of these genera indicates that there are inadequacies which need to be addressed for streamlining the salient aspects. Research on the taxonomy of Rhynchophorinae are very little and there was no field work done in Kerala. The morphological variations have not been well documented which leads to confusion in identifying the pests under subfamily Rhynchophorinae. The only substantial work on these had been carried out by Wattanapongsiri (1966) and Zimmerman (1968a; 1968b; 1993). The available information on Rhynchophorinae is limited and lacking in essential diagnostic characters especially on genitalia, taxonomic terminology and require redefinition. Even in those where detailed descriptions are available, these are lacking in morphometric ratios and need for more material and information. The genitalia diagrams available are incomplete, descriptions and diagrams are unsatisfactory.

Keeping these in view, the present study is proposed to bridge glaring lacuna of knowledge for five economically important species (*Cosmopolites sordidus*, *Diocalandra frumenti*, *Odoiporus longicollis*, *Rhynchophorus ferrugineus* and *Sitophilus oryzae*) of rhynchophorine weevils and to keep its taxonomy on international standards with the following objectives:

1. Survey and collection of economically important pests under the subfamily Rhynchophorinae from agro and forest ecosystems of Kerala
2. Analysing their characters and distribution
3. Redescription of economically important species under subfamily Rhynchophorinae from Kerala
4. Study of male and female genitalia
5. Preparation of key.

# *Review of Literature*

## 2. REVIEW OF LITERATURE

### 2.1 HIGHER CLASSIFICATION: CURCULIONOIDEA

Like most of the animal groups, the taxonomic foundation and naming of the weevils (superfamily Curculionoidea) was laid down by Carolus Linnaeus with the start of *Systema Naturae*. In the first volume of 10<sup>th</sup> edition of *Systema Naturae*, Linnaeus (1758) nominated and described the genus *Curculio* and diagnosed it as “*Antennae subclavatae, rostro insidentes, rostrum corneum prominens*”. Linnaeus (1758) described 600 beetle species under 22 genera, of which, 80 species were described in genus *Curculio*, thus forming the largest one. In Linnaeus classification the weevils form of 15.8% of the 600 beetle species. These weevils (described by Linnaeus (1758)) are now distributed under number of subfamilies and tribes in the modern classification of weevils, which also include several pest species, viz., *Metamasius hemipterus*, *Rhynchophorus palmarum* (palm weevil), *Rhodoaenus melanocardius*, and *Sitophilus granarius* (grain weevil). The name, *curculio* is derived from the Latin word which means, the grain-parasitic “**corn-worm**” or “**corn-bug**”. But Linnaeus did not designate the type specimen for the genus *Curculio* and 52 years later Latreille (1810) subsequently designated *Curculio nucum*, the European Hazelnut Weevil, as the type species of *Curculio*.

Sixty-two years after Linnaeus work, Billberg (1820) proposed the first classification of the Rhynchophora (weevils) by dividing them into seven *nationes* which were equivalent to modern families. It was Carl Johan Schoenherr (1826) shortly afterwards presented a first paper “*dispositio methodica* (orderly arrangement)” of the group, recognising the difference between those species with straight antennae (Ordo Orthoceri) and those with geniculate ones (Ordo Gonatoceri) and dividing each *ordo* into 16 *divisiones*. These groupings still form the backbone of the modern classification system, although a large number of others were added in the ensuing years.

Lacordaire (1863) proposed new arrangement for weevil classification, recognizing six families viz., Anthribidae, Brenthidae, Bruchidae, Curculionidae,

Uloceridae, and Scolytidae. Lacordaire (1863) classified Curculionidae according to the size of the mentum, into **Adelognatha** (mentum closing the buccal space, and concealing the maxillae) with 6 tribes and **Phanerognatha** (mentum smaller, maxillae visible) with 76 tribes. Later Jekel (1860, 1865) classified the Coleoptera in eight series, and chiefly discussed the Curculionidae and separated it into subfamilies. Pascoe (1870) gave Lacordaire's 82 curculionid tribes subfamily status, becoming the framework for weevils classification (Geminger and Harold, 1871; Blackwelder, 1947).

Crowson (1955) started a modern classification of Curculionoidea into nine families (treated several subfamilies as families). This classification of Curculionoidea was later adopted and further refined by Morimoto (1962a); Thompson (1992); Zimmerman (1993; 1994a & b); Zherikhin and Gratshev (1995) and Alonso-Zarazaga and Lyal (1999), and led to expansion of superfamily Curculionoidea to 22 families constituting around 72 subfamilies (Alonso-Zarazaga and Lyal, 1999). In contrast, application of phylogenetic principles and methodology, first by Kuschel (1995) and subsequently by Marvaldi and Morrone (2000) and Marvaldi *et al.* (2002), resulted in the identification of only 6–7 major lineages, treated as families.

The most recent comprehensive tally of the number of Curculionoidea (Kuschel, 1995) represents a total of 56,920 species under 5,087 described genera (status at about 1988). In the past 20 years many new genera and species are described that makes a sum total of 61,868 species under 5,604 genera, showing an increase of 8.7% and 10% respectively (Oberprieler *et al.*, 2014). Recently in the world catalogue of weevil of families and genera, Alonso-Zarazaga and Lyal (1999, 2002) and Lyal and Alonso-Zarazaga (2006), recognized about 5,646 valid genera (including the fossils), but excluded the Scolytinae and Platypodinae, which constitutes a total of 7,300 species under 266 genera (Scolytinae, 225 genera constituting 5,837 species, and Platypodinae, 41 genera constituting 1,463 species) (Wood and Bright, 1992; Bright and Skidmore, 1997). Thus with an accurate



estimation, there are 5,912 valid genera (excluding fossils of Scolytinae and Platypodinae) under Curculionoidea (Jordal *et al.*, 2014).

## 2.2 DRYOPHTHORIDAE SCHOENHERR, 1825

The family Dryophthoridae was earlier included under subfamily Rhynchophorinae (=Rhynchophoridae) (Anderson and Marvaldi, 2014). Dryophthoridae were linked with Cossonidae in classification because of its convergent characters in earlier classification, due to their association with the living habitat in decaying wood as occurring in typical cossonines and Dryophthorinae (Anderson and Marvaldi, 2014). It has been considered as the separate family (Morimoto, 1962a; Morimoto, 1962b; Morimoto, 1976; Thompson, 1992; Zimmerman, 1993; Morrone, 1998) or as a subfamily of the complex Curculionidae (Kuschel, 1995). Morimoto (1962a) and Kuschel (1971) reported that major difference between structures of genitalia, as median lobe (penis) of the Orthoceri and few of the Gonatoceri have a dorsal plate (tectum) and a single or bilobed plate (cap-piece), large dorsal tegmen; whereas in Gonatoceri, it consists of navicular or tubular ventral part (pedon) only and tegmen bears two dorsal parameres, which can become vestigial or lost. This discovery led to removal of many groups with geniculate antennae from Curculionidae (Oberprieler *et al.*, 2014), especially the Dryophthoridae (as Rhynchophorinae), and afterwards Thompson (1992) and Zimmerman (1993) excluded the Brachycerinae, Cryptlarynginae, Eirrhininae and Raymondionyminae from Curculionidae and kept the taxa with the apomorphic, pedal type of aedeagus. Morimoto (1976), Thompson (1992) and Zimmerman (1993) allotted the group (Dryophthoridae) a family rank and separated out Dryophthoridae from other weevils with derived, pedal type of genitalia. Thus Zimmerman (1993) placed it into the informal group (Heteromorphi) intermediate between primitive and advanced, as “primitive” male genitalia and “advanced” geniculate antennae as present in higher weevils (Anderson and Marvaldi, 2014).

Although Kuschel (1995) presented the first cladistic analysis of Curculionoidea, and suppressed the Dryophthoridae and Platypodidae (along with

other families recognised by Thompson, 1992 and Zimmerman, 1993) to the subfamilies in Curculionidae recognising Rhynchophorinae (=Dryophthorinae) as the subfamily among the only 6 subfamilies under the Curculionidae. The study was supported by Lawrence and Newton (1995) and Marvaldi (1997), where the later author also showed the relationship between Dryophthorinae and Platypodinae. Alonzo-Zarazaga and Lyal (1999) in World Catalogue of families and genera again adopted the group as family Dryophthoridae.

Dryophthoridae includes the following subfamilies: Dryophthorinae, Stromboscerinae, Cryptodermatinae, Orthognathinae, and Rhynchophorinae (Alonzo-Zarazaga and Lyal, 1999; Anderson and Marvaldi, 2014; Anderson, 2015). The family contains a total of 158 genera comprising approximately 1200 species under 5 subfamilies and 9 tribes (Alonzo-Zarazaga and Lyal, 1999; Anderson, 2002; Morrone and Cuevas, 2009). As most Dryophthoridae, like other “basal” curculionids such as brachycerines and erirhinines, are predominantly associated with monocotyledonous angiosperms, it appears that this host association played a similar role in the early diversification of Curculionidae as it seemingly did in Chrysomeloidea (Reid, 1995). The adult Dryophthoridae have peculiar autapomorphic antennal club, with spongiform and shiny apex, without sutures, and number of funicle always less than seven segments (Anderson and Marvaldi, 2014). Thompson (1992) suggested, the club is actually the enlarged seventh funicular segment which conceals the true compressed club. Several authors gave different other characters in support of the monophyly of this group as: prementum is not visible in ventral view, inflexed over the postmentum (Thompson, 1992; Kuschel, 1995). Zimmerman (1993) included the presence of dorsal and ventral dermal lobe which separates tarsal claws. Some of the genitalia characters in support of this are: aedeagal pedon (male genital) have a lateral line or groove (Morimoto, 1962a); whereas Thompson (1992) reported the tegmen lacks the dorsal plate and both sexes have concealed 8<sup>th</sup> abdominal tergite.

### 2.3 SUBFAMILY AND TRIBE: RHYNCHOPHORINAE SCHOENHERR, 1833

Rhynchophorinae was first suggested by Schoenherr (1833) for one of the 16 *divisiones* under group Gonatoceri. In Junk's Coleopterum Catalogus, Csiki (1936) proposed detailed bibliography of species under the subfamily Rhynchophorinae, Cossoninae, and divided the subfamily Rhynchophorinae under 5 tribes: Campyloscelini, Rhynchophorini, Stromboscerini, Cryptodermini, and Sipalini. Morimoto (1962a) stated that aedeagal pedon (male genitalia) of Rhynchophorinae (=Dryophthoridae) have a lateral line or groove. Zimmerman (1993) and Morrone (2000) demonstrated the characters of Rhynchophorinae as the adults have strongly exposed pygidium behind elytra which separates it from other Dryophthoridae.

The subfamily is distributed worldwide constituting 124 genera covered under 6 tribes. The tribe Rhynchophorini with 13 extant genera; Ommatolampini with four extant genera; Polytini with *Polytus* Faust only; Diocalandrini with *Diocalandra* Faust and *Myocalandra* Faust; Litosomini with 32 extant genera and one extinct Eocene genus from the USA, Sphenophorini with 70 extant and 2 extinct genera (Alonzo-Zarazaga and Lyal, 1999; Alonzo-Zarazaga and Lyal, 2002; Anderson, 2002; Anderson and Marvaldi, 2014). In the supplement of the World Catalogue of Genus of weevils, Alonzo-Zarazaga and Lyal (2002) transferred *Myocalandra* Faust, to the tribe Diocalandrini, while in the same year Anderson (2002) transferred *Cosmopolites* Chevrolat and *Eucalandra* Faust from Sphenophorini to Litosomini. Anderson (2003), raised a new genus *Daisya* Anderson, and included it under tribe Litosomini with 4 species.

In world Catalogue of Curculionidae by Alonzo-Zarazaga and Lyal (1999) promoted subtribes (mentioned by Kuschel, 1995 as Rhynchophorini) to tribes, thus subfamily (Rhynchophorinae) includes six tribes namely: Rhynchophorini, Diocalandrini, Litosomini, Ommatolampini, Polytini and Sphenophorini. In the present study five genera of economic importance to crops coming under four tribes are of interest: Rhynchophorini constitutes *Rhynchophorus*; Diocalandrini

constitutes *Diocalandra*; Litsomoini constitutes *Cosmopolites* and *Sitophilus*; and Sphenophorini constitutes *Odoiporus*.

## 2.4 GENUS

### 2.4.1 *Cosmopolites* Chevrolat, 1883

#### 2.4.1.1 Taxonomy

The genus *Cosmopolites*, comprises only two species, the banana weevil, *Cosmopolites sordidus* (Germar) and *C. pruinus* Heller (Zimmerman, 1968a, 1968b, 1968c). Heller (1934) first described *Cosmopolites pruinus* which is morphologically very similar to *C. sordidus*. Zimmerman (1968a; 1968c) reported that *pruinus* and *sordidus* differ on the basis of pruinosity on the dorsum and the character of elytral striae. The species *pruinus* is associated with bananas in Borneo, Philippines and the Caroline Islands (Zimmerman, 1968a; 1968b) and Masanza (2003) reported it to be a secondary pest species. Zimmerman (1968c) provided keys to these species.

Germar (1824) described the rhizome weevil of banana as *Calandra sordida*. Chevrolat (1885b) raised the new genus *Cosmopolites* and changed the name of species *Calandra sordida* to *C. sordidus*. Marshall (1930) synonymized *Sphenophorus cribricollis* to *C. sordidus*. Csiki (1936) reported *Curculio mendicus* Olivier, as a synonym of *sordidus*; while Zimmerman (1968b) reported it to be an error. Vaurie (1978) synonymized *Sphenophorus pygidialis*, to *Cosmopolites sordidus*. Several common names including banana weevil, banana corm borer, banana beetle, banana root borer, rhizome weevil, black banana borer (Zimmerman 1968b, 1968c; Masanza, 2003), migratory borer, plantain black weevil (Smith, 1995) have been assigned to *C. sordidus*.

The characters which distinguish the genus are: ventrally curved rostrum; impressed elytral striae, which fades away in the middle of length (vitae appearance); elytral intervals bear a single row of fine punctures; hind leg extending beyond the abdomen (Zimmerman, 1968b; Anderson, 2015). Zimmerman (1968c) reported that, in *Cosmopolites* spiculum gastrale (9<sup>th</sup> sternite) is absent or aborted.

#### **2.4.1.2 Species**

There are only two valid species in the genus. Chevrolat (1885b) first raised the genus, with the *Calandra sordida* naming it as *Cosmopolites sordidus*, the banana rhizome weevil. Heller (1934) described the second species, *C. pruinosus* as pest of banana from Caroline Island, Western Polynesia. The *C. pruinosus* is poorly known and closely related to species *sordidus* (Germar) in appearance (Zimmerman, 1968c). The species *pruinosus* is not reported from India.

#### **2.4.1.3 Distribution**

Only two species are described in the genus, out of which *Cosmopolites pruinosus* Heller, is restricted to Borneo, Philippines and Caroline Island (Heller, 1934; Zimmerman, 1968c). The species *Cosmopolites sordidus* (Germar) originated from Indo-Malayan region (Zimmerman, 1968c) which is now widely distributed over the Oriental and Indo-Pacific area along with various parts of Australia, North America, South America, and Africa. It had also been reported from West Indies and various Islands of Indian and Pacific Ocean (Graaf, 2006).

#### **2.4.1.4 Economic importance**

*Cosmopolites sordidus* is a pest specific to the species of *Musa* (banana and plantain) (Stover and Simmonds, 1987; Gold *et al.*, 2003; Simmonds, 1966; Zimmerman, 1968b; Gowen, 1995; Pavis and Lemaire, 1996). Larvae of the weevil tunnels in the corms which interferes in root initiation (Treverrow *et al.*, 1992; Shukla, 2010), plant nutrition uptake (Chavarría-Carvajal and Irizarry, 1997), and water transport (Collins *et al.*, 1991; Shukla, 2010). Gold *et al.* (2002) reported that, 100 percent yield loss of banana by rhizome weevil occurs during severe infestation. The other species *C. pruinosus* also infest the banana but very rare on field and its distribution is limited to Southern Polynesia (Zimmerman, 1968b; 1968c).

#### **2.4.1.5 Biology**

Adults of the rhizome weevil, *Cosmopolites sordidus* oval shaped, small in size measures 9 mm in length. Adult female lay down the elongate, oval, white eggs singly in small pits made by chewing the plant tissue, and seal it with plant sap and some gelatinous secretion (Simmonds, 1966; Beccari, 1967). Eggs are laid down at the basal region of plants, at crown of rhizome and base of pseudostem (Franzmann, 1972; Abera *et al.*, 1999). Upon emergence apodous creamy white crescent-shaped grub immediately tunnels into the rhizome or rarely in pseudostem, forming distinct circular tunnel, filled with the debris (Franzmann, 1972). Larvae passes through 5-8 larval instars depending upon the environmental conditions (Gold *et al.*, 1999), reaching upto 10-15 mm in size goes for pupation. The pupa develops in a chamber near the periphery of infested rhizome (Franzmann, 1972) which lasts for a week (Shukla, 2010). After eclosion adults are reddish brown (teneral stage) in colour which they pass in rhizome only, which changes to uniform black after 1-2 days (Pinese and Elder, 2004).

The banana rhizome weevil is a 'k' selective insect, which shows longer life span with low fecundity (Shukla, 2010). Adults can live upto one year but in some cases they can survive for four years in suitable environmental conditions.

#### **2.4.1.6 Host plant**

This species is monophagous pest of *Musa* (Zimmerman, 1968b; Gowen, 1995). Schmitt (1993) reported that starved adults can feed on the yams (*Dioscorea rotundata* Poir.). But according to Gold *et al.* (2003), host for this species is limited to *Musa* and *Ensete*, whereas reports as pest on other crops would be an error.

### **2.4.2 Diocalandra Faust, 1894**

#### **2.4.2.1 Taxonomy**

Zimmerman (1993) raised the Rhyncophoridae to family status within the super family Curculionoidea and proposed a new tribe, the Diocalandrini to include the genus *Diocalandra* with Arecaceae as hosts but excludes the seed and grain feeding genus *Sitophilus*. Zimmerman in his series of Australian Weevils III (1993),

suggested that spiculum gastrale (9<sup>th</sup> sternite) is deficient in both genera, *Diocalandra* and *Rhynchophorus*.

Fabricius (1801a) described the bark weevil, *Calandra frumenti*; while the species was transferred to *Sitophilus* by Schoenherr in 1838. Later, Faust (1894c) erected new genus *Diocalandra* and included the species *frumenti* in it. Due to variation in the size and the marking patterns there was a big confusion in the identification of this species (Zimmerman, 1993), and because of this reason the species have been described by many authors with different names and a lot of synonyms are available for the species, like, *Sitophilus subfasciata* (Boheman in Schoenherr), *S. stigmaticollis* (Gyllenhal in Schoenherr), *S. subsignata* (Boheman in Schoenherr), *Diocalandra crucigera* (Motschulsky), and *D. sechellarum* (Kolbe). Guerin-Meneville (1833) described the species *taitensis* under the genus *Calandra* on plates, and Gyllenhal (1838), included it in *Sitophilus*. Similarly, Roelofs (1875) described *elongata* under the genus *Calandra*. Quedenfeldt (1888) described two new species under *Calandra* (*reticulata* and *impressicollis*). Heller (1927) transferred the *reticulata* (Quedenfeldt) to *Diocalandra*. Csiki (1936) in Junk's Coleopterorum Catalogus transferred *taitensis* (Guerin-Meneville) and *impressicollis* (Quedenfeldt) to *Diocalandra*. Marshall (1948) described *Diocalandra caelata* from Myanmar. Morimoto (1978) in his checklist of Rhynchophorinae of Japan, described two new species and reported nine species in the genus.

The typical characters of this genus included: seventh funicular article as long as others; third segment of club tomentose (hairy); third tarsal segment dilated, bilobed and ventrally spongy; first two abdominal segments connate at middle; second segment as long as and as broad as third and fourth combined (Faust, 1894c).

#### **2.4.2.2 Species**

A total of eight species are present in the genus; of which, Quedenfeldt and Morimoto contributed two species each, while Fabricius, Guerin-Meneville, Marshall, and Roelofs contributed one species each.

From 1801 to 1850, only two species were described, while major work was done during 19<sup>th</sup> century in between 1851 to 1900, where 3 species had been described. But after the work of Quedenfeldt, Marshall (1948) described single species *caeleata*, from Myanmar. In between 1950 to 2000 only 2 species had been described.

#### **2.4.2.3 Distribution**

Out of the eight species, *frumenti* is widely distributed starting from Palearctic, Oceanic to New World (Europe: Spain (Canary Islands) (Nunez *et al.*, 2002); Africa: Madagascar, Mauritius, Seychelles, Somalia, and Tanzania (including Zanzibar); Asia: Bangladesh, India, Indonesia, Japan, Malaysia, Myanmar, Philippines, Singapore, Sri Lanka, Taiwan, and Thailand (Morimoto, 1978; Zimmerman, 1968b); Oceania: Australia, Guam, Palau, Papua New Guinea, Samoa, and Solomon Islands; and South America: Ecuador. The species *taitensis* is limited to the Polynesia (Zimmerman, 1968b). Four species *viz.*, *elongata*, *frumenti*, *kamiyai*, and *sasa* is distributed within the Palearctic region (Csiki, 1936; Morimoto, 1978). Two species namely, *reticulata* (Angola) and *impressicollis* (Angola, Gabon) have been reported from Ethiopian region (Csiki, 1936) while *caelata* from the Oriental region (Marshall, 1948).

#### **2.4.2.4 Economic importance**

The most important pest under the genus is the four spotted coconut weevil, *Diocalandra frumenti* which can bore galleries in any part of the palm such as roots, petioles, inflorescences, fronds, leaf sheaths, nuts and to all heights of the trunk (Nunez *et al.*, 2002). The holes made by the *D. frumenti* also invites microbial infection, besides debilitating the plants (Nunez *et al.*, 2002; Hill, 1983). The *D. frumenti* also attack arecanut, *Areca catechu* (Linnaeus) (Ray *et al.*, 2007). Another species the Tahiti coconut weevil, *Diocalandra taitensis* which is confined to the Pacific region and attacks coconut (Zimmerman, 1968b).



#### **2.4.2.5 Biology**

The four spotted coconut weevil, *Diocalandra frumenti* adults are attracted towards the sap exuding from the wounded palm tissue (Kalshoven, 1981) or from the flower bases (Lepesme, 1947) and lay down eggs at various sites like: base of the leaves and petioles, inflorescence, immature nuts, or in crack at base of the plants (EPPO). Adult female excavate a cavity on the surface near the unopened leaf sheath with the help of snout and lay eggs in it (Liao and Chen, 1997). According to Nunez *et al.* (2002), this species can bore galleries in any part of the palm: roots, petioles, inflorescences, fronds, leaf sheaths, fruits and to all heights of the trunk, thus causing indirect damage by inviting microbial infection besides debilitating the plants. Hill (1983) outlined the life cycle of pests to take 10-12 weeks for completion, of which incubation period lasts for 4-9 days, larval development lasts for 35-40 days passing 5-7 instars and pupation period lasts for 9-10 days. Similar duration of life stages were found by Liao and Chen (1997) and Nunez *et al.* (2002), and reported that adult survives for 11-22 days. Larvae can bore any part of the plants and develop entirely within the plants and exudation of gummy substances occur at the entrance site of galleries formed by grub (Hill, 1983). Pupation takes place towards the periphery of leaf sheath or petioles (Liao and Chen, 1997), within the galleries formed by the grub without forming any cocoon (Nunez *et al.*, 2002). Galleries formed by them are filled of debris (Hill, 1983), adults after eclosion, removes the debris at the debris with the mouth parts and emerge out. Suarez *et al.* (2000) reported that hundreds of individuals of various life stages could be found from a single palm.

#### **2.4.2.6 Host plants**

Species *Diocalandra frumenti* was first reported from India on coconut palms of Travancore by Fletcher (1918). *D. frumenti* has been reported from 17 genera of Arecaceae, including palms cultivated for food, housing, landscape plants and oil. Major hosts of the pest includes, *Cocos nucifera* L. (coconut), *Phoenix canariensis* H. (landscape palms), *Areca catechu* L. (arecanut) and other hybrid palms (Kalshoven, 1981; Suarez *et al.*, 2000). Minor pests of the species *Phoenix*

*dactylifera* L. (date palm), *Elaeis guineensis* L. (oil palm) and large number of other landscape palms (Salomone and Ruano, 2008).

### **2.4.3 *Odoiporus* Chevrolat, 1885**

#### **2.4.3.1 Taxonomy**

Genus *Odoiporus* was first described by Chevrolat (1885b) for *Calandra longicollis* (Olivier), which is the only single species in the genus. Chevrolat (1882b) synonymized *Calandra longicollis* to *Sphenophorus longicollis*, and later in 1885, proposed new genus *Odoiporus*, and designated *longicollis* as type species. Csiki (1936) reported *Sphenophorus glabridiscus* Walker and *Rhynchophorus gages* Herbst (non Fabricius) as synonym of the *Odoiporus longicollis*. There were many morphological variants reported (Lalitha and Ranjith, 2000; Shukla, 2010) but still the genus has only a single species, which suggests that many species are yet to be discovered under the genus.

This species had been reported with many colour variants, including ferrugineous and the dark black one (Padmanabhan *et al.*, 2001; Shukla, 2010). The characters which distinguish the genus are; elongated, flattened body; funicular segments with rounded anterior edges; one-third basal antennal club pubescent; pronotum not uniformly punctuate, with three short transverse furrows on the middle; elytral apex, truncated (Chevrolat, 1885a; Ayri, 2013).

#### **2.4.3.2 Species**

In the genus *Odoiporus*, only one valid species is reported *viz.*, *O. longicollis* (Olivier). Different colour morphs had been reported from different parts of world and from Kerala by Lalitha and Ranjith (2000). This reveals that there is extensive taxonomic work required and many more species are still to be reported.

#### **2.4.3.3 Distribution**

This species is supposed to have originated from South and South East Asia, the same centre of origin, that of Banana (Shukla, 2010). The species is mainly confined to Asia only and reported from China, India, Indonesia, Japan, Nepal,

Pakistan, Philippines, Sri Lanka, Thailand, Taiwan, and Vietnam as the key pest of banana and plantain (Valmayor *et al.*, 1994; Kung, 1955; Singh, 1966; Alonzo-Zarazaga and Lyal, 1999). In India this species occur in almost all banana cultivating area, starting from Jammu & Kashmir to Kerala (Shukla and Tripathi, 1978; Visalakshi *et al.*, 1989; Azam *et al.*, 2010). Visalakshi *et al.*, (1989) first time reported the occurrence of *O. longicollis* from Kerala.

#### **2.4.3.4 Economic importance**

Shukla (2010) reported that, the banana plants infested by pseudostem weevil at early stage shows symptoms of yellowing of leaves and exudation of sap from pseudostem; while in advanced stages of infestation, plant shows extensive patches of tunnelling, weak appearance of pseudostem, reduction of leaf and bunch size along with secondary rotting at the feeding site. Weevil infestation interferes the transportation of nutrients, plant growth and development, and nutrient uptake by plant (Padmanaban *et al.*, 2001). Infested plants become more prone to wind lodging (Shukla, 2010). In severe cases of infestation 10-90 percent yield loss of banana was observed (Shukla, 2010).

#### **2.4.3.5 Biology**

Adult weevil is of black coloured and measures 9.70–12.13 mm in length. Red-coloured morphs also been reported from certain areas of India and the variations are not due to sexual dimorphism, but phenomenon of non-sex linked and of sympatry (Dutt and Maiti, 1972; Lalitha and Ranjith, 2000; Azam *et al.*, 2010). These weevils are predominantly nocturnal, confines themselves to pseudostem and decomposing tissues of pseudostem (Shukla, 2010). Weevils breed throughout the year and adults are strong fliers and in this way move from one plant to another. Gravid females with their rostrum makes small slit on the outer epidermal layer of the leaf sheath down up to the air chamber, and insert their ovipositor and lay down creamy, cylindrical shaped egg singly in the air chamber (Shukla, 2010; Azam, *et al.*, 2010). With the increase of number of weevils on plants, the number of egg deposited on plants reduced, which indicates the existence

of any spacing pheromone, epideitic compound secreted by the species act as deterrent to conspecific females (Ranjith and Lalitha, 2001; Justin *et al.*, 2008).

Incubation period lasts for 3-5 days in summer and 5-8 days in winter (Dutt and Maiti, 1972). Grubs are creamy white in colour, soft bodied, apodous, having dark brown head with well sclerotized mandibles (Shukla, 2010; Azam *et al.*, 2010). Initially larvae feed on the tissues of succulent sheath and later bores in inner leaf sheath moving in horizontal or oblique directions towards the central trunk by extensively tunnelling (Shukla, 2010; Atwal and Dhaliwal, 2012). Larvae passes 5 instars in 26 days during summer and 68.1 days during the winter season (Dutt and Maiti, 1972), and measures 16.0-20.0 mm in length (Azam *et al.*, 2010). Full fed larvae enters pre pupal stage and construct cocoon by frass towards the periphery of the pseudostem, an exarate pupa pupates in this cocoon, which lasts for 20-24 days in summer and 37-44 days in winter (Azam *et al.*, 2010). Adults are robust, dark black to ferrugineous in colour measuring 17.5-19 mm in length (Azam *et al.*, 2010), and have a long life span of 90-100 days (Visalakshi *et al.*, 1989).

#### **2.4.3.6 Host plants**

*Odoiporus longicollis* is considered as the monophagous pest of *Musa* sp. This species is a key pest of banana and plantains, and particularly the highland banana i.e. 'Pome' type are preferable (Nahif *et al.*, 2003; Shukla, 2010). According to Anitha and Nair (2004) among the popular banana clones of Kerala, Nendran and Poovan are better suited to this species for population build up.

### **2.4.4 *Rhynchophorus* Herbst, 1795**

#### **2.4.4.1 Taxonomy**

The genus *Rhynchophorus* was erected by Herbst in 1795, and spelled the name in two different ways, "*Rhynchophorus*" in plates and "*Rynchophorus*" in the text. Illiger (1798) used the term *Rhynchophorus* and since then many authors used the same term. The genus name *Rhynchophorus* is now correct and valid name as per ICZN Articles 23(b) and 32(b). Herbst (1795) included 22 species in the genus,

out of which only three species are now valid viz., *palmarum*, *ferrugineus*, and *cruentatus*, but Herbst has not designated the type for the genus.

Thunberg (1797) on the basis of large, long rostrum and peculiar antennae, raised the genus *Cordyle* after two years of Herbst (1795), including five species in it. Thunberg (1797) described three of the present day valid species viz., *palmarum*, *barbirostris* and *sexmaculatus* where the later two species were new, but Thunberg too have not designated any type specimen. Fabricius (1801a) transferred three species of *Rhynchophorus*; viz., *palmarum*, *cruentatus*, and *ferrugineus* to *Calandra* along with two new described species *phoenicis* and *schach* under *Calandra*. Latreille (1804) while redescribing the genus *Curculio* included *palmarum* in it. Illiger (1805) later rearranged the genus and placed *cruentatus*, *ferrugineus*, *palmarum*, and *schach* in the genus *Calandra*.

Schoenherr (1826) rearranged the genus *Rhynchophorus* and merged *Curculio* Linnaeus (1758); *Cordyle* Thunberg (1797); and *Calandra* Fabricius, (1801a) as congeneric to *Rhynchophorus* Herbst, including the species *ferrugineus*, *phoenicis*, *palmarum*, and *schach* in the genus. Schoenherr (1826) also designated *Curculio palmarum* Linnaeus, 1758 as the “type species” for *Rhynchophorus* Herbst, 1795. Gyllenhal (1838) recognized *Rhynchophorus palmarum* (Linnaeus) as the type species, rearranged and redescribed the generic characters, and included the species viz., *phoenicis*, *schach*, *ferrugineus*, *vulneratus*, and *barbirostris* in the genus. Gyllenhal (1838) was the first to clarify the differences among the genera *Rhynchophorus*, *Curculio* and *Calandra*. Castelnau (1840) included *Rhynchophorus* as a subdivision of *Calandra* and mentioned *palmarum* in the genus. But, Boheman (1845) followed the same pattern as of Gyllenhal (1838), rearranged and described the species within the genus, and included *phoenicis*, *schach*, *pascha*, *zimmermanni*, *barbirostris* in the genus, of which *pascha* and *zimmermanni* were new species described by Boheman (1845) and Fahraeus (1845) respectively. Lacordaire (1866) mentioned the generic characters, included a discussion of *zimmermanni* and *palmarum*, and placed the genus *Rhynchophorus* under *Calandrides*. Horn (1873) and LeConte (1874) placed *Rhynchophorus* under

the tribe Rhynchophorini, subfamily Calandridae, while later LeConte and Horn (1874) changed the spelling to Calandrinae.

Chevrolat (1883) while describing species of the tribe Calandrides, gave a very good arrangement of the species in *Rhynchophorus* according to their spatial distribution and divided them in five groups: Indian species group- *ferrugineus*, *indostanus*, *pascha*, *signaticollis*, *lobatus*; Oceanic species group- *bilineatus*, *rubrocintus*; African species group *phoenicis*; South American and West Indies group- *cycadis*, *palmarum*, *depressus*, *lanuginosus*; Central American species group- *cruentatus*, *barbirostris*. Of which the species *lanuginosus* and *depressus*, were described in 1880; and *indostanus*, *signaticollis*, *rubrocintus* were described in 1883 as new species. Chevrolat (1883) raised a new genus *Dynamis* for four species, *borassi*, *germari*, *politus*, and *nitidulus* which was excluded from *Rhynchophorus*, but no type was designated for *Dynamis*. Champion (1910a) while discussing the tribe Rhynchophora, included *palmarum* in the genus *Rhynchophorus*, under the group Rhynchophorina, of the aforesaid tribe. Blatchley and Leng (1916) included *cruentatus* and *palmarum* in the genus, and placed it in subfamily Calandrinae. While reviewing the history of the genera *Rhynchophorus*, *Calendra*, *Sphenophorus*, and *Sitophilus*, Pierce (1925) designated *Rhynchophorus palmarum* (Linnaeus) as the type species of the genus *Cordyle* Thunberg.

Leng (1920) in the "Catalogue of the Coleoptera of America, North of Mexico" placed the genus *Rhynchophorus* in the tribe Rhynchophorini, under the subfamily Calandrinae, while in 1927 supplement, he changed it to Rhynchophoridae. Csiki (1936) in Junk's "Coleopterorum catalogus" discussed Rhynchophorinae and Cossoninae, and placed *Rhynchophorus* in the subtribe Rhynchophori of the tribe Rhynchophorini, under the subfamily Rhynchophorinae, and also included 18 species under the concerned genus with detailed bibliography. Blackwelder (1947) followed the same pattern as of Csiki (1936) in the "Checklist of the Coleopterous insects of Mexico, Central America, the West Indies, and South America" and placed *Rhynchophorus* under the tribe Rhynchophini of subfamily Rhynchophorinae.

Wattanapongsiri (1966) done extensive work on the morphology and taxonomy of the three genera (*Rhynchophorus*, *Dynamis*, and *Rhynchodynamis*), and provided key to species, for both adults and larval stage of all the three genera. Wattanapongsiri (1966) rearranged and redescribed 10 species under the genus *Rhynchophorus*, of which, *distinctus* and *ritcheri* were the two newly described species. Hallett *et al.*, (2004) synonymized *vulneratus* (Panzer) with the *Rhynchophorus ferrugineus* (Olivier).

The genus is characterized by: colour varies from ferrugineous or reddish-brown to dark black; rostrum cylindrical, glabrous in female; male with rostral setae on dorsum, all species bears rostral setae, except *cruentatus* and sometimes *quadrangulus*; gular suture always distinctly visible, may be narrow or wide; antennal scape mainly half of the length of rostrum; elytron, with five or six deep striae and four or three more at sides are represented by traces; scutellum long and broad at base, extended apically; phallobase of male genitalia have a width to length ratio of 1:2, except *distinctus* (1:1) and *ritcheri* (1:4). Female pygidium are more pointed, and vaginal base have a width to length ratio of 1: 3; spermatheca distally truncated (Wattanapongsiri, 1966).

#### **2.4.4.2 Species**

Presently nine valid and known species are there in this genus, of which *palmarum* (Linnaeus, 1758) was the first one, described under *Curculio* but later transferred to *Rhynchophorus* by Herbst (1795). From 1758 to 1800, only three species had been described while from 1801 to 1900, four species; while in 1966, two species had been described. After Wattanapongsiri (1966), very little work had been carried out on taxonomy of *Rhynchophorus* and no species had been described.

Wattanapongsiri and Fabricius, contributed two species of each, followed by Montrouzier, Olivier, Ritsema, Linnaeus, and Quedenfeldt with one species each.

#### **2.4.4.3 Distribution**

*Rhynchophorus* distributed worldwide, wherever palms cultivated (Wattanapongsiri, 1966). Out of nine species, four species viz., *ferrugineus*, *lobatus*, *distinctus*, and *biliniatus* had been reported from Oriental region, three species viz., *phoenicis*, *quadrangulus*, and *ritcheri* from Ethiopian region, one species (*cruentatus*) from Neotropical region, while *palmarum*, had been reported from both Neotropical and Nearctic region.

#### **2.4.4.4 Economic importance**

Wattanapongsiri (1966) reported that seven species of the *Rhynchophorus* were major pests of coconut and other palms throughout the world. *Rhynchophorus ferrugineus*, *R. distinctus*, and *R. lobatus* had reported from Oriental region infesting the coconut and other palms (Wattanapongsiri, 1966). Similarly *R. phoenicis* and *R. quadrangulus* reported from Africa; *R. palmarum* and *R. ritcheri* from USA, Mexico and South America; and *R. bilineatus* from Pacific Islands, attacking palms and other crops. These weevils attack healthy as well as damaged crops, utilizing the hole made by other organism or wound made by humans to lay the eggs (Wattanapongsiri, 1966). The grub is responsible for damaging the palms, as they bore inside the palm after hatching and reach the heart of the cabbage, and once they reach the crown portion, it results in death of the palms (Ghosh, 1940; Jose *et al*, 2008). Jose *et al*. (2008) reported that 12-32 percent yield loss to coconut palms occurs by infestation of red palm weevil. Wattanapongsiri (1966) recorded that apart from palms these weevils also attack sugarcane, cacao, papaya, pineapple and banana.

#### **2.4.4.5 Biology**

Biology of red palm weevil was first studied by Banks (1906) from Philippines, while Ghosh (1912) first studied biology of the species from India and reported, species requires 48-82 days for completing the life cycle. Detailed biology of red palm weevil (RPW) has studied in field as well as laboratory conditions by many researchers. Adult female of RPW lay eggs singly in petiole tissues by



ovipositor (Lefroy, 1906). Adult female excavate cavity with the help of mandibles and lay down oval whitish eggs singly or in clusters in these cavities, and seal them with the help of gelatinous substances secreted by them (Menon and Pandalai, 1960). Incubation period lasts from three to several days depending upon the environmental conditions (Murphy and Briscoe, 1999).

Larvae are creamy white, apodous and pyriform, strong brown head, with sclerotized hard mandibles and body comprised of 13 segments. Depending upon the diet and prevailing temperature, larval development ranges 24 to 124 days (Butani, 1975; Salama *et al.*, 2009) passing 4-13 larval instars (Nirula, 1956; Martin and Cabello, 2006; Dembilio and Jacas, 2011). Jaya *et al.* (2000) reported seven larval instars when reared on sugarcane, while Dembilio (2012) reported 13 larval instars of RPW studied at Valencia (Spain). The young emerged larvae feeds on the palm tissues and produces frass (chewed up plant fibre) forming irregular tunnels (Murphy and Briscoe, 1999). With each instar larvae increases in size and tunnels formed by them, later filled up with the frass and plant exudates (Murphy and Briscoe, 1999). Larvae of later instars move towards the periphery of the trunk or crown and grub changes into a pre-pupa for three days, spin spinning a cocoon of frass around it and pupates inside the cocoon (Viado and Bigornia, 1949; Atwal and Dhaliwal, 2012). Pupal period lasts for about 14 days and have an average size of 80×35 mm (Murphy and Briscoe, 1999). Newly emerged adults are large and varies in colouration (Hallett *et al.*, 2004). Adults of RPW have well developed wings and are capable to fly for long distance (Lepesme, 1947; Wattanapongsiri, 1966). Adults after emergence remain in the same palm until the meristem is completely consumed, which results in death of plants and subsequently weevil leaves the plant for new palm hosts.

According to Gunawardena and Bandarage (1995) males of RPW emits aggregation pheromone which alarms or informs other weevils for food location. On severe infestation, the stem or crown sometimes break off the tree (Abraham *et al.*, 1998). Many nematodes and phoretic mites has been reported of having association with RPW (Kanzaki *et al.*, 2008; Al-Dhafar, 2012).

#### 2.4.4.6 Host plants

Red palm weevil (*Rhynchophorus ferrugineus*) is a serious pest of coconut (*Cocos nucifera* L.), date (*Phoenix dactylifera* L.) and several cultivated members of family Arecaceae (Abraham *et al.*, 1998). Ghosh (1912) reported this species attack Plamyra or Toddy plam (*Borassus flabellifer* L.) from India. Other hosts for this pest are *Phoenix dactylifera* L. (date palm), *P. sylvestris* (L.), *P. canariensis* (Hort.), *Elaeis guineensis* L. (oil palm), *Corypha gebanga* Blume (buri palm), *Corypha elata* Roxb. (Bagatai), *Roystonea regia* (Kunth) (Royal palm), *Areca catechu* L. (Arecanut), *Arenga pinnata* (Wurmb) (Arenga palm), *Caryota maxima* Blume (Fishtail palm), *Caryota urens* L. (Fishtail palm), *Livistona decipiens* Becc. (cabbage-tree palm), *Metroxylon sagu* Rottb. (sago palm), *Sabal umbraculifera* (Jacq.) (Dominican palm), *Trachycarpus fortunei* H. (windmill palm), *Washingtonia* sp., (Leefmans, 1920; Viado and Bigornia, 1949; Esteban-Duran *et al.*, 1998). Longo *et al.* (2011) reported *Chamaerops humilis* L. (European fan palm), *Brahea armata* (S. Watson) (Blue hesper palm), *Howea forsteriana* (Moore and Muell.) (Thatch Palm), *Jubaea chilensis* (Chilean wine palm) as new hosts of red palm weevil.

#### 2.4.5 *Sitophilus* Schoenherr, 1838

##### 2.4.5.1 Taxonomy

This genus is considered as an Old World genus that constitutes widespread or nearly cosmopolitan infesting seeds, grains, and cereals. Linnaeus, along with *Curculio palmarum*, also described, *granarius*, in the genus *Curculio* in his 12<sup>th</sup> Latin edition of the “Systema Naturae”. Clairville and Schellenberg (1798) established the genus *Calendra* (= *Calandra*) (where they spelled it with “e” in the original text, whereas with “a” in the plates) and included the granary weevil and other species, in this genus. This particular typographical error was discussed in many of the authors (Cotton, 1924; Muller, 1927; Andersen, 1938). Herbst (1795) included the grainary weevil in his new genus, *Rhynchophorus*, while Thunberg (1815) described the same species in his new genus, *Cordyle*. Finally Schoenherr (1838) proposed the genus *Sitophilus* for these stored grain pests, replacing the

generic name *Calendra* (= *Calandra*). The genus *Calendra* (= *Calandra*) was also rejected by International Commission on Zoological Nomenclature (ICZN) in 1959, where *Sitophilus* was declared as the valid generic name (Riley and Melville, 1959).

Riley and Melville (1959) reported that the rice weevil, *S. oryzae* was first described as *Curculio oryzae* by Linnaeus, in 1763 from the rice collected from a shipment in Surinam, which was changed to *Calandra oryzae* in 1801a, by Fabricius. Schoenherr (1838) proposed the new name as *Sitophilus oryzae* in the new genus.

Motschulsky (1855), described the maize weevil as, *Sitophilus oryzae* var. *zeamais* collected from corn plants in Cayenne. This species have great morphological similarities with the rice weevil and that's why they were confused in identification in past, or considered as the morphs (Kuschel, 1961; Plarre, 2010). The confusion was more certain as, the smaller race of the rice weevil (present day rice weevil, *Sitophilus oryzae*) was considered as the *Calandra sasakii*, whereas the larger race, the present day maize weevil, *Sitophilus zeamais* was called as *Calandra oryzae* (Kuschel, 1961; Frey, 1962). Thus these two weevils were termed as the “sister species” or “sibling species” representing their uttermost similarities (Plarre, 2010). Kuschel (1961) revised the synonyms of *Sitophilus oryzae* complex and taken sibling species as separate species, providing keys for these two species.

In Junk's Coleopterum Catalogus, Csiki (1936) revised the genus reporting 17 species in it, while Delobel and Grenier (1993) included 14 species in the genus. Zherikhin (2000) proposed a new fossil species *Sitophilus punctatissimus* dated in lower Miocene time.

The typical characters of this genus includes: rostrum straight, at base in continuation with head; eyes are visible in dorsum; total length always less than 5mm; large uncus, distinct subapical tooth at inner angle of tibia (Anderson, 2003; Ayri, 2013).

#### **2.4.5.2 Species**

At present there are 16 species described under this genus, with 15 extant and one extinct species. In these, *granarius* (Linnaeus, 1758) which was firstly described under the genus *Curculio*. Marshall described four species viz., *conicollis*, *erosa*, *glandium*, and *vateriae*; Linnaeus and Pascoe had contributed 2 species each; while Casey, Gyllenhal, Herbst, Huchstetter, Motschulsky, Thunberg, Wiedemann, and Zherikhin contributed 1 species each, including the fossil species.

From 1758 to 1800, only three species were described, while major work was done during 19<sup>th</sup> century i.e. from 1801 to 1900, eight species had been described, while in between 1901 to 2000, only five species had been described.

#### **2.4.5.3 Distribution**

The genus is considered to be, nearly cosmopolitan. The three species viz., *oryzae*, *zeamais*, and *granarius* are considered as the cosmopolitan species (Csiki, 1936; Zimmerman, 1968b). The tamarind weevil *Sitophilus linearis* also widely distributed species, reported from Jamaica (Ritchie, 1916), India (Fletcher, 1916), United States of America, Mexico, including the Ethiopian region, New World and Australia (Cotton, 1920; Csiki, 1936; Vaurie, 1983; Zimmerman, 1993). The species *rugicollis* is reported from New World (Csiki, 1936; Vaurie, 1983) while *rugosus* is reported from the Ethiopian region. Eight species, viz., *conicollis*, *cribrosus*, *erosa*, *glandium*, *quadrinotatus*, *rugosulus*, *sculpturatus*, and *vateriae* were reported to be distributed in Oriental region and sometimes in Palearctic region (Csiki, 1936; Lobl and Smetana, 2011); while one species, *gotschi*, have reported only from Palearctic region along with the three cosmopolitan species.

#### **2.4.5.4 Economic importance**

The species constituting under genus are one of the notorious pests of stored grains, cereals, and seeds (Zimmerman, 1968b). Three cosmopolitan species viz., rice weevil, (*Sitophilus oryzae* (Linnaeus)), granary weevil (*S. granarius* (Linnaeus)), and maize weevil (*S. zeamais* (Motschulsky)) are serious pest of cereal grains and products (Kuschel, 1961; Zimmerman, 1968b; Koehler, 1994) and larvae

complete its development inside a seed kernel or equivalent products (Koehler, 1994). Thakur (2000) reported that the attack of acorn weevil, *S. glandium* (Marshall) on the acorn of various oak trees from eastern and western Himalaya. The tamarind pod borer, *S. linearis* (Herbst), attack the seed of tamarind, of which grubs bore the seeds or beans and reduce them to powder (Cotton, 1920).

#### **2.4.5.5 Biology**

The rice weevil are black to ferruginous in colour and measure less than 3 mm in length (Kuschel, 1961; Ayri, 2013). Adult female make a cavity on grains with the help of mandibles and lay down creamy eggs singly in each cavity, sealing the cavity with the help of gelatinous secretion from ovipositor (Lathrop, 1914; Koehler, 1994). Female can lay as many as 400 eggs (Atwal and Dhaliwal, 2012), on an average of 4 eggs per day. The full life cycle can complete in 26-34 days depending upon the environmental conditions whereas in cooler climate life cycle extends to 45 days or more (Koehler, 1994). Incubation period lasts for 6-8 days and young larvae after hatching bores directly into the grain (Koehler, 1994), where they feed on grain kernel, hollowing it out while feeding (Davis, 2011).

Larval period lasts for 18 days on an average passing four larval instars (Richards, 1947; Soderstrom, 1960), and pupation takes place within the grains (Zimmerman, 1968a; Koehler, 1994). Initially pupa is dirty white, later on becomes dark brown and lasts for 6-8 days (Atwal and Dhaliwal, 2012).

The new adult will remain in the seed for 3-4 days for hardening of cuticle (Koehler, 1994), on emergence, the adult weevil cuts out the grain and lives for about 3-6 months (Cotton, 1920). At least 3-4 generations are completed in a year.

#### **2.4.5.6 Host plants**

The rice weevil, *Sitophilus oryzae* and the granary weevil, *Sitophilus granarius* are serious pests of stored cereals and grains (Atwal and Dhaliwal, 2012). Both species are similar in size and appearance, and found together feeding on wheat, corn, oats, rye, barley, sorghum, buckwheat, dried beans, cashew nuts, wild bird seed, and cereal products, especially macaroni (Dobie and Kilminster, 1978;

Schwartz and Burkholder, 1991; Koehler, 1994). Egbon and Ayertey (2013) reported the rice weevil from Ghana feeding on Cowpea.

*Materials and*  
*Methods*

### 3. MATERIALS AND METHODS

#### 3.1 MATERIALS

The present study on the economically important pests *viz.*, *Cosmopolites sordidus*, *Diocalandra frumenti*, *Odoiporus longicollis*, *Rhynchophorus ferrugineus*, and *Sitophilus oryzae*, were based on the specimens from the following sources.

##### **3.1.1 Collection in the Malabar Insect Repository (MIR), College of Agriculture (CoA), Kerala Agricultural University, Padannakkad, Kerala**

Base material for the study was from the personal collections of B. Ramesha which are authentically identified and they are sorted from the unidentified collections of MIR, Department of Agricultural Entomology, CoA, Padannakkad. In addition, the specimens of *Rhynchophorus ferrugineus* were also collected from laboratory of Indian Council of Agricultural Research (ICAR)-Central Plantation Crop Research Institute (CPCRI), Regional station, Kayamkulam, Kerala.

##### **3.1.2 Personal collections**

Periodical survey and collection trips were organized in different agroecosystems of Kerala to collect the weevils. Commercially available pheromone traps were installed for collecting banana rhizome weevil (*C. sordidus*), banana pseudostem weevil (*O. longicollis*) and red palm weevil (*R. ferrugineus*) in five agroclimatic zones of Kerala *viz.*, Northern zone, Regional Agricultural Research Station, Pilicode (RARS, Pilicode); High range (RARS, Ambalavayal); Central Zone (RARS, Pattambi); Problem zone (RARS, Kumarakom) and Southern zone (RARS, Vellayani). Traps were also installed in the fields of Banana Research Station, Kannara and ORARS (Onattukara Regional Agricultural Research Station), Kayamkulam. The genera *Diocalandra* and *Sitophilus* were collected from field and storage respectively from these agroclimatic zones. Weevils had also been



collected from the Instructional farm of CoA, Padannakkad from banana and coconut.

## 3.2 METHODS

### 3.2.1 Collection, killing, drying, mounting, and preservation

The live insects collected from different regions were killed using ethyl acetate and mounted on triangular cards or pinned on the entomological pins suiting the requirements. The mounted specimens were labelled and dried in hot air oven, and thereafter stored in insect boxes for later examination.

### 3.2.2 Designing bucket traps with pheromone

Buckets of 9 l capacity with lid and of uniform size, shape and colour were taken for trapping red palm weevil, banana pseudostem weevil, and rhizome weevil. Buckets were provided with square window holes of size 2.5' × 2.5' to facilitate entry of weevils inside the traps. Gunny bag was plastered using fevicol marine on the surface of buckets. The pheromones of respective weevils were hung by the thread with lid by making a hole on it. Chemical insecticide (Malathion @ 2ml trap<sup>-1</sup>) along with the food bait were provided in the trap. The trapped insects were collected on weekly basis and pinned with entomological pins.

### 3.2.3 Setting of bucket traps

At every station three traps for each of three insects *viz.* *C. sordidus*, *O. longicollis*, and *R. ferrugineus* were installed. Thus a total of 63 traps were installed at all seven stations, 9 traps at each station (three traps for each insect at every station).

### 3.2.4 Method of study

The family, subfamily and generic level classification proposed by Thompson (1992), Zimmerman (1993) and Alonzo-Zarazaga and Lyal (1999) was followed. The preserved and identified specimens were examined, these specimens were run through the keys (Chevrolat, 1885; Kuschel, 1961; Wattanapongsiri, 1966; Zimmerman, 1968c; Morimoto, 1978; Hallet *et al.*, 2004) and specimens were

identified, and further confirmed with the identified specimens in MIR, CoA, Padannakkad. Further the identified specimens apparently resembling were pooled together according to morphological variations, and thus morphologically different groups were identified within the species. An accession number was allotted to every population (group).

The general morphological characters and genitalia were studied with the help of Leica M80 stereo zoom microscope. Photographs of habitus and genitalia were captured, using software Leica Application Suite (LAS) V4.4. Photographs of habitus of *Rhynchophorus ferrugineus* and *Odoiporus longicollis* taken by Nikon L310 digital camera. The total length given in the description is excluding the rostrum, and standard length from anterior margin of pronotum to the end of pygidium. The illustrations were made by using tube fitted with a camera lucida and the scale of magnification are provided in the illustrations. For male and female genitalia study, terminologies of Wattanapongsiri (1966), Zimmerman (1968b), Supare *et al.*, (1990), Thompson (1992), Poorani and Ramamuthy (1997), Wanat (2007) and Davis (2009) were followed.

### **3.2.5 Processing of different parts for morphological studies**

All the major taxonomic characters except the genitalia, were studied in intact specimens. For the study of genitalia, specimens were processed following the method of Supare *et al.*, (1990) with slight modifications and the process mainly involved the following steps:

- i. Relaxing the specimen in a relaxing box containing relaxing fluid for 10-15 minutes.
- ii. Detaching the venter by inserting a pin between metasternum and its intercoxal process with a gentle jerk.
- iii. Boiling in 10% KOH for 15-20 minutes at 90-95<sup>0</sup> C for softening the tissues using spirit lamp.
- iv. Dissecting the genitalia and cleaning the associated muscles and other tissues.

- v. Washing the dissected genitalia first with distilled water and dehydrated in 50% ethanol containing a few drops of acetic acid to neutralize excess potassium hydroxide.
- vi. Staining the genitalia with chlorazol black in 70% ethanol.
- vii. Excess stain was removed with 70% ethanol and genitalia were transferred to 50% ethanol.
- viii. Storing the genitalia after study, in microvials containing small drop of glycerol and then pinning on the respective specimens. Genitalia of *Rhynchophorus ferrugineus* stored in PCR tubes with a small drop of glycerol.
- ix. Replacing the venter on to the dissected specimens.

## *Results*

## 4. RESULTS

### 4.1 KEY TO SPECIES OF RHYNCHOPHORINAE OF KERALA

Eight species of subfamily Rhynchoporinae found in Kerala, infesting various crops (Visalakshi *et al.*, 1989; Nair and Visalakshi, 1999; Padmanaphan *et al.*, 2001; Azam *et al.*, 2010; Atwal and Dhaliwal, 2012). A key to the all eight species under the subfamily Rhynchophorinae of Kerala; *Cosmopolites sordidus* (Germar), *Diocalandra frument* (Fabricius), *Metaprodiocetes haematicus* (Chevrolat), *Odoiporus longicollis* (Olivier), *Rhynchophorus ferrugineus* (Olivier), *Sitophilus linearis* (Herbst), *Sitophilus oryzae* (Linnaeus), *Sitophilus zeamais* Motschulsky is given below:

#### 4.1.1.1 Key to species of Rhynchophorinae of Kerala:

1. Size small, total length less than 5 mm .....2
- Size small, total length more than 5 mm .....3
2. Rostrum straight in lateral view with base continuous to head; pygidium dorsally bears a median sulcus.....6
- Head and rostrum not on same plane; head separated from rostrum by weak transverse depression at interocular region; pygidium devoid any median sulcus.....*Diocalandra frument* (Fabricius)
3. Size smaller to larger, total length less than 25 mm; scutellum, not elongated apically; rostrum glabrous in case of both sexes.....4
- Size larger, total length always more than 25 mm; scutellum, apically elongated; female with glabrous rostrum, males with thick erect setae apically or subapically on rostrum...*Rhynchophorus ferrugineus* (Olivier)
4. Elytra with four black spots, two-two spots on each lateral edges of elytron.....*Metaprodiocetes haematicus* (Chevrolat)
- Elytra does not have any spots, rather uniform in colouration.....5
5. Body oval shaped; antennomeres with sharp anterior edges; pronotum uniformly punctated on dorsum, hind leg extending way beyond the abdomen.....*Cosmopolites sordidus* (Germar)

- Body flattened and elongated; antennomeres with rounded anterior edges; pronotum laterally punctured with smooth disc and two transverse rows of punctures; hind leg not extending much beyond the abdomen.....  
.....*Odoiporus longicollis* (Olivier)
- 6. Dorsal part of scrobe contiguous to eye; microsetae on the dorsal margin of eye hardly project above margins of punctures.....*Sitophilus linearis* (Herbst)
- Dorsal part of scrobe separated from eye by a coarsely punctated area; erect, clavate setae projecting beyond the punctures.....7
- 7. Total length, usually less than 3 mm; dorsum of aedeagus evenly convex, without two longitudinal impressions; microsculptures on pronotum and elytron are more alutaceous; dorsal surface with dull colouration.....*Sitophilus oryzae* (Linnaeus)
- Total length, usually more than 3 mm; dorsum of aedeagus flattened, with two longitudinal impressions; microsculptures on pronotum and elytron are less alutaceous; dorsal surface shiny.....*Sitophilus zeamais* Motschulsky

## 4.2 REDESCRIPTION OF ECONOMICALLY IMPORTANT PESTS OF SUBFAMILY RHYNCHOPHORINE

### 4.2.1 *Cosmopolites sordidus* (Germar)

(Plates 1, 2, 3, 4, 5, 6, 7)

*Synonyms:* *Calandra sordida* Germar, 1824: 299; Gyllenhal in Schoenherr, 1838: 925 (*Sphenophorus*); Chevrolat, 1885b: 289

*Sphenophorus striatus* Fahraeus in Schoenherr, 1845: 251; Chevrolat, 1882a: 140

*Sphenophorus cribricollis* Walker, 1859: 218; Marshall, 1930: 576

*Sphenophorus pygidialis* Chevrolat, 1880c: 198; Vaurie, 1978: 5

#### 4.2.1.1 *Digonistic characters:*

Oval shaped body; elytral striae well impressed, striae fade up in middle, giving vittae appearance; elytral intervals raised in between, distinctly polished, bare of punctures; pronotum with central smooth region; hind legs extending beyond pygidium.

#### 4.2.1.2 *Description:*

*General colour* shiny black to ferrugineous (Plate 5, A, B, C). *Head* punctate,  $3.8\times$  as broad as long, dorsum partially covered with eyes,  $0.1\times$  as long as and  $1.7\times$  as broad as rostrum. *Eyes* well visible ventrally than dorsally, moderately flat, posteriorly approximating,  $3.25\times$  as long as broad. *Rostrum* basally broad, dilated upto antennal insertion, rounded transversely,  $0.8\times$  as long as head and pronotum combined,  $4.2\times$  as long as broad basally; base  $1.46\times$  as broad as apex, shiny, finely impunctate from apex to middle, with coarse punctations from scrobe to base, with deep depression between eyes. *Scrobe* lateroventral,  $4\times$  as long as broad, dorsally enclosed, laterally concave (Plate 1, A, B). *Antennae* inserted  $0.23\times$  length from base of rostrum; scape clavate, shiny, impunctate,  $0.8\times$  as long as funicle and club combined,  $5.63\times$  as long as broad; funicle with six antennomeres; all antennomeres nearly conical, with sharp anterior edges, II antennomere,  $1.43\times$ ,  $1.7\times$ , and  $1.5\times$  as

long as I, III, and VI respectively, 2.0× as long as IV and V; VI antennomere, 1.2× as broad as I, II, III and V, 1.3× as broad as IV; basally 0.61× club glabrous, 1.50× as long as broad (Plate 1, C).

*Pronotum* coarsely punctate, with semi-rounded edges, dorsally flattened, 1.27× as long as broad, base 1.85× as broad as apex, uniformly punctate dorsally and ventrally, punctures more broad medially than laterally, narrow with smooth surface centrally (Plate 1, D). *Scutellum*, subquadrate, 0.8× as long as broad, with slight humeral angle.

*Elytra* punctatostriate, curved apically covering back of abdomen, apex subrounded, partially exposing pygidium; 2.91× as long as broad; basally 1.15× and 2.16× as broad as middle and apex respectively; striae 1.28× as broad as interstriae, with deep punctures, broad and continued, intervals with row of punctations; tenth stria abbreviated, not continued to base (Plate 4, A).

*Sternum* flattened, pro, meso and metasternum with pits; prosternum 3.17× as long as mesosternum and 1.32× as long as metasternum.

*Legs* densely punctate, procoxae globularly raised; pro and mesocoxae cylindrical, metacoxae oval; pro, meso and metacoxae separated by 0.2×, 0.58× and 2× of its breadth respectively; all femur laterally compressed, curved, distal end widened, ventrally inflated medially, emarginated beyond, bilobed apically, with groove; metafemur 1.12× and 1.23× as long as pro and mesofemur respectively, each reaching apex of pygidium (Plate 2, A, B, C). Tibia moderately straight, grooved beneath, provided with a row of setae on each side of groove; uncinata, uncus arising from middle of tibial apex, apically curved downwards, punctures aligned into pubescent striae; premucro in addition to uncus arising from outer apical margin, premucro more prominent in protibia; metatibia 1.13× and 1.3× as long as pro and mesotibia respectively (Plate 2, D, E, F). Tarsi pseudotetramerous, sclerotised extensions of tarsal segment IV distinctly separating bases of claws, I and II subequally broad, III tarsal segment 1.21× as broad as II tarsal segment, tarsi of all three legs subequal, IV tarsal segment 1.28×, 2.51× and 1.54× as long as I, II,



and III respectively;  $0.7\times$  and  $0.58\times$  as broad as II and III respectively; III tarsal segment triangular, first three tarsal segments with short silky hairs towards edges, apically with long reddish brown setae (Plate 3, A, B, C).

*Venter* shiny black, arcuate in profile, sternites uniformly punctate, sternite I,  $1.2\times$ ,  $1.31\times$ ,  $1.47\times$ , and  $1.82\times$  as long as II, III, IV and V, respectively (Plate 3, D).

*Female genitalia* (Plate 4, 6): Spermatheca 'C' shaped, sclerotized at distal arm, distal arm  $1.25\times$  as long as proximal arm, subcylindrical; angle between proximal and distal arms obtuse; ramus well differentiated from nodullus (Plate 4, C; Plate 6, D). Spiculum ventrale with shaft short, globous, truncated posteriorly, @ as long as basal plate, apical end truncated with few setaceous hairs (Plate 4, B; Plate 6, C).

*Male genitalia* (Plate 5, 6): Spiculum gastrale vestigial. Aedeagus arcuate medially, base  $1.13\times$  as broad as median lobe apically, slightly arcuate at base, length: breadth ratio 1.73:1; apophyses  $3.28\times$  as long as median lobe, spatulate, apically pointed; median lobe, short, sturdy, sclerotized, with slight ventral curve; endophallus with spicule at apical end. Tegmen with dorsal piece as broad as basal piece; parameres short, slender, apically pointed,  $1.43\times$  as long as base; manubrium elongate, slender,  $0.85\times$  as long as median lobe, uniformly thick, with broadened, subconical apex (Plate 5, C, D; Plate 6, A, B).

*Total length*:  $6.7-8.0\pm 0.18$  mm; *Standard length*:  $6.8-8.3\pm 0.2$  mm; *Breadth*:  $3.8-3.4\pm 0.14$  mm.

*Specimen examined*: 1♀, INDIA: Kerala: Kasargod: Padannakad, N  $12^{\circ} 15.423'$  E  $075^{\circ} 07.018'$ , 13 m, 29.ix.2014, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 2♀, 1♂, Wayanad: RARS Ambalavayal, N  $11^{\circ} 28.160'$  E  $076^{\circ} 29.553'$ , 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 5♀, 2♂, Wayanad: Narrikundu, N  $11^{\circ} 36.230'$  E  $076^{\circ} 12.906'$ , 02.iii.2015, 858 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 4♀, 4♂, Wayanad: Andoor, N  $11^{\circ} 35.226'$  E  $076^{\circ} 13.572'$ , 03.iii.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, 1♂, Wayanad: Andoor, N  $11^{\circ} 35.226'$  E  $076^{\circ} 13.572'$ , 21.ix.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, 1♂, Thrissur: BRS Kannara, N  $10^{\circ} 32.250'$

E 076°19.238', 12.vi.2015, 32 m. Coll. Arun Singh, Host *Musa × paradisiaca* L.; 1♀, 1♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 1♂, Alappuzha: ORARS Kayamkulam, N 09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh, Pheromone trap.

*Distribution:* American Samoa, Angola, Argentina, Australia, Bangladesh, Benin, Bermuda, Bolivia, Borneo, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Chile, China, Colombia, Comoros, Congo, Cook Island, Costa Rica, Cuba, Democratic Republic of Congo, Dominica, Ecuador, El Salvador, Fiji, French Guiana, Gabon, Ghana, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guyana, Haiti, Honduras, India, Indonesia, Israel, Jamaica, Japan, Kenya, Madagascar, Malawi, Malaysia, Maldives, Mali, Martinique, Mauritania, Mauritius, Mexico, Myanmar, New Caledonia, Nicaragua, Niger, Nigeria, Pakistan, Palau, Panama, Papua New Guinea, Peru, Philippines, Portugal, Puerto Rico, Republic of Korea, Reunion, Rwanda, Saint Helena, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Island, Somalia, South Africa, Spain, Sri Lanka, Suriname, Taiwan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Uganda, United States of America, Venezuela, Vietnam, Wallis and Futuna Islands. India: Andaman Islands, Assam, Bihar, Delhi, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal.

*Remarks:* Female have rostrum 1.09× longer than male. Elytral striae are broader at base, narrowed down length, striae II, IV, VI, VII, and VIII fade away in the mid length providing vittae appearance. All collected specimens were segregated into four different groups owing to their morphological variations. Groups were named in the alphabetical order as Group A, Group B, Group C and Group D. Above description is based on individuals of Group A. In total 26 specimens studied under this group. Differential distinguishing characters of three groups are compared in Table 1. Variations among these four groups discussed as follows;

#### **4.2.1.3 Variation I (Group B):**

*Remarks:* In total 18 specimens studied under this group. The characters of this group are similar with the group A in many extents, the variations among the groups are as follows;

*General colour* shiny ferrugineus (shiny black to ferrugineus in group A; shiny black with micropilose setae in Group C), ovate, coarsely punctate (Plate 7, A, B, C) (Group A, mainly black coloured with very few micropilose setae; Group C dull black, covered with mat of micropilose setae). *Tibia* ferrugineus (black in group A; black with micropilose setae in group C), covered with thick layer of micropilose setae, row of punctures running down the length (Group A with very few micropilose setae; Group C with micropilose setae arising from punctures, mat of micropilose setae present all along length). *Pygidium* not clearly visible on dorsum, covered with mat of setae (setae more dense in case of Group C).

*Genitalia:* No difference in the female and male genitalia are observed.

*Total length:* 6.4–8.2±0.23 mm; *Standard length:* 6.1–7.9±0.21 mm; *Breadth:* 2.0–3.3±0.19 mm.

*Specimens examined:* 1♀, INDIA: Kerala: Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 16.xi.2014, Coll. Arun Singh, *Musa × paradisiaca* L.; 1♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 2♀, 1♂, Wayanad: Narrikundu, N 11°36.230' E 076°12.906', 02.iii.2015, 858 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 1♀, 3♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 03.iii.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 3♀, 2♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 21.ix.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, 1♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Pheromone trap; 1♀, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.vi.2015, 32 m. Coll. Arun Singh, Host *Musa × paradisiaca* L.; 1♂, Alappuzha: ORARS Kayamkulam, N 09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh, Pheromone trap;

2♀, Trivandrum: RARS Vellayani, N 8° 26.44' E 076° 59.33' 28 m, 23.x.2014, Coll. Arun Singh, Host *Musa × paradisiaca* L.

#### 4.2.1.4 Variation II (Group C):

*Remarks:* In total 17 specimens studied under this group. The characters of this group are similar with the Group A in many extents, the variations among the two group are as follows;

*General colour* dull black, body ovate, 3.1× as long as broad, coarsely punctate, distinct tuft of micropilose nodules arising from the punctures (Plate 7, D, E, F) (Group A mainly black coloured with very few micropilose setae; Group B shiny ferruginous with few setae). *Rostrum* coarsely punctate, 0.84× as long as head and thorax combined, rounded transversely, micropilose arising at punctures (micropilose setae on punctures are confined to the basal region in Group A and B). *Elytra* same as that of group A, differs in thick tuft of small setae at apical end, apical two third area covered with mat of micropilose setae (micropilose not dense in Group A, B and D).

*Total length:* 6.9–7.26±0.14 mm; *Standard length:* 6.32–6.92±0.16; *Breadth:* 2.6–2.9±0.12.

*Specimens examined:* 2♀, 3♂, INDIA: Kerala: Wayanad: Narrikundu, N 11°36.230' E 076°12.906', 02.iii.2015, 858 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 4♀, 2♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 03.iii.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, 1♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 21.ix.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, 1♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.vi.2015, 32 m. Coll. Arun Singh, Host *Musa × paradisiaca* L.

#### 4.2.1.5 Variation III (Group D):

*Remarks:* In total seven specimens were studied under this group. Specimen very small as compared to other three groups. The characters of this group are similar with the Group A in most cases, the variations among the two group are as follows;

*General colour* shiny black, ovate body, coarsely punctate, prothoracic punctures devoid of setae (Plate 7, G, H, I).

*Total length:* 5.74–6.31±0.22 mm; *Standard length:* 5.32–5.67±0.18 mm; *Breadth:* 2.2–2.4±0.13 mm.

*Specimens examined:* 1♀, 1♂, INDIA: Kerala: Wayanad: Narrikundu, N 11°36.230' E 076°12.906', 02.iii.2015, 858 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 2♀, Wayanad: Andoor, N 11°35.226' E 076°13.572', 03.iii.2015, 879 m, Coll. Arun Singh, Host *Musa × paradisiaca* L.; 1♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.vi.2015, 32 m. Coll. Arun Singh, Host *Musa × paradisiaca* L.

#### 4.2.1.6 Sexual dimorphism

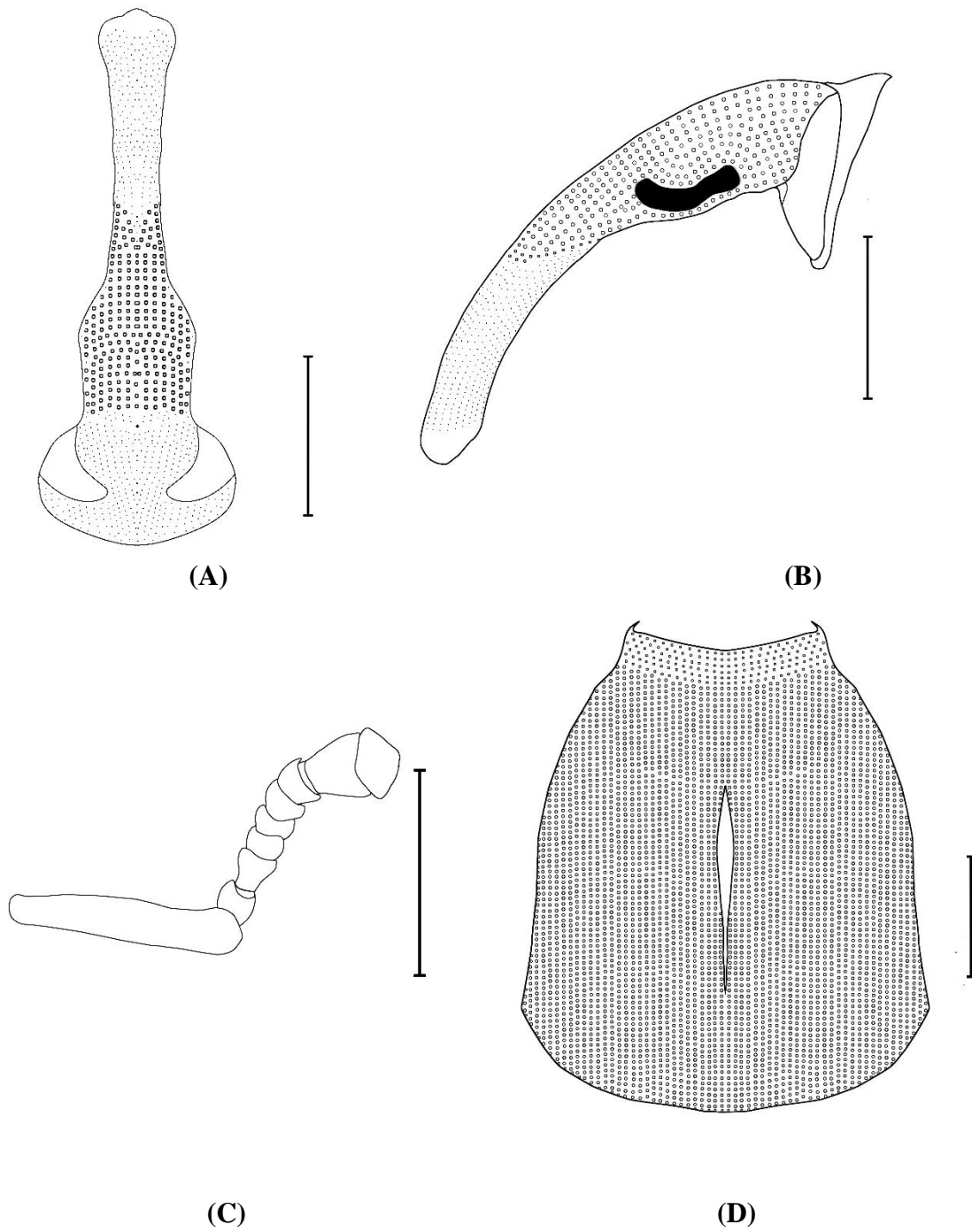
Sexes are difficult to separate in this species. Female have rostrum 1.09× longer than male. Antennal insertion is closer in case of female. Distance from scrobe to anterior margin of head in case of male 0.91× as long as in case of female. Apically rostrum more arcuate in case of female.

#### 4.2.1.7 Key to the species of *Cosmopolites* Chevrolat:

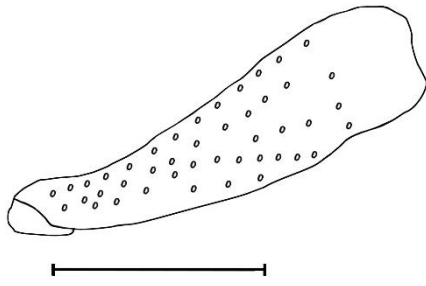
4. Elytral striae well impressed, striae fade up in middle, giving vittae appearance; elytral intervals raised in between, distinctly polished, bare of punctures; pronotum with central smooth region.....*C. sordidus* (Germar)
- Elytral striae feebly impressed, striae does not fade up in middle; elytral intervals uniform, not polished; pronotum evenly punctate and pruinose.....*C. pruinus* Heller

**Table 1. Comparison between differential distinguishing characters of four groups of *Cosmopolites sordidus* (Germar)**

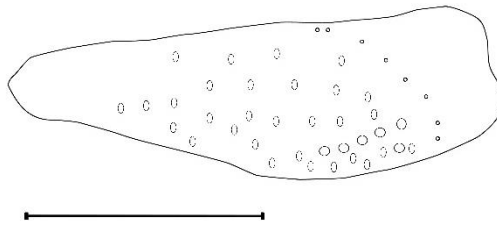
<b>Characters</b>	<b>Group A</b>	<b>Group B</b>	<b>Group C</b>	<b>Group D</b>
<i>General body colour</i>	Shiny black to slightly ferrugineus	Shiny ferrugineus	Dull black	Shiny black
<i>Micropilose setae</i>	Present all over the body	Very few micropilose setae arising from the punctures	Very few micropilose setae arising from the punctures	Prothoracic punctures devoid of Micropilose setae
<i>Size</i>	6.7-8.0±0.18 mm	6.4-8.2±0.23 mm	6.9-7.26±0.14 mm	5.74-6.31±0.2 mm



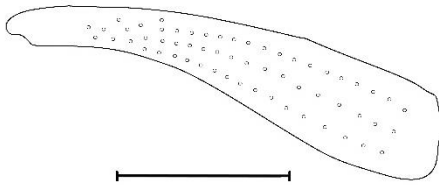
**Plate 1. *Cosmopolites sordidus*: (A) Rostrum, dorsal view; (B) Rostrum, lateral view; (C) Antenna; (D) Pronotum, dorsal view. Scale= 1mm**



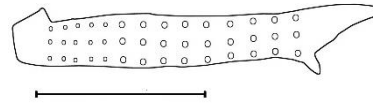
(A)



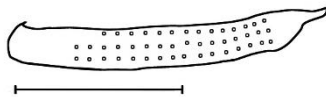
(B)



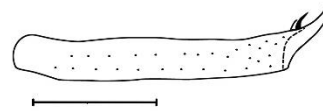
(C)



(D)



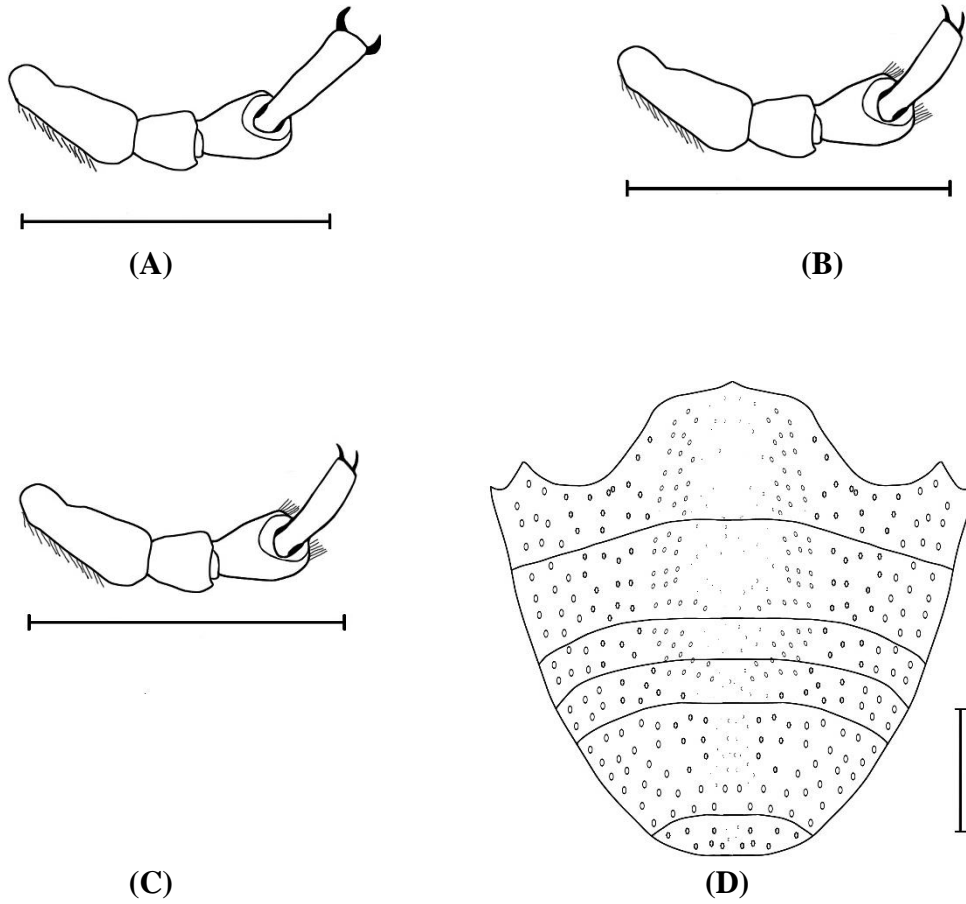
(E)



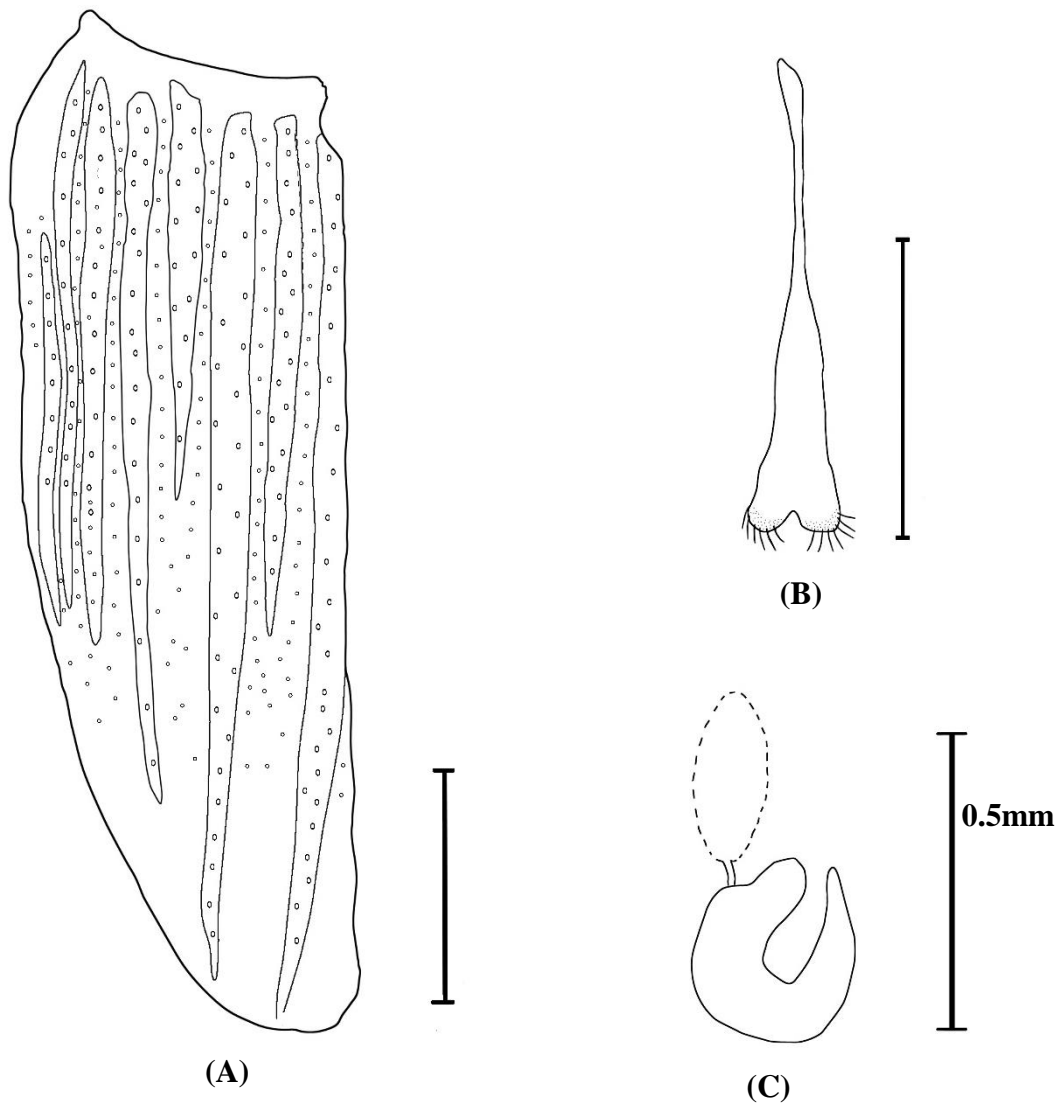
(F)

**Plate 2. *Cosmopolites sordidus*: (A) Profemur; (B) Mesofemur; (C) Metafemur; (D) Protibia; (E) Mesotibia; (F) Metatibia. Scale= 1mm**

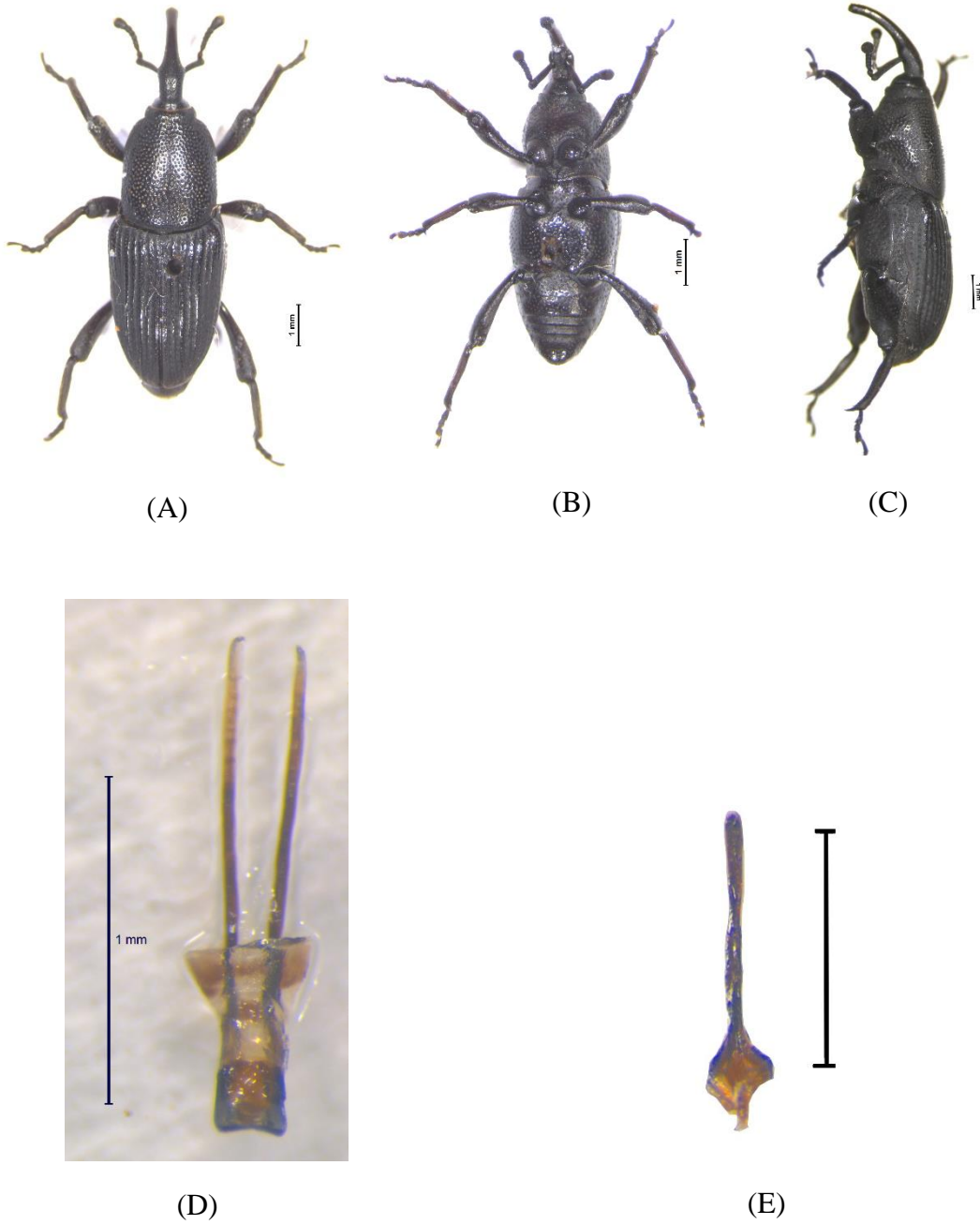




**Plate 3. *Cosmopolites sordidus*: (A) Protarsus; (B) Mesotarsus; (C) Metatarsus; (D) Venter. Scale= 1mm**



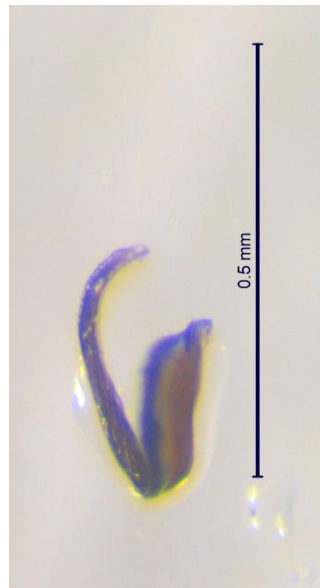
**Plate 4. *Cosmopolites sordidus*: (A) Elytron, dorsal view. Female genitalia; (B) Spiculum ventrale; (C) Spematheca. Scale= 1mm**



**Plate 5. *Cosmopolites sordidus*: (A) Habitus, dorsal; (B) Habitus, ventral; (C) Habitus, lateral; (D) Aedeagus, ventral; (E) Tegmen. Scale= 1mm**



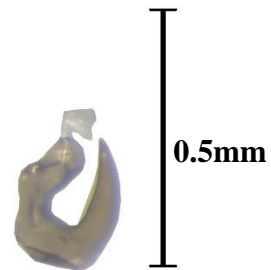
(A)



(B)



(C)



(D)

**Plate 6. *Cosmopolites sordidus*: (A) Aedeagus, lateral; (B) Spicule; (C) Spiculum ventrale; (D) Spermatheca. Scale= 1mm**



(A)



(B)



(C)



(D)



(E)



(F)



(G)



(H)



(I)

**Plate 7. *Cosmopolites sordidus*: Habitus of variations, dorsal view; ventral view and lateral view; (A)-(C) Group B; (D)-(F) Group C; (G)-(I) Group D.**

**Scale= 1mm**

#### 4.2.2 *Diocalandra frumenti* (Fabricius)

(Plates 8, 9, 10, 11, 12, 13)

*Synonyms:* *Calandra frumenti* Fabricius, 1801a: 438; Schoenherr, 1838: 982 (*Sitophilus*); Faust, 1894c: 353

*Sitophilus subfasciata* Boheman in Schoenherr, 1938: 971; Csiki, 1936: 76

*Sitophilus stigmaticollis* Gyllenhal in Schoenherr, 1838: 972; Kolbe, 1910: 46 (*Calandra*); Hustache, 1925: 519

*Sitophilus subsignata* Boheman in Schoenherr, 1838: 973; Csiki, 1936: 77

*Calandra punctigera* Pascoe, 1885: 305; Csiki, 1936: 77

*Diocalandra crucigera* Motschulsky, 1858: 69; Csiki, 1936: 77

*Diocalandra sechellarum* Kolbe, 1910: 46; Csiki, 1936: 77

##### 4.2.2.1 *Digonistic characters:*

Elongated body, Last segment of club (tomentose) 0.2×– 0.33× as long as club; head with fovea; head and rostrum not on same plane; head separated from rostrum by weak transverse depression at interocular region; third tarsal segment deeply bilobed. Rostrum apically more arcuate in case of female.

##### 4.2.2.2 *Description:*

*General colour* yellow to ferrugineus, with black markings on pronotum and elytron (Plate 13, A, B, C). *Head* dull black, coarsely punctate, with deep median sulcus; row of yellow, erect setae on either side; 3.8× as broad as long, dorsum partially covered with eyes, 0.1× as long as and 1.7× as broad as rostrum; frons separated from rostrum by weak transverse depression at interocular region. *Eyes* lateroventral, moderately flat, posteriorly approximating, 2.57× as long as broad. *Rostrum* black to ferrugineus, rounded transversely, more or less cylindrical, with deep depression between eyes; 0.78× as long as head and pronotum combined, 5.76× as long as broad basally; base 1.78× as broad as apex, moderately expanded in dorsal view, broadest at antennal insertion, 1.92× as broad as apex; dorsally and

laterally dense deep punctures near base; dorsal punctures arranged in two rows on either side, lined parallel to central shiny region, extending upto apex, punctures finer and shallower towards apex; row of punctures extending backward, meets at interocular region forming transverse depression; in lateral view one row of punctures arranged on each side. *Scrobe* lateroventral, 3.93× as long as broad, dorsally enclosed, laterally concave (Plate 8, A, B, C, D). *Antennae* inserted 0.11× length from base of rostrum; scape clavate, strongly curved, shiny, impunctate, with small setae, 0.61× as long as funicle and club combined, 3.9× as long as broad; funicle with six antennomeres; all antennomeres nearly conical, with sharp anterior edges, II antennomere 1.94× as long as I, III, IV and V, 1.6× as long as VI; antennomere V and VI subequally broad; V antennomere 1.67× as broad as I, II, III and IV; 0.60× club glabrous basally, 1.42× as long as broad, with circlet of setae, densely arranged on pubescent part (Plate 8, E).

*Pronotum* ferrugineus with triangular black spot, covering major area; coarsely punctate, with semi-rounded edges, basal part almost parallel-sided, narrowing down to a deep subapical constriction; dorsally flattened, 1.38× as long as broad, base 1.81× as broad as apex, uniformly punctate dorsally and ventrally, shallow punctures more broad at middle than lateral (Plate 8, F). *Scutellum*, subtriangular, 1.0× as long as broad.

*Elytra* punctatostriate, ferrugineus with edges black in colour, additional two spots at apical end and middle of elytron, rough in profile, nearly rectangular, gradually narrowing towards apex, clearly exposing pygidium; 3.7× as long as broad basally; base 1.11× and 1.76× as broad as middle and apex respectively; striae and intervals with broad quadrate punctures; alternate intervals more raised, bears shallow punctures with sparse row of erect clavate setae (Plate 9, A).

*Sternum* flattened. Pro, meso and metasternum with broad pits, metasternum centrally bears 0.37× long sulcus starts from posterior margin, fades away in middle; prosternum 2.46× and 1.73× as long as meso and metasternum respectively.

*Legs* densely punctate; procoxae raised; pro and mesocoxae cylindrical, metacoxae oval; pro, meso and metacoxae separated by 0.50×, 0.67× and 0.97× of breadth respectively; all femur laterally compressed, curved on outer side, distal end widened, bilobed apically, with groove, coarsely punctured, apically more dense in arrangement, clavate setae arising from puncture; meta femur 1.10× and 1.51× as long as pro and mesofemur respectively (Plate 9, A, B, C). Tibia moderately straight; uncinata, with sharp unculus arising from inner apical margin, apically curved downwards; along with unculus premucro arising from outer apical margin; punctures aligned into striae, arranged in four to five rows; meta tibia 1.07× and 1.16× as long as pro and mesotibia respectively, (Plate 9, E, F, G). Tarsi four segmented; tarsal segment III bilobed, matted with fine setae ventrally, extending to base; sclerotised extensions of IV tarsal segment distinctly separating bases of claws; tarsi of all three legs subequal, III tarsal segment 1.70× as broad as I and II, 2.30× as broad as IV; IV tarsal segment 1.92×, 3.60× and 1.71× as long as I, II, and III respectively; 0.7× and 0.58× as broad as II and III respectively (Plate 10, A, B, C).

*Venter* dull reddish brown with black patches, arcuate in profile, sternites uniformly punctate, setae arising from punctations, sulcus dividing sternite I and II not prominent, first sternite 1.52×, 3.96×, 4.73×, and 1.06× as long as II, III, IV and V, respectively (Plate 10, E). *Pygidium* ferrugineous to black, coarsely punctate, erect setae arranged in middle, extending in one row each laterally and two rows centrally; pygidium 0.94× as long as broad (Plate 10, D).

*Female genitalia* (Plate 11): Spermatheca 'C' shaped having proximal arm 1.5× as broad and 0.75× as long as distal arm, subcylindrical; angle between proximal and distal arms acute; ramus well differentiated from nodulus, cornu pointed. Spiculum ventrale long-rectangular or more cylindrical, truncated posteriorly; arm 0.81× as long as basal plate and 1.5× as broad as spiculum ventrale basally, with setae at base; basal plate slender, spatulate with pointed apically, bifurcated, flattened, base fixed with sternite VIII (Plate 11, A, B, C, D).



*Male genitalia* (Plate 12): Spiculum gastrale abandoned. Aedeagus arcuate medially, base  $0.85\times$  as broad as median lobe apically, slightly arcuate at base, length: breadth ratio 3.67:1; apophyses  $1.04\times$  as long as median lobe, spatulate, apically globous; median lobe short, sturdy, sclerotized, with slight ventral curve. Tegmen with dorsal piece as broad as basal piece; parameres short, slender, apically pointed; manubrium elongate, slender,  $0.95\times$  as long as median lobe,  $0.86\times$  as long as apophyses, uniformly thick, with broadened, subconical apex (Plate 12, A, B, C, D).

*Total length*: 2.11–2.45 $\pm$ 0.18 mm; *Standard length*: 2.01–2.31 $\pm$ 0.2 mm; *Breadth*: 0.62–0.75 $\pm$ 0.09 mm.

*Specimen examined*: 3♀, 2♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 26.ii.2016, Coll. Arun Singh, Host: *Cocus nucifera* L.; 5♀, 3♂, Kasargod: RARS Pillicode, N 12°12.09420' E 075°09.78282', 25 m, 11.ii.2016, Coll. K. M. Sreekumar, Host: *Cocus nucifera* L.; 6♀, 8♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, *Cocus nucifera* L.; 2♀, 1♂, Trivandrum: RARS Vellayani, N 8° 26.44' E 076° 59.33' 28m, 24.v.2016, Coll. Arun Singh, Feeding *Cocus nucifera* L.

*Distribution*: Australia, Bangladesh, Ecuador, Guam, India, Indonesia, Japan, Madagascar, Malaysia, Mauritius, Myanmar, Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Singapore, Solomon Islands, Somalia, Sri Lanka, Taiwan, Tanzania (including Zanzibar) and Thailand. India:

*Remarks*: Body elongate subcylindrical. Black spots on pronotum and elytron vary in size and shape. Pronotum with small black spot to totally black. Elytron with laterally black margins, additionally apical end black in colour, with another black spot centrally. Elytron gives a vitae appearance due to alternate raised striae. Female have longer rostrum,  $1.16\times$  longer than male. All collected specimens were segregated into two different groups owing to their morphological variations. Groups were named in the alphabetical order as Group A and Group B. Above description is based on individuals of Group A. In total 20 specimens studied under

Group A. Differential distinguishing characters of three groups are compared in Table 2. Variations among these two groups can be discussed as follows;

#### **4.2.2.3 Variation I (Group B):**

*Remarks:* In total 9 specimens studied under this group. The characters of this group are similar with the Group A in many extents, the variations among the groups are as follows;

*General colour* dull black to ferrugineous (ferrugineous, with black patches in Group A), ovate, coarsely punctate (Plate 13, D, E, F). *Pronotum* black in colour, with traces of ferrugineous patch at apical end (ferrugineous, with triangular black patches at basal region in Group A).

*Genitalia:* There are no variations in genitalia observed.

*Total length:* 2.11–2.32±0.16 mm; *Standard length:* 1.98–2.23±0.18 mm; *Breadth:* 0.59–0.71±0.08 mm.

*Specimens examined:* 2♀, 1♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 26.ii.2016, Coll. Arun Singh, Host: *Cocus nucifera* L.; 2♀, 1♂, Kasargod: RARS Pillicode, N 12°12.09420' E 075°09.78282', 25 m, 11.ii.2016, Coll. K. M. Sreekumar, Host: *Cocus nucifera* L.; 1♀, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, *Cocus nucifera* L.; 1♀, 1♀, Trivandrum: RARS Vellayani, N 8° 26.44' E 076° 59.33' 28m, 24.v.2016, Coll. Arun Singh, Feeding *Cocus nucifera* L.

#### **4.2.2.4 Sexual dimorphism**

Sexes can easily be separated on the basis of the rostral and pygidium characters. Rostrum in case of female is more slender shiny and apically arcuate; whereas in case of male, rostrum 1.10× broader than female, rough in texture with more prominent rugose punctures and apically not curved (Plate 8, A, B, C, D). Pygidium in case of female apically more pointed and bears dense row of setae apically, while male have very few setae at apical margin of pygidium.

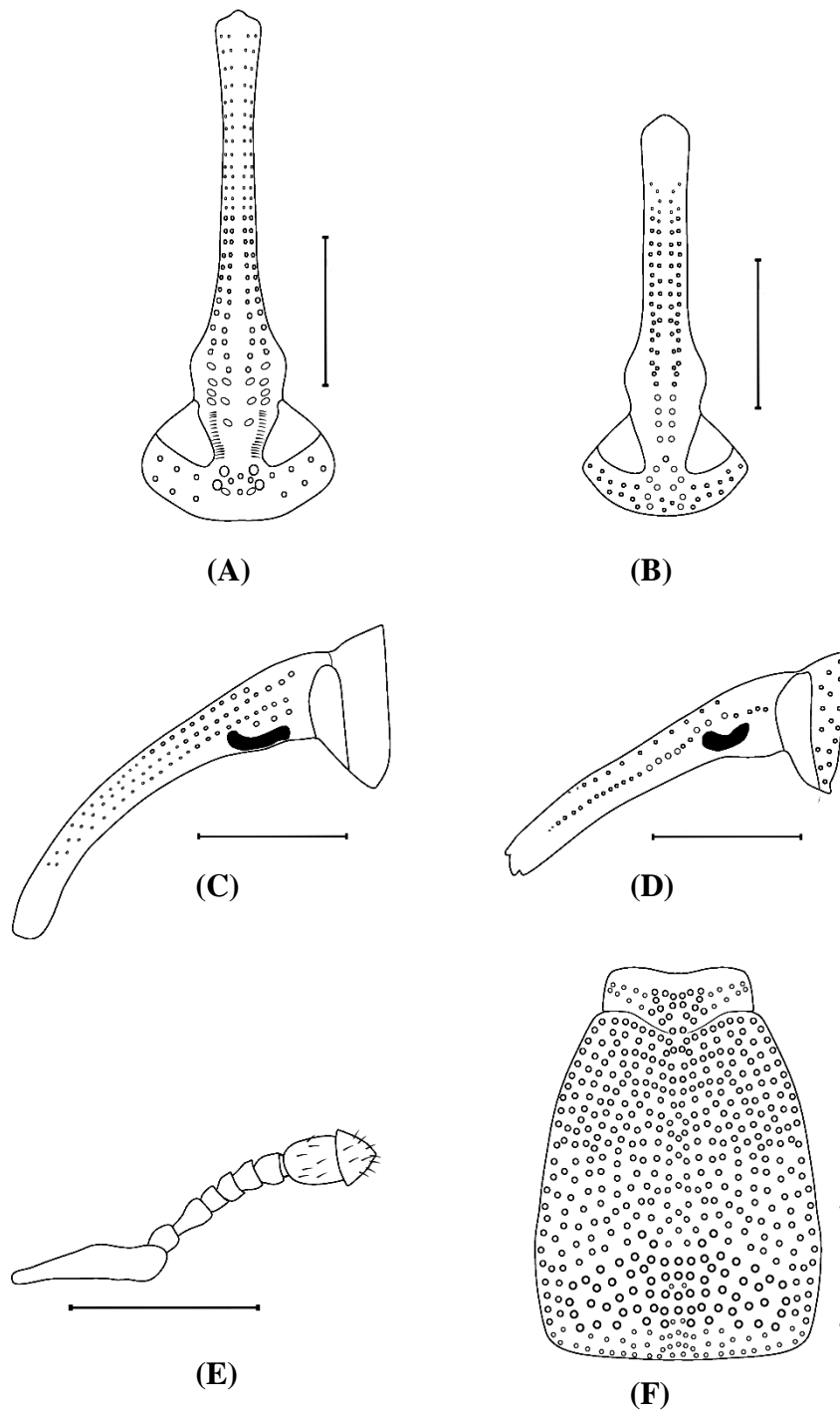
**Table 2. Comparison between differential distinguishing characters of two Groups of *Diocalandra frumenti* (Fabricius)**

<b>Characters</b>	<b>Group A</b>	<b>Group B</b>
<i>Pronotum marking and colouration</i>	Triangular cum semi-rounded black spot basally, extending upto 0.6× length of pronotum from base	Dull black pronotum along with few small yellow to ferrugineous spots apically

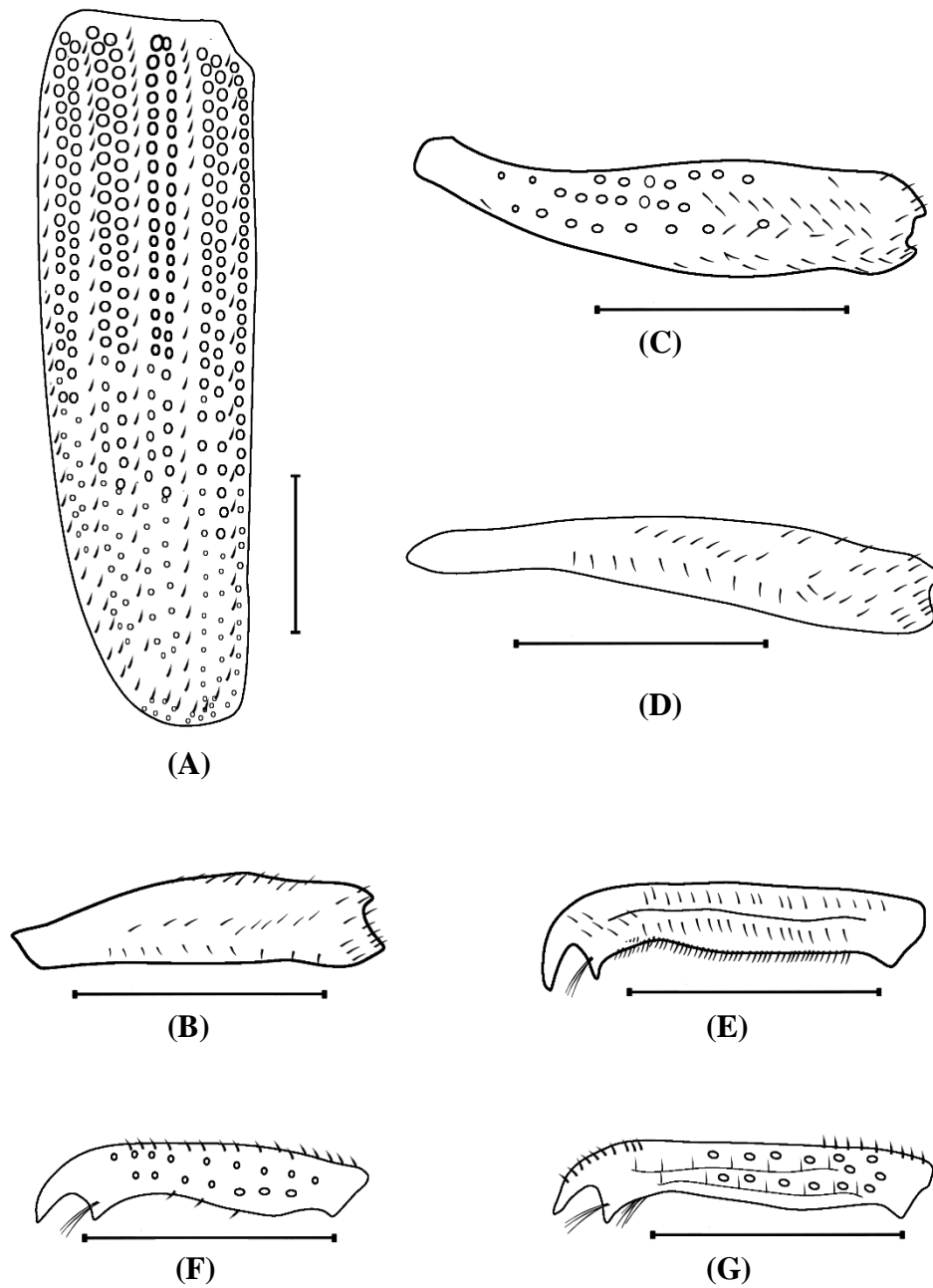
**4.2.2.5 Key to the species of *Diocalandra* Faust:**

1. Last segment of club (tomentose) 0.4×–0.5× as long as club.....2
  - Last segment of club (tomentose) 0.2×– 0.33× as long as club.....3
2. Third tarsal segment deeply bilobed and much broader than II tarsal segment.....*D. elongata* (Roelofs)
  - Third tarsal segment weakly bilobed and slightly broader than II tarsal segment .....4
3. Third tarsal segment deeply bilobed.....6
  - Third tarsal segment not bilobed or slightly notched.....5
4. Rostrum short, bare of granules in male.....*D. caelata* Marshall
  - Rostrum comparatively longer, dorsum with fine granules.....*D. impressicollis* (Quedenfeldt)
5. Third tarsal segment not bilobed.....*D. taitensis* (Guerin-Meneville)
  - Third tarsal segment slightly notched.....*D. reticulata* (Quedenfeldt)
6. Head with fovea; head and rostrum not on same plane; head separated from rostrum by weak transverse depression at interocular region .....*D. frumenti* (Fabricius)
  - Head with deep median sulcus; head and rostrum on same plane, transverse depression absent.....7

7. Larger body; protibial strongly expanded internally; elytral red spot smaller; Pygidium strongly convex longitudinally, with long erect setae at middle .....*D. kamiyai* Morimoto
- Smaller body; protibial weakly expanded internally; elytral red spot larger; Pygidium evenly or slightly convex, with long erect setae at middle .....*D. sasa* Morimoto

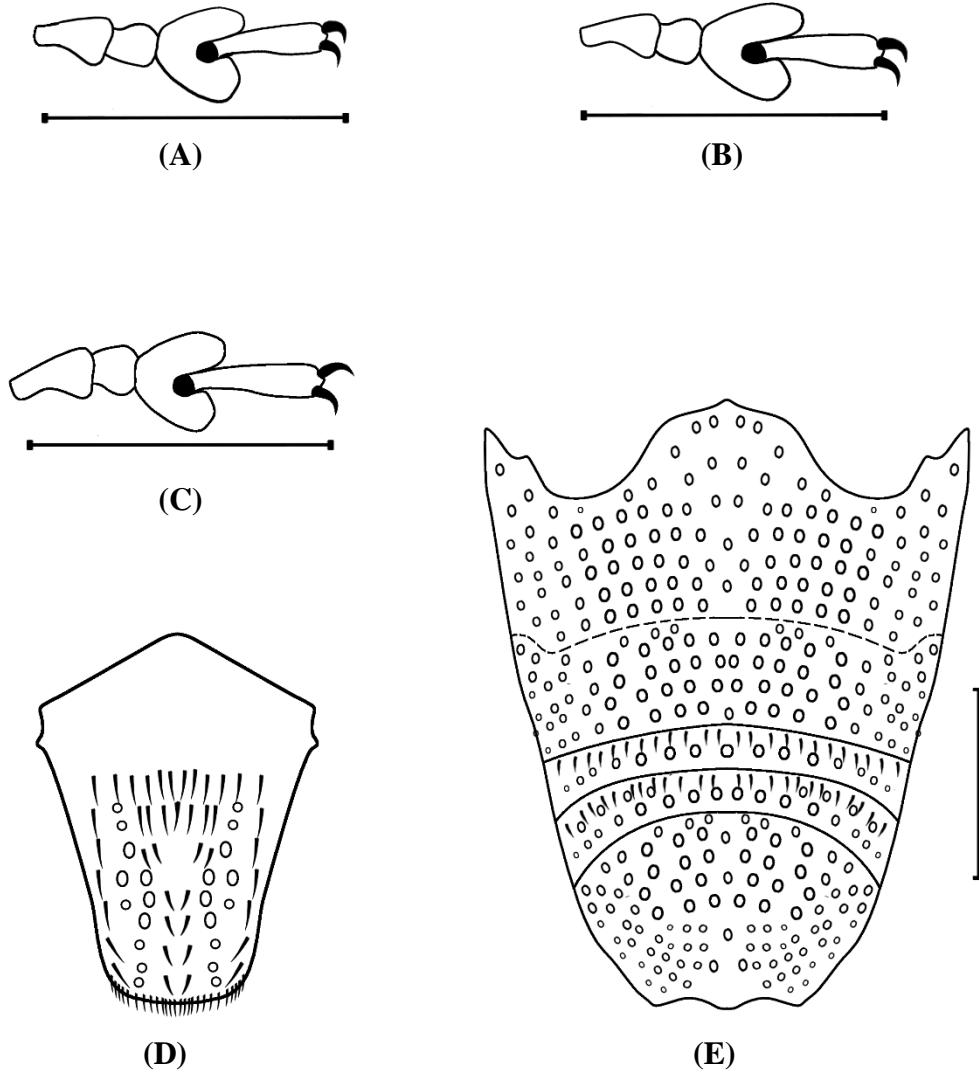


**Plate 8. *Diocalandra frumenti*: (A) ♀ Rostrum, dorsal view; (B) ♂ Rostrum, dorsal view; (C) ♀ Rostrum, lateral view; (D) ♂ Rostrum, lateral view; (E) Antenna; (F) Pronotum, dorsal view. Scale= 0.5 mm**



**Plate 9. *Diocalandra frumenti*: (A) Elytron, dorsal view; (B) Profemur; (C) Mesofemur; (D) Metafemur; (E) Protibia; (F) Mesotibia; (G) Metafemur.**

**Scale= 0.5 mm**



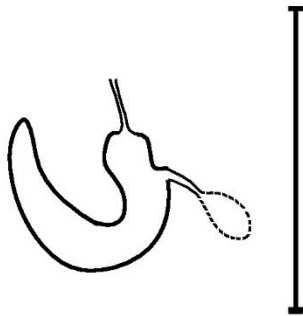
**Plate 10. *Diocalandra frumenti*: (A) Protarsus; (B) Mesotarsus; (C) Metatarsus; (D) Pygidium; (E) Venter. Scale= 0.5 mm**



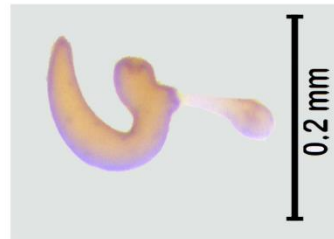
(A)



(B)



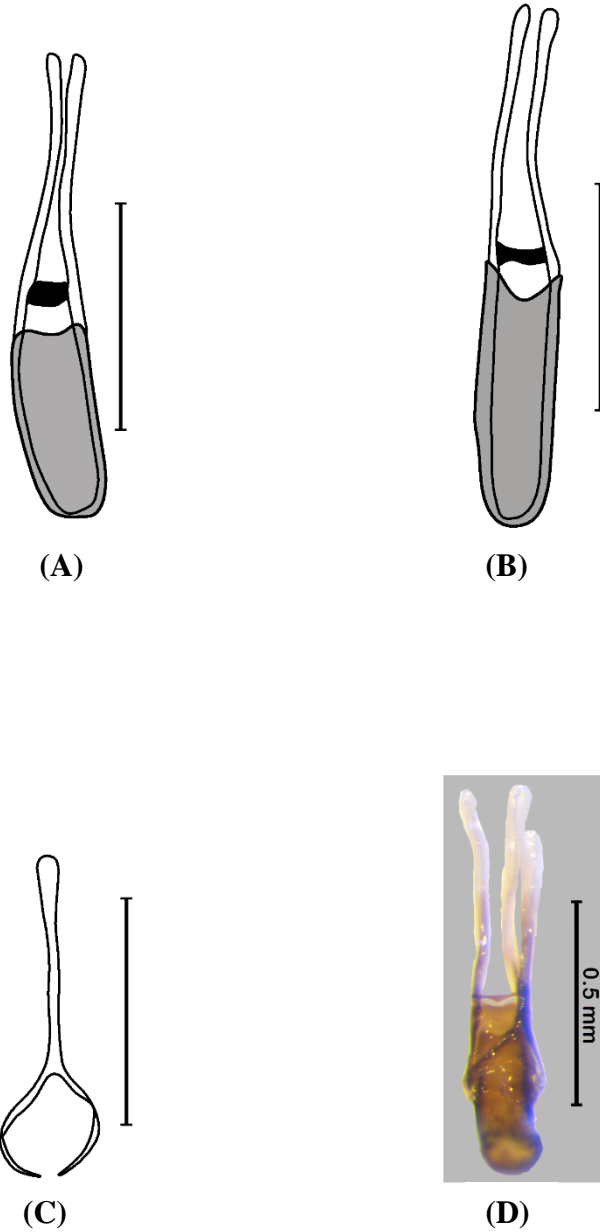
(C)



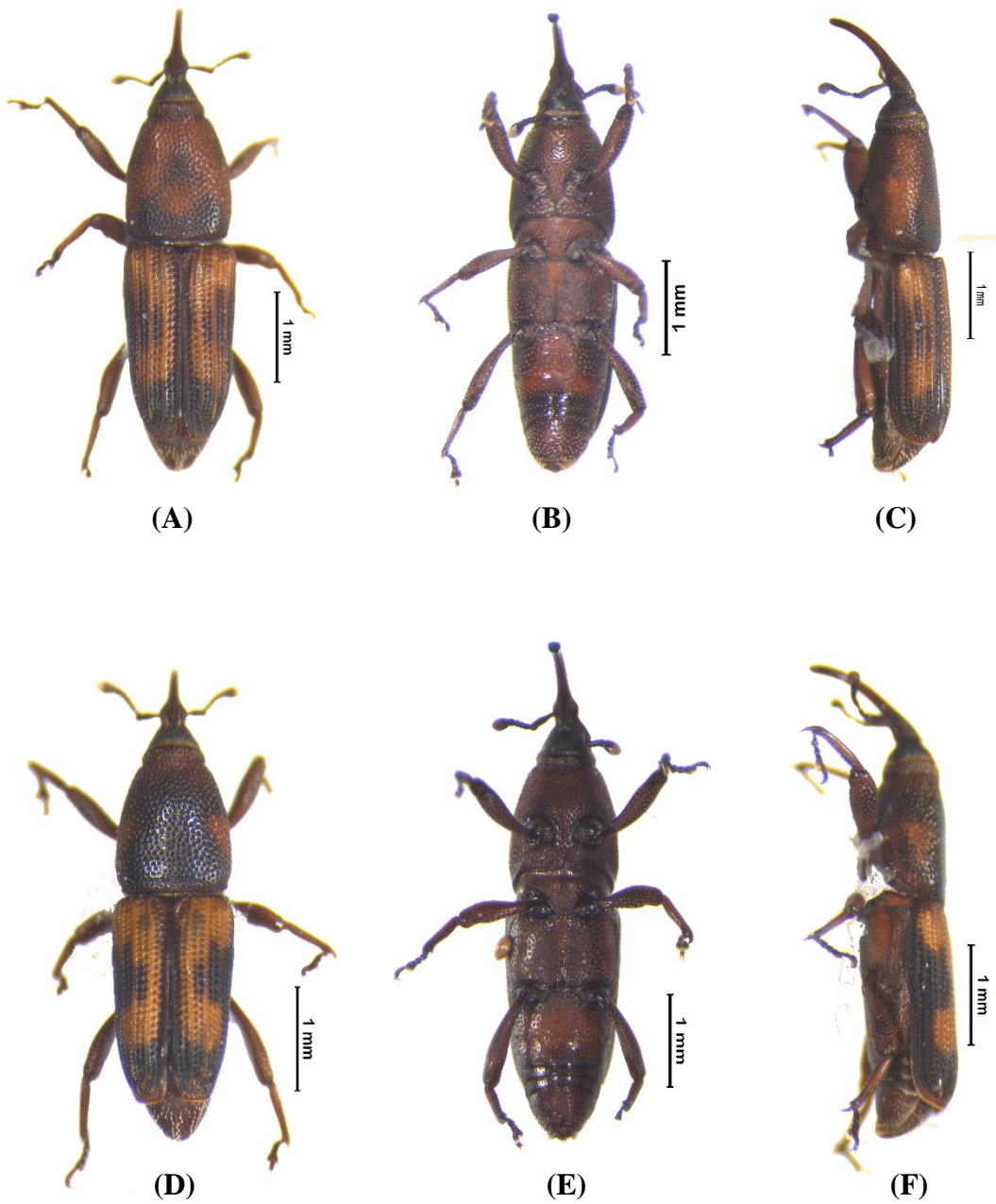
(D)

**Plate 11. *Diocalandra frumenti* female genitalia (A) Spiculum ventrale; (B) Spiculum ventrale; (C) Spermatheca; (D) Spermatheca. Scale= 0.25 mm**





**Plate 12.** *Diocalandra frumenti* male genitalia (A) Aedeagus, dorsal view; (B) Aedeagus, ventral view; (C) Tegmen; (D) Aedeagus and tegmen. Scale= 0.5 mm



**Plate 13. *Diocalandra frumenti*: Habitus; dorsal, ventral and lateral view;  
(A)-(C) Group A; (D)-(F) Group B.**

### 4.2.3 *Odoiporus longicollis* (Olivier)

(Plates 14, 15, 16, 17, 18, 19, 20, 21)

*Synonyms:* Chevrolat, 1882a: 140 (*Rhynchophorus*); Chevrolat, 1885b: 288

*Sphenophorus glabridiscus* Walker, 1859: 218; Csiki, 1936: 65

*Sphenoporus planipennis* Gyllenhal in Schoenherr, 1838: 911;  
Chevrolat, 1885b: 288

*Sphenophorus glabricollis* Gyllenhal in Schoenherr, 1838: 913;  
Chevrolat, 1885b: 288

*Rhynchophorus gages* Herbst, 1795: 17; Csiki, 1936: 65

*Odoiporus longicollis* var. *major* Heller, 1898: 33; Csiki, 1936: 65

#### 4.2.3.1 *Diagnostic charaters:*

Dorsally flattened and elongated body. One-third of antennal club pubescent at base, antennomeres with rounded anterior edges; pronotum uniformly punctuated at lateral edges, with smooth disc and two rows of punctures medially; apically truncated elytra.

#### 4.2.3.2 *Description:*

*General colour* shiny black to ferrugineous (Plate 20, A, B, C). *Head* flat, basally  $3.1\times$  as broad as long, smooth, shiny,  $0.12\times$  as long as and  $2.16\times$  as broad as rostrum. *Eyes* partially visible dorsally, posteroventrally approximating,  $1.95\times$  as long as broad. *Rostrum*  $0.74\times$  as long as head and pronotum combined,  $5.81\times$  as long as broad basally, base  $1.70\times$  as broad as apex, slightly arcuate at apex, finely punctate shiny from apex to scrobe, with coarse punctations from base to antennal insertion, with deep depressions between eyes. *Scrobe* lateroventral, enclosed dorsally, concave laterally,  $4.9\times$  as long as broad (Plate 14, A, C; Plate 15, A, C). *Antennae* black, inserted  $0.24\times$  length from base of rostrum; scape  $0.70\times$  as long as funicle and club combined,  $6.20\times$  as long as broad, clavate shiny, with or without punctures; funicle with six antennomeres, antennomeres subglobular, with round anterior edges; I antennomere,  $1.08\times$  as long as II,  $1.80\times$  as long as III, IV and V,  $1.625\times$  as long as VI; VI antennomere,  $1.28\times$ ,  $1.44\times$ ,  $1.35\times$ ,  $1.28\times$  and  $1.21\times$  as

broad as I, II, III, IV and V; club  $0.42\times$  glabrous basally,  $1.31\times$  as long as broad, last segment dorsolaterally flattened, apically triangular; club along with IV, V, and VI antennomere bears sensory setae (Plate 16, A).

*Prothorax* with disk smooth and plain, dorsally glabrous, constricted near anterior margin, laterally distinctly punctate,  $1.37\times$  as long as broad basally, base  $2.0\times$  as broad as apex; central smoother region with two rows of fine punctures (Plate 17, A). *Scutellum* ovidal,  $1.0\times$  as long as broad, base  $1.2\times$  broad as apex.

*Elytra* punctatostriate, apically subtruncate broadly exposing pygidium, almost rectangular, basally  $2.48\times$  as long as broad, base  $1.04\times$  and  $1.37\times$  as broad as middle and apex respectively, punctures deep broad and continued with distinct tuft of micropilosity, intervals smooth and raised, tenth stria abbreviated, not continued to base; humeri bare and shiny (Plate 16, C).

*Sternum* black, flat and punctate; metasternum  $1.41\times$  and  $3.83\times$  as long as pro and mesosternum respectively; metepisternum with pits and as broad as mesepimeron and mesepisternum.

*Legs* procoxae raised, globular; pro, meso and metacoxae apart by  $0.37\times$ ,  $1.34\times$  and  $1.1\times$  of breadth, respectively; all femora laterally compressed, curved, distal end widened, ventrally inflated at middle; metafemur  $1.19\times$  and  $1.29\times$  as long as pro and mesofemur respectively (Plate 16, B, D, E). Tibiae uncinatae, with uncus arising from inner apical angle; metatibia  $1.04\times$  and  $1.08\times$  as long as pro and mesotibia respectively; punctures not aligned into striae, grooved beneath and provided with a row of setae of more or less equal length on each side of groove internally from base to apex; bears premucro at outer apical angle in addition of uncus, two additional spine in between uncus and premucro; third spine and premucro more prominent in protibia (Plate 17, D; Plate 18, A, B). Tarsi of all three legs subequal, pseudotetramerous, sclerotised extensions of IV tarsal segment distinctly separating bases of claws, I and II tarsi subequally broad, with small setae ventrally at apical end; III tarsal segment  $2.9\times$  as broad as II tarsal segment; IV tarsal segment  $2.05\times$ ,  $3.9\times$  and  $1.54\times$  as long as I, II, and III respectively;  $0.77\times$  and  $0.26\times$  as broad as II

and III respectively; tarsal segment three widely dilated, pilose ventrally except for base and V-shaped median area (Plate 18, C, D, F).

*Venter* not arcuate in profile, sternites uniformly punctured, sternite V 1.28×, 1.89×, 3.43× and 2.75× as long as I, II, III and IV respectively; I sternite, 1.08×, 1.12×, 1.30× and 1.48× as broad as, II, III, IV and V respectively (Plate 18, E).

*Female genitalia* (Plate 6, 8): Spermatheca having proximal arm 1.0× as broad and as long as distal arm, subcylindrical, angle between proximal and distal arms obtuse; ramus not differentiated from nodullus (Plate 19, A, D; Plate 21, A, D); basal plate slender with spatulate, apically pointed and bifurcated lobed base fixed with sternite VIII; spiculum ventrale globous, truncated posteriorly, arm 4.78× as long as spiculum ventrale and 1.3× as broad as spiculum ventrale basally, setae absent at base.

*Male genitalia* (Plate 6, 8): Aedeagus with median lobe slightly arcuate medially in profile, broadest and slightly arcuate at base, length: breadth ratio 1.63:1, broadest at its junction with apophyses; apophyses 4.65× as long as median lobe, spatulate bearing sharp pointed hooks at apex. Tegmen with dorsal piece as broad as basal piece; parameres short, slender, with pointed apices, 1.75× as long as basal piece; manubrium elongate, slender, 2.91× as long as median lobe, 0.62× as long as apodeme of aedeagus; apophyses, uniformly thick, with broadened, subrounded apex bearing pointed curved hooks (Plate 19, G, H, K; Plate 21, F, G, H).

*Total length:* 9.70–12.13±0.31mm; *Standard length:* 8.50–19.21±0.24mm; *Breadth:* 3.5–4.4±0.16mm.

*Specimens examined:* 7♀, 5♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Ramesha B., Host: *Musa × paradisiaca* L.; 15♀, 18♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 1♀, 2♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 8♀, 6♂, Wayanad: Narrikundu, N 11°36.230' E 076°12.906', 02.iii.2015, 858 m, Coll. Arun Singh, Host: *Musa × paradisiaca* L.;

2♀, 5♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 03.iii.2015, 879 m, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 4♀, 1♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.iv.2015, 32 m. Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 2♀, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 3♀, Alappuzha: ORARS Kayamkulam, N 09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh, Pheromone trap; 2♀, 1♂, Trivandrum: Vellayani, N 08°25.74006'; 076°59.17194', 28m; 23.x.2014, Coll. Sivakumar T, Host: *Musa × paradisiaca* L.

*Distribution:* Bhutan, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam. India: Andaman Islands, Assam, Bihar, Delhi, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Manipur, Tamil Nadu, Uttar Pradesh, West Bengal.

*Remarks:* All collected specimens were segregated into three different groups owing to their morphological variations. Groups were named in the alphabatcal order as Group A, Group B and Group C. Above description is based on individuals of Group A. In total 82 specimens studied under this Group A. Differential distinguishing characters of three groups are compared in Table 3. Variations among these three groups can be discussed as follows:

#### **4.2.3.3 Variation I (Group B):**

*Remarks:* In total 41 specimens were examined under Group B. The characters of this group are similar with the Group A in many extents, the variations among the groups are as follows;

*General colour* shiny black (Plate 20, D, E, F). *Rostrum* slender, 0.74× as long as head and pronotum combined, base 1.52× as broad as apex; transversely rounded, shiny from apex to scrobe centrally on dorsal view in male, laterally shallow rugose run along the length upto apex, leaving shiny mid region. Female with eye prominent on dorsal view. *Scrobe* thinner than group A, 4.3× as long as broad (Plate 14, B, D; Plate 15, B, D) (Group A with laterally more prominent rugose at base,

extending upto scrobe, apex to scrobe rugose not arranged in row in males; Group C with smooth rostrum from apex to scrobe, very few punctures in basal region). *Prothorax* 1.32× as long as broad basally, with length subparallel on basal three fourth, convergent subapically to apex, flanks uniformly punctate, disc smooth with very few shallow punctures, basal rugose joins with lateral row of rugose (Plate 17, B) (Group A with less rugose laterally, basal row of rugose does not join with lateral one; Group C with very few rugose laterally in apical 0.60× of pronotum length). *Legs* smoother at base, uniformly punctate along the length, rugose area more prominent towards apex. All femora laterally compressed, curved; metafemur 1.15× and 1.25× as long as pro and mesofemur respectively; metatibia 1.06× and 1.25× as long as pro and mesotibia respectively. Tibial spines more prominent, protibia with more prominent fourth spine between premucro and third spine is sharper (Plate 17, E) (Group A with two additional spine in between uncus and premucro; third spine and premucro prominent in protibia; Group C with three spines on protibia, spine between third and premucro rudimentary).

*Female genitalia* (Plate 6, 8): Spermatheca having proximal arm 1.02× as broad and as long as distal arm, subcylindrical, angle between proximal and distal arms obtuse, less sclerotized than group A (Plate 19, B, E; Plate 21, B, E); spiculum ventrale with manubrium slender, swollen apex; basal plate, bifurcated lobed base fixed with sternite VIII (pointed apex in case of Group A, basal lobes comparatively less globous in case of Group C; additional loop, 0.52× as long as VIII<sup>th</sup> sternite present in Group C).

*Male genitalia*: Plate 19, I, J, L; Plate 21, I, J, K

*Total length*: 10.1–11.0±0.30 mm; *Standard length*: 8.4–9.9±0.23 mm; *Breadth*: 3.6–4.3±0.18 mm.

*Specimens examined*: 2♀, 3♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Ramesha B., Host: *Musa × paradisiaca* L.; 9♀, 7♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 5♀, 2♂, Wayanad:

Narrikundu, N 11°36.230' E 076°12.906', 02.iii.2015, 858 m, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 2♂, Wayanad: Andoor, N 11°35.226' E 076°13.572', 03.iii.2015, 879 m, Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 5♀, 2♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.iv.2015, 32 m. Coll. Arun Singh, Host: *Musa × paradisiaca* L.; 1♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 1♀, 2♂, Trivandrum: RARS Vellayani, N 08°25.74006'; 076°59.17194', 28 m; 23.x.2014, Coll. Arun Singh, Pheromone trap.

#### 4.2.3.4 Variation II (Group C):

*Remarks:* Only 1♀ studied under this group. The characters of this group are similar with the Group A in many extent, the variations among the groups are as follows;

*General colour* shiny ferrugineous (Plate 20, G, H, I). *Rostrum* slender, 0.77× as long as head and pronotum combined, base 1.67× as broad as apex; transversely rounded, scrobes enclosed dorsally; coarse punctation from base to antennal insertion, shiny from apex to scrobe. *Eye* prominent on dorsal view. *Scrobe* 0.82× as long as of group A, 4.1× as long as broad, concave laterally, ventrally touching rostrum (Plate 14, E; Plate 15, E) (Group A with laterally more prominent rugose extending upto scrobe, apex to scrobe finely punctured; rugose arranged in row in males; Group B with finely punctate rostrum, laterally shallow rugose run along the length upto apex in rows). *Prothorax* 1.35× as long as broad basally, with length subparallel on basal three fourth, convergent subapically to apex, flanks uniformly punctate in two third of apex, disc smooth with very few shallow punctures in middle; apical end separated by constriction at edges (Plate 17, C) (Group A with less rugose laterally, basal row of rugose does not join with lateral one; Group B with prominent rugose laterally, basal row of rugose join with lateral one). *Legs* smoother at base, rugose more prominent towards apex. Femora laterally compressed, curved, uniformly punctate along the lateral length, leaving dorsal central portion smooth and shiny, metafemur 1.03× and 1.14× as long as pro and mesofemur respectively. Protibia with three spines, spine between third and premucro rudimentary, rugose are smaller and confined to lateral edges; mesotibia and metatibia with series of small



spines at apical end, metatibia 1.21× and 1.23× as long as pro and mesotibia respectively; tibial spines less prominent, protibia lack prominent fourth spine between premucro, third spine not prominent (Plate 17, F) (Group A with two additional spine in between uncus and premucro; third spine and premucro more prominent in protibial; protibia with more prominent fourth spine between premucro and third in Group B).

*Female genitalia* (Plate 19, 21): Spermatheca 'C' shaped, proximal arm 1.04× as broad and as long as distal arm, subcylindrical, angle between proximal and distal arms obtuse, less sclerotized than group A; spiculum ventrale not glabrous, loop present at the base of apodeme of spiculum ventrale, loop 0.52× as long as VIII<sup>th</sup> sternite; basal bifurcated arms uniform in length and 1.45× as broad as apodeme; apodeme slender and not glabrous at apex. Basal plate slender with spatulate pointed apex and bifurcated lobed base fixed with sternite VIII (Plate 19, C, F; Plate 21, C) (pointed apex in case of Group A; no loop present on spiculum ventrale in Group A and Group B).

*Total length:* 10.4 mm; *Standard length:* 9.6 mm; *Breadth:* 4.1 mm.

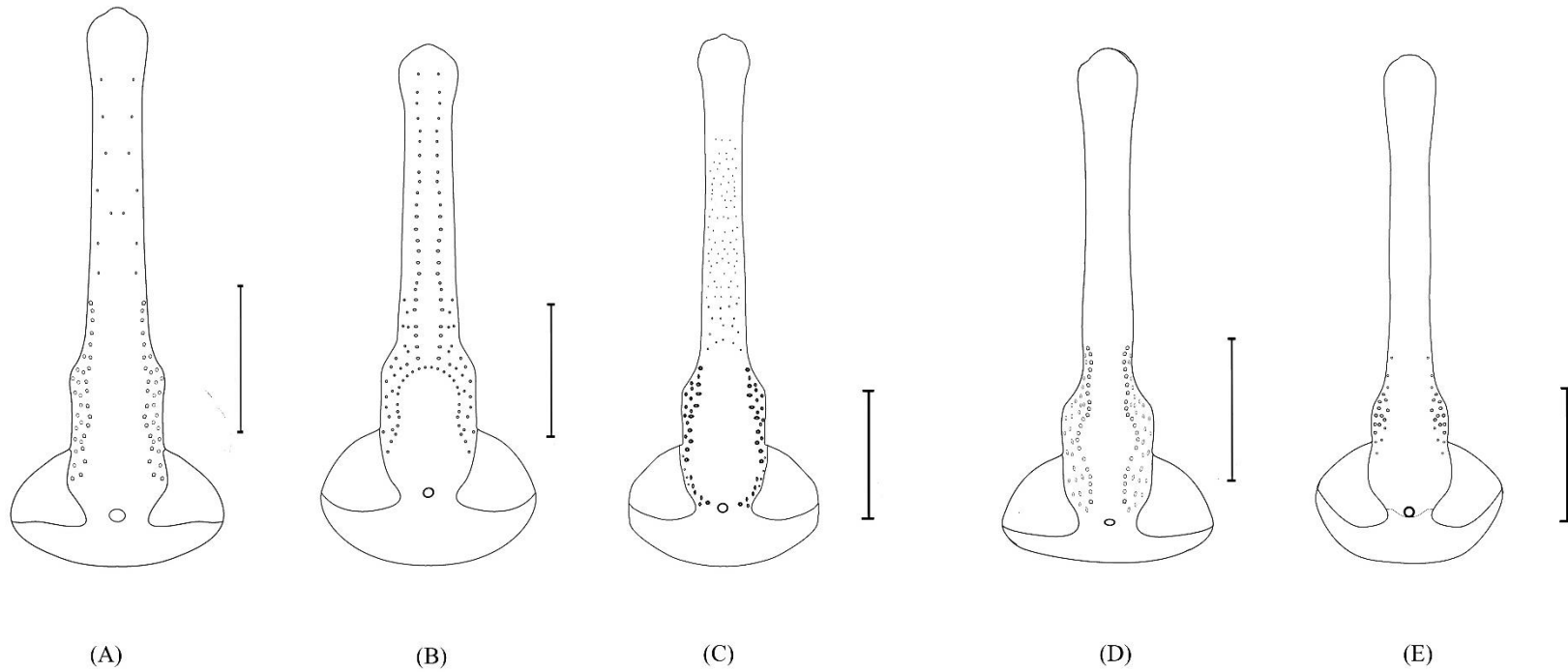
*Specimens examined:* 1♀, INDIA: Kerala: Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.iv.2015, 32 m. Coll. Arun Singh, Host: *Musa × paradisiaca* L.

#### **4.2.3.5 Sexual dimorphism**

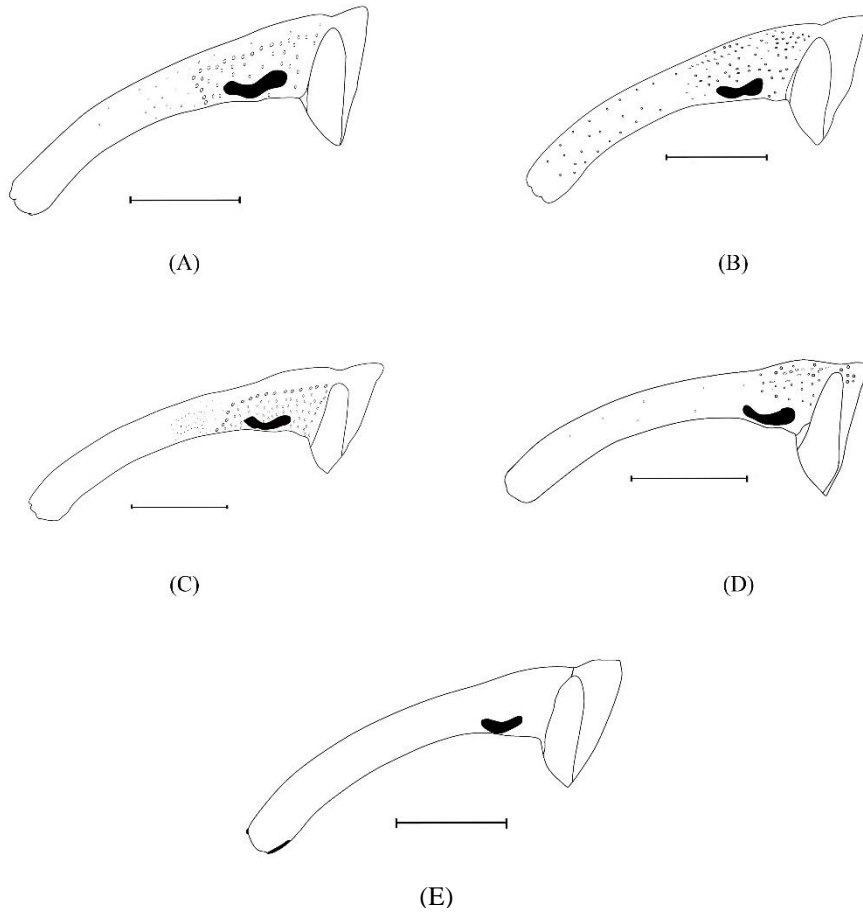
Sexes can be separated on the basis of rostral and pygidium characters. Rostrum in females is more slender and longer compared to males and males have broader rostrum. Distance from scrobe to apex of rostrum is more in case of females. While distance from base of rostrum to scrobe is more in case of males, as the antennal insertion in case of females is nearer to the head in females (Plate 14, A, B, C, D, E; Plate 15, A, B, C, D, E). Pygidium is more pointed in case of females.

**Table 3. Comparison between differential distinguish characters of three groups of *Odoiporus longicollis* (Olivier)**

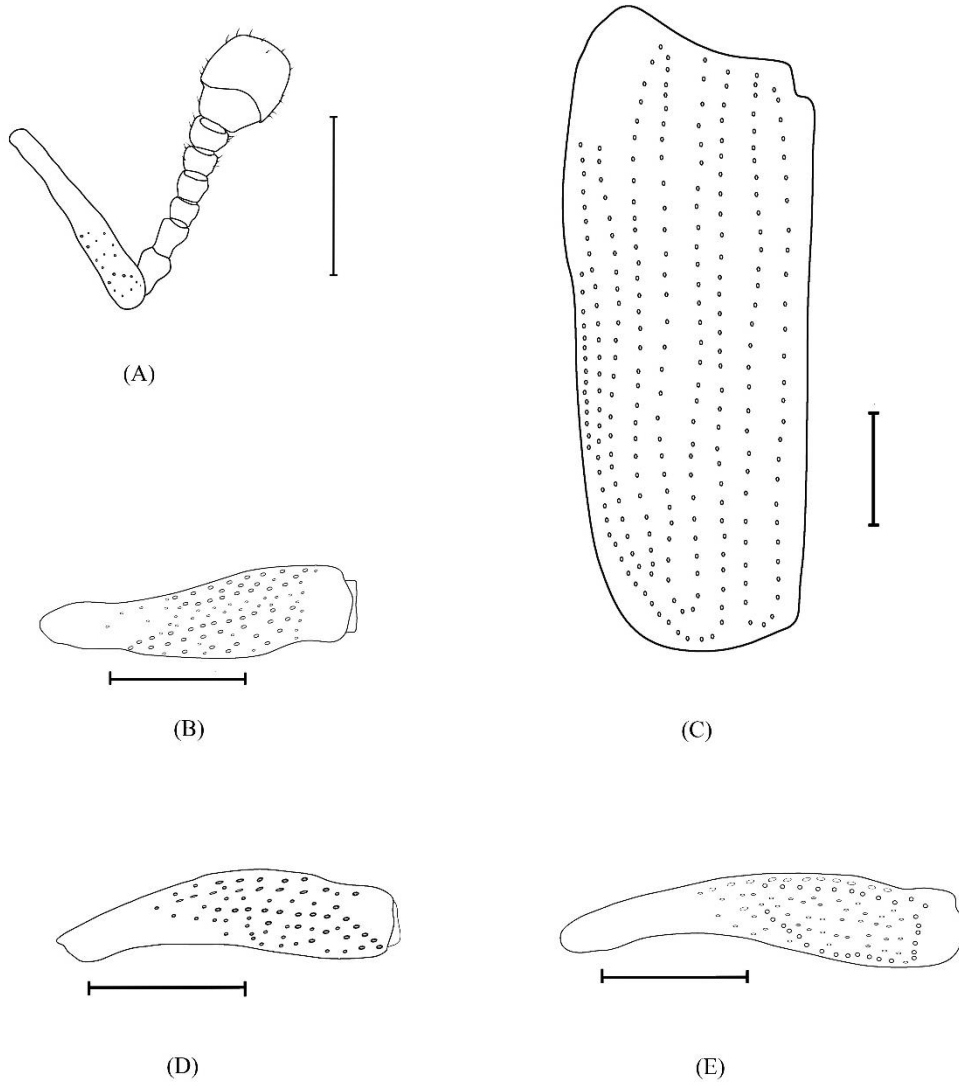
<b>Characters</b>	<b>Group A</b>	<b>Group B</b>	<b>Group C</b>
<i>General body colour</i>	Shiny black to slightly ferrugineus	Shiny black	Shiny ferrugineus
<i>Rostrum punctation</i>	Laterally more prominent rugose at base extending upto scrobe; apex to scrobe rugose not arranged in row in males	Laterally less prominent rugose from base to scrobe; shiny from apex to scrobe centrally on dorsal view in male, shallow rugose run along the length in one row each of side upto apex laterally, demarking shiny region centrally	Smooth rostrum from apex to scrobe, very few punctures in basal region
<i>Pronotum punctation</i>	Less rugose laterally, basal row of rugose does not join with lateral one	Flanks uniformly punctate, disc smooth with very few shallow punctures, basal rugose joins with lateral row of rugose	Very few rugose laterally in apical 0.60× of pronotum length
<i>Protibial spine</i>	Prominent third spine and premucro	Sharper third spine and elongated premucro	Three spines on protibia, spine between third and premucro rudimentary, third spine blunted
<i>Spiculum ventrale</i>	Slender and pointed apodeme without any additional loop	Globous and swollen apodeme, without any additional loop	Basal bifurcated arm slender and not globous, additional loop, 0.52× as long as VIII <sup>th</sup> sternite,



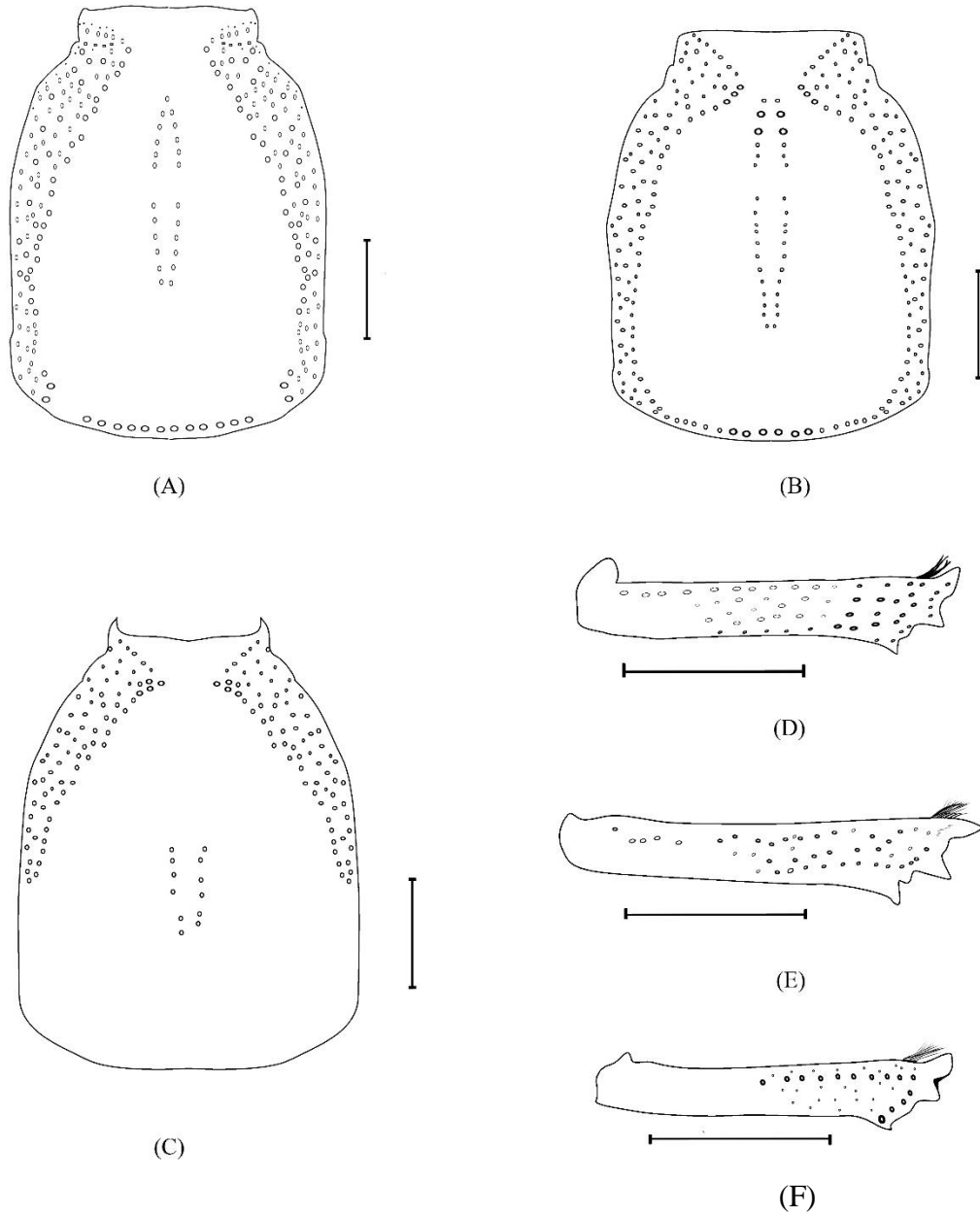
**Plate 14. *Odoiporus longicollis*: rostrum, dorsal view; (A) ♂ of *Odoiporus longicollis* (Group A) (B) ♂ of Group B (C) ♀ of Group A (D) ♀ of Group B (E) ♀ of Group C; Scale= 1mm**



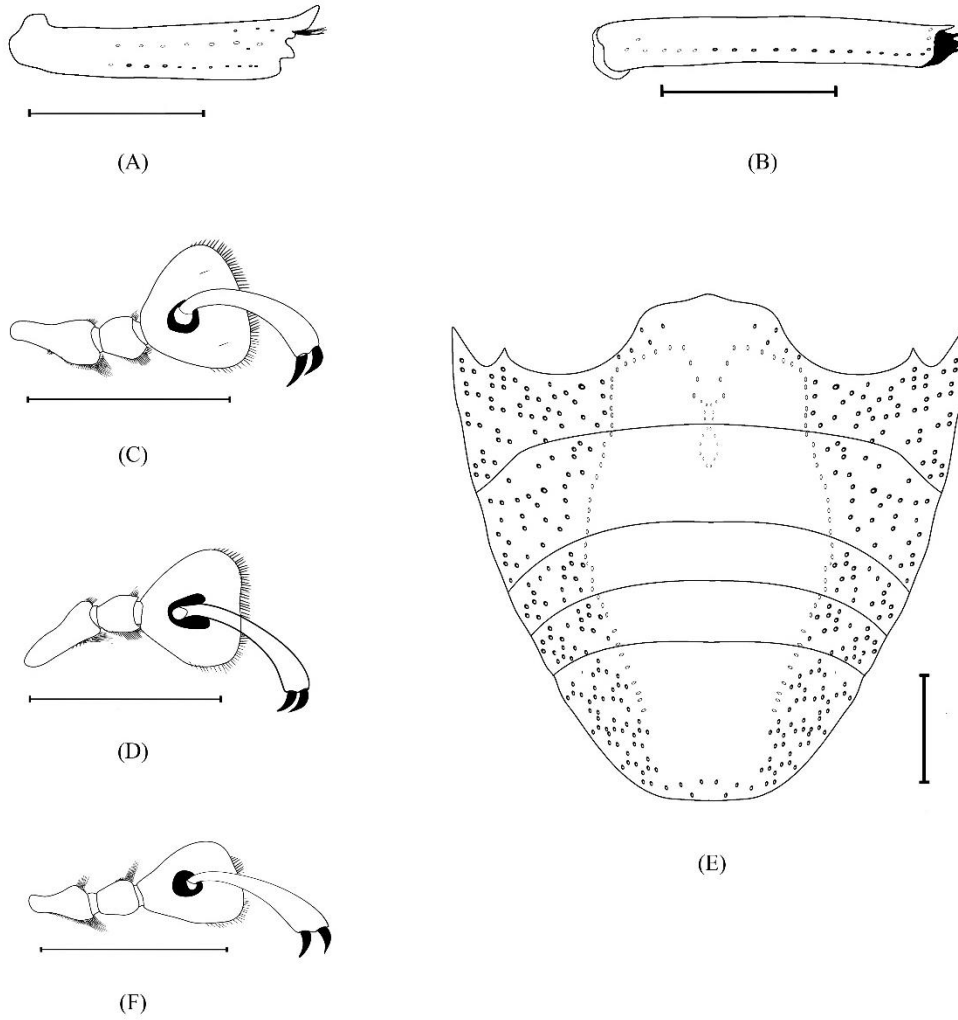
**Plate 15. *Odoiporus longicollis*: rostrum, lateral view; (A) ♂ of *O. longicollis* (Group A); (B) ♂ of Group B; (C) ♀ of Group A; (D) ♀ of Group B; (E) ♀ of Group C. Scale= 1mm**



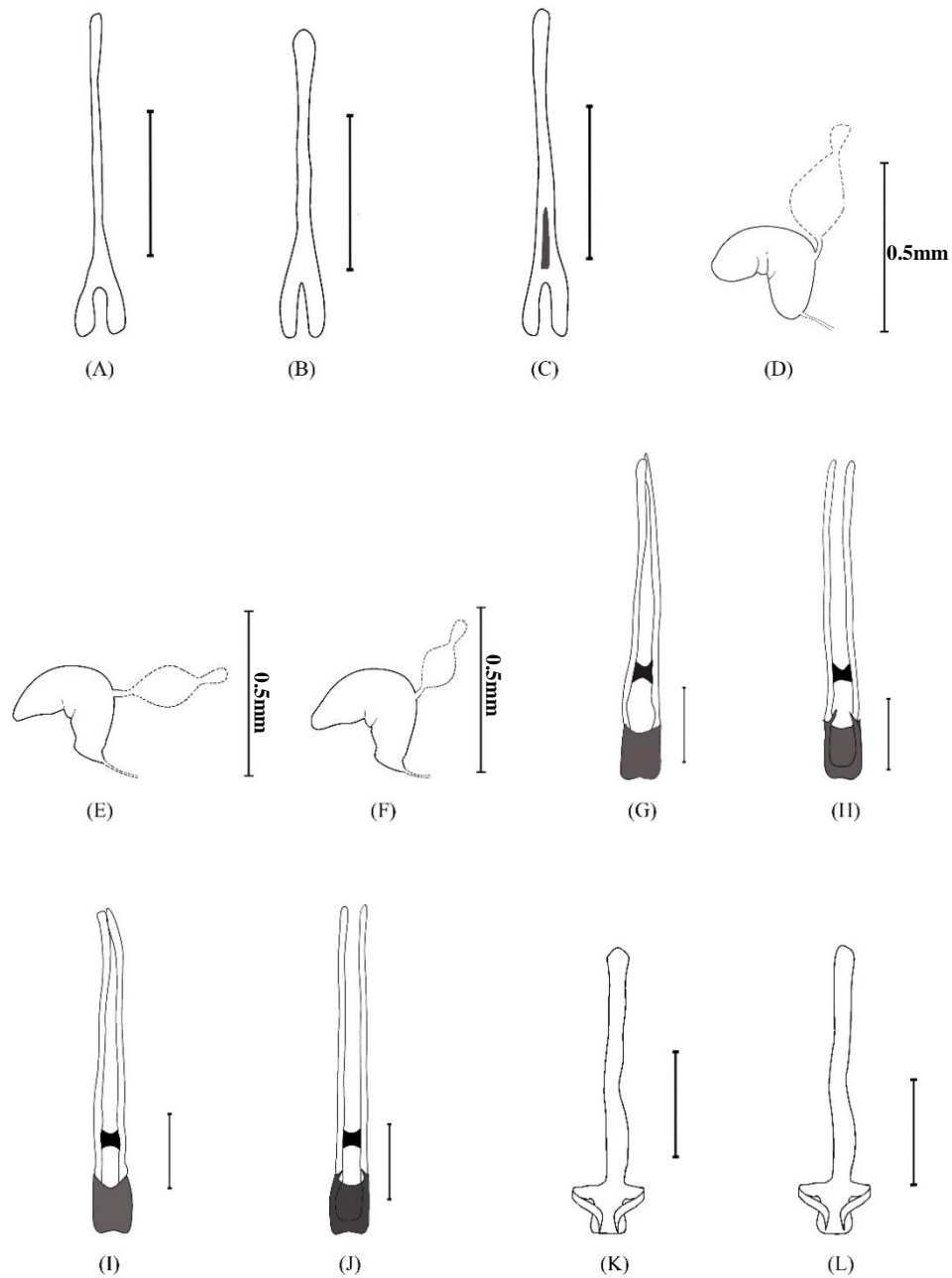
**Plate 16. *Odoiporus longicollis*: (A) Antenna; (B) Profemur; (C) Elytron, dorsal view; (D) Mesofemur; (E) Metafemur. Scale= 1mm**



**Plate 17. *Odoiporus longicollis*: (A)-(C) Variations on Pronotum, dorsal; (A) Group A; (B) Group B; (C) Group C; (D)-(F) Variations on Protibia; (D) Group A; (E) Group B; (F) Group C. Scale= 1mm**

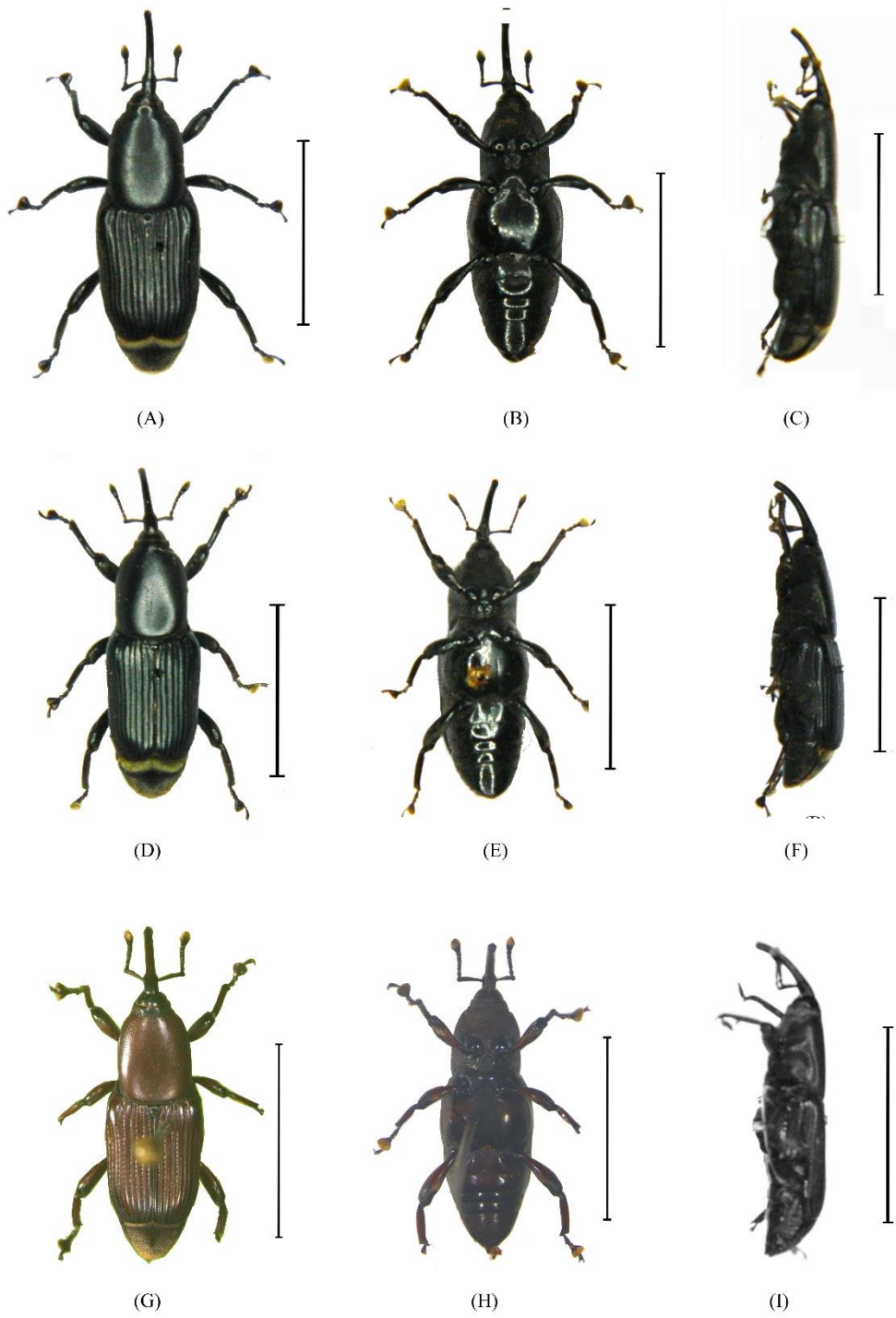


**Plate 18. *Odoiporus longicollis*: (A) Mesotibia; (B) Metatibia; (C) Protarsus; (D) Mesotarsus; (E) Venter; (F) Metatarsus. Scale= 1mm**



**Plate 19. *Odoiporus longicollis*: (A)-(C) Spiculum Ventrale, (A) Group A (B) Group B (C) Group C; (D)-(F) Spermatheca, (D) Group A (E) Group B (F) Group C; (G) Aedeagus, Group A, dorsal view (H) Aedeagus, Group A, ventral view (I) Aedeagus, Group B, dorsal view (J) Aedeagus, Group A, ventral view (K) Tegmen, Group A (L) Tegmen, Group B. Scale= 1mm**





**Plate 20. *Odoiporus longicollis*: Habitus, dorsal; ventral and lateral view; (A)-(C) Group A; (D)-(F) Group B; (G)-(I) Group C. Scale= 1cm**



**Plate 21. *Odoiporus longicollis*: (A)-(C) Spiculum Ventrale, (A) Group A; (B) Group B; (C) Group C; (D)-(E) Spermatheca, (D) Group A; (E) Group B; (F)-(G) Aedeagus, Group A, (F) Dorsal view; (G) Ventral view; (H) Tegmen, Group A; (I)-(J) Aedeagus, Group B, (I) Dorsal view; (J) Ventral view ;(K) Tegmen, Group B. Scale= 1mm**

#### 4.2.4 *Rhynchophorus ferrugineus* (Olivier)

(Plates 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32)

- Synonyms:* *Cossus sanguarius* Rumpf<sup>1</sup>, 1755: 79; Herbst, 1795: 8  
*Curculio ferrugineus* Olivier, 1790: 473; Herbst, 1795: 8  
*Curculio hemipterus* Sulzer, 1776: 39; Csiki, 1936: 16  
*Cordyle sexmaculatus* Thunberg, 1797: 46; Csiki, 1936: 16  
*Calandra ferruginea* Fabricius, 1801a: 433; Schoenherr, 1826: 327  
*Calandra schach* Fabricius, 1801a: 433; Gyllenhal in Schoenherr, 1838: 827  
*Curculio vulneratus* Panzer in Voet, 1798: 10; Bohemann in Schoenherr, 1845: 218 (*Rhynchophorus*); Hallett *et al.*, 2004: 2863  
*Rhynchophorus ferrugineus* var. *tenuirostris* Chevrolat, 1883: 561; Wattanapongsiri, 1966: 206; Hallett *et al.*, 2004: 2863  
*Rhynchophorus glabrirostris* Schaufuss, 1885: 203; Hallett *et al.*, 2004: 2863  
*Rhynchophorus indostanus* Chevrolat, 1883: 561; Wattanapongsiri, 1966: 151-152  
*Rhynchophorus pascha* Bohemann in Schoenherr, 1845: 218; Wattanapongsiri, 1966: 206; Hallett *et al.*, 2004: 2863  
*Rhynchophorus pascha* var. *cinctus* Faust, 1894c: 330; Csiki, 1936: 16  
*Rhynchophorus signaticollis* Chevrolat, 1883: 561; Wattanapongsiri, 1966: 152  
*Rhynchophorus signaticollis* var. *dimidiatus* Faust, 1894c: 330; Csiki, 1936: 16

##### 4.2.4.1 Diagnostic characters:

Elongated-oval shaped pre-gular suture, narrowing to the base; tridentate mandible; submentum truncately concave with narrowly elongate median

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<sup>1</sup> This name, however, is not valid according to the ICZN Articles 3, 11 (a), and 86

depression, extending throughout its length; body black or ferrugineous, usually with a broad black stripe or spots on pronotum.

#### **4.2.4.2 Description:**

*General colour* ferrugineous to black, legs lighter coloured than body; elytra dark red to black, shining or slightly pubescent, body elongate-oval; black spots on pronotum covers major part, shape may vary (Plate 32, A, B, C). *Head* dull to shining; smooth to finely punctured; basally  $2.07\times$  as broad as apex and  $3.72\times$  as broad as long. *Rostrum* varying from ferruginous to black; usually ferruginous;  $0.8\times$  as long as head and pronotum combined; base  $1.99\times$  as broad as apex; straight, smooth to minutely punctured. in profile; erect, thick, setae apically or subapically; extending  $0.38\times$  length of rostrum from apex and not reaching antennal scrobe; rows of tubercles present or not; if present, one row on each side of rostrum starts from scrobe; with central carina; epistoma rounded at apex; very finely punctured ventrally; space between antennal scrobe strongly narrowing (Plate 22, A, B; Plate 23, A, B) posteriorly; gular suture oval at base. *Antenna* inserted at  $0.04\times$  of length from base of rostrum; scrobe deep, broad and widely opened ventrally, concave laterally,  $4.62\times$  as long as broad; scape elongate,  $0.95\times$  as long as funicle and club combined; funicle with six antennomeres; VI antennomeres,  $1.07\times$  as long as I and II,  $1.32\times$  as long as III, IV and V; antennomeres I and IV subequally broad, antennomeres II and III subequally broad; VI antennomere  $1.6\times$  as broad as I and IV,  $1.75\times$  as broad as II and III,  $1.41\times$  as broad as V; second and third almost rounded; third with one seta, fourth with two; sixth almost triangular with two setae; antennal club large, ferruginous or reddish-brown, club  $0.60\times$  glabrous basally,  $0.78\times$  as long as broad, broadly triangular with several setae dorally and ventrally; inner spongy side with eight to fifteen setae,  $1.06\times$  as broad as I. (Plate 24, A)

*Pronotum* with sides gradually curved to apex and abruptly constricted anteriolaterally; slightly pubescent to shining; posterior margin nearly rounded,  $1.16\times$  as long as broad basally; base  $2.42\times$  as broad as apex; color mostly ferrugineous and varying to dark brown and black; if not, black with extremely variable markings; variation from no markings to more than seven black spots;

under side of pronotum mostly ferrugineous or dark brown, may vary to almost black, very minutely punctured (Plate 26, A).

*Leg* punctured on outer edges of femur and tibia; front coxa strongly globose, widely separated; pro, meso and metacoxae apart by 0.25×, 0.59× and 0.47× of breadth, respectively; metafemur, 1.08× and 1.10× as long as pro and mesofemur respectively; profemur subcylindrical; mid and hind femur gradually widened apically, slightly curved outwards, widest at apex with groove (Plate 24, B, C, D); protibia, 1.11× and 1.43× as long as meso and metatibia respectively, tibia moderately straight, grooved beneath and provided with a row of setae on each side of groove, tibiae uncinata with uncus arising from inner apical margin, apically curved downwards, small tooth like spine preceding uncus (Plate 24, E, F, G); tarsi psuedotetramerous, tarsi of all leg subequal, sclerotised extensions of IV tarsal segment distinctly separating bases of claws, III tarsal segment 1.95× as broad as I, II and III tarsal segment; IV tarsal segment as long 2.16× as I and III tarsal segment, 3.86× as long as II tarsal segment; reddish-brown setae beneath I and II tarsal segment, protruding outward on dorsal view; apical 0.3× length of III tarsal segment matted with reddish-brown setae and with two rows, one on each side, of small reddish-brown setae extending to the base; IV tarsal segment with nine to twelve setae ventrally; pair of curved claws, 5.20× as long as broad (Plate 25, A, B, D).

*Scutellum* varying from reddish-brown to black; pointed posteriorly, 1.85× as long as broad at base, base 3.80× as broad as apex; hump may or may not be present, if present prominent apically, runs parallel to length (Plate 27, B).

*Elytra* smooth, sometimes pubescent, nearly rectangular; with punctation along outer edges; elytron 2.46× as long as broad basally, base 1.76× and 1.44× as broad as middle and apex respectively; with five deep striae and other four striae not prominent; third to fifth striae sometimes prolonged to base (Plate 25, C).

*Venter* usually black, but may vary from ferruginous to almost black; if black, ferruginous spots present on terminal sternites, varying in shape; V abdominal sternite 1.41×, 3.03×, 2.94× and 1.14× as long as I, II, III and IV respectively,

sparsely and diffusely punctured medially, strongly punctured laterally; fifth strongly punctured dorsolaterally (Plate, 26, D). *Pygidium* 0.73× as long as broad basally, varying from ferrugineous to nearly black, sparsely and minutely punctured posteriorly and dorsolaterally (Plate, 27, A).

*Female genitalia.* Proximal arm of spermatheca 1.08× as long as distal arm, angle between proximal and distal arms acute; nodulus with many folds towards curvature; ramus broad; cornu bent and blunt and glabrous; well sclerotized, with four deep irregular ventral lobes, with two strongly convex dorsal lobes located near base of spermathecal gland. Spiculum ventrale long-rectangular, 0.74× as long as length of basal plate; spiculum ventrale truncate posteriorly, with two semi-circular sclerotized plates 0.5× as broad as spiculum ventrale (Plate, 28, A, D; Plate, 30, A, D).

*Male genitalia.* Aedeagus narrowly oval anteriorly, lateral arms small, slender, and joining aedeagal apodemes; apophyses 0.67× as long as median lobe; pedon sharply truncate posteriorly and gradually curved at outer margins, bearing several setae laterally, membranous area between sclerites rectangular, length: breadth ratio 2.21:1; aedeagal dorsal cleft triangular, sharply pointed anteriorly, extending 0.7× of its length; abruptly concave, divergent posteriorly, joined to manubrium with membrane; manubrium elongate, slender, 3.51× as long as median lobe, (Plate, 29, A, B; Plate, 31, A, B). Tegmen with dorsal piece 1.0× as broad as basal piece; parameres short, slender, with pointed apices, 0.17× as long as tegminal apodeme; manubrium elongate, slender, 1.77× as long as median lobe; apophyses, uniformly thick, broadened, subrounded apically bearing pointed curved hooks (Plate). Tegminal apodeme thick and tapering anteriorly; tegminal plate broadly fan-shaped; more rounded in smaller specimens; dorsal side of tegminal sclerites, parameres with a distinct emargination distally, 0.87× as long as tegminal apodeme; dorsal keel with two branches, extending 0.41× length of plate; in rounded tegminal plate, dorsal keel not branching and extending to posterior end of plate (Plate, 29, C; Plate, 31, C).

*Total length:* 15.4–31.92±0.88 mm; *Standard length:* 14.0–27.24±0.69 mm;  
*Breadth:* 8.1–12.94±0.52 mm.

*Specimens examined:* 3♀, 2♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Ramesha B., Host: *Cocus nucifera* L.; 15♀, 8♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 16.xi.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 4♀, 2♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 12.x.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 1♀, 3♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 16.vii.2015, Coll. Arun Singh, Pheromone trap; 2♀, 1♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 23.vii.2015, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 29.vii.2015, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 04.viii.2015, Coll. Arun Singh, Pheromone trap; 2♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 18.viii.2015, Coll. Arun Singh, Pheromone trap; 42♀, 31♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 21♀, 25♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Pheromone trap; 7♀, 4♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.ix.2015, 32 m. Coll. Arun Singh, Pheromone trap; 6♀, 8♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Alappuzha: ORARS Kayamkulam, N 09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh; 4♀, 3♂, Trivandrum: RARS Vellayani, N 08°25.74006'; 076°59.17194', 28 m; 23.x.2014, Coll. Arun Singh, Pheromone trap.

*Distribution:* Albania, Aruba, Australia, Bahrain, Bangladesh, Canary Islands, China, Croatia, Cyprus, Egypt, France, Greece, India, Indonesia, Iran, Iraq, Israel, Italy, Japan, Jordan, Kuwait, Laos, Lebanon, Libya, Malaysia, Malta, Morocco, Myanmar, Netherlands Antilles, Oman, Pakistan, Papua New Guinea, Philippines, Portugal, Qatar, Republic of Georgia, Samoa, Saudi Arabia, Singapore, Slovenia,

Solomon Islands, Spain, Sri Lanka, Syria, Taiwan, Thailand, Tunisia, Turkey, United Arab Emirates, Vietnam and Yemen. India: Andaman Islands, Assam, Karnataka, Kerala, Lakshdeep, Madhya Pradesh, Maharashtra, Manipur, Tamil Nadu.

*Remarks:* Profemur at middle  $1.07\times$  as broad as apex; uncus  $1.2\times$  as long as apical width of tibia. Adult female, 28 to 45 mm.in length, width 10.4 to 13.1 mm. Very similar to male in body size, color, markings on pronotum, except rostral setae absent; rostrum with three carina dorsally, midian carina starts at base of rostrum, lateral one on each side originates at scrobe, parallel to middle carina; additional two carina laterally; upper carina longer, starts near scrobe, lower carina starts at middle of rostrum, joint together near to apex; rostrum longer, slender and more cylindrical; setae on front femur absent; setae on front tibia much shorter (Plate 22, A; Plate 23, A). All collected specimens were segregated into three different groups owing to their morphological variations. Groups were named in the alphabatcal order as Group A, Group B and Group C. Above description is based on individuals of Group A. In total 200 specimens studied under this group. Differential distinguishing characters of three groups are compared in Table 4. The variations among these three groups can be discussed as follows:

#### **4.2.4.3 Variation I (Group B):**

*Remarks:* In total 134 specimens studied under this group. The characters of this group are similar with the Group A in many extents, the variations among the groups are as follows;

*General colour* ferrugineus to black. Body elongate-oval, shiny (Plate 32, D, E, F)  
*Head* dull to shining, smooth to finely punctured, black behind eyes, interocular region ferrugineus. *Rostrum* dorsally darker or reddish brown, laterally black, row of tubercles not so prominent compaired to other two group, median carina light in texture fades in groove of setae, with deep depression in interocular region (Plate 22, B, E; Plate 23, B, E) (median carina prominent and does not fades in groove of setae in Group A and Popilation C; lateral tubercles may or may not present in



Group A, lateral tubercles starts at 0.25× of rostrum length in Group C). *Pronotum* with six black spots scattered in two rows, shape and size may vary (Plate 26, B) (pronotum small to large black marks in Group A; major area covered by black marks in Group C).

*Female genitalia.* Spermatheca 'C' shaped with more curve. (Plate 28, B, E; Plate 30, B, E) (Group A and Group C with less curved spermatheca).

*Male genitalia:* There are no variations in male genitalia observed (Plate 29, D, E, F; Plate 31, D, E).

*Total length:* 16.4-26.58±0.581 mm; *Standard length:* 15.2-25.5±0.41 mm;  
*Breadth:* 9.1-11.83±0.36 mm.

*Specimens examined:* 3♀, 2♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 23 m, 29.ix.2014, Coll. Ramesha B., Host: *Cocus nucifera* L.; 6♀, 5♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 23 m, 16.xi.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 5♀, 1♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 23 m, 12.x.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 2♀, 6♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 16.vii.2015, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 23.vii.2015, Coll. Arun Singh, Pheromone trap; 1♀, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 04.viii.2015, Coll. Arun Singh, Pheromone trap; 1♀, 1♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 18.viii.2015, Coll. Arun Singh, Pheromone trap; 2♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 08.ix.2015, Coll. Arun Singh, Pheromone trap; 36♀, 17♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 11♀, 7♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Pheromone trap; 3♀, 2♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.ix.2015, 32 m. Coll. Arun Singh, Pheromone trap; 11♀, 6♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 1♀, Alappuzha:

ORARS Kayamkulam, N 09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh; 1♀, 2♂, Trivandrum: RARS Vellayani, N 08°25.74006'; 076°59.17194', 28m; 23.x.2014, Coll. Arun Singh, Pheromone trap.

*Remarks:* Interocular space 0.26× as broad as rostrum at base. Adult female very similar to male in body size, color, markings on pronotum, except rostral setae absent; three carina on dorsal of rostrum; middle one, starts at base of rostrum, lateral one on each side originates at scrobe, parallel to middle carina; additional two carina laterally; upper carina longer, starts near scrobe, lower carina starts at middle of rostrum, join together before apical end; rostrum longer, slender and more cylindrical (two carina laterally, upper longer carina originate at 0.20× of rostrum length in Group A; one carina laterally, originate at 0.35× of rostrum length in Group C) (Plate 22, B; Plate 23, B).

#### **4.2.4.4 Variation II (Group C)**

*Remarks:* In total 93 specimens studied under this Group. Characters of this group are similar with the Group A in many extents, the variations among the groups are as follows;

*General colour* ferrugineous to black. Body elongate-oval, shiny (Plate 32, G, H, I). *Head* dull to shining; smooth to finely punctured, basally black in colour. *Rostrum* dorsally ferrugineous, laterally black, row of tubercles on each side, median carina light in texture, with deep depression in interocular region. *Rostrum*, tubercles starts at 0.25× of rostrum length (Plate 22, C, F) (Group A with prominent median carina, lateral tubercles may or may not present; Group B with laterally black, row of tubercles not so prominent compared to other two group, median carina light in texture fades in groove of setae). *Pronotum* with three black spots covering major part, shape may vary (Plate 26, C) (Group A with small to large black mars on pronotum; Group C with six black spots scattered in two rows).

*Genitalia:* There are no variations in genitalia observed (Plate 28, C, F; Plate 29, G, H, I; Plate 30, C, F; Plate 31, F, G, H).

*Total length:* 20.4–28.43±0.68 mm; *Standard length:* 18.4–26.0±0.74 mm;  
*Breadth:* 9.2–12.5±0.51 mm.

*Specimens examined:* 5♀, 1♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 29.ix.2014, Coll. Ramesha B., Host: *Cocus nucifera* L.; 2♀, 5♂, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 16.xi.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 2♀, Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 13 m, 12.x.2014, Coll. Arun. Singh, Host: *Cocus nucifera* L.; 1♀, 4♂, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 16.vii.2015, Coll. Arun Singh, Pheromone trap; 1♀, Kasargod: RARS Pilicode, N 12°12.09420' E 075°09.78282', 25 m, 23.vii.2015, Coll. Arun Singh, Pheromone trap; 12♀, 26♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Pheromone trap; 9♀, 13♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Pheromone trap; 2♀, 1♂, Thrissur: BRS Kannara, N 10°32.250' E 076°19.238', 12.ix.2015, 32 m. Coll. Arun Singh, Pheromone trap; 1♀, 6♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Pheromone trap; 2♀, Trivandrum: RARS Vellayani, N 08°25.74006'; 076°59.17194', 28 m; 23.x.2014, Coll. Arun Singh, Pheromone trap.

*Remarks:* Markings on pronotum covers major area. Adult female very similar to male in body size, color, markings on pronotum, except rostral setae absent; three carina on dorsal of rostrum; middle one, starts at base of rostrum, lateral one on each side originates at scrobe, parallel to middle carina; additional one carina laterally, originate at 0.35× of rostrum length, extends upto apex; rostrum longer, slender and more cylindrical; setae on front femur absent; setae on front tibia much shorter (two carina laterally, upper longer carina originate at 0.20× of rostrum length in Group A; two carina laterally, upper longer carina originate at 0.28× of rostrum length in Group B) (Plate 22, C; Plate 23, C).

#### 4.2.4.5 Sexual dimorphism:

Two sexes can easily be identified by the rostral characters. Males of this species have thick erect setae, apically or subapically on rostrum; rostrum with one median carina dorsally, median carina starts at base of rostrum, laterally row of tubercles may or may not present, if present one on each side originates at scrobe, parallel to median carina (Plate 22, D, E, F; Plate 23, D.,E ,F). Females does not have erect setae on rostrum, whereas bears three carina dorsally, one median and two lateral, running parallel to median carina. Additional one or two carina laterally; if two carina, upper carina longer, starts near scrobe, lower carina starts at middle of rostrum, joint together near to apex; rostrum longer, slender and more cylindrical; setae on front femur absent; setae on front tibia much shorter (Plate 22, A, B, C; Plate 23, A, B, C).

#### 4.2.4.6 Key to the species of *Rhynchophorus* Herbst:

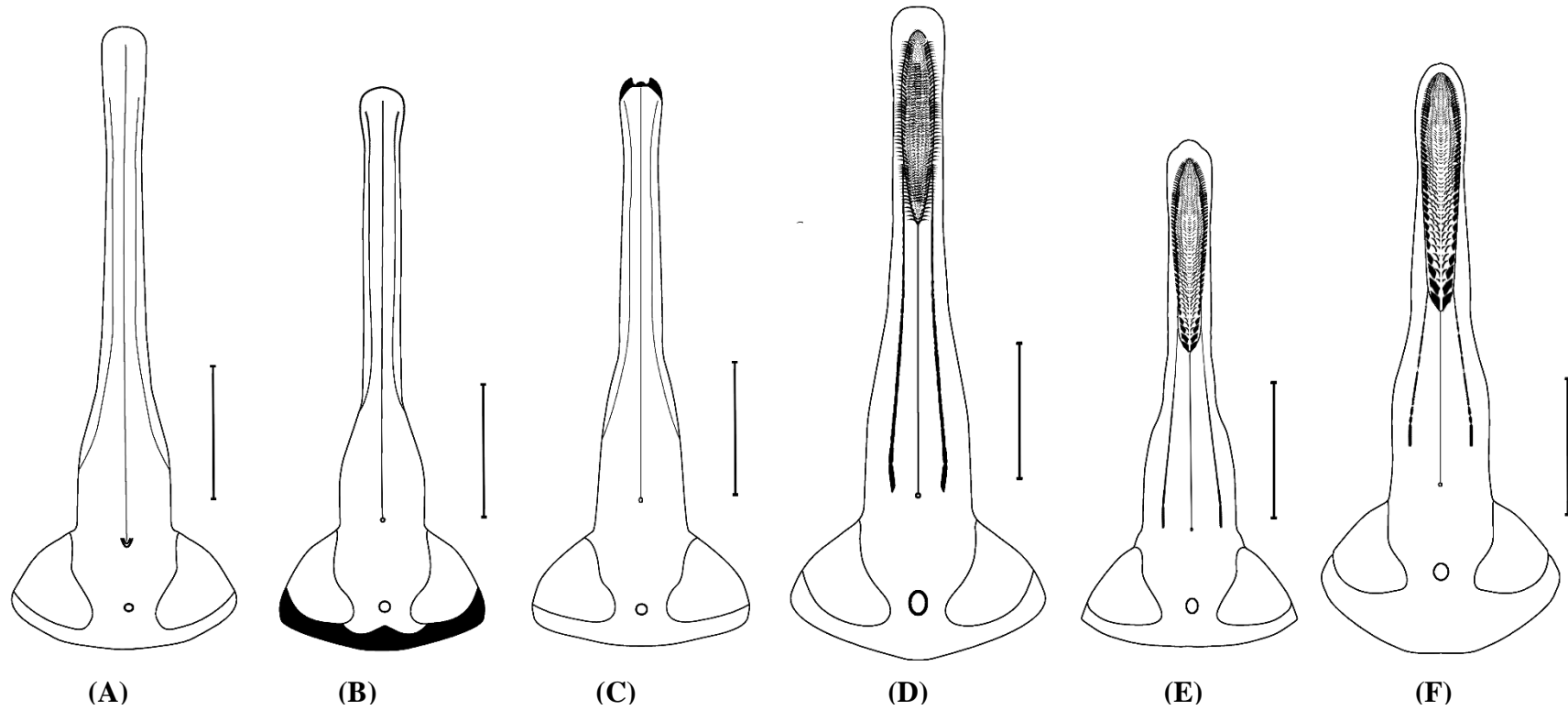
1. Mandible distally rounded or oval.....2
  - Mandible distally toothed.....4
2. Nasal plate absent; setae beneath III tarsal segment covering one-sixth area, pronotum oval posteriorly; gular suture narrowed; tip of rostrum not convex ventrally, slightly compressed or cylindrical, not convex or oval baso-dorsally; submentum truncate distally.....3
  - Nasal plate present, distinct rounded; setae beneath III tarsal segment covering two-third area; pronotum almost square and broadly rounded posteriorly; gular suture wide; tip of rostrum strongly convex ventrally, strongly compressed, convex and oval baso-dorsally; submentum oval distally.....*R. quadrangulus* Quedenfeldt
3. Protibia broad, flat, with two broad distal lobes; meso and metatibia truncate distally; pronotum with sides curved, broadened before constricting anteriorly; rostrum quadrate and slightly compressed, dorsally concave or grooved at apex; submentum truncately concave distally; male rostral setae thick, erect.....*R. ritcheri* Wattanapongsiri

- Protibia not flat; meso and metatibiae not truncate; pronotum with sides straight before contracting anteriorly; rostrum cylindrical, oval or feebly convex at apex; submentum sharply concave distally, mandible broadly oval distally; male rostral setae absent, represented by tubercles dorsally.....***R. cruentatus***(Fabricius)
- 4. Pronotum produced at base; pre-gular suture narrowed; ventral space between antennal scrobes narrowed; tip of rostrum dorsally grooved or nearly truncate; interocular space always one-third or less than one-third as broad as rostrum at base.....5
- Pronotum oval or broadly rounded at base; pre-gular suture widened; ventral space between antennal scrobes broadened; tip of rostrum not grooved but oval distally; interocular space not less than one-third as broad as rostrum at base.....6
- 5. Mandible deeply tridentate, sharply pointed distally; ventral space between antennal scrobes smooth, without setae; meso and metatibia with distinct spines at base of uncus; pygidium flat dorsally; setae beneath III tarsal segment almost covering the entire area; submentum tridentate, sharply pointed and curved inwards; antenna small, slender; scutellum sharply pointed posteriorly; body ferrugineous with black patches.....***R. distinctus*** Wattanapongsiri
- Mandible with two broad lobes; ventral space between antennal scrobes rugous with several long, slender setae; meso and metatibia without distal spines; pygidium convex dorsally; setae beneath III tarsal segment covering one-half the entire area; submentum oval; antenna thick; scutellum produced posteriorly; body completely black.....***R. palmarum*** (Linnaeus)
- 6. Pygidium smooth; beneath III tarsal segment without two rows of lateral setae; interocular space nearly one-third as broad as rostrum at base; base of pronotum broadly rounded, usually with two long red stripes extending the entire length; scutellum very narrowly produced posteriorly.....***R. phoenicis*** (Fabricius)

- Pygidium punctured; beneath III tarsal segment with two rows of lateral setae; base of pronotum oval or broadly oval, usually with one broad red or two small, short red stripes, or several spots on pronotum; scutellum somewhat pointed posteriorly.....7
- 7. Pre-gular suture uniformly broadened to the base, mandible four-dentate; submentum truncate with small triangular median depression confined to apex; body black, usually with small narrowed, short, red stripes on pronotum.....***R. bilineatus*** (Montrouzier)
- Pre-gular suture with elongate-oval shape before narrowing to the base; mandible tridentate; submentum truncately concave with narrowly elongate median depression, extending throughout its length; body black or ferrugineus, usually with a broad black stripe or spots on pronotum.....***R. ferrugineus*** (Olivier)

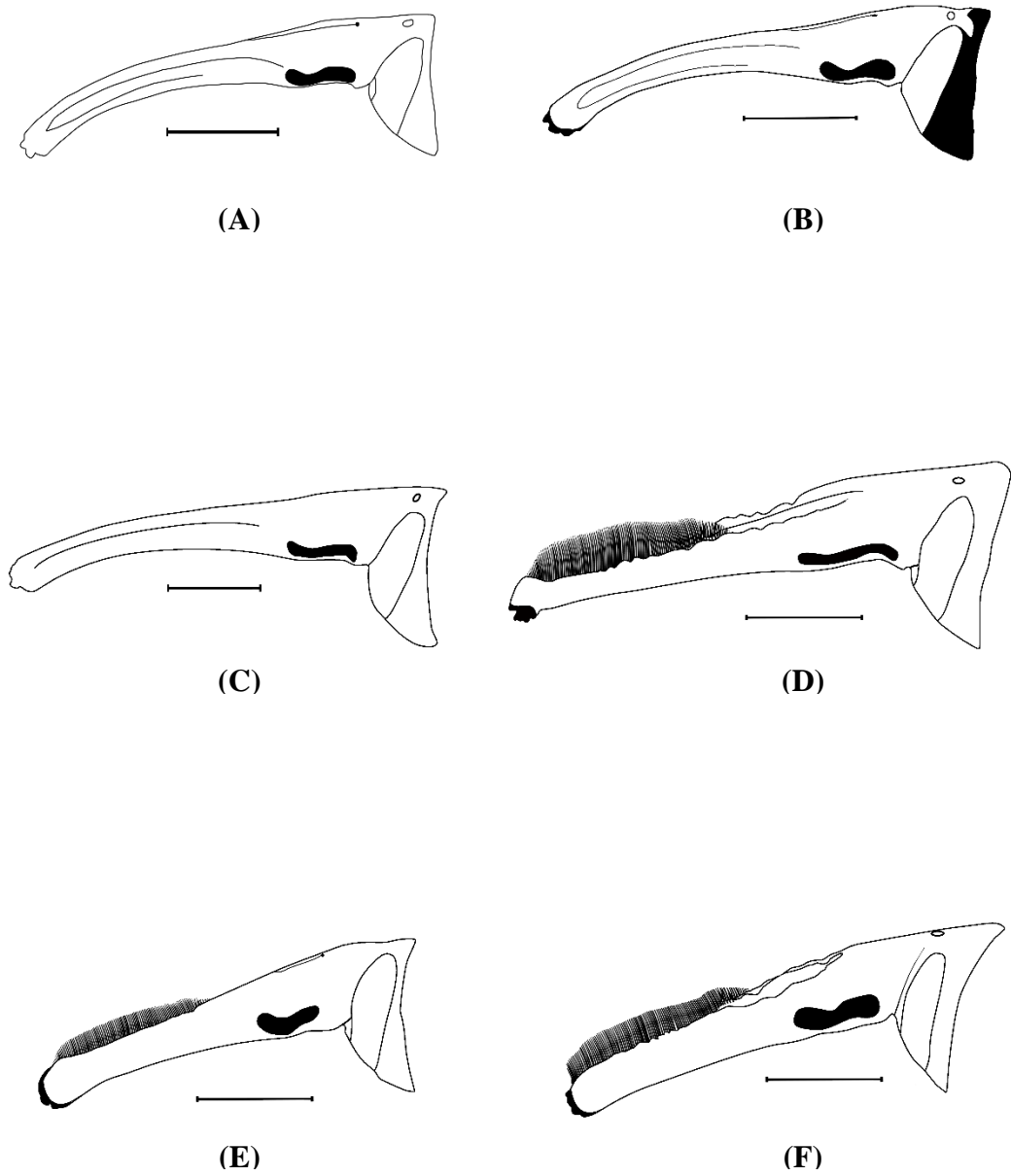
**Table 4. Comparison between differential distinguishing characters of three population of *Rhynchophorus ferrugineus* (Olivier)**

<b>Characters</b>	<b>Population A</b>	<b>Population B</b>	<b>Population C</b>
<i>Rostrum carina</i>	Median and tubercles prominent in male and median carina fades in groove of setae. Female with two carina laterally, one on each side.	Median and tubercles not prominent in male and median carina fades in groove of setae. Female with two carina laterally, one on each side.	Prominent median carina and does not fades in groove of setae. In male median carina and does not fades in groove of setae. Laterally less prominent row of tubercles. Female with one carina laterally, on each side.
<i>Pronotum vittae</i>	Six smaller black markings arranged in two rows.	Six black markings larger in size, arranged in two rows.	Three large markings covering the major area dorsally.
<i>Spermatheca</i>	‘C’shaped with less curvature and four folds in nodulus region.	‘C’shaped with less curvature and few folds in nodulus region	‘C’shaped with more curvature and many folds in nodulus region

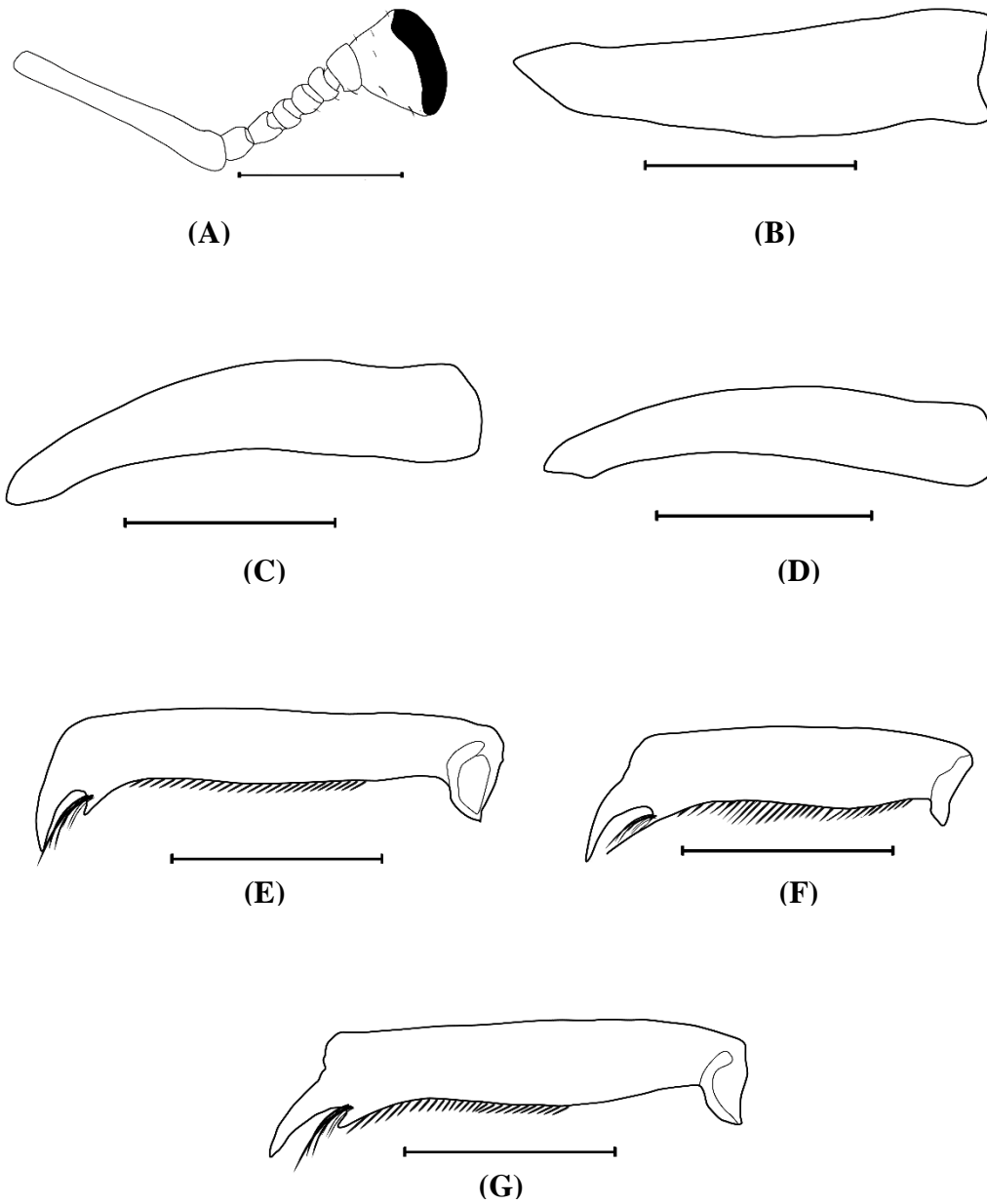


**Plate 22. *Rhynchophorus ferrugineus*: rostrum, dorsal view; (A) ♀ of Group A; (B) ♀ of Group B; (C) ♀ of Group C; (D) ♂ of Group A; (E) ♂ of Group B; (F) ♂ of Group C. Scale= 2 mm.**





**Plate 23. *Rhynchophorus ferrugineus*: rostrum, lateral view; (A) ♀ of Group A; (B) ♀ of Group B; (C) ♀ of Group C; (D) ♂ of Group A; (E) ♂ of Group B; (F) ♂ of Group C. Scale= 2 mm.**



**Plate 24. *Rhynchophorus ferrugineus*: (A) Antenna; (B) Profemur; (C) Mesofemur; (D) Metafemur; (E) Protibia; (F) Mesotibia; (G) Metatibia.**

**Scale= 2 mm.**

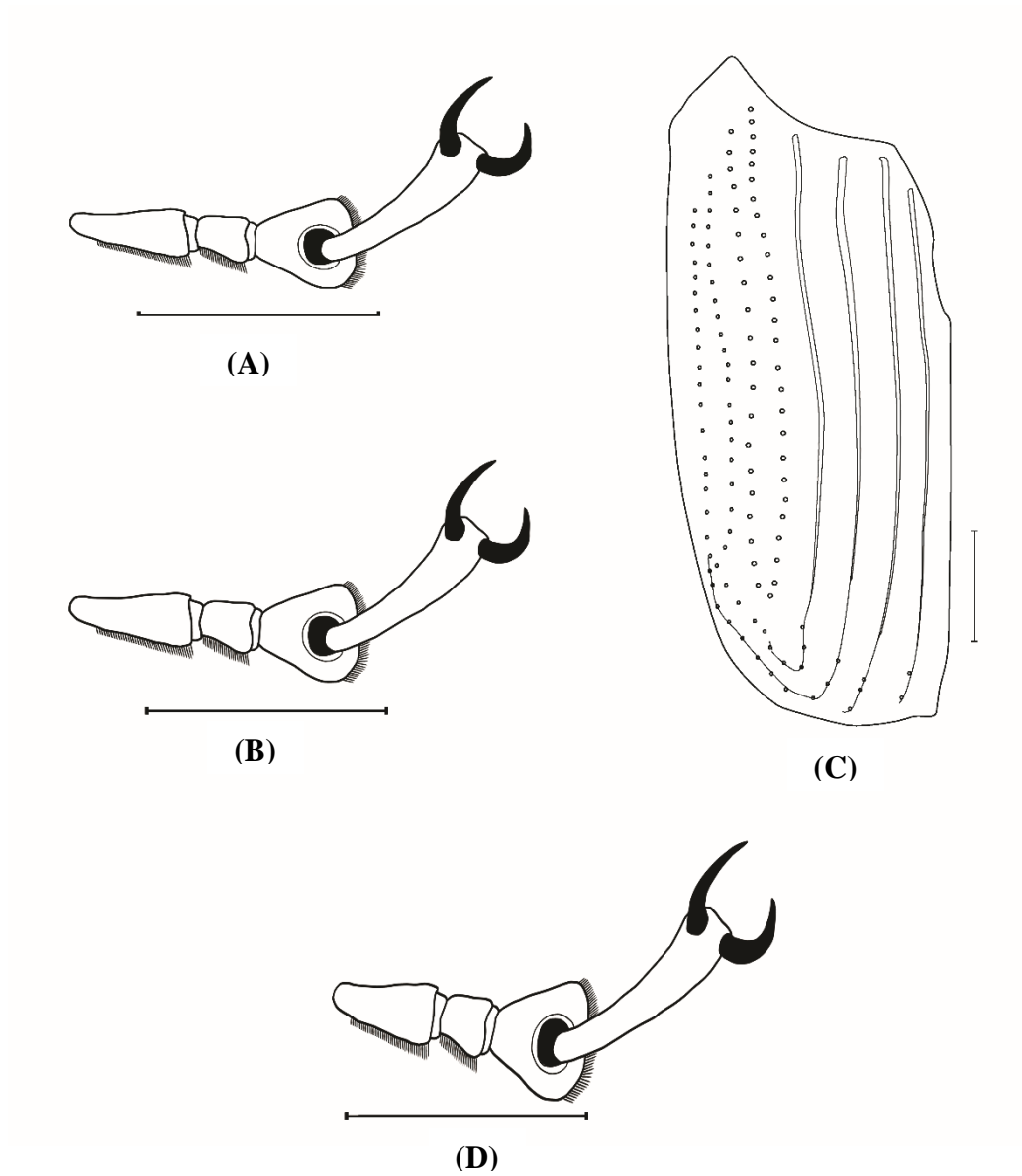
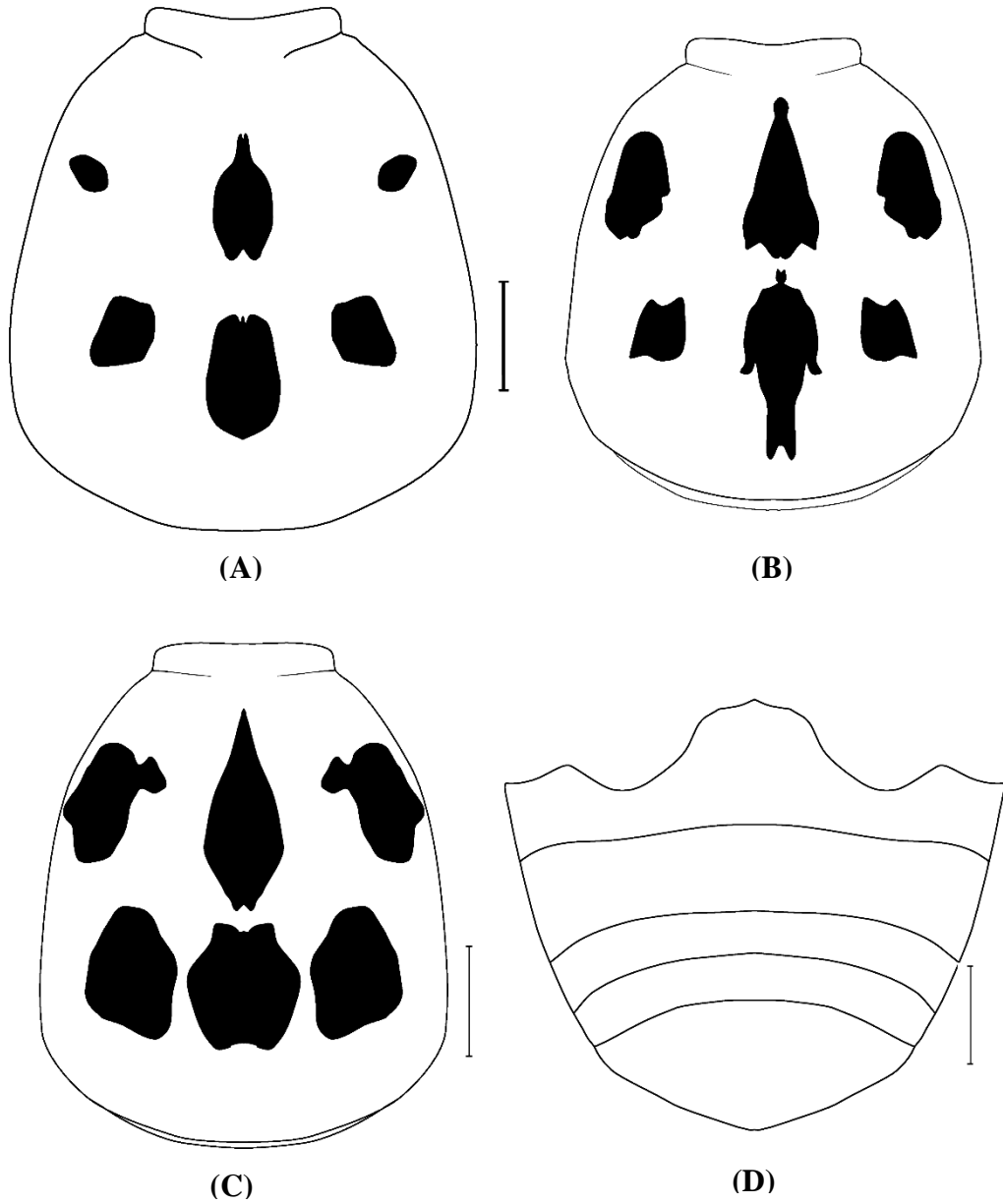
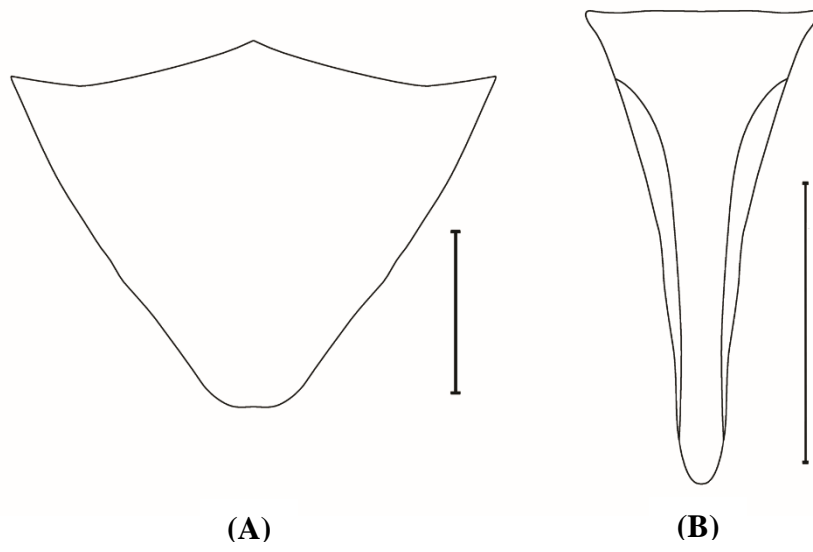


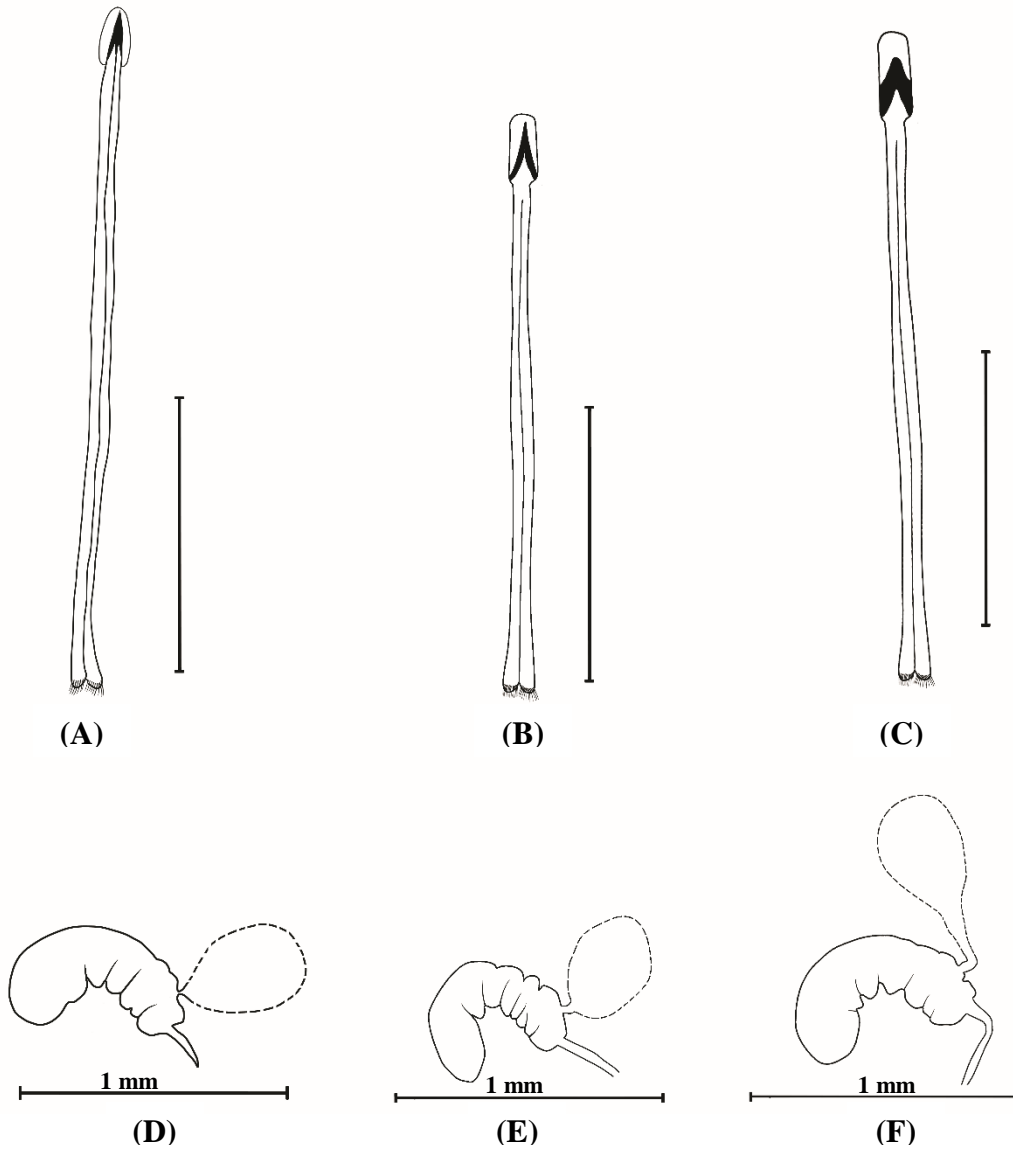
Plate 25. *Rhynchophorus ferrugineus*: (A) Protarsus; (B) Mesotarsus; (C) Elytron, dorsal view; (D) Metatarsus. Scale= 2 mm.



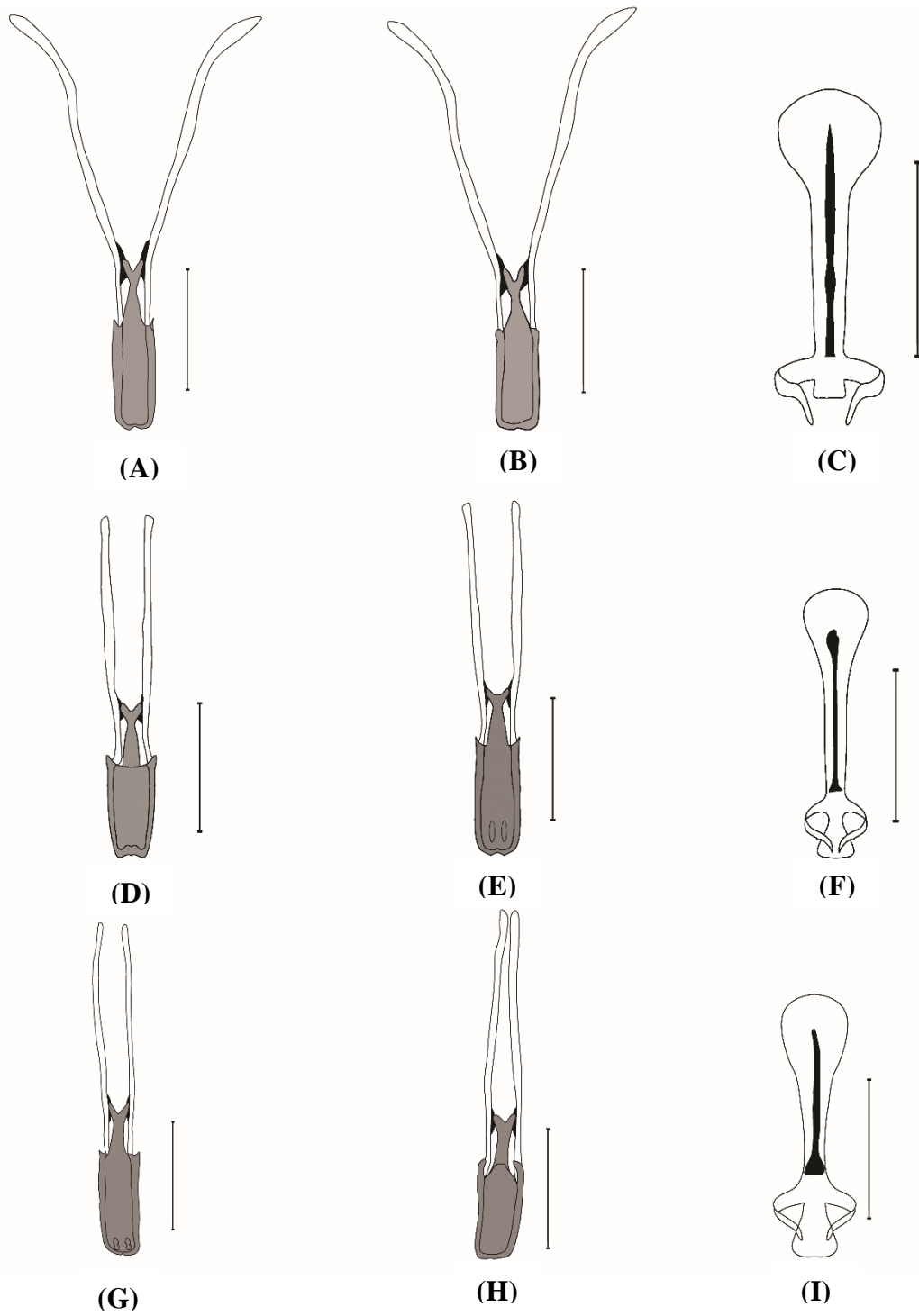
**Plate 26. *Rhynchophorus ferrugineus*: (A)-(C) Pronotum, dorsal view; (A) Group A; (B) Group B; (C) Group C. (D) Venter. Scale= 2 mm.**



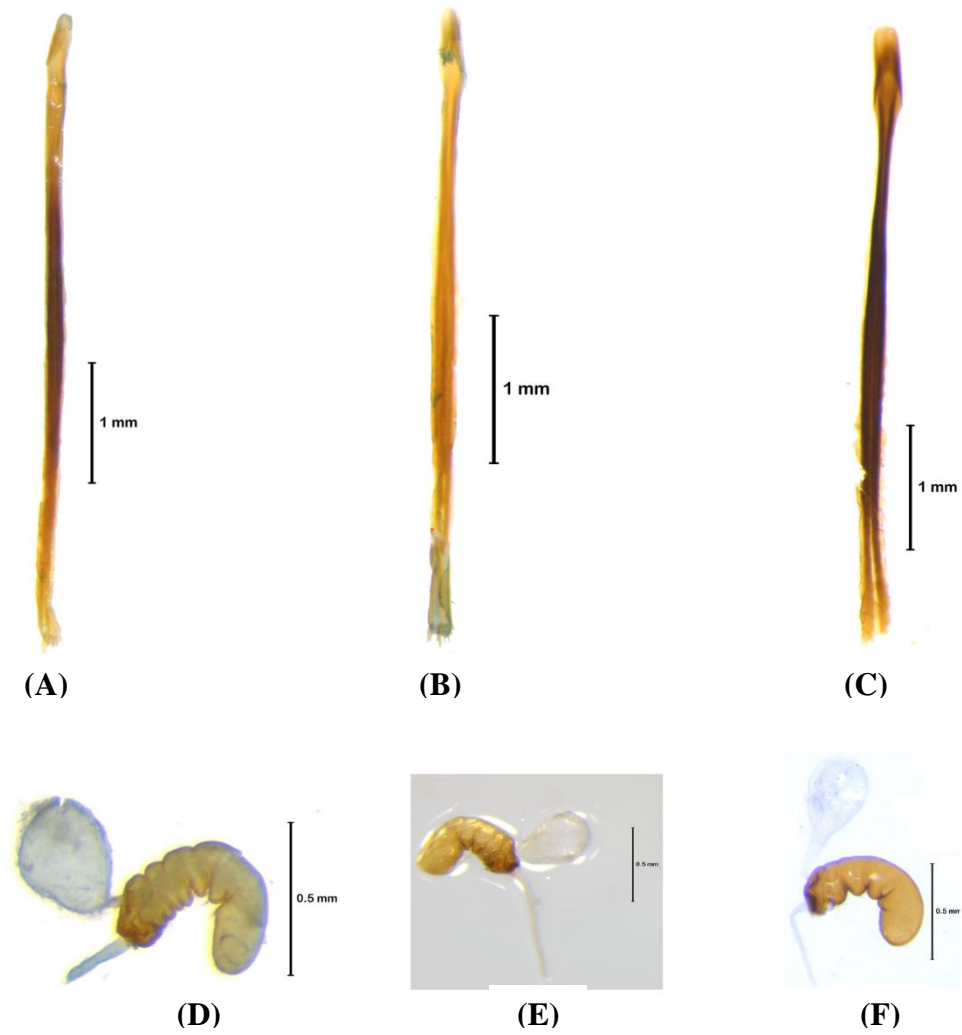
**Plate 27. *Rhynchophorus ferrugineus*: (A) Pygidium; (B) Scutellum. Scale= 2 mm.**



**Plate 28. *Rhynchophorus ferrugineus*: female genitalia (A)-(C) Spiculum venrale; (A) Group A; (B) Group B; (C) Group C. (D)-(F) Spermatheca; (D) Group A; (E) Group B; (F) Group C. Scale= 2 mm**

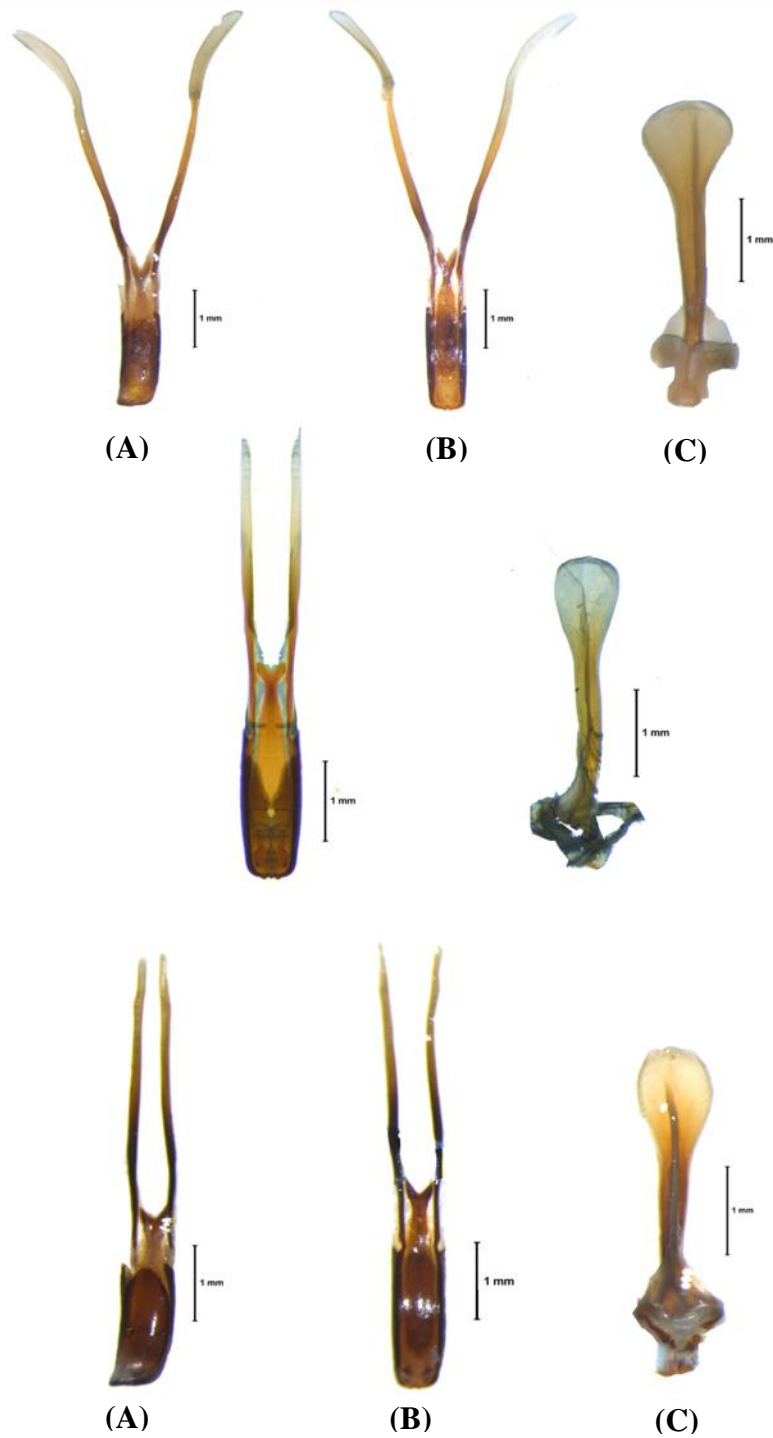


**Plate 29. *Rhynchophorus ferrugineus*: male genitalia, aedeagus dorsal, aedeagus ventral and tegmen; (A)-(C) Group A; (D)-(F) Group B; (G)-(I) Group C. Scale= 2 mm.**

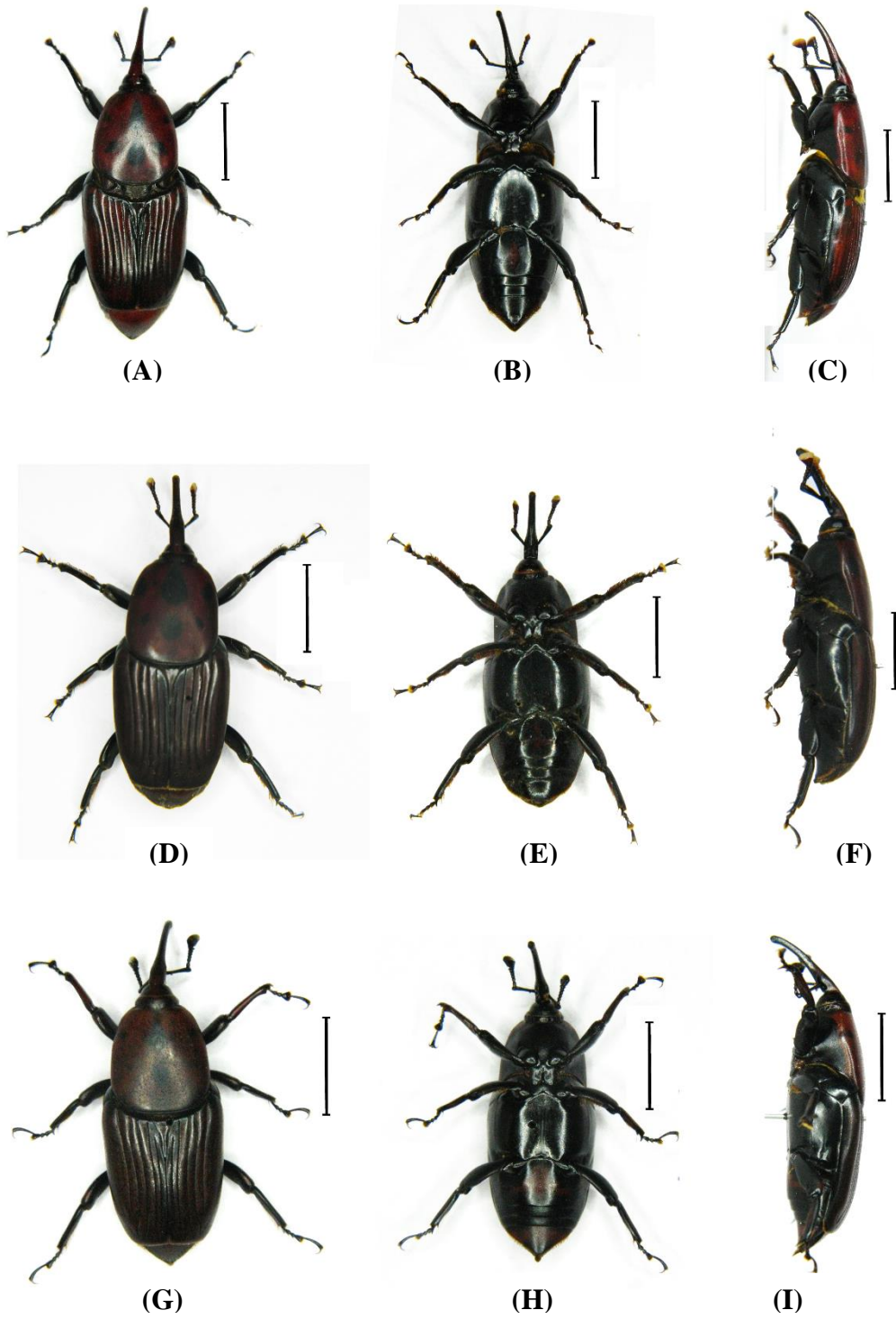


**Plate 30. *Rhynchophorus ferrugineus*: female genitalia (A)-(C) Spiculum venrale; (A) Group A; (B) Group B; (C) Group C. (D)-(F) Spermatheca; (D) Group A; (E) Group B; (F) Group C.**





**Plate 31. *Rhynchophorus ferrugineus*: male genitalia, aedeagus dorsal, aedeagus ventral and tegmen; (A)-(C) Group A; (D)-(E) Group B; (F)-(H) Group C. Scale= 2 mm.**



**Plate 32. *Rhynchophorus ferrugineus*: Habitus, dorsal view, ventral view and lateral view; (A)-(C) Group A, (D)-(F) Group B, (G)-(I) Group C; Scale= 1 cm.**

#### 4.2.5 *Sitophilus oryzae* (Linnaeus)

(Plates 33, 34, 35, 36, 37, 38)

*Synonyms:* *Curculio oryzae* Linnaeus, 1763: 395; Fabricius, 1801a: 438 (*Calandra*); Herbst, 1795: 18 (*Rhynchophorus*); Gyllenhal in Schoenherr, 1838: 981

*Curculio ferugilegus* DeGeer, 1781: 273; Csiki, 1936: 76

*Calandra minor* Sasaki, 1899: 485; Kuschel, 1961: 243

*Calandra sasakii* Takahashi, 1928: 164; Kuschel, 1961: 243

*Sphenophorus quadriguttatus* Montrouzier, 1861: 910; Kuschel, 1961: 243

##### 4.2.5.1 *Diagnostic characters:*

Black to ferrugineous in colour, size not more than 3mm. Rostrum straight in lateral view with base continuous with head; eyes clearly visible in dorsal view. Pygidium with a basal (dorsal), longitudinal sulcus into which the elytral sutural margins “lock”; small, grain infesting species. Upper aedeagus surface evenly convex, without longitudinal line. Microsculpture (punctures) on prothorax and elytron are more alutaceous.

##### 4.2.5.2 *Description:*

*General colour* black to ferrugineous, antennae and tarsi brown (Plate 37, A, B). *Head* moderately punctate at crown region, punctations dense near eye, 3.34× as broad as long; 0.27× as long as and 2.78× as broad as rostrum. *Eyes* subdorsal, well visible in dorsal view, ventrally approximating, 3.11× as long as broad. *Rostrum* 0.72× as long as head and pronotum combined, 1.28× as long as broad basally; base 1.50× as broad as apex, rostrum not curved ventrally, continuous with head without any basal constriction, with sides moderately concave from scrobes to apex; middle to apex with minute punctures; remaining portion of dorsum coarsely and in part confluent punctured; punctures arranged in two rows on either side from base to apex, either of row meets at base, forming distinct groove; outer groove meet in between eyes; grooves in males more prominent. *Scrobe* concave laterally, enclosed

dorsally,  $4.1\times$  as long as broad (Plate 33, A, B, C, D). *Antennae* brown, inserted  $0.125\times$  of length from base of rostrum; scape clavate,  $0.61\times$  as long as funicle and club combined; funicle comprise of six antennomeres; antennomere II, III, IV and VI subequally long, I antennomere,  $1.25\times$  and  $1.5\times$  as long as II, and V, respectively; antennomere I, II, III, IV and V subequally broad, antennomere VI,  $1.33\times$  as broad as each antennomere, antennomeres contains setae; club subconical,  $0.67\times$  club glabrous basally,  $1.92\times$  as long as broad, row of setae encircling joint between the club (Plate 34, A).

*Prothorax*  $1.1\times$  as long as broad basally; base  $1.58\times$  as broad as apex; anterior margin subtruncate, moderately constricted subapically, posterior margin bisinuate and truncated at middle, punctures on dorsum individually discrete, moderately coarse, apart by  $0.5\times$  of diameter on disc, except the apical thin margin; setae borne by punctures inconspicuous (Plate 34, B). *Scutellum* rectangular,  $1.34\times$  as broad as long.

*Elytra* punctatostriate, subparallel sided,  $2.51\times$  as long as broad, basally  $1.10\times$  and  $1.61\times$  as broad as middle and apex; striae well impressed,  $1.81\times$  as broad as interstriae, punctures continuous not clearly separated from each other, setae small, very fine and inconspicuous and similar to that on pronotum; red to yellow spots of varying size on each elytron, may vary in size (Plate 34, C).

*Sternum*. Prosternum with convex, punctures as on pronotum, prointercoxal process impressed with punctures; mesointercoxal process apically distinctly arcuate, metasternum depressed in middle; prosternum  $2.35\times$  as long as mesosternum and  $1.69\times$  as long as metasternum.

*Legs* moderate, rather slender; pro, meso, and metacoaxa apart by  $0.48\times$ ,  $0.37\times$  and  $0.72\times$  breadth of procoxa, mesocoxae and metacoxae respectively. Femur laterally flattened, moderately punctate, setae on punctures inconspicuous; metafemur  $1.13\times$  and  $1.28\times$  as long as pro and mesofemur respectively (Plate 35, C, D, E). Tibiae slender, with very fine microsculpture; protibia  $1.38\times$  and  $1.23\times$  as long as meso and metatibia respectively; uncinated, with sharp uncus arising from inner apical

angle; sparsely punctate, setae small, very fine and inconspicuous, grooved beneath, ventrally dentate, providing serrated appearance; premucro at outer apical angle (Plate 35, A, B, C). tarsi of all three legs subequal, tarsal segment I and II subequal, III tarsus 1.33× as long and as broad as II conspicuous third tarsi bilobed (Plate 35, D, E, F).

*Venter* coarsely punctate, first sternite with depression in middle, rest of the sternites convexly raised. V sternite, 1.11×, 1.21×, 1.92× and 2.0× as long as I, II, III and IV respectively (Plate 35, G). *Pygidium* visible, 1.0 × as long as broad, medially sulcate, punctate, setae borne on punctures.

*Female genitalia* (Plate 36, 38): Spermatheca C shaped with or without gland, proximal arm as long and as broad as distal arm, angle between proximal and distal arms obtuse. Sternite eight “Y” shaped with a strip like broad shaft, 4.5× as long as broad at base; broadest at base, 4.5× as broad as apex, base truncated, forming two arms, arms 0.2× as long as total length (Plate 36, A; Plate 38, A).

*Male genitalia* (Plate 36, 38): Aedeagus with median lobe arcuate in profile, evenly convex in cross-section; pedon with longitudinal sulci, apophysis 0.9× as long as median lobe. Tegmen 0.92× as long as median lobe; tegminal plate broad, flag like, rounded at apex, 1.2× as broad as tegminal sclerites; tegminal apodeme slender and widened towards apex (Plate 36, B, C, D, E; Plate 38, B, C, D, E).

*Total length*: 2.30-2.73±0.11 mm; *Standard length*: 2.08-2.45±0.13 mm; *Breadth*: 1.20-1.42±0.13 mm.

*Specimens examined*: 11♀, 16♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 23 m, 17.xii.2014, Coll. Arun. Singh, Host: *Oryza sativa* L.; 5♀, 4♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Host: *Oryza sativa* L.; 7♀, 3♂, Palakkad: RARS Pattambi, N 10°48.781' E 76°11.506', 12.ix.2015, 54 m, Coll. Arun Singh, Host: *Oryza sativa* L.; 2♀, 3♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 04.vii.2015, 3 m, Coll. Arun Singh, Host: *Oryza sativa* L.; 7♀, 3♂,

Trivandrum: RARS Vellayani, N 08°25.74006'; 076°59.17194', 28m; 23.x.2014, Coll. Arun Singh, Host: *Oryza sativa* L.

*Distribution:* Cosmopolitan

*Remarks:* Protibia with sharp premucro, 0.52× as long as uncus. All collected specimens were segregated into two different groups owing to their colouration and elytral spots. Groups were named in the alphabetical order as Group A and Group B. Above description is based on individuals of Group A. In total 61 specimens studied under Group A. Differential distinguishing characters of three groups are compared in Table 5. The variations among these three groups can be discussed as follows:

#### **4.2.5.3 Variation I (Group B):**

(Plate 33, C, D)

*Remarks:* In total 48 specimens studied under this group. The characters of this group are similar with the Group A in many extents, the variations among the groups are colour and yellow spots on elytron is not prominent as in case of Group A.

*General colour* black to dull brown with antennae and tarsi darker than group A (Plate 37, A, B).

*Genitalia:* There are no variations in genitalia observed.

*Total length:* 2.40-2.80±0.19 mm; *Standard length:* 2.20-2.62±0.16 mm; *Breadth:* 1.23-1.40±0.14 mm.

*Specimens examined:* 10♀, 7♂, INDIA: Kerala: Kasargod: Padannakad, N 12° 15.423' E 075° 07.018', 23 m, 17.xii.2014, Coll. Arun. Singh, Host: *Oryza sativa* L.; 8♀, 8♂, Wayanad: RARS Ambalavayal, N 11°28.160' E 076°29.553', 12.ix.2015, 883 m, Coll. Arun Singh, Host: *Oryza sativa* L.; 3♀, 5♂, Kottayam: RARS Kumarakom, N 09°37.650' E 076°25.871', 18.ix.2015, 3 m, Coll. Arun Singh, Host: *Oryza sativa* L.; 2♀, 5♂, Alappuzha: ORARS Kayamkulam, N

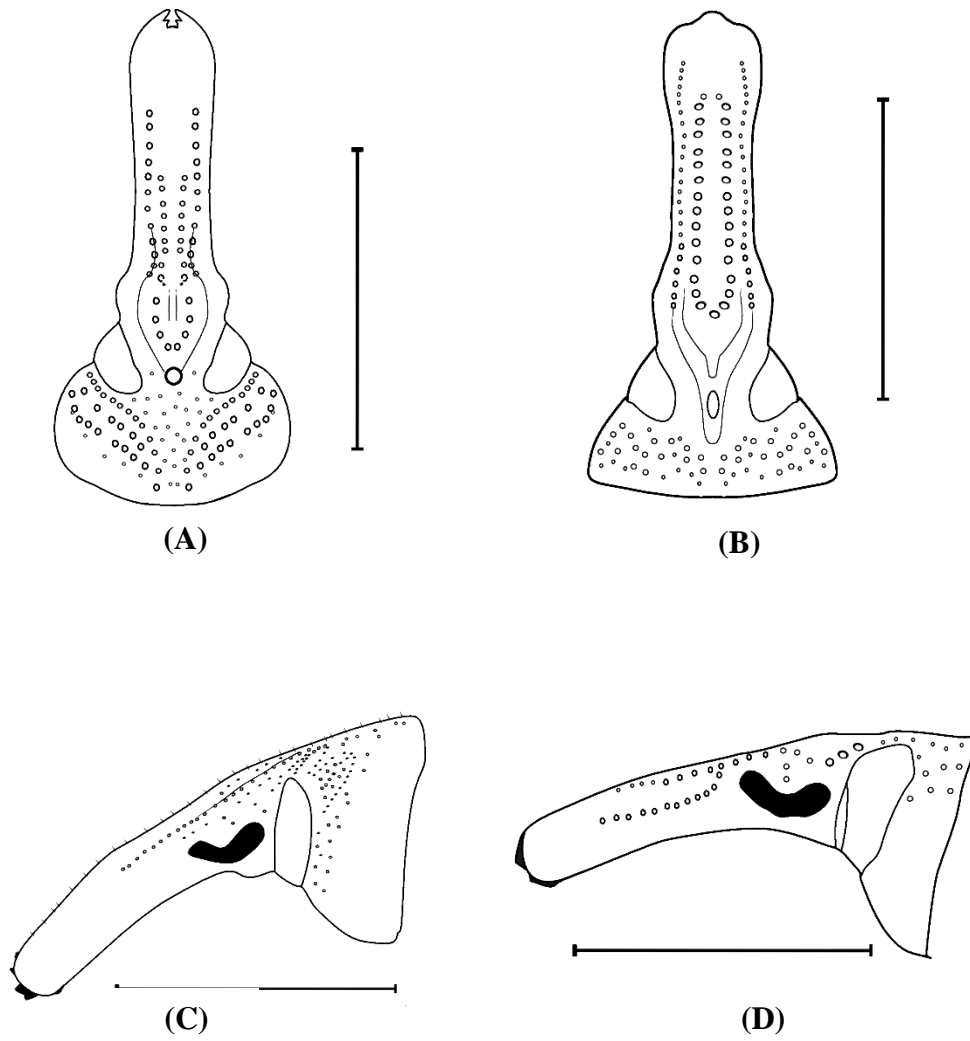
09°10.57992' E 076°31.03746', 20.ix.2015, 2 m, Coll. Arun Singh, Host: *Oryza sativa* L.

#### 4.2.5.4 Sexual dimorphism:

Sexes can be separated out easily by the shape of rostrum and arrangement of punctations on rostrum. Females can be separated by having slender and longer rostrum than male. Males with thick-stout rostrum, widened at middle as compared to female with more prominent punctures. Distance from scrobe to apex of rostrum 1.10× as long as of males, whereas distance from base of rostrum to scrobe in female is 0.90× as long as in male. Two rows of punctures extend backward and meet individually at interocular region forming two distinct grooves. Grooves are more prominent in case of males and outer groove extend deep in interocular region (Plate 33, A, B, C, D).

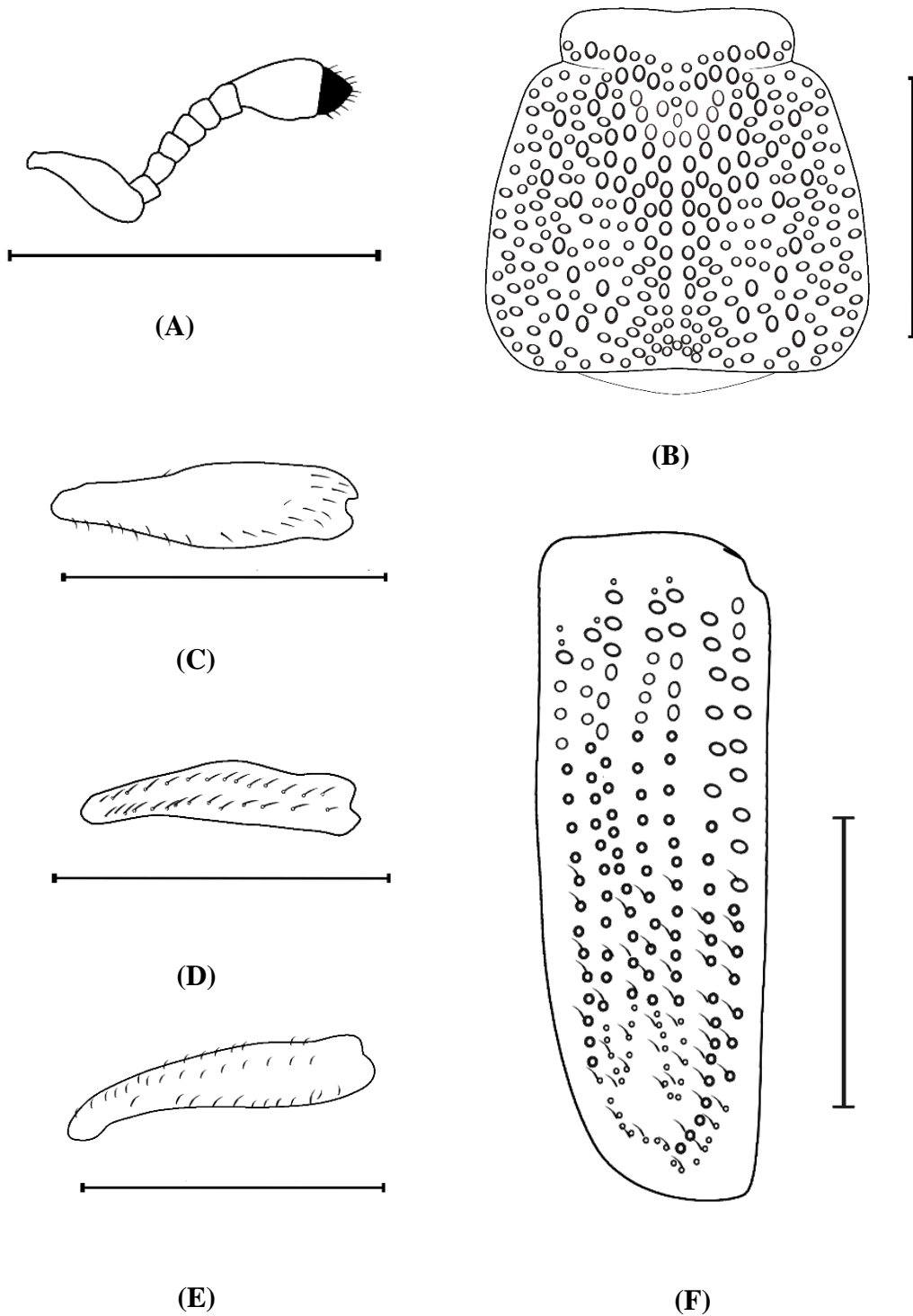
**Table 8. Comparison between differential distinguishing characters of two groups of *Sitophilus oryzae* (Linnaeus)**

<b>Characters</b>	<b>Group A</b>	<b>Group B</b>
<i>General body colour</i>	Black to ferrugineous in colour, comparatively shiny with lighter antennae and tarsi	Black to dull brown in colour, with darker antennae and tarsi
<i>Pronotum colour</i>	Yellow spots on elytron is prominent and clearly visible	Yellow spots on elytron very light or may not be visible clearly

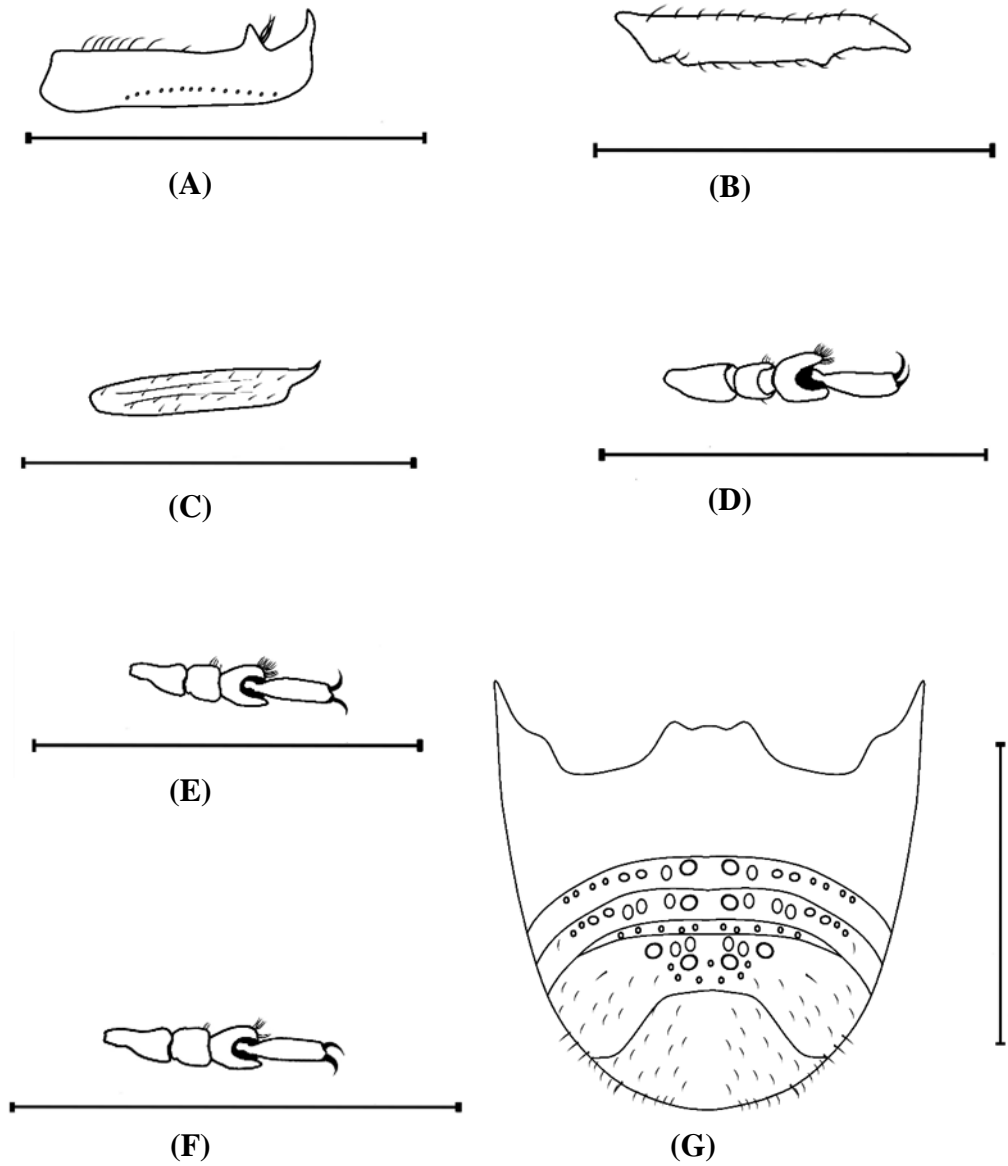


**Plate 33: *Sitophilus oryzae*: Rostrum; (A) ♀, Dorsal view; (B) ♂, Dorsal view; (C) ♀, Lateral view; (D) ♂, Lateral view. Scale= 0.5 mm**

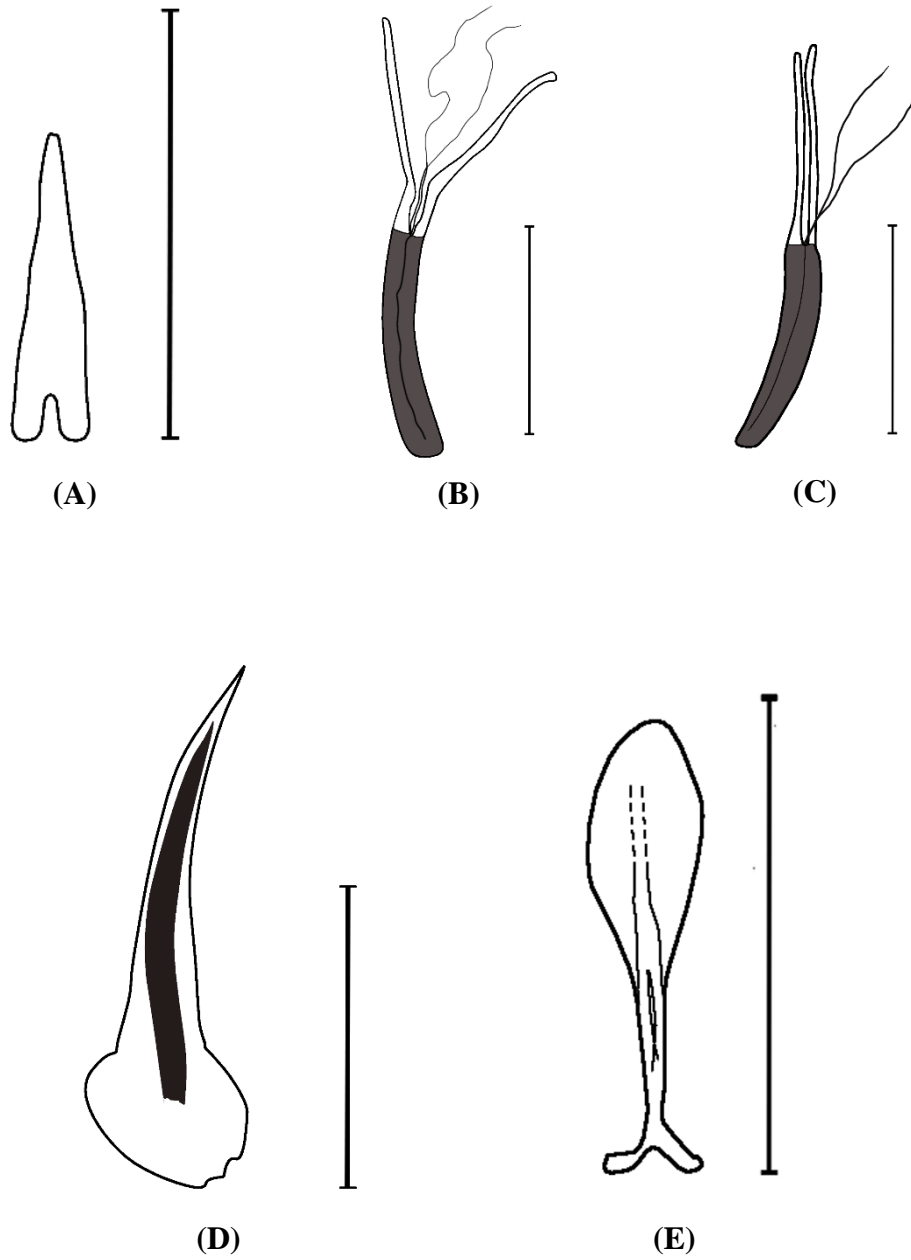




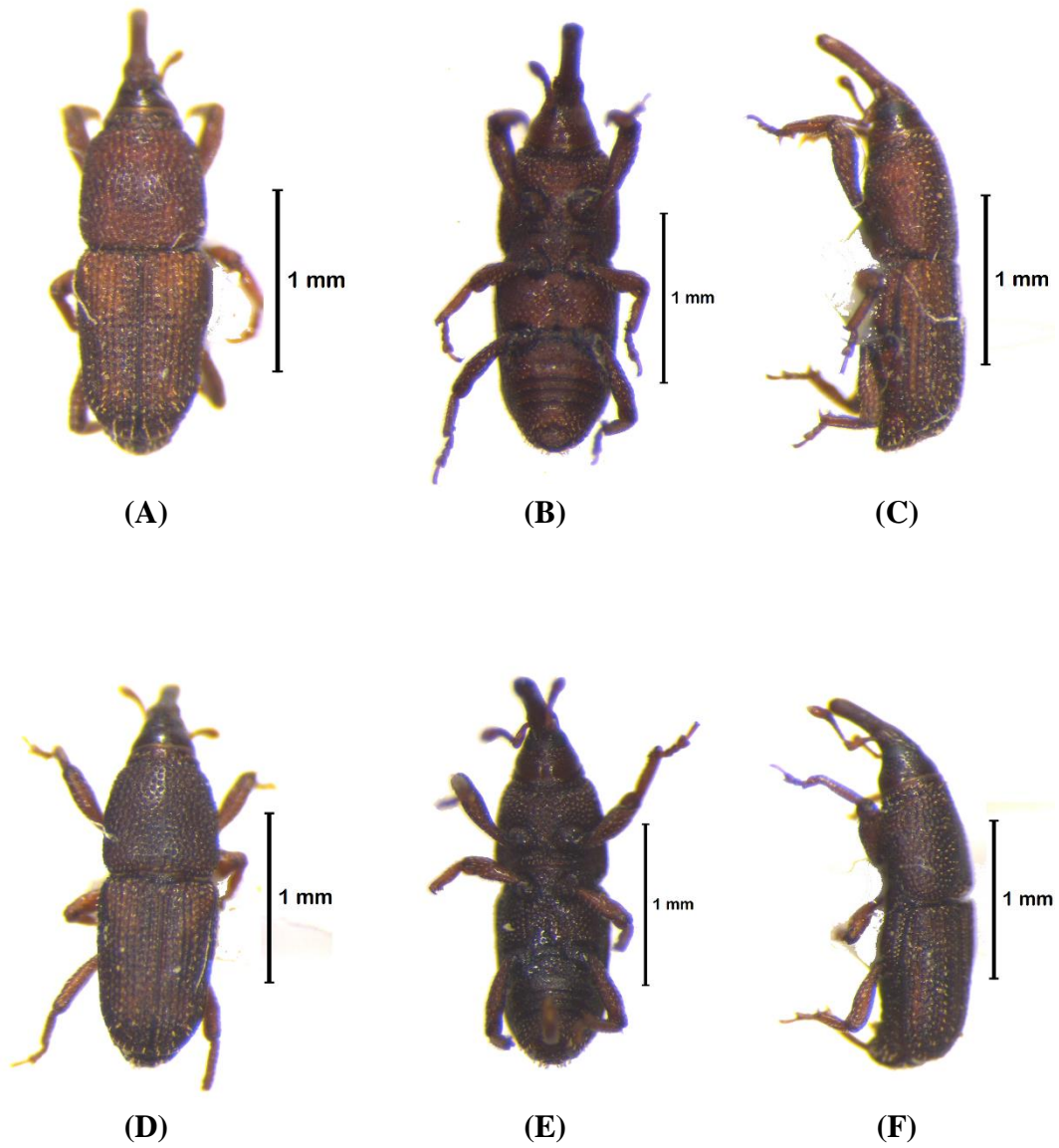
**Plate 34: *Sitophilus oryzae*: (A) Antenna, (B) Pronotum, dorsal view; (C) Profemur; (D) Mesofemur; (E) Metafemur; (F) Elytron. Scale= 0.5 mm**



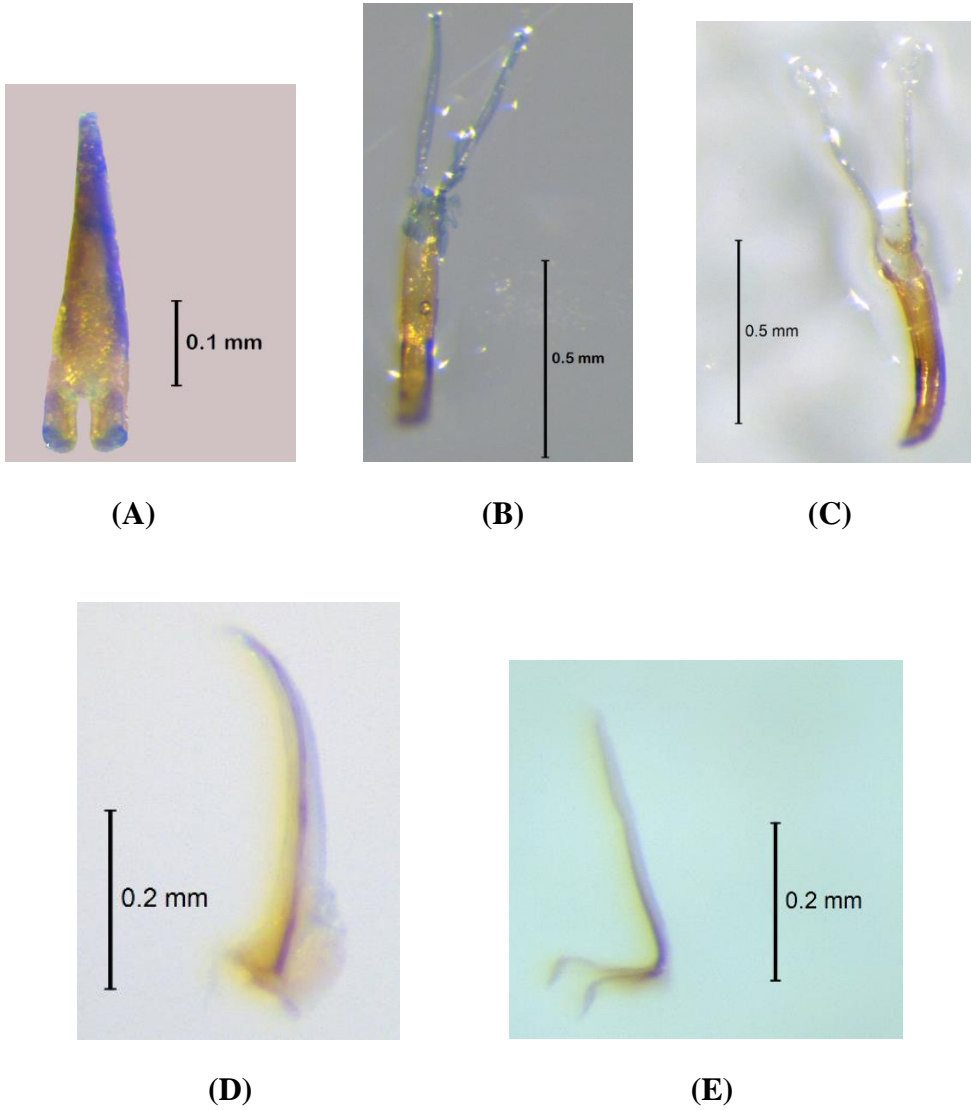
**Plate 35: *Sitophilus oryzae*: (A) Protibia; (B) Mesotibia; (C) Metatibia; (D) Protarsus; (E) Mesotarsus; (F) Metatarsus; (G) Venter. Scale= 0.5 mm**



**Plate 36: *Sitophilus oryzae*: Genitalia; (A) Spiculum ventrale; (B) Aedeagus, dorsal; (C) Aedeagus, ventral; (D) Side arm; (E) Tegmen. Scale= 0.5 mm**



**Plate 37: *Sitophilus oryzae*: Habitus dorsal view, dorsal view and dorsal view;  
(A)-(C) Group A; (D)-(F) Group B.**



**Plate 38: *Sitophilus oryzae*: Genitalia; (A) Spiculum ventrale; (B) Aedeagus, dorsal; (C) Aedeagus, ventral; (D) Side arm; (E) Tegmen.**

## 4.3 ANNOTATED CHECKLIST OF WORLD RHYNCHOPHORINAE

1. **Rhynchophorini** Schoenherr

Rhynchophorini Schoenherr, 1833: 26; *Rhynchophorides* Schoenherr, 1833: 26 [*Rhynchophorus* Herbst]; Agassiz, 1846: 326 (*Rhynchophoridae*); Gistel, 1856: 369 (*Rhynchophoridae*); Thomson, 1858: 141 (*Rhynchophoridae*); LeConte, 1876: 330 (*Rhynchophorini*); Champion, 1910: 79 (*Rhynchophorina*); Hustache, 1925: 9 (*Rhynchophorini*); Csiki, 1936: 8 (*Rhynchophori*); Hoffmann, 1965: 1423 (*Rhynchophorinae*); Alonso-Zarazaga and Lyal, 1999: 64

I. ***Abrachius*** Roelofs

*Abrachius* Roelofs, 1892e: 210

Type specie: *Abrachius insularis* Roelofs, 1892e: 211

S. No.	Species	Distribution
1.	<i>insularis</i> Roelofs, 1892e: 211	Indonesia

II. ***Cyrtotrachelus*** Schoenherr

*Cyrtotrachelus* Schoenherr, 1838: 833; Thunberg, 1797: 44 (*Cordyle*); Ritsema, 1891: 148 (*Roelofsia*); Morimoto, 1978: 114 (*Cyrtotrachelus*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 64

Type specie: *Cyrtotrachelus thompsoni* Alonso-Zarazaga and Lyal, 1999: 64 =*Curculio longipes* Fabricius, 1781: 162 (non Drury, 1773)

*areolatus* (Fairmaire) transferred to *Otidognathus*

Lacordaire, 1866: 271

1.	<i>bipartitus</i> Hartmann, 1899: 29;	Indonesia
	<i>holomelus</i> Heller, 1923: 156; Csiki, 1936: 9	
	<i>nigrinus</i> Heller, 1923: 156; Csiki, 1936: 9	
	<i>dorsalis</i> Heller, 1923: 156; Csiki, 1936: 9	Indonesia, Borneo
	<i>humeralis</i> Heller, 1923: 156; Csiki, 1936: 9	Malaysia,
	<i>sumatranus</i> Heller, 1923: 156; Csiki, 1936: 9	Indonesia

- bispinus* Chevrolat, 1882b: 145 see *buqueti*  
Guerin-Meneville, 1844:176
- borealis* Jordan, 1894: 493 see *buqueti* Guerin-Meneville, 1844:176
2. *buqueti* Guerin-Meneville, 1844:176 China, India, Japan,  
*bispinus* Chevrolat, 1882b: 145; Chevrolat, Myanmar, Vietnam  
1883: 555  
*dux* Boheman in Schoenherr, 1845: 221;  
Lacordaire, 1866: 271  
*dux* var. *rex* Chevrolat, 1883: 555; Lacordaire,  
1866: 271  
*nifrocinctus* Faust, 1894c: 320; Heller, 1923:  
153  
*borealis* Jordan, 1894: 493; Heller, 1923: 153  
*dauidis* (Fairmaire) transferred to *Otidognathus*  
Lacordaire, 1866: 271
3. *dichrous* Fairmaire, 1878b: 273 China, Cambodia,  
Vietnam  
*dux* Boheman in Schoenherr, 1845:221 see *buqueti*  
Guerin-Meneville, 1844:176  
*dux* var. *rex* Chevrolat, 1883: 555 see *buqueti*  
Guerin-Meneville, 1844:176  
*elegans* (Fairmaire) transferred to *Otidognathus*  
Lacordaire, 1866: 271
4. *fae* Faust, 1894c: 320 Myanmar
5. *himalayanus* Heller, 1923: 155 India
6. *lar* Erichson and Burmeister, 1834: 265 Philippines
7. *longimanus* (Fabricius) India, Cambodia,  
*Curculio longimanus* Fabricius, 1775: 822; China, Indonesia,  
Gyllenhal in Schoenherr, 1838: 835 Japan, Philippines,

- Curculio longipes* Fabricius, 1781: 162; Myanmar,  
Fabricius, 1801a: 431 (*Calandra*); Gyllenhal Vietnam,  
in Schoenherr, 1838: 835
- nifrocinctus* Faust, 1894c: 320 see *buqueti* Guerin-  
Meneville, 1844:176
- obscuriceps* Chevrolat, 1883: 556 see  
*rufopectinipes* Chevrolat, 1883: 556
- 8.** *rufopectinipes* Chevrolat, 1883: 556 China, India, Sri  
*obscuriceps* Chevrolat, 1883: 556; Heller, Lanka  
1923: 154  
*subnotatus* Voss, 1931: 37; Csiki, 1936: 10  
*rufithorax* Heller, 1923: 154; Csiki, 1936: 10  
*nigrinus* Heller, 1923: 155; Csiki, 1936: 10  
*nigrodiscalis* Heller, 1923: 155; Csiki, 1936:  
10
- 8a.** *rufopectinipes* var. *birmanicus* Faust, 1894c: 321 China, Myanmar,  
Vietnam
- 8b.** *rufopectinipes* var. *javanus* Heller, 1923: 154 Indonesia
- 8c.** *rufopectinipes* var. *montanus* Heller, 1923: 154 India, China

### III. *Dynamis* Chevrolat

*Dynamis* Chevrolat, 1883: 563

Type specie: *Calandra borassi* (Fabricius, 1801); SD: Champion, 1910: 79

- 1.** *artornitipae* Wattanapongsiri, 1966: 255 Brazil, Peru
- 2.** *borassi* (Fabricius) Argentina, Bolivia,  
*Calandra borassi* Fabricius, 1801a: 430; Brazil, Chile,  
Gyllenhal in Schoenherr, 1838: 818 Colombia,  
(*Rhynchophorus*); Chevrolat, 1883: 563 Ecuador, French  
*Calandra germari* Perty, 1830: 82; Chevrolat, Guiana, Guyana,  
1883: 563 (*Dynamis*); Kuschel, 1955: 281 Panama, Paraguay,



- Rhynchophorus noxius* Gyllenhal in Peru, Suriname,  
Schoenherr, 1838: 21; Chevrolat, 1883: 563 Uruguay,  
*Rhynchophorus politus* Gyllenhal in Venezuela  
Schoenherr, 1838: 819; Chevrolat, 1883: 563  
(*Dynamis*); Kuschel, 1955: 281  
(*Rhynchodynamis*); Wattanapongsiri, 1966:  
235
3. *callirostris* Wattanapongsiri, 1966: 266 Ecuador, Guyana
4. *coracinus* Wattanapongsiri, 1966: 270 Brazil, Guyana
5. *nitidulus* (Guerin-Meneville) Bolivia, French  
*Rhynchophorus nitidulus* Guerin-Meneville, Guiana  
1844: 175; Chevrolat, 1883: 564  
*Rhynchophorus nitidipennis* Boheman in  
Schoenherr, 1845: 216; Chevrolat, 1883: 564
6. *palmiphilus* Wattanapongsiri, 1966: 283 Panama, Colombia
7. *peropacus* Champion, 1910: 80 Costa Rica,  
Nicaragua
8. *perplexus* Wattanapongsiri, 1966: 298 Bolivia, Brazil
9. *perryi* Wattanapongsiri, 1966: 302 Brazil, Peru,  
Venezuela
10. *rebecca* Wattanapongsiri, 1966: 309 Brazil
11. *rockefelleri* Wattanapongsiri, 1966: 314 Bolivia

#### IV. *Macrocheirus* Schoenherr

*Macrocheirus* Schoenherr, 1838: 831; Agassiz, 1846: 220  
(*Macrochirus*) (non Perty, 1831) (UE of *Macrocheirus*); Gemminger  
and Harold, 1871: 2640 (*Macrochirus*) (non Perty, 1831, nec Agassiz,  
1846) (UE of *Macrocheirus*); Schoenherr, 1838: 833 (*Macrocheira*)  
[NA=SYN]; Alonzo-Zarazaga and Lyal, 1999: 64

Type specie: *Macrocheirus praetor* Gyllenhal in Schoenherr, 1838: 833

*druryi* Guerin-Meneville, 1844: 175 see *longipes*

(Drury)

1. *herveyi* Waterhouse, 1887: 295 Malaysia, Myanmar
2. *longipes* (Drury) Comoros
  - Curculio longipes* Drury, 1773: 61;
  - Lacordaire, 1866: 273
  - Rhynchophorus colossus* Herbst, 1795: 19;
  - Lacordaire, 1866: 273
  - drury* Guerin-Meneville, 1844: 175;
  - Lacordaire, 1866: 273
3. *praetor* Gyllenhal in Schoenherr, 1838: 833 Indonesia (Java)
4. *spectabilis* Dohrn, 1883: 362, 397 Indonesia
5. *vittatus* Jordan, 1894: 488 Borneo, Indonesia, Malaysia

V. *Mahakamia* Ritsema

*Mahakamia* Ritsema, 1913: 148

Type specie: *Mahakamia kampmeinerti* Ritsema, 1913: 149

1. *kampmeinerti* Ritsema, 1913: 149 Borneo, Comoros, Indonesia, Malaysia

VI. *Omotemnus* Chevrolat

*Omotemnus* Chevrolat, 1883: 559

Type specie: NYD

*blandus* Jordan, 1894: 489 see *princeps* Heller,  
1894a: 100

1. *carnifex* Faust, 1891a: 344 China
- ceylanensis* Roelofs, 1869: 343 see *introducens*  
(Walker)

- cinctus* Faust, 1895b: 101 see *miniatocrinitus*  
Chevrolat, 1883: 560
2. *coelirostris* Heller, 1894a: 98 India  
*compressirostris* Jordan, 1894: 492; Jordan,  
1895: 143  
*compressirostris* Jordan, 1894: 492 see  
*coelirostris* Heller, 1894a: 98
3. *conicus* Jordan, 1894: 490 Borneo, Indonesia,  
*nigrocrinitus* Faust, 1895b: 99; Guenther, Malaysia  
1936a: 69
4. *cryptodiacrites* Guenther, 1936: 69 Borneo, Indonesia,  
Malaysia
5. *fleutiauxi* Faust, 1891a: 345 Japan
- 5a. *fleutiauxi* var. *bisignatus* Faust, 1892c: 552 Japan
6. *gracilis* Jordan, 1894: 490 Borneo, Indonesia,  
Malaysia
- hauseri* Faust, 1891a: 341 see *miniatocrinitus*  
Chevrolat, 1883: 560
7. *introducens* (Walker) Sri Lanka  
*Rhynchophorus introducens* Walker, 1859:  
218; Marshall, 1930: 577  
*ceylanensis* Roelofs, 1869: 343; Marshall,  
1930: 577
8. *miniatocrinitus* Chevrolat, 1883: 560 Indonesia  
*hauseri* Faust, 1891a: 341; Csiki, 1936: 14  
*cinctus* Faust, 1895b: 101; Csiki, 1936: 14  
*vitticollis* Hartmann, 1899: 31; Csiki, 1936:  
14
9. *nanus* Heller, 1908: 183 Borneo, Indonesia,  
Malaysia
10. *niassicus* Jordan, 1894: 491 Indonesia

- nigrocrinitus* Faust, 1895b: 99 see *conicus*  
Jordan, 1894: 490
- 11.** *nigrosignatus* Hartmann, 1899: 31 Indonesia
- 12.** *princeps* Heller, 1894a: 100 Borneo, Indonesia,  
*blandus* Jordan, 1894: 489; Csiki, 1936: 14 Malaysia
- 13.** *regalia* Guenther, 1934a: 245 Indonesia
- 14.** *rhinoceros* Chevrolat, 1883: 560 China
- 15.** *sanguinosus* Heller, 1916: 296 Philippines
- 15a.** *sanguinosus* var. *x-rufum* Heller, 1924: 296;  
Guenther, 1936: 21
- 16.** *serrirostris* (Fabricius) Indonesia  
*Calandra serrirostris* Fabricius, 1801a:  
429; Chevrolat, 1883: 559
- 16a.** *serrirostris* var. *reaumuri* Gyllenhal in Indonesia  
Schoenhher, 1838: 882
- 16b.** *serrirostris* var. *seriatus* (Fabricius) India  
*Calandra serrirostris* var. *seriatus*  
Fabricius, 1801a: 429; Chevrolat, 1883:  
559
- 17.** *stolzi* Ritsema, 1914: 170 Indonesia
- 18.** *swierstrae* (Ritsema) Indonesia  
*Rhynchophorus swierstrae* Ritsema, 1891:  
151; Guenther, 1934a: 242  
*vicarious* Faust, 1895b: 100; Csiki, 1936:  
14
- 19.** *variabilis* Guenther, 1934a: 243 Indonesia  
*vicarious* Faust, 1895b: 100 see *swierstrae*  
Ritsema, 1891: 151  
*vitticollis* Hartmann, 1899: 31 see  
*miniatocrinitus* Chevrolat, 1883: 560

VII. *Otidognathus* Lacordaire

*Otidognathus* Lacordaire, 1866: 273 (RN for *Litorhynchus*);  
Schoenherr, 1845: 222 (*Lithorrhynchus*) (non Macquart, 1841); Chenu,  
1860: 249 (*Lithorrhynchus*) [NA=L]; Gemminger and Harold, 1871:  
2641 (*Lithorrhynchus*) [NA=L]; Csiki, 1936: 10 (*Lithorrhynchus*)  
[NA=L]; Alonso-Zarazaga and Lyal, 1999: 64

Type specie: *Litorhynchus westermanni* Boheman, 1845: 223

- |     |   |                    |
|-----|---|--------------------|
| 1.  | <i>aberrans</i> Faust, 1894c: 328   | Myanmar, Indonesia |
| 2.  | <i>anchora</i> Faust, 1894c: 326  | Myanmar, Indonesia |
| 3.  | <i>aphanes</i> Guenther, 1934b: 454   | China              |
| 3a. | <i>aphanes</i> var. <i>tonkinensis</i> Guenther, 1934b: 455                         | Laos               |
| 4.  | <i>areolatus</i> (Fairmaire)  | China              |
|     | <i>Cyrtotrachelus areolatus</i> Fairmaire, 1899a:<br>636; Heller, 1923: 150         |                    |
| 5.  | <i>assamensis</i> Chevrolat, 1882a: 139   | India, Indonesia,  |
|     | <i>quadrimaculatus</i> Buquet in Guerin-<br>Meneville, 1844: 177; Faust, 1891b: 287 | Myanmar            |
| 6.  | <i>badius</i> Guenther, 1938: 85  | China              |
| 7.  | <i>bifasciatus</i> Chevrolat, 1882a: 140  | Bangladesh         |
| 8.  | <i>cantonensis</i> Guenther, 1938: 83   | China              |
| 9.  | <i>celatus</i> Pascoe, 1887: 374  | Cambodia           |
| 10. | <i>collaris</i> Jordan, 1894: 495   | Indonesia          |
| 11. | <i>comptus</i> Pascoe, 1887: 373  | Cambodia           |
| 12. | <i>dauidis</i> (Fairmaire)  | China              |
|     | <i>Cyrtotrachelus dauidis</i> Fairmaire, 1878a:<br>127; Heller, 1923: 150           |                    |
| 13. | <i>decemstriatus</i> Chevrolat, 1883: 557   | Bangladesh         |
| 14. | <i>elegans</i> (Fairmaire)  | Philippines        |

*Cyrtotrachelus elegans* Fairmaire, 1878a:  
128; Heller, 1915b: 234; Guenther, 1934a:  
245

- |             |  |                  |
|-------------|--|------------------|
| <b>14a.</b> | <i>elegans</i> var. <i>fulvopictus</i> Heller, 1915b: 234          | Philippines      |
| <b>14b.</b> | <i>elegans</i> var. <i>sericoplaga</i> Heller, 1915a: 32           | Philippines      |
| <b>14c.</b> | <i>elegans</i> var. <i>pictus</i> Heller, 1922b: 623               | Philippines      |
| <b>14d.</b> | <i>elegans</i> var. <i>banahaoensis</i> Guenther, 1934c: 251       | Philippines      |
| <b>14e.</b> | <i>elegans</i> var. <i>buguioensis</i> Guenther, 1934c: 254        | Philippines      |
| <b>14f.</b> | <i>elegans</i> var. <i>cebuensis</i> Guenther, 1934c: 255          | Philippines      |
| <b>14g.</b> | <i>elegans</i> var. <i>centralis</i> Guenther, 1934c: 250          | Philippines      |
| <b>14h.</b> | <i>elegans</i> var. <i>gloriosus</i> Guenther, 1934c: 250          | Philippines      |
| <b>14i.</b> | <i>elegans</i> var. <i>injucundus</i> Guenther, 1934c: 248         | Philippines      |
| <b>14j.</b> | <i>elegans</i> var. <i>palawanicus</i> Guenther, 1934c: 249        | Philippines      |
| <b>14k.</b> | <i>elegans</i> var. <i>panaonensis</i> Guenther, 1934c: 252        | Philippines      |
| <b>14l.</b> | <i>elegans</i> var. <i>peregrinus</i> Guenther, 1934c: 248         | Philippines      |
| <b>14m.</b> | <i>elegans</i> var. <i>septentrionalis</i> Guenther, 1934c:<br>249 | Philippines      |
| <b>14n.</b> | <i>elegans</i> var. <i>surigaoensis</i> Guenther, 1934c: 253       | Philippines      |
| <b>15.</b>  | <i>extraordinalis</i> Guenther, 1938: 80                           | India            |
| <b>16.</b>  | <i>foersteri</i> Hartmann, 1901: 290                               | Papua New Guinea |
| <b>17.</b>  | <i>immaculatus</i> Guenther, 1938: 85                              | Vietnam          |
| <b>18.</b>  | <i>incertus</i> Guenther, 1938: 86                                 | Vietnam          |
| <b>19.</b>  | <i>inexpectatus</i> Guenther, 1935b: 163                           | Indonesia        |
| <b>20.</b>  | <i>intermedius</i> Guenther, 1938: 87                              | China            |
| <b>21.</b>  | <i>jansoni</i> Roelofs, 1875: 186                                  | Japan            |
| <b>22.</b>  | <i>maculipennis</i> Voss, 1931:38                                  | China            |
| <b>23.</b>  | <i>madurensis</i> Guenther, 1943: 88                               | Indonesia        |
| <b>24.</b>  | <i>melli</i> Guenther, 1938: 83                                    | China            |
| <b>25.</b>  | <i>meridionalis</i> Guenther, 1938: 72                             | Sri Lanka        |
| <b>26.</b>  | <i>myrmidon</i> Buquet in Guerin-Meneville, 1844:<br>177           | Indonesia        |

27. *naevus* Faust, 1894c: 322 Myanmar
28. *nemorivagus* Guenther, 1935a: 154 India
29. *nigricollis* Heller, 1924: 295 Philippines
30. *nigropictus* Fairmaire, 1878a: 128 China
31. *notatus* Voss, 1932: 299 China: Yunnan
32. *papuanus* Hartmann, 1901: 290 Papua New Guinea
33. *pendleburyi* Guenther, 1938: 71 Borneo, Indonesia, Malaysia
34. *perminutus* Guenther, 1934b: 455 Vietnam
35. *primigenius* Guenther, 1938: 83 Vietnam
36. *punctatissimus* Guenther, 1938: 91 India
37. *purpuratus* Hartmann, 1901: 290 Papua New Guinea
38. *pygidialis* Jordan, 1894: 495 China  
*quadrimaculatus* Buquet in Guerin-Meneville, 1844: 177 see *assamensis* Chevrolat, 1882a: 138
39. *rarus* Guenther, 1935a: 154 China, India, Vietnam
40. *robustus* Faust, 1894c: 324 Myanmar
41. *rubriceps* Chevrolat, 1882a: 140 Bangladesh
42. *rufescens* Hartmann, 1901: 290 Papua New Guinea
43. *satelles* Guenther, 1935a: 155 India, Vietnam
44. *separandus* Faust, 1894c: 327 Myanmar
45. *subfasciatus* Chevrolat, 1882a: 140 India
46. *tirstis* Guenther, 1938: 71 Myanmar
47. *turbatus* Faust, 1894c: 323 Myanmar
- 47a. *turbatus javanicus* Guenther, 1937c: 326 Indonesia
48. *ursinus* Faust, 1899b: 117 Papua New Guinea  
Papua New Guinea
49. *variopictus* Guenther, 1938: 73 India
50. *velutinus* Hartmann, 1901: 290 Papua New Guinea
51. *westermanni* Boheman in Schoenherr, 1845: 223 India

**VII. *Paratasis* Chevrolat**

*Paratasis* Chevrolat, 1883: 564

Type species: *Calandra rubiginea* Wiedemann, 1819: 74

1. *celebensis* Guenther, 1935b: 164 Indonesia
2. *dajaca* Heller, 1929a: 19 Borneo, Indonesia,  
Malaysia
3. *fausti* Heller, 1893: 168 Indonesia
4. *rubiginea* (Wiedemann) India, Indonesia  
*Calandra rubiginea* Wiedemann, 1819: 174;  
Gyllenhal in Schoenherr, 1838: 824  
(*Rhynchophorus*); Chevrolat, 1883: 564  
*Calandra festiva* Sturm, 1826: 106; Csiki,  
1936: 18  
*Rhynchophorus elegans* Guerin-Meneville,  
1844: 176; Csiki, 1936: 18  
*rubiginosus* Chevrolat, 1883: 564; Csiki,  
1936: 18  
*rubiginosus* Chevrolat, 1883: 564 see *rubiginea*  
(Wiedemann)
5. *viridiaenea* Heller, 1892: 269 Indonesia

**VIII. *Pristirhina* Heller**

*Pristirhina* Heller, 1903: 8; Csiki, 1936: 17 (*Pristirrhina*) [NA=L];

Alonso-Zarazaga and Lyal, 1999: 64

Type specie: *Pristirhina variolosa* Heller, 1903: 9

1. *variolosa* Heller, 1903: 9 Venezuela



**IX. *Protocerius* Schoenherr**

*Protocerius* Schoenherr, 1838: 828; Schoenherr, 1838: 831  
 (*Protocerieus*) [NA=L; rejected by Neave, 1940: 938]; Alonso-  
 Zarazaga and Lyal, 1999: 64

Type specie: *Curculio colossus* Olivier, 1790: 472

1. *aemulus* Dohrn, 1883:159 Indonesia
2. *angustipennis* Chevrolat, 1883: 559 Bangladesh, India
3. *colossus* (Olivier) Borneo, India,  
*Curculio colossus* Olivier, 1790: 472; Olivier, Indonesia, Malaysia  
 1807: 76 (*Calandra*); Thunberg, 1797: 47  
 (*Cordyle*); Lacordaire, 1866: 274  
*Calandra heros* Fabricius, 1801a: 431;  
 Chevrolat, 1883: 558  
*Calandra molossus* Olivier, 1807: 75;  
 Lacordaire, 1866: 274  
*goliath* Guerin-Meneville, 1844: 174;  
 Chevrolat, 1883: 558
4. *fervidus* Pascoe, 1871: 216 India, Indonesia,  
Malaysia,  
*goliath* Guerin-Meneville, 1844: 174 see *colossus*  
 (Olivier)
5. *grandis* Guerin-Meneville, 1844: 174 India, China  
*incarnatus* Chevrolat, 1883: 558 see *marginatus*  
 Chevrolat, 1883: 558
6. *laetus* Vollenhoven, 1866: 228 Indonesia
7. *marginatus* Chevrolat, 1883: 558 Indonesia  
*incarnatus* Chevrolat, 1883: 558; Csiki,  
 1936: 13
8. *praetor* Faust, 1895b: 102 Indonesia

9. *purpuratus* Dohrn, 1881: 447 Borneo, Indonesia,  
Malaysia
10. *rufifrons* Heller, 1915a: 33 Philippines

**X. *Rhynchodynamis* Heller**

*Rhynchodynamis* Heller, 1906: 49; *Dynamis* (*Rhynchodynamis*) Heller,  
1906: 49; Wattanapongsiri, 1966: 323

Type specie: *Rhynchodynamis filirostris* Heller, 1906: 49

1. *filirostris* Heller, 1906: 49 Brazil

**XI. *Rhynchophorinus* Guenther**

*Rhynchophorinus* Guenther, 1937b: 179

Type specie: *Cercidocerus heros* Pascoe, 1887: 377

1. *heros* (Pascoe) Indonesia, Malaysia  
*Cercidocerus heros* Pascoe, 1887: 377;  
Guenther, 1937b: 179

**XII. *Rhynchophorus* Herbst**

*Rhynchophorus* Herbst, 1795: 3; Herbst, 1795: 60 (*Rynchophorus*)  
[NA=L]; Thunberg, 1797: 44 (*Cordyle*); Schrank, 1798: 511  
(*Rhynchopterus*) [NA=L]; Chevrolat, 1833: 20 (*Rhynchophorus*)  
[NA=L]; Gistel, 1834: 27 (*Rhynchophorus*) [NA=L]; Schoenherr, 1845:  
216 (*Cordylus*) (non Gronovius, 1763, nec Wagler, 1828) [NA=L];  
Jacob, 1936: 157 (*Rhynchophorus*) [NA=L]; Alonso-Zarazaga and  
Lyal, 1999: 64

Type species: *Curculio palmarum* (Linnaeus); SD: Schoenherr, 1826: 23

*barbirostris* (Thunberg) see *palmarum* (Linnaeus)

1. *bilineatus* (Montrouzier) Indonesia, Papua  
New Guinea

- Calnadra bilineata* Montrouzier, 1857: 55;  
Faust, 1899b: 118
- Sphenophorus palmarum* Montrouzier, 1860:  
911; Faust, 1899b: 118
- kaupii* Schaufuss, 1864: 22; Wattanapongsiri,  
1966: 111
- velutinus* Fairmaire, 1877: 185; Faust, 1899b:  
118
- pascha* var. *papuanus* Kirsch, 1877: 156;  
Wattanapongsiri, 1966: 111
- montrouzieri* Chevrolat, 1882a: 138;  
Wattanapongsiri, 1966: 111
- rubrocinctus* Chevrolat, 1883: 563;  
Wattanapongsiri, 1966: 112
- borassi* (Fairmaire) transferred to *Dynamis*  
Chevrolat, 1883: 563
- carbonarius* Chevrolat, 1833: 20 transferred to  
*Metamasius* Horn, 1873: 408
- cinereus* (Illiger in Wiedemann) transferred to  
*Sphenocorynes* Schoenherr, 1938: 866
2. *cruentatus* (Fabricius) United States of  
America  
*Curculio cruentatus* Fabricius, 1775: 128;  
Fabricius, 1801a: 430 (*Calandra*); Herbst,  
1795: 12
- zimmermanni* Fahraeus in Schoenherr, 1845:  
219; Chevrolat, 1883: 563
- cycadis* Erichson, 1847: 136 see *palmarum*  
(Linnaeus)
3. *distinctus* Wattanapongsiri, 1966: 144 Borneo, Indonesia,  
Malaysia

*depressus* Chevrolat, 1880b: 315 see *palmarum*  
(Linnaeus)

*fasciatus* (Olivier) transferred to *Metamasius*  
Horn, 1873: 408

4. *ferrugineus* (Olivier) Albania, Aruba,  
*Cossus sanguarius* Rumpf<sup>2</sup>, 1755: 79; Herbst, Australia, Bahrain,  
1795: 8 Bangladesh, Canary  
*Curculio ferrugineus* Olivier, 1790: 473; Islands, China,  
Herbst, 1795: 8 Croatia, Cyprus,  
*Curculio hemipterus* Sulzer, 1776: 39; Csiki, Egypt, France,  
1936: 16 Greece, India,  
*Cordyle sexmaculatus* Thunberg, 1797: 46; Indonesia, Iran,  
Csiki, 1936: 16 Iraq, Israel, Italy,  
*Calandra ferruginea* Fabricius, 1801a: 433; Japan, Jordan,  
Schoenherr, 1826: 327 Kuwait, Laos,  
*Calandra schach* Fabricius, 1801a: 433; Lebanon, Libya,  
Gyllenhal in Schoenherr, 1838: 827 Malaysia, Malta,  
*Curculio vulneratus* Panzer in Voet, 1798: 10; Morocco,  
Bohemann in Schoenherr, 1845: 218 Myanmar,  
(*Rhynchophorus*); Hallett *et al.*, 2004: 2863 Netherlands  
*ferrugineus* var. *tenuirostris* Chevrolat, 1883: Antilles, Oman,  
561; Wattanapongsiri, 1966: 206; Hallett *et* Pakistan, Papua  
*al.*, 2004: 2863 New Guinea,  
*glabrirostris* Schaufuss, 1885: 203; Hallett *et* Philippines,  
*al.*, 2004: 2863 Portugal, Qatar,  
*indostanus* Chevrolat, 1883: 561; Republic of  
Wattanapongsiri, 1966: 151-152 Georgia, Samoa,  
Saudi Arabia,  
Singapore,

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<sup>2</sup> This name, however, is not valid according to the ICZN Articles 3, 11 (a), and 86

- pascha* Bohemann in Schoenherr, 1845: 218; Slovenia, Solomon  
Wattanapongsiri, 1966: 206; Hallett *et al.*, Islands, Spain, Sri  
2004: 2863 Lanka, Syria,  
*pascha* var. *cinctus* Faust, 1894c: 330; Csiki, Taiwan, Thailand,  
1936: 16 Tunisia, Turkey,  
*signaticollis* Chevrolat, 1883: 561; United Arab  
Wattanapongsiri, 1966: 152 Emirates, Vietnam,  
*signaticollis* var. *dimidiatus* Faust, 1894c: Yemen  
330; Csiki, 1936: 16
- 4a. *ferrugineus* var. *palmarum* Herbst, 1795: 8
- 4b. *ferrugineus* var. *seminiger* Faust, 1894c: 330 Myanmar  
*funbris* (Illiger) transferred to *Korotyaevius*  
Alonzo-Zarazaga and Lyal, 1999: 67  
*glabrirostris* Schaufuss, 1885: 203 see *ferrugineus*  
(Olivier)  
*granarius* (Linnaeus) transferred to *Sitophilus*  
Schoenherr, 1838: 967  
*hemipterus* (Linnaeus) transferred to *Metamasius*  
Horn, 1873: 408  
*indostanus* Chevrolat, 1883: 561 see *ferrugineus*  
(Olivier)  
*introducens* (Walker) transferred to *Omotemnus*  
Chevrolat, 1883: 559  
*kaupii* Schaufuss, 1864: 1877 see *bilineatus*  
(Montrouzier)  
*lanuginosus* Chevrolat, 1880b: 315 see *palmarum*  
(Linnaeus)
5. *lobatus* Ritsema, 1882: 179 Indonesia  
*linearis* (Herbst) ) transferred to *Sitophilus*  
Schoenherr, 1838: 967

*montrouzieri* Chevrolat, 1882a: 138 see *bilineatus*  
(Montrouzier)

*nitidulus* (Guerin-Meneville) transferred to  
*Dynamis* Chevrolat, 1883: 563

*oryzae* (Linnaeus) transferred to *Sitophilus*  
Schoenherr, 1838: 967

6. *palmarum* (Linnaeus) Argentina, Belize,  
*Curculio palmarum* Linnaeus, 1767: 506; Bolivia, Brazil,  
Herbst, 1795: 5 (*Rhynchophorus*); Thunberg, Chile, Colombia,  
1797: 46 (*Cordyle*); Fabricius, 1801b: 430 Costa Rica,  
(*Calndra*); Gyllenhal in Schoenherr, 1826: Ecuador, EL  
820 Salvador, French  
*Cordyle barbirostris* Thunberg, 1797: 46; Guiana,  
Gyllenhal in Schoenherr, 1838: 828 Guadeloupe,  
(*Rhynchophorus*); Wattanapongsiri, 1966: 79 Guatemala,  
*cycadis* Erichson, 1847: 136; Kuschel, 1955: Guyana, Honduras,  
281 Nicaragua, Panama,  
*depressus* Chevrolat, 1880b: 315; Champion, Paraguay, Peru,  
1910: 162 Suriname, United  
*lanuginosus* Chevrolat, 1880b: 315; States of America,  
Champion, 1910: 162 Uruguay,  
Venezuela

*pascha* Bohemann in Schoenherr, 1845: 218 see  
*ferrugineus* (Olivier)

*pascha* var. *cinctus* Faust, 1894c: 330 see  
*ferrugineus* (Olivier)

*pascha* var. *papuanus* Kirsch, 1877: 156 see  
*bilineatus* (Montrouzier)

7. *phoenicis* (Fabricius) Guinea,  
*Calandra phoenicis* Fabricius, 1801a: 430; Mozambique,  
Schoenherr, 1826: 327

- |            |  |  |
|------------|--|--|
|            |  | Senegal, Sierra Leone  |
| <b>7a.</b> | <i>phoenicis</i> var. <i>niger</i> Faust, 1899a: 424   | Gabon  |
| <b>7b.</b> | <i>phoenicis</i> var. <i>ruber</i> Faust, 1899a: 425   | Gabon, Calabar   |
|            | <i>piceus</i> (Pallas) transferred to <i>Sphenophorus</i> Schoenherr, 1938: 327              |  |
|            | <i>politus</i> (Gyllenhal in Schoenherr) transferred to <i>Dynamis</i> Chevrolat, 1883: 563  |  |
| <b>8.</b>  | <i>quadrangulus</i> Quedenfeldt, 1889: 302   | Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo            |
| <b>8a.</b> | <i>quadrangulus</i> var. <i>rex</i> Faust, 1899a: 425  | Benin, Burkina Faso, Gambia, Ghana, Guinea-Bissau, Ivory Coast, Liberia, Mali, Mauritania, Nigeria, Niger, Senegal, Sierra Leone, Togo |
|            | <i>quadripustulatus</i> (Fabricius) transferred to <i>Temnoschoita</i> Chevrolat, 1885b: 289 |  |
|            | <i>rectus</i> Say, 1831: 23 transferred to <i>Sphenophorus</i> Schoenherr, 1938: 327         |  |
| <b>9.</b>  | <i>ritcheri</i> Wattanapongsiri, 1966: 198   | Brazil, Peru   |

- rubrocinctus* Chevrolat, 1883: 563 see *bilineatus* (Montrouzier)
- rubiginea* (Wiedemann) transferred to *Paratasis* Chevrolat, 1883: 564
- sanguinolentus* (Olivier) transferred to *Cactophagus* LeConte, 1876: 331
- signaticollis* Chevrolat, 1883: 561 see *ferrugineus* (Olivier)
- signaticollis* var. *dimidiatus* Faust, 1894c: 330 see *ferrugineus* (Olivier)
- tenuirostris* Chevrolat, 1883: 561 see *ferrugineus* (Olivier)
- tredecimpunctatus* (Illiger in Schneider) transferred to *Rhodoaenus* LeConte, 1876: 332
- variegatus* (Fabricius) transferred to *Phacecorynes* Schoenherr, 1845: 228
- velutinus* Fairmaire, 1877: 185 see *bilineatus* (Montrouzier)
- venatus* Say, 1831: 22 transferred to *Sphenophorus* Schoenherr, 1826: 327
- vulneratus* (Panzer) see *ferrugineus* (Olivier)
- zimmermanni* Fahraeus in Schoenherr, 1845: 219 see *cruentatus* (Fabricius)

## 2. **Diocalandrini** Zimmerman

Diocalandrini Zimmerman, 1993: 99

## XIII. **Diocalandra** Faust

*Diocalandra* Faust, 1894c: 353

Type specie: *Calandra frumenti* Fabricius, 1801a: 438



1. *caelata* Marshall, 1948: 472 Myanmar  
*crucigera* Motschulsky, 1858: 69 see *frumenti*  
(Fabricius)
2. *elongata* (Roelofs) Japan  
*Calandra elongata* Roelofs, 1875: 187;
3. *frumenti* (Fabricius) Borneo, Democratic  
*Calandra frumenti* Fabricius, 1801a: 438; Republic of Congo,  
Schoenherr, 1838: 982 (*Sitophilus*); Faust, India, Indonesia,  
1894c: 353 Japan, Madagascar,  
*Sitophilus subfasciata* Boheman in Malaysia,  
Schoenherr, 1938: 971; Csiki, 1936: 76 Mauritius,  
*Sitophilus stigmaticollis* Gyllenhal in Myanmar, Papua  
Schoenherr, 1838: 972; Kolbe, 1910: 46 New Guinea,  
(*Calandra*); Hustache, 1925: 519 Philippines, Samoa,  
*Sitophilus subsignata* Boheman in Seychelles, Tonga,  
Schoenherr, 1838: 973; Csiki, 1936: 77 Trinidad and  
*Calandra punctigera* Pascoe, 1885: 305; Tobago,  
Csiki, 1936: 77  
*crucigera* Motschulsky, 1858: 69; Csiki,  
1936: 77  
*sechellarum* Kolbe, 1910: 46; Csiki, 1936: 77
4. *impressicollis* (Quedenfeldt) Angola, Gabon  
*Sitophilus impressicollis* Quedenfeldt, 1889:  
307; Csiki, 1936: 77
5. *kamiyai* Morimoto, 1978: 109 Japan
6. *reticulatus* (Quedenfeldt) Angola  
*Sitophilus reticulatus* Quedenfeldt, 1889:  
307; Heller, 1927: 2
7. *sasa* Morimoto, 1978: 108 Japan  
*sechellarum* Kolbe, 1910: 46 see *frumenti*  
(Fabricius)

8. *taitensis* (Guerin-Meneville) French Polynesia  
*Calandra taitensis* Guerin-Meneville, 1844:  
 171; Csiki, 1936: 77

**XIV. *Myocalandra* Faust**

*Myocalandra* Faust, 1894c: 354; Chujo and Morimoto 1959: 26  
 (*Paracalendra*); Morimoto, 1978: 118

Type specie: *Myocalandra discors* Faust, 1894c: 355

1. *discors* Faust, 1894c: 355 Indonesia,  
 Myanmar,  
 Philippines
2. *exarata* (Boheman in Schoenherr) India, Indonesia,  
*Sitophilus exarata* Boheman in Schoenherr, Madagascar,  
 1838: 970; Champion, 1914: 495 Mauritius, Mayotte  
*Sphenophorus exquisite* Walker, 1859: 218; (France), Myanmar,  
 Csiki, 1936: 78 Seychelles,  
*Paracalendra saccharivora* Chujo and Singapore, Sri  
 Morimoto 1959: 26; Morimoto, 1978: 118 Lanka
3. *hovana* Hustache, 1922: 416 Madagascar
4. *intermedia* Hustache, 1921: 190 Madagascar,  
 Mauritius
5. *signatella* (Fairmaire) Madagascar  
*Calandra signatella* Fairmaire, 1899b: 544;  
 Hustache, 1925: 517

3. **Litosomini** Lacordaire

*Litosomini* Lacordaire, 1866: 270; Schoenherr, 1825: 587 (*Calandraeides*)<sup>3</sup> [NA=SG]; Schoenherr, 1838: 790 (*Calandrides*)<sup>4</sup> [NA=SG]; Lacordaire, 1866: 303 (*Litosomides*) [= *Litosomus* Lacordaire]; Stein, 1868: 110 (*Calandrini*) [NA=SG]; Pascoe, 1870: 437 (*Calandrinae*); LeConte, 1874: 465 (*Calandridae*) [NA=SG]; Marseul, 1888: 445 (*Calandri*) [NA=SG]; Faust, 1895b: 224 (*Litosomini*); Acloque, 1896: 351 (*Calandrii*) [NA=SG]; Champion, 1910: 170 (*Litosomina*); Csiki, 1936: 68 (*Sitophili*) [*Sitophilus* Schoenherr] (RN for *Calandrina* Thomson, 1865 and *Calandrides* vrais Lacordaire, 1866); Csiki, 1936: 80 (*Litosomi*); Anderson, 1949: 415 (*Sitophilini*); Zimmerman, 1968: 65 (*Sitophilina*); Ienistea, 1986: 33 (*Litosomidae*); Alonso-Zarazaga and Lyal, 1999: 6

**XV.** *Anogelia* Heller

*Anogelia* Heller, 1926: 186; Heller, 1926: 185 (*Anogolia*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 65

Type specie: *Laogenia cylindricollis* Heller, 1924: 305; SM: Heller, 1927b: 41

**1.** *cylindricollis* (Heller) Philippines

*Laogenia cylindricollis* Heller, 1924: 305;  
Heller, 1926: 186

**XVI.** *Autonopsis* Pascoe

*Autonopsis* Pascoe, 1874: 75; Csiki, 1936: 81 (*Autonopsis*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 65

Type specie: *Autonopsis lineata* Pascoe, 1874: 75

**1.** *agrana* Heller, 1927: 12 India

<sup>3</sup> Placed on the Official Index of Rejected and Invalid Family-Group Names in Zoology, ICZN 1959.

<sup>4</sup> Placed on the Official Index of Rejected and Invalid Family-Group Names in Zoology, ICZN 1959.

- |    |                                     |                                |
|----|-------------------------------------|--------------------------------|
| 2. | <i>cruentata</i> Heller, 1927: 12   | Borneo, Indonesia,<br>Malaysia |
| 3. | <i>lineata</i> Pascoe, 1874: 75     | Borneo, Indonesia,<br>Malaysia |
| 4. | <i>stellata</i> Heller, 1927: 13    | Indonesia                      |
| 5. | <i>tenuicornis</i> Heller, 1927: 12 | Indonesia                      |

**XVII. *Brenthidogenia* Heller**

*Brenthidogenia* Heller, 1926: 187

Type specie: *Brenthidogenia ibis* Heller, 1927: 13; SM: Heller, 1927b: 13

- |    |                              |             |
|----|------------------------------|-------------|
| 1. | <i>ibis</i> Heller, 1927: 13 | Philippines |
|----|------------------------------|-------------|

**XVIII. *Calandrites* Scudder**

*Calandrites* Scudder, 1893: 316

Type specie: *Calandrites defessus* Scudder, 1893: 316; SD: Carpenter, 1992: 316

- |    |                                    |                 |
|----|------------------------------------|-----------------|
| 1. | <i>defessus</i> Scudder, 1893: 316 | Eocene (Fossil) |
|----|------------------------------------|-----------------|

**XIX. *Calandrotopus* Faust**

*Calandrotopus* Faust, 1899c: 26

Type specie: *Calandrotopus punctiger* Faust, 1899c: 26

- |    |                                   |         |
|----|-----------------------------------|---------|
| 1. | <i>punctiger</i> Faust, 1899c: 26 | Myanmar |
|----|-----------------------------------|---------|

**XX. *Catapyges* Schoenherr**

*Catapyges* Schoenherr, 1838: 982

Type specie: *Lixus albostriatus* Fabricius, 1801b: 503

- |    |                                 |        |
|----|---------------------------------|--------|
| 1. | <i>albostriatus</i> (Fairmaire) | Guinea |
|----|---------------------------------|--------|

*Lixus albostriatus* Fabricius, 1801b: 503;  
Gyllenhal in Schoenherr, 1838: 984

**XXI.** *Crepidotus* Schoenherr

*Crepidotus* Schoenherr, 1838: 859

Type specie: *Crepidotus audouini* Gyllenhal in Schoenherr, 1838: 860  
(*Calandra variolosus* Klug, 1833: 201)

*audouini* Gyllenhal in Schoenherr see *variolosus*  
(Klug)

1. *variolosus* (Klug) Madagascar  
*Calandra variolosus* Klug, 1833: 201;  
Guerin-Meneville, 1844: 171  
*audouini* Gyllenhal in Schoenherr, 1838: 860;  
Csiki, 1936: 69

**XXII.** *Cosmopolites* Chevrolat

*Cosmopolites* Chevrolat, 1885b: 289

Type specie: *Calandra sordida* Germar, 1824: 299

1. *pruinus* Heller, 1934: 302 Philippines  
2. *sordidus* (Germar) American Samoa,  
*Calandra sordida* Germar, 1824: 299; Angola, Argentina,  
Gyllenhal in Schoenherr, 1838: 925 Australia,  
(*Sphenophorus*); Chevrolat, 1885b: 289 Bangladesh, Benin,  
*Sphenophorus striatus* Fahraeus in Bermuda, Bolivia,  
Schoenherr, 1845: 251; Chevrolat, 1882a: Borneo, Brazil,  
140 Burkina Faso,  
*Sphenophorus cribricollis* Walker, 1859: Burundi,  
218; Marshall, 1930: 576 Cambodia,  
Cameroon, Cape

*Sphenophorus pygidialis* Chevrolat, 1880c: Verde, Chile,  
 198; Vaurie, 1978; 5 China, Colombia,  
 Comoros, Congo,  
 Cook Island, Costa  
 Rica, Cuba,  
 Democratic  
 Republic of Congo,  
 Dominica, Ecuador,  
 El Salvador, Fiji,  
 French Guiana,  
 Gabon, Ghana,  
 Grenada,  
 Guadeloupe, Guam,  
 Guatemala, Guinea,  
 Guyana, Haiti,  
 Honduras, India,  
 Indonesia, Israel,  
 Jamaica, Japan,  
 Kenya,  
 Madagascar,  
 Malawi, Malaysia,  
 Maldives, Mali,  
 Martinique,  
 Mauritania,  
 Mauritius, Mexico,  
 Myanmar, New  
 Caledonia,  
 Nicaragua, Niger,  
 Nigeria, Pakistan,  
 Palau, Panama,  
 Papua New Guinea,

Peru, Philippines,  
 Portugal, Puerto  
 Rico, Republic of  
 Korea, Reunion,  
 Rwanda, Saint  
 Helena, Saint  
 Lucia, Saint  
 Vincent and the  
 Grenadines, Samoa,  
 Senegal,  
 Seychelles, Sierra  
 Leone, Singapore,  
 Solomon Island,  
 Somalia, South  
 Africa, Spain, Sri  
 Lanka, Suriname,  
 Taiwan, Tanzania,  
 Thailand, Togo,  
 Tonga, Trinidad  
 and Tobago,  
 Uganda, United  
 States of America,  
 Venezuela,  
 Vietnam, Wallis  
 and Futuna Islands

**XXIII.** *Daisya* Anderson

*Daisya* Anderson, 2002: 7, 13

Type specie: *Daisya andersonae* Anderson, 2003: 428

1. *andersonae* Anderson, 2003: 428 Costa Rica
2. *huetheri* Anderson, 2003: 429 Costa Rica,  
Ecuador, Panama
3. *obriani* Anderson, 2003: 427 Costa Rica, Panama
4. *umbratilis* (Lacordaire) French Guiana  
*Melchus umbratilis* Lacordaire, 1866: 301;  
Anderson, 2003: 425

**XXIV. *Dichthorrhinus* Waterhouse**

*Dichthorrhinus* Waterhouse, 1878: 293; Rye, 1880: 101 (*Dichorrhinus*)  
(non Desbrochers, [1875]) (UE of *Dichthorrhinus*); Rye, 1880: 101  
(*Dichthadiorrhinus*) (UE of *Dichthorrhinus*); Heller, 1926: 183  
(*Dichtorrhinus*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 65

Type specie: *Dichthorrhinus bicornis* Waterhouse, 1878: 294

1. *albozebrinus* Fairmaire, 1904: 252 Madagascar
2. *bicornis* Waterhouse, 1878: 294 Madagascar
3. *nivipictus* Fairmaire 1897: 184 Madagascar
4. *rubrocollaris* Fairmaire, 1897: 184 Madagascar

**XXV. *Dyspnoetus* Faust**

*Dyspnoetus* Faust, 1894c: 357 (= *Dyspneutus* Heller, 1926: 185)

Type specie: NYD

1. *dingus* Faust, 1894c: 357 Myanmar
2. *lincellus* Faust, 1894c: 357 India, Myanmar
3. *moroi* Faust, 1894c: 357 Myanmar

**XXVI. *Eucalandra* Faust**

*Eucalandra* Faust, 1899c: 25

Type specie: *Sitophilus setulosus* Gyllenhal in Schoenherr, 1838: 969



1. *alas* Anderson, 2008a: 65 Costa Rica, Panama
2. *boxi* Marshall, 1952a: 326 Mexico, Venezuela
3. *luteosignata* (Blanchard) Argentina, Brazil,  
*Sipalus luteosignata* Blanchard in d'Orbigny, Paraguay  
1847: 203; Wibmer and O'Brien 1986: 366
4. *mexicana* (Champion) Mexico  
*Calendra mexicana* Champion, 1910: 170;  
O'Brien and Wibmer 1982: 221 (*Polytus*);  
Anderson, 2008a: 64
5. *setulosa* (Gyllenhal in Schoenherr) Argentina, Bolivia,  
*Sitophilus setulosus* Gyllenhal in Schoenherr, Brazil, Colombia,  
1838: 969; Champion, 1910: 169; O'Brien Costa Rica,  
and Wibmer, 1982: 221 Ecuador,  
Guatemala,  
Honduras, Mexico,  
Panama, Peru,  
Trinidad, Venezuela

**XXVII. *Eugnoristus* Schoenherr**

*Eugnoristus* Schoenherr, 1838: 848

Type specie: *Calandra monacha* Olivier, 1807: 90

1. *arcifer* Fairmaire, 1896: 480 Madagascar
2. *braueri* Kolbe, 1910: 47 Seychelles
3. *latevittatus* Fairmaire, 1893: 548 Cameroon
4. *monachus* (Olivier) Madagascar  
*Calandra monacha* Olivier, 1807: 90;  
Gyllenhal in Schoenherr, 1838: 849  
*tristis* Pascoe, 1887: 377; Hustache, 1925: 509
- 4a. *monachus* var. *alluaudi* Hustache, 1925: 509 Madagascar
5. *niger* Pascoe, 1883: 100 Madagascar

*rectilineatus* (Fairmaire) transferred to  
*Symmorphorhinus* Faust, 1895c: 224  
*tristis* Pascoe, 1887: 377 see *monachus* (Olivier)

**XXVIII.** *Fursovia* Alonso-Zarazaga and Lyal

*Fursovia* Alonso-Zarazaga and Lyal, 1999 (RN for *Calandrella*): 65;  
 Fursov, 1935: 440 (*Calandrella*) (non Kaup, 1829); Alonso-Zarazaga  
 and Lyal, 1999: 65

Type specie: *Calandrella paschini* Fursov, 1935: 440

1. *paschini* Fursov, 1935: 440 Tajikistan

**XXIX.** *Ganae* Pascoe

*Ganae* Pascoe, 1885: 307

Type specie: NYD

1. *amoena* Pascoe, 1885: 307 Papua New Guinea  
 2. *pulchella* Pascoe, 1885: 307 Indonesia, Papua  
 New Guinea

a) *Ganae (Euganae)* Heller

*Ganae (Euganae)* Heller, 1927: 9

Type specie: *Ganae maculithorax* Heller, 1926: 185

1. *maculithorax* Heller, 1926: 185 Philippines

**XXX.** *Gypsophorus* Marshall

*Gypsophorus* Marshall, 1928a: 425

Type specie: *Gypsophorus albidiventris* Marshall, 1928a: 425

1. *albidiventris* Marshall, 1928a: 425 Uganda

**XXXI. *Laocalandra* Heller**

*Laocalandra* Heller, 1926: 186

Type specie: *Laocalandra impressicollis* Heller, 1926: 185

- |    |   |             |
|----|---|-------------|
| 1. | <i>forticornis</i> Heller, 1926: 185    | Philippines |
| 2. | <i>impressicollis</i> Heller, 1926: 185 | Philippines |

**XXXII. *Laodaria* Heller**

*Laodaria* Heller, 1926: 186

Type specie: *Laodaria dajaca* Heller, 1927: 7

- |    |                               |                                |
|----|-------------------------------|--------------------------------|
| 1. | <i>dajaca</i> Heller, 1927: 7 | Borneo, Indonesia,<br>Malaysia |
|----|-------------------------------|--------------------------------|

**XXXIII. *Laogenia* Pascoe**

*Laogenia* Pascoe, 1874: 75

Type specie: NYD

*cylindricollis* (Heller) transferred to *Anogelia*  
Heller, 1926: 186

- |    |                                      |                                |
|----|--------------------------------------|--------------------------------|
| 1. | <i>dispar</i> Faust, 1890: 81        | India, Indonesia               |
| 2. | <i>dohrni</i> Faust, 1890: 80        | Philippines                    |
| 3. | <i>episternalis</i> Heller, 1927: 10 | Philippines                    |
| 4. | <i>formosana</i> Heller, 1927: 11    | Taiwan                         |
| 5. | <i>geminata</i> Faust, 1898c: 212    | Papua New Guinea,<br>Taiwan    |
| 6. | <i>intrusa</i> Pascoe, 1874: 76      | Borneo, Indonesia,<br>Malaysia |
| 7. | <i>laticollis</i> Pascoe, 1887: 379  | Borneo, Indonesia,<br>Malaysia |

*longicollis* (Pascoe) transferred to *Timiotatus*  
Faust, 1899c: 25

8. *sorex* Pascoe, 1874: 76 Borneo, Indonesia,  
Malaysia
9. *subrufescens* Heller, 1927: 9 Philippines

**XXXIV. *Laostates* Heller**

*Laostates* Heller, 1926: 186

Type specie: *Laostates albiventris* Heller, 1926: 185

1. *albiventris* Heller, 1926: 185 Philippines

**XXXV. *Melchus* Lacordaire**

*Melchus* Lacordaire, 1866: 298

Type specie: NYD

1. *gomezi* Anderson, 2003: 419 Costa Rica
2. *jessae* Anderson, 2013: 396 Dominica, St. Lucia  
(Lesser Antilles)
3. *jolyi* Anderson, 2003: 422 Venezuela
4. *leprosus* Lacordaire, 1866: 301 Venezuela
5. *onorei* Anderson, 2003: 420 Ecuador
6. *perplexus* Anderson, 2003: 421 Bolivia
- umbratilis* Lacordaire, 1866: 301 see *Daisya*  
Anderson, 2002: 7

**XXXVI. *Microspathe* Faust**

*Microspathe* Faust, 1899b: 122

Type specie: *Calandra fuliginosa* Pascoe, 1885: 306

1. *fuliginosa* (Pascoe) Indonesia,  
*Calandra fuliginosa* Pascoe, 1885: 306; Myanmar, Papua  
Faust, 1899b: 122

New Guinea,  
Philippines

**XXXVII. *Neocalandra* Faust**

*Neocalandra* Faust, 1899c: 22; Fairmaire, 1904: 252 (*Nycterorhinus*);  
Csiki, 1936: 70

Type specie: NYD

- |    |   |            |
|----|---|------------|
| 1. | <i>arguta</i> Faust, 1899c: 23  | Madagascar |
| 2. | <i>ebena</i> (Fairmaire)  | Madagascar |
|    | <i>Nycterorhinus ebena</i> Fairmaire, 1904: 252;<br>Hustache, 1925: 512 |            |
| 3. | <i>obsoleta</i> Faust, 1899c: 22  | Madagascar |

**XXXVIII. *Neophrynoides* O'Brien and Wibmer**

*Neophrynoides* O'Brien and Wibmer, 1982: 221 (RN for *Phrynoides*);  
Chevrolat. 1885: 94 (*Phrynoides*) (non Simon 1864); O'Brien and  
Wibmer, 1982: 221

Type specie: *Phrynoides luteus* Chevrolat, 1885a: 95

- |    |   |                          |
|----|---|--------------------------|
| 1. | <i>luteus</i> (Chevrolat)   | Panama, South<br>America |
|    | <i>Phrynoides luteus</i> Chevrolat, 1885a: 95;<br>O'Brien and Wibmer, 1982: 221 |                          |

**XXXIX. *Oliabus* Fairmaire**

*Oliabus* Fairmaire, 1903: 244

Type specie: *Oliabus grandicollis* Fairmaire, 1903: 245

- |    |  |            |
|----|--|------------|
| 1. | <i>grandicollis</i> Fairmaire, 1903: 245 | Madagascar |
|----|--|------------|

**XL. *Paramorphorrhinus* Guenther**

*Paramorphorrhinus* Guenther, 1943: 96Type specie: *Paramorphorrhinus longirostris* Guenther, 1943: 95

1. *longirostris* Guenther, 1943: 95 Madagascar

**XLII.** *Periphemus* Pascoe*Periphemus* Pascoe, 1874: 69

Type specie: NYD

1. *albomaculatus* Heller, 1925a: 301 Philippines
2. *corporaali* Heller, 1925b: 242 Indonesia
3. *deletes* Pascoe, 1874: 70 India, Laos,  
*Megaproctus bilineatus* Desbrochers, 1891: Myanmar  
361; Heller, 1925b: 242
4. *dorsalis* Hartmann, 1914: 128 Indonesia
5. *pygidialis* Faust, 1894c: 352 Myanmar
- 5a. *pygidialis* var. *laevior* Faust, 1894c: 352 Myanmar
6. *retrorsus* Pascoe, 1874: 69 Borneo, Indonesia,  
Malaysia
7. *superciliaris* Pascoe, 1874: 70 Indonesia
8. *tricolor* Faust, 1894c: 350 Myanmar
9. *vittiger* Faust, 1894c: 351 Myanmar

**XLIII.** *Sitophilus* Schoenherr*Sitophilus* Schoenherr, 1838: 967; Gistel, 1848: 136 (*Calandra*) (non Clairville, 1798) (RN for *Sitophilus*) [NA=S]<sup>5</sup>; Schoenherr, 1838: 967Type specie: Type species: *Curculio oryzae* Linnaeus, 1763: 395*banoni* (Guerin-Meneville) transferred to  
*Toxorrhinus* Lacordaire

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<sup>5</sup> Junior homonym of *Calandra* [Clairville], 1798; rejected and placed on the Official Index of Rejected and Invalid Generic Names in Zoology, ICZN 1959.

- chilensis* Philippi, 1864: 374 see *zeamais*  
(Motschulsky)
1. *conillis* Marshall,
  2. *cribrosus* Pascoe, 1885: 306 Papua New Guinea
  3. *erosa* Marshall, Thailand  
*exarata* (Boheman in Schoenherr) transferred to  
*Myocalandra* Faust  
*frumenti* (Fabricius) transferred to *Diocalandra*  
Faust
  4. *glandium* Marshall, 1920: 277 India
  5. *gotschi* Huchstetter, 1847: 579 Turkey
  6. *granarius* (Linnaeus) America, Europe,  
*Curculio granarius* Linnaeus, 1758: 378; Asia, Africa, Papua  
Fabricius, 1801a: 437 (*Calandra*); Herbst, New Guinea  
1795: 14 (*Rhynchophorus*); Thunberg, 1815:  
112 (*Cordyle*); Gyllenhal in Schoenherr,  
1838: 977  
*Curculio segetis* Linnaeus, 1758: 381;  
Latreille, 1804: 193 (*Rhynchaenus*);  
Gyllenhal in Schoenherr, 1838: 977  
*Curculio pulicarius* Panzer in Voet, 1798: 54;  
Csiki, 1936: 74  
*remotepunctatus* Gyllenhal in Schoenherr,  
1838: 979; Horn, 1873: 431  
*incarnates* (Gyllenhal in Schoenherr) transferred  
to *Trypsetus* Faust, 1894c: 355  
*laevicosta* Philippi, 1864: 374 see *granarius*  
(Linnaeus)
  7. *linearis* (Herbst) Argentina, Bolivia,  
*Rhynchophorus linearis* Herbst, 1795: 5; Brazil, Chile,  
Gyllenhal in Schoenherr, 1838: 979 Colombia,

- Cordyle striatus* Thunberg, 1815: 112; Comoros, Ecuador,  
Gyllenhal in Schoenherr, 1838: 979 Guyana, India,  
*Calandra tamarindi* Christy, 1834: 36; Paraguay, Peru,  
Gyllenhal in Schoenherr, 1838: 979 Seychelles,  
Suriname, Uruguay,  
Venezuela  
Burundi, Djibouti,  
Ethiopia, Eritrea,  
Kenya, Rwanda,  
South Africa,  
Sudan, Tanzania,  
Uganda  
North America
- mellerborgi* (Gyllenhal in Schoenherr) transferred  
to *Polytus* Faust
- 8.** *oryzae* (Linnaeus) Cosmopolitan
- Curculio oryzae* Linnaeus, 1763: 395;  
Fabricius, 1801a: 438 (*Calandra*); Herbst,  
1795: 18 (*Rhynchophorus*); Gyllenhal in  
Schoenherr, 1838: 981  
*Curculio ferugilegus* DeGeer, 1781: 273;  
Csiki, 1936: 76  
*Calandra minor* Sasaki, 1899: 485; Kuschel,  
1961: 243  
*Calandra sasakii* Takahashi, 1928: 164;  
Kuschel, 1961: 243  
*Sphenophorus quadriguttatus* Montrouzier,  
1861: 910; Kuschel, 1961: 243
- 9.** *punctatissimus* Zherikhin, 2000: 333 Late Miocene  
(Fossil)
- 10.** *quadrinotatus* Wiedemann, 1823: 121 India



- remotepunctatus* Gyllenhal in Schoenherr see  
*granaries* (Linnaeus)
11. *rugicollis* Casey, 1892: 686 United States of  
(=*Calandra rugicollis* Casey)<sup>6</sup> America  
*Calandra rugosicollis* Hustache, 1921: 192;  
Csiki, 1936: 76  
*rugosulus* Pascoe, 1885: 306 transferred to  
*Diocalandra* Faust, 1894c: 353
12. *rugosulus* (Pascoe) Papua New Guinea  
*Calandra rugosulus* Pascoe, 1885: 306;
13. *rugosus* (Thunberg) Guinea, Senegal  
*Cordyle rugosus* Thunberg, 1815: 112;  
Gyllenhal in Schoenherr, 1838: 975
14. *sculpturatus* Gyllenhal in Schoenherr, 1838: 974 India, Mauritius  
*Calandra shoreae* Marshall, 1920: 276;  
Hustache, 1925: 518  
*setulosa* (Gyllenhal in Schoenherr) transferred to  
*Eucalandra* Faust, 1899c: 25  
*tamarindi* Christy, 1834: 36 see *linearis* (Herbst)
15. *vateriae* Marshall,  
*viduus* (Guerin-Meneville) transferred to  
*Toxorrhinus* Lacordaire, 1866: 304
16. *zeamais* (Motschulsky) France, Argentina,  
*Sitophilus oryzae* var. *zeamais* Motschulsky, Bolivia, Brazil,  
1855: 77; Kuschel, 1961: 244 Chile, Colombia,  
*Calandra chilensis* Philippi and Philippi, Comoros, Ecuador,  
1864: 374; Csiki, 1936: 72 (*Sitophilus*); Guyana, India,  
Kuschel, 1961: 244 Paraguay, Peru,  
Seychelles,

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<sup>6</sup> NA=S; junior homonym of *Calandra* (Clairville)

*Calandra platensis* Zacher, 1922: 55; Suriname, United  
Kuschel, 1961: 244 States of America,  
*Cossonus quadrimaculatus* Walker, 1859: Uruguay,  
219; Kuschel, 1961: 244 Venezuela

**XLIII. *Symmorphorhinus* Faust**

*Symmorphorhinus* Faust, 1895c: 224; Fairmaire, 1904: 253  
(*Stenolandra*); Hustache, 1925: 510 (*Symmorphorinus*) [NA=L];  
Alonso-Zarazaga and Lyal, 1999: 65

Type specie: *Symmorphorhinus bilineatus* Faust, 1895c: 224

1. *bilineatus* Faust, 1895c: 224 Madagascar
2. *rectelineatus* (Fairmaire) Madagascar  
*Eugnoristus rectelineatus* Fairmaire, 1900:  
500; Hustache, 1925: 511 (*Symmorphorinus*);  
Fairmaire, 1904: 253 (*Stenolandra*);  
Hustache, 1925: 511  
*Stenolandra rectelineatus* var. *lacteostrigatus*  
Fairmaire, 1904: 253; Hustache, 1925: 511  
(*Symmorphorinus*); Alonso-Zarazaga and  
Lyal, 1999: 65

**XLIV. *Tatitimus* Heller**

*Tatitimus* Heller, 1926: 186

Type specie: *Tatitimus ruficornis* Heller, 1926: 185

1. *ruficornis* Heller, 1926: 185 Philippines

**XLV. *Timiotatus* Faust**

*Timiotatus* Faust, 1899c: 25

Type specie: *Timiotatus birmanus* Faust, 1899c: 25

*birmanus* Faust, 1899c: 25 see *longicollis*  
(Pascoe)

1. *longicollis* (Pascoe) Indonesia,  
*Laogenia longicollis* Pascoe, 1885: 305; Myanmar  
Heller, 1926: 185  
*birmanus* Faust, 1899c: 25; Csiki, 1936: 78
2. *superciliosus* Heller, 1927: 4 Philippines

#### XLVI. *Toxorhinus* Lacordaire

*Toxorhinus* Lacordaire, 1866: 304; Dejean, 1835: 280 (*Toxorhinus*)  
[NA=NI]; Lacordaire, 1866: 303 (*Litosomus*); Lacordaire, 1866: 305  
(*Myorhinus*) (non Schoenherr, 1826) [NA=SYN]; Gemrninger and  
Harold, 1871: 2654 (*Toxorrhinus*) [NA=L]; Champion, 1910: 170  
(*Toxorrhinus*); Wibmer and O'Brien, 1986: 364; Alonzo-Zarazaga and  
Lyal, 1999: 65

Type specie: *Sitophilus banonii* Guerin-Meneville, 1844: 172

1. *banonii* (Guerin-Meneville) Bolivia, Brazil,  
*Sitophilus banonii* Guerin-Meneville, 1844: Ecuador, France,  
172; Lacordaire, 1866: 305 Panama, Peru  
*peruvianus* Heller, 1927: 13; Wibmer and  
O'Brien, 1986: 364
2. *grallarius* (Lacordaire) Alajuela, Columbia,  
*Litosomus grallarius* Lacordaire, 1866: 305; Costa Rica  
Wibmer and O'Brien, 1986: 364  
*incarnates* (Gyllenhal in Schoenherr) transferred  
to *Tryphetus* Faust, 1894c: 355  
*peruvianus* Heller, 1927: 13 see *banonii* (Guerin-  
Meneville)

3. *viduus* (Guerin-Meneville) Reunion (French  
*Sitophilus viduus* Guerin-Meneville, 1844: Department)  
 171; Lacordaire, 1866: 305

**XLVII. *Tryphetus* Faust**

*Tryphetus* Faust, 1894c: 355; Heller, 1926: 186 (*Ttiphetus*); Csiki, 1936:  
 78

Type specie: *Sitophilus incarnates* Gyllenhal in Schoenherr, 1838: 968; SD:  
 Voss, 1958: 127

1. *incarnates* (Gyllenhal in Schoenherr) China, Indonesia,  
*Sitophilus incarnates* Gyllenhal in Myanmar  
 Schoenherr, 1838: 968; Gemminger and  
 Harold, 1871: 2654 (*Toxorrhinus*);  
 Lacordaire, 1866: 305 (*Toxorrhinus*); Csiki,  
 1936: 79
2. *solidus* Faust, 1894c: 356 Myanmar

**4. *Ommatolampini* Lacordaire**

*Ommatolampini* Lacordaire, 1866: 270; Lacordaire, 1866: 276  
 (*Ommatolampides*) [*Ommatolampes* Schoenherr]; Heyne and  
 Taschenberg, 1907: 233 (*Ommatolampini*); Csiki, 1936: 18  
 (*Ommatolampi*); Ienistea, 1986: 33 (*Ommatotopidae*); Alonso-Zarazaga  
 and Lyal, 1999: 66

**XLVIII. *Aphiocephalus* Lacordaire**

*Aphiocephalus* Lacordaire, 1866: 277 (RN for *Conocephalus*);  
 Schoenherr, 1838: 839 (*Conocephalus*) (non Thunberg, 1815; nec  
 Zenker, 1833); Lacordaire, 1866: 277; Chevrolat, 1882a: 138 [NA=L];  
 Alonso-Zarazaga and Lyal, 1999: 65

Type specie: *Curculio limbatus* Olivier, 1790: 473

1. *castanescens* Fairmaire, 1888: 12 Madagascar
2. *guerini* (Kulg) Madagascar  
*Calandra guerini* Klug, 1833: 112; Gyllenhal  
in Schoenherr, 1838: 840 (*Conocephalus*);  
Lacordaire, 1866: 277
3. *gyllenhali* (Gyllenhal in Schoenherr) Madagascar  
*Conocephalus gyllenhali* Gyllenhal in  
Schoenherr, 1838: 840; Lacordaire, 1866: 277  
*plannicollis* Fairmaire, 1901: 240; Hustache,  
1925: 495
- 3a. *gyllenhali* var. *niger* Hustache, 1925: 496 Madagascar
4. *limbatus* (Olivier) Mauritius  
*Curculio limbatus* Olivier, 1790: 473;  
Fabricius, 1801a: 434 (*Calandra*); Gyllenhal  
in Schoenherr, 1838: 841 (*Conocephalus*);  
Lacordaire, 1866: 277  
*plannicollis* Fairmaire, 1901: 240 see *gyllenhali*  
(Kulg)

**XLIX. *Cylindrocyba* Faust**

*Cylindrocyba* Faust, 1894b: 368 (RN for *Cylindrocephalus*); Faust,  
1893b: 300 (*Cylindrocephalus*) (non Motschulsky, 1860; nec Trenkner,  
1868); Hustache, 1922: 415 (*Rhynchohovanus*); Guenther, 1941: 29

Type specie: *Cylindrocephalus helleri* Faust, 1893b: 300

1. *helleri* Faust, 1893b: 300 Madagascar  
*Cylindrocephalus helleri* Faust, 1893b: 300;  
Hustache, 1922: 415 (*Rhynchohovanus*);  
Guenther, 1941: 29  
*Aphiocephalus decemmaculatus* Fairmaire,  
1902b: 380; Hustache, 1925: 496

**L. *Lampommatus* Heller***Lampommatus* Heller, 1896a: 20Type specie: *Lampommatus cephalotus* Heller, 1896a: 21

1. *cephalotus* Heller, 1896a: 21 Indonesia

**LI. *Ommatolampes* Schoenherr***Ommatolampes* Schoenherr, 1838: 837; Schoenherr, 1845: 225*(Ommatolampus)* [NA=L]; Pascoe, 1887: 374 (*Ommatolampus*) (UE of *Ommatolampes*); Heller, 1908: 186 (*Ommonatolampus*); [NA=L]

Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Calandra haemorrhoidalis* Wiedemann, 1819: 175

1. *annamensis* Heller, 1922a: 25 Vietnam  
*allardi* Chevrolat, 1883: 565 see *germari*  
 Bohemann in Schoenherr, 1845: 226
2. *cuvieri* Bohemann in Schoenherr, 1845: 225 Indonesia  
*dajacus* Heller, 1896b: 247 see *germari*  
 Bohemann in Schoenherr, 1845: 226
3. *germari* Bohemann in Schoenherr, 1845: 226 Borneo, Indonesia,  
*allardi* Chevrolat, 1883: 565; Heller, 1908: Malaysia  
 188  
*dajacus* Heller, 1896b: 247; Heller, 1908: 188
4. *haemorrhoidalis* (Wiedemann) India  
*Calandra haemorrhoidalis* Wiedemann,  
 1819: 175; Gyllenhal in Schoenherr, 1938:  
 838
- 4a. *haemorrhoidalis* var. *borneensis* Heller, 1908: 186 Borneo, Indonesia,  
 Malaysia
- 4b. *haemorrhoidalis* var. *pygidialis* Heller, 1913: 148 Philippines

- |      |  |                                |
|------|--|--------------------------------|
| 5.   | <i>hewitei</i> Heller, 1908: 185                                     | Borneo, Indonesia,<br>Malaysia |
| 6.   | <i>paratasioides</i> Heller, 1896b: 244                              | Philippines                    |
| 7.   | <i>pictus</i> Roelofs, 1891a: 115                                    | Indonesia                      |
| 8.   | <i>schultzei</i> Heller, 1924: 296                                   | Philippines                    |
| 9.   | <i>stigma</i> Pascoe, 1887: 374                                      | India                          |
| 10.  | <i>sulcirostris</i> Heller, 1924: 297                                | Philippines                    |
| 11.  | <i>tetraspilotus</i> Guerin-Meneville, 1844: 170                     | Indonesia                      |
| 11a. | <i>tetraspilotus</i> var. <i>nigrolimbatus</i> Heller, 1894b:<br>169 | Indonesia                      |
| 12.  | <i>whiteheadi</i> Heller, 1896b: 243                                 | Philippines                    |

5. **Polytini** Zimmerman

*Polytini* Zimmerman, 1993: 94

LII. ***Polytus*** Faust

*Polytus* Faust, 1894: 353

Type specie: *Sitophilus mellerborgii* Boheman in Schoenherr, 1838: 976

- |    |  |   |
|----|--|---|
| 1. | <i>mellerborgii</i> (Boheman in Schoenherr)<br><i>Sitophilus mellerborgii</i> Boheman in<br>Schoenherr, 1838: 976; Heller, 1927: 2<br><i>Calandra mellenborgi</i> Geminger and Harold,<br>1871: 2653; Heller, 1927: 2<br><i>Clandra remota</i> Sharp, 1885: 183; Perkins,<br>1900: 139<br><i>Sphenophorus musaecola</i> Fairmaire, 1898a:<br>489; Csiki, 1936: 71<br><i>mexicana</i> (Champion) transferred to <i>Eucalandra</i><br>Faust, 1899c: 25 | India, Indonesia,<br>Madagascar,<br>Malaysia, Mexico,<br>Myanmar, Papua<br>New Guinea,<br>Seychelles, Sri<br>Lanka, United<br>States of America |
|----|--|---|

**6. Sphenophorini** Lacordaire, 1866

Sphenophorini Lacordaire, 1866: 278; Billberg, 1820: 40 (*Calandraedes*) [NA=SG] [*Calandra* Clairville]; Kirby, 1837: 196 (*Calandridae*) [NA=SG]; Agassiz, 1846: 57 (*Calandroidae*) [NA=SG]; Lacordaire, 1866: 279 (*Sphenocorynides*) [*Sphenocorynes* Schoenherr]; Lacordaire, 1866: 286 (*Sphenophorides*) [*Sphenophorus* Schoenherr]; LeConte, 1876: 330 (*Sphenophorini*); Aurivillius, 1886: 97 (*Sphenocoryninae*); Kolbe, 1899: 5 (*Oxyopisthinae*) [NA=BMI]; Kolbe, 1899: 5 (*Sphenophorinae*); Heller, 1904: 196 (*Sphenophoridae*); Heyne and Taschenberg, 1907: 233 (*Sphenocorynini*); Champion, 1910: 82 (*Sphenophorina*); Leng, 1920: 335 (*Calendrinae*<sup>7</sup>) [NA=L]; Leng, 1920: 336 (*Calendrini*) [NA=SG]; Hustache, 1925: 9 (*Sphenocoryni*); Csiki, 1936: 25 (*Oxyopisthi*); Guenther, 1937b: 179 (*Sphenocorynini*); Voss, 1954: 330 (*Sphenocorynina*); Morimoto, 1962b: 65 (*Sphenocoryna*); Ienistea, 1986: 33 (*Sphenocorynidae*); Kuschel, 1995: 24 (*Oxyopisthini*) [NA=BMI]; Alonso-Zarazaga and Lyal, 1999: 66

**LIII. Abacobius** Lacordaire

*Abacobius* Lacordaire, 1866: 280; Chevrolat, 1883: 570 (*Calyptris*); Quedenfeldt, 1889: 303 (*Calyptrix*) [NA=L]; Hoffmann, 1965: 1422 (*Abocobius*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Abacobius jekelii* Lacordaire, 1866: 286

1. *fissirostris* Hustache, 1934: 35 Indonesia
2. *jekelii* Lacordaire, 1866: 286 Angola, South  
*Sphenophorus gigas* Fahraeus, 1871: 282; Africa  
Chevrolat, 1883: 570 (*Abacobius*); Csiki,  
1936: 29  
*Calyptrix procerus* Quedenfeldt, 1889: 303;  
Csiki, 1936: 30

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<sup>7</sup> Incorrect subsequent spelling for Calandrini, placed on the official Index of Rejected and Invalid Family Group Names in Zoology, ICZN 1959.



3. *politus* (Quedenfeldt) Angola  
*Calyptrix politus* Quedenfeldt, 1889: 304;  
 Csiki, 1936: 30
4. *sengalensis* (Gyllenhal in Schoenherr) Democratic  
*Sphenophorus sengalensis* Gyllenhal in Republic of the  
 Schoenherr, 1838: 877; Chevrolat, 1883: 570 Congo, Senegal  
 (*Calyptris*);  
*Curculio caffer* Olivier, 1790: 470; Olivier,  
 1807: 84 (*Calandra*); Herbst, 1795: 28  
 (*Rhynchophorus*); Csiki, 1936: 30

**LIV. *Acantharhinus* Schoenherr**

*Acantharhinus* Schoenherr, 1838: 861; Agassiz, 1846b: 2  
 (*Acanthorhinus*) (non Blainville, 1816); Imhoff, 1856: 212  
 (*Acantharinus*); Gmminger and Harold, 1871: 2646 (*Acanthorrhinus*)  
 [NA=L]; Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Acantharhinus dergei* Gyllenhal in Schoenherr, 1838: 863

1. *carinatus* Marshall, 1906: 955 South Africa
2. *dergei* Gyllenhal in Schoenherr, 1838: 863 Democratic  
 Republic of Congo,  
 South Africa
3. *zambesianus* Marshall, 1906: 956 South Africa

**LV. *Acherus* Roelofs**

*Acherus* Roelofs, 1891c: 173; Hoffmann, 1968: 21 (*Acherrus*) [NA=L];  
 Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Acherus nigricans* Roelofs, 1891c: 174

1. *discrepans* Kolbe, 1899: 41 Cameroon
2. *femoralis* Faust, 1895:222 Cameroon

- |     |   |          |
|-----|---|----------|
| 2a. | <i>femoralis</i> var. <i>nigricans</i> Roelofs, 1892b: 37 | Cameroon |
| 3.  | <i>nigricans</i> Roelofs, 1891c: 174                      | Gabon    |
| 4.  | <i>rubripes</i> Kolbe, 1899: 40                           | Cameroon |

**LVI.** *Adapanetus* Guenther

*Adapanetus* Guenther, 1936a: 77; Voss, 1958: 117 (*Adapanetes*)  
[NA=L]; Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Adapanetus sericoclava* Guenther, 1936a: 77

- |    |  |                  |
|----|--|------------------|
| 1. | <i>sericoclava</i> Guenther, 1936a: 77 | Myanmar, Vietnam |
|----|--|------------------|

**LVII.** *Aeetes* Alonso-Zarazaga and Lyal

*Aeetes* Alonso-Zarazaga and Lyal, 1999: 66 (RN for *Axinophorus*);  
Schoenherr, 1838: 863 (*Axinophorus*); Alonso-Zarazaga and Lyal,  
1999: 66

Type specie: *Curculio gages* Fabricius, 1792: 416

- |    |  |        |
|----|--|--------|
| 1. | <i>gages</i> (Faimaire)  | Guinea |
|    | <i>Curculio gages</i> Fabricius, 1792: 416;<br>Fabricius, 1802: 500 ( <i>Lixus</i> ); Fabricius, 1807:<br>325 ( <i>Calandra</i> ); Alonso-Zarazaga and Lyal,<br>1999: 66 |        |

**LVIII.** *Alloscolytroproctus* Hustache

*Alloscolytroproctus* Hustache, 1929: 230 [NA=L]; Csiki, 1939: 6  
(*Alloscolytroproctus*) (unjustified emendation); Guenther, 1943: 90  
(*Brenthidomimus*) [NA=ND]; Kuschel, 1955: 280; Anderson, 2002: 8

Type specie: *Alloscolytroproctus peruanus* Hustache, 1929: 230

- |    |                                     |              |
|----|-------------------------------------|--------------|
| 1. | <i>peruanus</i> Hustache, 1929: 230 | Panama, Peru |
|----|-------------------------------------|--------------|

*Brenthidomimus hartmanni* Guenther, 1943:  
90; Kuschel, 1955: 280; Wibmer and O'Brien,  
1986: 366

2. *dominicae* Anderson, 2008b: 41                      Dominica
3. *ashei* Anderson, 2008b: 42                              Venezuela

**LIX.**     *Anapygus* Kirsch

*Anapygus* Kirsch, 1875b: 44

Type specie: *Anapygus carinicollis* Kirsch, 1875b: 45

1.     *carinicollis* Kirsch, 1875b: 45                      Malaysia

**LX.**     *Anathymus* Pascoe

*Anathymus* Pascoe, 1885: 299

Type specie: *Anathymus singularis* Pascoe, 1885: 299

1.     *coloratus* Faust, 1895c: 208                          Indonesia
2.     *lineatocollis* Heller, 1934: 301                      Philippines
3.     *maximus* Heller, 1929a: 19                            Borneo, Indonesia,  
Malaysia
4.     *meyeri* Faust, 1895c: 207                              Indonesia
5.     *nigroscutellatus* Heller, 1924: 297                    Philippines
6.     *singularis* Pascoe, 1885: 299                          Papua New Guinea
7.     *tricolor* Heller, 1931: 110                              Taiwan

**LXI.**     *Anoxyopisthen* Kolbe

*Anoxyopisthen* Kolbe, 1899: 119

Type specie: *Anoxyopisthen buettneri* Kolbe, 1889: 131

1.     *aurivillianum* Kolbe, 1899: 133                      Cameroon

2. *buettneri* Kolbe, 1889: 131 Democratic Republic of the Congo, Portugal
3. *carbonatum* Kolbe, 1899: 130 Cameroon
4. *calvatum* (Roelofs) Democratic Republic of the Congo, Gabon  
*Oxyopisthen calvatum*, Roelofs, 1891c: 169; Faust, 1898a: 87 (*Ichthyopisthen*); Kolbe, 1899: 131  
*Ichthyopisthen rufoclavatum* Aurivillius, 1891: 366; Csiki, 1936: 28
5. *conradti* Kolbe, 1899: 135 Cameroon
6. *deplanatum* (Roelofs) Gabon, Togo  
*Oxyopisthen deplanatum* Roelofs, 1891a: 116; Kolbe, 1899: 125
7. *depressum* (Roelofs)  
*Oxyopisthen depressum*, Roelofs, 1893d: 242; Kolbe, 1899: 128  
*rufofemoratus* Aurivillius, 1891: 364; Csiki, 1936: 28
8. *pygidiale* (Simpson in Jameson) Democratic Republic of the Congo  
*Oxyopisthen pygidiale* Simpson in Jameson, 1890: 425; Roelofs, 1891a: 116 (*Ichthyopisthen*); Kolbe, 1899: 131  
*rufofemoratus* Aurivillius, 1891: 364 see *depressum* (Roelofs)
9. *sejunctum* Kolbe, 1899: 132 Cameroon

**LXII.** *Aphanomastix* Heller

*Aphanomastix* Heller, 1904: 196

Type specie: *Aphanomastix cryptophodus* Heller, 1904: 197

1. *cryptophodus* Heller, 1904: 197 Cameroon

**LXIII.** *Aplotes* Chevrolat

*Aplotes* Chevrolat, 1885a: 100

Type specie: *Aplotes alienus* Chevrolat, 1885a: 100; SD: Voss, 1958: 100

1. *alienus* Chevrolat, 1885a: 100 Indonesia
2. *bisulcatus* Faust, 1894c: 340 Myanmar
3. *carinicollis* (Gyllenhal in Schoenherr) Indonesia  
*Sphenophorus carinicollis* Gyllenhal in  
 Schoenherr, 1838: 882; Chevrolat, 1882a: 140  
 (*Cercidocerus*); Chevrolat, 1885a: 100
4. *crassirostris* Chevrolat, 1885a: 100 Indonesia
5. *cruciger* (Motschulsky) Myanmar  
*Sphenophorus cruciger* Motschulsky, 1858:  
 69; Chevrolat, 1885a: 100
6. *diversicollis* Hartmann, 1914: 127 Indonesia
7. *diversilineis* Chevrolat, 1885a: 100 Indonesia
8. *lateritius* Faust, 1894c: 338 Myanmar
9. *quinquemaculatus* Hartmann, 1914: 126 Indonesia
10. *roelofsi* (Chevrolat) China, Indonesia,  
*Sphenophorus roelofsi* Chevrolat, 1882c: 159; Japan  
 Chevrolat, 1885a: 100  
*Sphenophorus carinicollis* Roelofs, 1875: 187  
 (non Gyllenhal); Chevrolat, 1885a: 100

**LXIV.** *Aporophemus* Guenther

*Aporophemus* Guenther, 1941: 51

Type specie: *Aporophemus weiskei* Guenther, 1941: 51

1. *weiskei* Guenther, 1941: 51 New Guinea

**LXV. *Atarphaeus* Guenther***Atarphaeus* Guenther, 1937c: 329Type specie: *Atarphaeus rhinodontulus* Guenther, 1937c: 329

1. *rhinodontulus* Guenther, 1937c: 330 Indonesia

**LXVI. *Barystethus* Lacordaire***Barystethus* Lacordaire, 1866: 286Type specie: *Calandra melanosoma* Boisduval, 1835: 449

1. *aberrans* Guenther, 1935c: 216 Papua New Guinea
2. *ater* Pascoe, 1874: 71 Indonesia, Papua  
*Calandra melanosoma* Boisduval, 1835: 449; New Guinea  
 Schoenherr, 1838: 987; Zimmerman, 1993:  
 53  
*chevrolati* Faust, 1899b: 119; Heller, 1914a:  
 138
- 2a. *ater* var. *basilis* Faust, 1899b: 119 Papua New Guinea
- 2b. *ater* var. *dispar* Chevrolat, 1880: 330; Faust, Papua New Guinea  
 1899b: 118
- 2c. *ater* var. *puncticollis* Heller, 1914a: 138 Papua New Guinea
- 2d. *ater* var. *purvulus* Heller, 1914a: 138 Papua New Guinea
- 2e. *ater* var. *rufus* Faust, 1899b: 119 Indonesia  
*chevrolati* Faust, 1899b: 119 see *ater* Pascoe,  
 1874: 71
3. *cletusi* Heller, 1914a: 140 Papua New Guinea
4. *dispar dispar* (Chevrolat) Papua New Guinea  
*Diathetes dispar dispar* Chevrolat, 1880d:  
 333; Setliff, 2007: 76

- tropicus* Pascoe, 1885: 303; Faust, 1899b:  
119
- 4a. *dispar basalis* Faust, 1899b: 119 Papua New Guinea
5. *globithorax* Heller, 1914a: 139 Papua New Guinea
6. *imparatus* (Pascoe) Papua New Guinea  
*Daihetes imparatus* Pascoe, 1885: 304;  
Heller, 1914b: 312
7. *imperialis* Heller, 1914b: 304 Papua New Guinea
8. *macilentus* Heller, 1914a: 141 Papua New Guinea
9. *neopommeranus* Guenther, 1943: 91 Papua New Guinea  
*tropicus* Pascoe, 1885: 303 see *dispar dispar*  
(Chevrolat)  
*semitomentosus* (Chevrolat) transferred to  
*Diathetes* Pascoe, 1874: 71
10. *wahnesi* Hartmann, 1901: 294 Papua New Guinea

**LXVII. *Belopoeus* Schoenherr**

*Belopoeus* Schoenherr, 1838: 872; Chenu, 1860: 249 (*Belopaeus*)  
[NA=L]; Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Calandra carmelita* Germar, 1824: 296

1. *carmelita* (Germar) Brazil, French  
*Calandra carmelita* Germar, 1824: 296; Guiana, Peru,  
Gyllenhal in Schoenherr, 1838: 873 Venezuela  
*carmelitus* Gyllenhal in Schoenherr, 1838:  
873<sup>8</sup>
2. *caudatus* Vannin, 1995: 873 Brazil
3. *heikeae* Vannin, 1995: 872 Brazil
4. *niger* Arrow, 1903: 252 Brazil, Peru
5. *orbignya* Bondar, 1954: 216 Brazil

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<sup>8</sup> Spelling mistake

**LXVIII. *Belorhynus* Guerin-Meneville**

*Belorhynus* Guerin-Meneville, 1833: 39pl. (non Fabricius, 1801b) [= *Megaproctus ocellatus* Guerin-Meneville, 1844: 177]; Schoenherr, 1838: 68 (*Belorhynchus*) (non Berthold, 1827); Schoenherr, 1838: 868 (*Megaproctus*) [URN for *Belorhynus* Guerin-Meneville (as *Belorhynchus*, lapsus)]; Schoenherr, 1838: 868 (*Megaproctus*) [NA=L]; Agassiz, 1846: 20 (*Belorhinus*); Thomson, 1858: 141 (*Oxyopisthen*); Lacordaire, 1866: 281 (*Oxyptygus*); Chevrolat, 1882: 138 (*Oxypleurus*) (non Mulsant, 1839) [NA=L]; Desbrochers, 1891d: 353 (*Megaproctes*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 66

Type specie: *Belorhynus acutus* Guerin-Meneville, 1833: 39pl = *Megaproctus ocellatus* Guerin-Meneville, 1844: 177

- |    |   |            |
|----|---|------------|
| 1. | <i>acutus</i> (Fairmaire)   | Indonesia  |
|    | <i>Lixus acutus</i> Fabricius, 1801b: 505; Gyllenhal in Schoenherr, 1838: 870 ( <i>Megaproctus</i> ); Lacordaire, 1866: 281 ( <i>Oxyptygus</i> ); Alonso-Zarazaga and Lyal, 1999: 64            |            |
|    | <i>Megaproctus ocellatus</i> Guerin-Meneville, 1844: 177; Alonso-Zarazaga and Lyal, 1999: 64  |            |
| 2. | <i>affinis</i> Guerin-Meneville, 1844: 178  | Indonesia  |
| 3. | <i>exclamationis</i> (Wiedemann)  | Indonesia, |
|    | <i>Curculio exclamationis</i> , Wiedemann, 1823: 121; Gyllenhal in Schoenherr, 1838: 871 ( <i>Megaproctus</i> ); Lacordaire, 1866: 281 ( <i>Oxyptygus</i> ); Alonso-Zarazaga and Lyal, 1999: 64 |            |
| 4. | <i>filiformis</i> Guerin-Meneville, 1844: 179   | Indonesia  |
| 5. | <i>furcatus</i> (Chevrolat)   | Malaysia   |



*Oxypygus furcatus* Chevrolat, 1883: 567;  
Csiki, 1936: 23 (*Megaproctus*); Alonso-  
Zarazaga and Lyal, 1999: 64

6. *pugionatus* Pascoe, 1874: 68 Malaysia  
*trisignatus* Kirsch, 1875b: 44 transferred to  
*Pleurothorax* Chevrolat, 1883: 566

**LXIX. *Billbergia* Blackwelder**

*Billbergia* Blackwelder, 1947: 912 (RN for *Aethes*); Chevrolat, 1883:  
582 (*Aethes*) (non Billberg, 1820); Blackwelder, 1947: 912

Type specie: *Aethes spinocollis* Chevrolat, 1883: 583

1. *spinocollis* (Chevrolat) Mexico  
*Aethes spinocollis* Chevrolat, 1883: 583;  
Blackwelder, 1947: 912

**LXX. *Cactophagus* LeConte**

*Cactophagus* LeConte, 1876: 331; Champion, 1910: 96  
(*Eucactophagus*); Chevrolat, 1885a: 92 (*Phyllerythrurus*); Sharp, 1886:  
121 (*Phylleruthrus*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 66;  
Champion, 1910: 89 (*Cactophagoides*); Chevrolat, 1885b: 287  
(*Paradiaphorus*); Anderson, 2002: 23

Type specie: *Sphenophorus validus* LeConte, 1858: 80

*auriculatus* (Chevrolat) transferred to  
*Rhodobaenus* LeConte, 1876: 332

1. *amoenus* (Guenther) Ecuador  
*Phyllerythrurus amoenus* Guenther, 1941: 38;  
Vaurie, 1967a: 203 (*Metamasius*); Wibmer  
and O'Brien, 1986: 372
2. *annulatus* (Champion) Costa Rica, Panama

- Phyllerythrurus annulatus* Champion, 1910:  
95; Vaurie, 1967a: 229 (*Metamasius*);  
Wibmer and O'Brien, 1986: 372
- aurantiacus* Hustache, 1936: 89 see *ornatus*  
(Champion)
3. *aurocinctus* (Champion) Costa Rica,  
*Eucactophagus aurocinctus* Champion, 1910: Mexico, Nicaragua,  
99; Vaurie, 1967a: 240 (*Metamasius*); Panama  
Wibmer and O'Brien, 1986: 372  
*Eucactophagus biocellatus* Barber, 1917: 22;  
Vaurie, 1967a: 241
- 3a. *aurocinctus* var. *albopunctatus* Champion, 1910: Mexico  
99
4. *aurofaciatus* (Breme) Columbia, Mexico  
*Sphenophorus aurofaciatus* Breme, 1844:  
308; Chevrolat, 1885a: 92 (*Phyllerythrurus*);  
Vaurie, 1967a: 233 (*Metamasius*); Wibmer  
and O'Brien, 1986: 372
- bigeminatus* Champion, 1910: 108 see *biguttatus*  
(Champion)
5. *biguttatus* (Champion) Guatemala, Mexico  
*Metamasius biguttatus* Champion, 1910: 108;  
Vaurie, 1967a: 253; Wibmer and O'Brien,  
1986: 372  
*bigeminatus* Champion, 1910: 108; Kuschel,  
1955: 281; Wibmer and O'Brien, 1986: 372
6. *bolivari* (Vaurie) Ecuador  
*Metamasius bolivari* Vaurie, 1967a: 204;  
Wibmer and O'Brien, 1986: 372
7. *carinipyga* (Champion) Mexico, Nicaragua,  
Peru

- Eucactophagus carinipyga* Champion, 1910: 98; Vaurie, 1967a: 235 (*Metamasius*); Wibmer and O'Brien, 1986: 372
- ciliatus* (Champion) transferred to *Metamasius* Horn, 1873: 408
8. *circumdatus* (Champion) Costa Rica,  
*Phyllerythrurus circumdatus* Champion, Nicaragua  
 1910: 94; Vaurie, 1967a: 199 (*Metamasius*);  
 Wibmer and O'Brien, 1986: 372
9. *circumjectus* (Champion) Costa Rica, Panama  
*Phyllerythrurus circumjectus* Champion,  
 1910: 95; Vaurie, 1967a: 202 (*Metamasius*);  
 Wibmer and O'Brien, 1986: 372
10. *condylus* (Vaurie) Costa Rica, Panama  
*Metamasius condylus* Vaurie, 1967a: 206;  
 Wibmer and O'Brien, 1986: 372
11. *crenatus* (Billberg) Brazil  
*Cordyle crenatus* Billberg, 1820:41;  
 Gyllenhal in Schoenherr, 1838: 576  
 (*Sphenophorus*); Chevrolat, 1885b: 287  
 (*Paradiaphorus*); Anderson, 2002: 22
12. *dragoni* Anderson, 2002: 28 Panama
13. *duplocinctus* (Champion) Costa Rica,  
*Eucactophagus duplocinctus* Champion, Guatemala,  
 1910: 97; Vaurie, 1967a: 205 (*Metamasius*); Mexico, Nicaragua,  
 Wibmer and O'Brien, 1986: 372 Panama
14. *elegantulus* (Hustache) Brazil, Ecuador  
*Metamasius elegantulus* Hustache, 1936: 105;  
 Wibmer and O'Brien, 1986: 372
15. *fahraei* (Gyllenhal in Schoenherr) Mexico

- Sphenophorus fahraei* Gyllenhal in Schoenherr, 1838: 884; Chevrolat, 1883: 579; Vaurie, 1967a: 248 (*Metamasius*); Wibmer and O'Brien, 1986: 372
- 15a.** *fahraei fahraei* (Gyllenhal in Schoenherr)  
*Sphenophorus fahraei* Gyllenhal in Schoenherr, 1838: 884; Chevrolat, 1883: 579; Vaurie, 1967a: 250 (*Metamasius*); Wibmer and O'Brien, 1986: 372
- 15b.** *fahraei striatoforatus* (Gyllenhal in Schoenherr)  
*Sphenophorus striatoforatus* Gyllenhal in Schoenherr, 1838: 878; Chevrolat, 1883: 579; Vaurie, 1967a: 251 (*Metamasius*); Wibmer and O'Brien, 1986: 372  
*perforatus* Fahraeus in Schoenherr, 1845: 236; Chevrolat, 1883: 579
- 16.** *gasbarrinorum* Anderson, 2002: 30 Panama
- 17.** *gibberosus* (Champion) Costa Rica  
*Cactophagoides gibberosus* Champion, 1910: 90; Anderson, 2002: 23
- 18.** *graphipterus* (Champion) Columbia, Costa Rica, Guatemala, Panama  
*Eucactophagus graphipterus* Champion, 1910: 98; Vaurie, 1967a: 238 (*Metamasius*); Wibmer and O'Brien, 1986: 372  
*hustachei* Guenther, 1941: 31 transferred to *Metamasius* Horn, 1873: 408
- 19.** *imitator* (Vaurie) Peru  
*Metamasius imitator* Vaurie, 1967a: 216; Wibmer and O'Brien, 1986: 372
- 20.** *incisus* (Vaurie) Ecuador, Peru

*Metamasius incisus* Vaurie, 1967a: 214;  
Wibmer and O'Brien, 1986: 372

21. *lacordairei* Chevrolat, 1883: 581 Colombia
22. *laetus* (Erichson) Brazil, Ecuador,  
*Sphenophorus laetus* Erichson. 1847: 136; Peru  
Hustache, 1936: 109 (*Rhodobaenus*); Voss,  
1954: 334 (*Phyllerythrurus*); Vaurie, 1967a:  
200 (*Metamasius*); Wibmer and O'Brien,  
1986: 372  
*Rhodobaenus luteus* Hustache, 1938: 232;  
Guenther, 1941: 40 (*Phyllerythrurus*);  
Kuschel, 1950: 20; Vaurie, 1967a: 200  
(*Metamasius*); Wibmer and O'Brien, 1986:  
372
23. *limulus* (Vaurie) Brazil  
*Metamasius limulus* Vaurie, 1967a: 214;  
Wibmer and O'Brien, 1986: 372
24. *lineatus* Anderson, 2002: 32 Costa Rica
25. *lingorum* Anderson, 2002: 34 Costa Rica
26. *lojanus* (Heller) Bolivia, Brazil,  
*Metamasiopsis lojanus* Heller, 1912a: 391; Ecuador, Peru  
Vaurie, 1967a: 254 (*Metamasius*); Wibmer  
and O'Brien, 1986: 372
27. *mesomelas* (Champion) Costa Rica,  
*Rhodobaenus mesomelas* Champion, 1910: Ecuador, Mexico,  
121; Vaurie, 1967a: 223 (*Metamasius*); Nicaragua, Panama,  
Wibmer and O'Brien, 1986: 372 South America  
*metamasioides* (Guenther) transferred to  
*Metamasius* Horn, 1873: 408

28. *miniatopunctatus* Chevrolat, 1883: 580 Costa Rica,  
Ecuador,  
Guatemala,  
Mexico, Nicaragua
29. *monilis* (Vaurie)  
*Metamasius monilis* Vaurie, 1967a: 214;  
Wibmer and O'Brien, 1986: 372 Ecuador, Peru
30. *morrissi* Anderson, 2002: 37 Panama  
*nawradi* (Kirsch) transferred to *Rhodobaenus*  
LeConte, 1876: 332  
*oblique-fasciatus* Chevrolat, 1883: 580 see  
*spinolae spinolae* (Gyllenhal in Schoenherr)
31. *ohausi* (Guenther) Ecuador, Peru  
*Phyllerythrurus ohausi* Guenther, 1941: 40;  
Vaurie, 1967a: 213 (*Metamasius*); Wibmer  
and O'Brien, 1986: 372  
*Phyllerythrurus decoratus* Guenther, 1941:  
41; Vaurie, 1967a: 213; Wibmer and O'Brien,  
1986: 372
32. *orizabaensis* (Chevrolat) Guatemala, Mexico  
*Sphenophorus orizabaensis* Chevrolat, 1883:  
578; Champion, 1910: 94 (*Metamasius*);  
Vaurie, 1967a: 234; Wibmer and O'Brien,  
1986: 372
33. *ornatus* (Champion) Bolivia, Brazil,  
*Phyllerythrurus ornatus* Champion, 1910: 94; Colombia, Ecuador,  
Vaurie, 1967a: 219 (*Metamasius*); Wibmer Nicaragua, Peru  
and O'Brien, 1986: 372  
*aurantiacus* Hustache, 1936: 89; Vaurie,  
1967a: 220

34. *pallisteri* (Vaurie) Bolivia, Ecuador,  
*Metamasius pallisteri* Vaurie, 1967a: 208; Guyana, Peru  
 Wibmer and O'Brien, 1986: 372
35. *personatus* (Vaurie) Costa Rica, Panama  
*Metamasius personatus* Vaurie, 1967a: 217;  
 Wibmer and O'Brien, 1986: 372  
*perforatus* Fahraeus in Schoenherr, 1845: 236 see  
*fahraei striatoforatus* (Gyllenhal in Schoenherr)
36. *pruinus* (Champion) Colombia, Panama  
*Eucactophagus pruinus* Champion, 1910:  
 99; Vaurie, 1967a: 237 (*Metamasius*);  
 Wibmer and O'Brien, 1986: 372
37. *pulcherrimus* (Chevrolat) Costa Rica, Mexico  
*Sphenophorus pulcherrimus* Chevrolat, 1883:  
 581; Chevrolat, 1885a: 92 (*Phyllerythrurus*);  
 Champion, 1910: 83 (*Cactophagus*); Vaurie,  
 1967a: 228 (*Metamasius*); Wibmer and  
 O'Brien, 1986: 372  
*quadripunctatus* (Chevrolat) transferred to  
*Rhodoaenus* LeConte, 1876: 332
38. *rectistriatus* (Champion) Costa Rica,  
*Phyllerythrurus rectistriatus* Champion, Nicaragua, Panama  
 1910: 92; Vaurie, 1967a: 205 (*Metamasius*);  
 Wibmer and O'Brien, 1986: 372
39. *riesenorum* Anderson, 2002: 38 Costa Rica
40. *rubricatus* Hustache, 1936: 88 Brazil, Ecuador,  
 French Guiana
41. *rubrovariegatus* Bovie, 1907: 328 Brazil, Costa Rica,  
*Phyllerythrurus quadrinotatus* Champion, Panama  
 1910: 92; Vaurie, 1967a: 205
42. *rudeli* (Voss) Colombia, Ecuador

- Eucactophagus rudeli* Voss, 1953: 81; Vaurie, 1967a: 212 (*Metamasius*); Wibmer and O'Brien, 1986: 372
- sanguinipes* (Hustache) transferred to *Metamasius* Horn, 1873: 408
43. *sanguinolentus* (Olivier) Costa Rica,  
*Curculio sanguinolentus* Olivier, 1790: 473; Colombia,  
 Olivier, 1807: 83 (*Calandra*); Fabricius, Guatemala,  
 1792: 398 (*Curculio*); Fabricius, 1801a: 434 Mexico, Nicaragua,  
 (*Calandra*); Herbst, 1795: 24 Panama, Trinidad  
 (*Rhynchophorus*); Chevrolat, 1883: 578 and Tobago  
 (*Phyllerythrurus*); Vaurie, 1967a: 221  
 (*Metamasius*); Wibmer and O'Brien, 1986:  
 372
- scutellatus* Hustache, 1936: 101 transferred to  
*Metamasius* Horn, 1873: 408
- sierrakowskyi* (Gyllenhal in Schoenherr)  
 transferred to *Metamasius* Horn, 1873: 408
44. *silron* Anderson, 2002: 41 Costa Rica
45. *sinuatus* (Champion) Costa Rica, Panama  
*Phyllerythrurus sinuatus* Champion, 1910:  
 93; Vaurie, 1967a: 219 (*Metamasius*);  
 Wibmer and O'Brien, 1986: 372
46. *spinolae* (Gyllenhal in Schoenherr)  
*Sphenophorus spinolae* Gyllenhal in  
 Schoenherr, 1838: 883; LeConte, 1876: 331
- 46a. *spinolae spinolae* (Gyllenhal in Schoenherr)  
*Sphenophorus spinolae* Gyllenhal in  
 Schoenherr, 1838: 883; LeConte, 1876: 331  
*oblique-fasciatus* Chevrolat, 1883: 580;  
 Champion, 1910: 87



- 46b.** *spinolae validus* (LeConte)  
*Sphenophorus validus* LeConte, 1858: 80;  
 LeConte, 1876: 331  
*Sphenophorus procerus* LeConte, 1858: 80;  
 LeConte, 1876: 331  
*subnitens* Casey, 1892: 685; Vaurie, 1967a:  
 248
- 47.** *spurius* (Vaurie) Ecuador  
*Metamasius spurius* Vaurie, 1967a: 218;  
 Wibmer and O'Brien, 1986: 372
- 48.** *strigosus* (Erichson) Brazil, French  
*Sphenophorus strigosus* Erichson. 1847: 137; Guiana, Panama,  
 Vaurie, 1967a: 225 (*Metamasius*); Wibmer Peru  
 and O'Brien, 1986: 372  
*subnitens* Casey, 1892: 685 see *spinolae validus*  
 (LeConte)
- 49.** *sunatoriorum* Anderson, 2002: 42 Panama
- 50.** *transatlanticus* (Kirsch) Ecuador  
*Heterotoxus transatlanticus* Kirsch, 1889: 35;  
 Heller, 1912a: 390 (*Metamasiopsis*); Vaurie,  
 1967a: 256 (*Metamasius*); Wibmer and  
 O'Brien, 1986: 372 Ecuador  
*transatlanticus* var. *maculicollis* Heller,  
 1912a: 390; Csiki, 1936: 40; Vaurie, 1967a:  
 256; Wibmer and O'Brien, 1986: 372  
*transatlanticus* var. *maculicollis* Heller, 1912a:  
 390 see *transatlanticus* (Kirsch)
- 51.** *validirostris* (Gyllenhal in Schoenherr) Costa Rica, Mexico  
*Sphenophorus validirostris* Gyllenhal in  
 Schoenherr, 1838: 886; Chevrolat, 1883: 579

- Sphenophorus bifasciatus* Gyllenhal in  
Schoenherr, 1838: 885; Champion, 1910: 82
52. *venezolensis* Guenther, 1941: 33 Venezuela
53. *verrucosus* (Champion) Costa Rica  
*Cactophagoides verrucosus* Champion, 1910:  
89; Anderson, 2002: 23
54. *viduus* (Hustache) Costa Rica,  
*Eucactophagus viduus* Hustache, 1936: 91; Nicaragua, Panama,  
Vaurie, 1967a: 236 (*Metamasius*); Wibmer South America  
and O'Brien, 1986: 372  
*Eucactophagus peruanus* Guenther, 1943: 93;  
Vaurie, 1967a: 236 (*Metamasius*); Wibmer  
and O'Brien, 1986: 372

**LXXI. *Cercidocerus* Guerin-Meneville**

*Cercidocerus* Guerin-Meneville, 1833: 39; Schoenherr, 1838: 850  
(*Sphyroles*) [NA=SYN]; Imhoff, 1856: 212 (*Cercicoderus*) [NA=L];  
Hoffmann, 1965: 1421 (*Cericoderus*) [NA=L]; Alonso-Zarazaga and  
Lyal, 1999: 67

Type specie: *Cercidocerus nigrolateralis* Guerin-Meneville, 1833: 39

1. *albicollis* (Olivier) Democratic  
*Curculio albicollis* Olivier, 1807: 91; Faust, Republic of the  
1893a: 151 Congo, Gabon,  
Nigeria
- 1a. *albicollis* var. *rubromaculatus* Faust, 1899a: 428 Democratic  
Republic of the  
Congo
2. *bimaculatus* Boheman in Schoenherr, 1845: 231 India, Indonesia
3. *bipunctatus* Gyllenhal in Schoenherr, 1838: 851 Myanmar
4. *birmanicus* Faust, 1894c: 343 Indonesia

- |      |   |                                |
|------|---|--------------------------------|
| 5.   | <i>bisulcatus</i> Chevrolat, 1883: 574  | Bangladesh                     |
| 6.   | <i>carinensis</i> Faust, 1894c: 344<br><i>carinicollis</i> (Gyllenhal in Schoenherr) transferred<br>to <i>Aplotes</i> Chevrolat, 1885a: 100                   | Myanmar                        |
| 7.   | <i>chevrolati</i> Faust, 1890: 78   | Indonesia                      |
| 8.   | <i>curvaturatus</i> Heller, 1915b: 235  | Philippines                    |
| 9.   | <i>distinctus</i> Faust, 1890: 79   | India                          |
| 10.  | <i>doherty</i> Guenther, 1937b:: 187  | India                          |
| 11.  | <i>effectus</i> Pascoe, 1874: 74  | Singapore                      |
| 12.  | <i>erubescens</i> Heller, 1931: 111   | Taiwan (Formosa)               |
| 13.  | <i>erythroceus</i> Gyllenhal in Shoenherr, 1838: 854<br><i>eximius</i> Guerin-Meneville, 1844: 180 transferred<br>to <i>Pleurothorax</i> Chevrolat, 1883: 566 | Indonesia                      |
| 14.  | <i>fabricator</i> Gyllenhal in Shoenherr, 1838: 852   | Borneo, Indonesia,<br>Malaysia |
| 15.  | <i>fabrilis</i> Gyllenhal in Shoenherr, 1838: 853   | Borneo, Indonesia,<br>Malaysia |
| 16.  | <i>flavopictus</i> Heller, 1913: 136  | Philippines                    |
| 17.  | <i>flavopunctulatus</i> Guenther, 1935c: 213  | Indonesia                      |
| 18.  | <i>haemetopterus</i> Chevrolat, 1883: 574<br><i>heros</i> Pascoe, 1887: 377 transferred to<br><i>Rhynchophorinus</i> Guenther, 1937b: 179                     | Indonesia                      |
| 19.  | <i>hispidulus</i> Pascoe, 1874: 73  | Malaysia                       |
| 19a. | <i>hispidulus pendleburyi</i> Guenther, 1937b:: 185   | Malaysia                       |
| 20.  | <i>hypocrita</i> Faust, 1894c: 345  | Myanmar                        |
| 21.  | <i>incertus</i> Guenther, 1937b:: 186   | Myanmar, India                 |
| 22.  | <i>indicator</i> Pascoe, 1874: 73   | Singapore                      |
| 23.  | <i>infernalis</i> Chevrolat, 1883: 575  | India                          |
| 24.  | <i>interruptolineatus</i> Heller, 1908: 192   | Borneo, Indonesia,<br>Malaysia |
| 25.  | <i>lateralis</i> Fahraeus in Schoenherr, 1845: 232  | Myanmar                        |

26. *nervosus* Pascoe, 1874: 74 Borneo, Indonesia, Malaysia
27. *niger* Aurivillius, 1926: 9 Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo
- nigrolateralis* Guerin-Meneville, 1844: 39 see *securifer* (Gaede)
28. *paraprodioides* Guenther, 1937b:: 188 Borneo, Malaysia
29. *pictus* Faust, 1894c: 347 Myanmar
30. *prodioides* Heller, 1908: 190 Borneo, Indonesia, Malaysia
31. *pygmaeus* Faust, 1894c: 346 Myanmar
32. *rufipes* Guenther, 1935b: 166 India
33. *sanguinipes* Heller, 1924: 303 Philippines
34. *saturatus* Pascoe, 1874: 74 Malaysia
35. *schoenherri* Guerin-Meneville, 1844: 179 Borneo, Indonesia, Malaysia, Myanmar
- 35a. *schoenherri* var. *funbris* Guerin-Meneville, Indonesia  
1844: 180; Kraatz, 1893: 318
36. *securifer* (Gaede) Borneo, Indonesia, Malaysia  
*Calandra securifer* Gaede, 1833: 458; Kaartz, 1893: 318  
*nigrolateralis* Guerin-Meneville, 1844: 39; Kaartz, 1893: 318

*similis* Chevrolat, 1883: 573 transferred to  
*Rhabdoscelus* Marshall, 1943: 119

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|-----|--|-------------|
| 37. | <i>sulicicollis</i> Chevrolat, 1883: 573 | India       |
| 38. | <i>sutura-alba</i> Chevrolat, 1883: 573  | Indonesia   |
| 39. | <i>trichopygus</i> Chevrolat, 1885a: 91  | Bangladesh  |
| 40. | <i>viduus</i> Chevrolat, 1883: 573       | Vietnam     |
| 41. | <i>x-rubrum</i> Desbrochers, 1910: 132   | Philippines |

**LXXII. *Conopisthen* Faust**

*Conopisthen* Faust, 1895a: 256

Type specie: *Coptopisthen pruinosum* Faust, 1895a: 257

- |    |                                      |          |
|----|--------------------------------------|----------|
| 1. | <i>mucrosternale</i> Kolbe, 1899: 33 | Cameroon |
| 2. | <i>pruinosum</i> Faust, 1895a: 257   | Togo     |

**LXXIII. *Coptopisthen* Kolbe**

*Coptopisthen* Kolbe, 1899: 96

Type specie: NYD

- |    |                                     |          |
|----|-------------------------------------|----------|
| 1. | <i>amitinum</i> Kolbe, 1899: 99     | Cameroon |
| 2. | <i>consobrinum</i> Kolbe, 1899: 101 | Cameroon |
| 3. | <i>exhaustum</i> Kolbe, 1899: 99    | Cameroon |
| 4. | <i>obtusatum</i> Kolbe, 1899: 104   | Cameroon |
| 5. | <i>separandum</i> Kolbe, 1899: 99   | Cameroon |

**LXXIV. *Coraliphorus* Chevrolat**

*Coraliphorus* Chevrolat, 1883: 564

Type specie: *Coraliphorus longus* Chevrolat, 1883: 565

- |    |                                    |       |
|----|------------------------------------|-------|
| 1. | <i>longus</i> Chevrolat, 1883: 565 | India |
|----|------------------------------------|-------|

**LXXV. *Cryptocordylus* Faust**

*Cryptocordylus* Faust, 1895c: 222; Hoffmann, 1965: 1422  
 (*Cryptocordulus*) [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 67

Type specie: *Cryptocordylus quadrimaculatus* Faust, 1895c: 233

1. *linea-alba* (Thomson) Gabon  
*Oxyopisthen linea-alba* Thomson, 1858: 143;  
 Roelofs, 1892b: 34 (*Ichthyopisthen*); Kolbe,  
 1899: 88
2. *quadrimaculatus* Faust, 1895c: 233 Cameroon,  
 Democratic  
 Republic of the  
 Congo
3. *vittatus* (Roelofs) Democratic  
 Republic of the  
 Congo  
*Oxyopisthen vittatus* Roelofs, 1891a: 119;  
 Roelofs, 1892b: 33 (*Ichthyopisthen*); Kolbe,  
 1899: 88

**LXXVI. *Diathetes* Pascoe**

*Diathetes* Pascoe, 1874: 71; Chevrolat, 1880c: 333 (*Dialtates*); Heller,  
 1924c: 179 (*Diasthetus*); Guenther, 1941: 29

Type specie: *Diathetes ruficollis* Pascoe, 1874: 72; SD: Zimmerman, 1993:  
 61

1. *amoenus* Faust, 1898c: 210 Papua New Guinea
2. *buxtoni* Marshall, 1931: 316 Samoa
3. *caviscutatus* (Fairmaire) Palau  
*Calandra caviscutatus* Fairmaire, 1878c: 282;  
 Zimmerman, 1993: 62  
*dispar* Chevrolat, 1880: 330 transferred to  
*Barystethus* Lacordaire, 1866: 286

- imparatus* (Pascoe) transferred to *Barystethus*  
Lacordaire, 1866: 286
4. *intrusus* Faust, 1898c: 209 Papua New Guinea
  5. *kukenthali* Faust, 1895b: 104 Indonesia, Papua  
New Guinea
  6. *lyriger* Marshall, 1931: 318 Samoa
  7. *maculosus* Guenther, 1934b: 443 Papua New Guinea
  8. *nigripennis* Pascoe, 1874: 72 Indonesia
  9. *nitidicollis* Pascoe, 1874: 72 Indonesia
  10. *pandanae* Zimmerman, 1993: 335 Fiji
  11. *pictus* Pascoe, 1885: 304 Papua New Guinea
  12. *planus* Heller, 1910: 36 Papua New Guinea
  13. *pulchellus* Guenther, 1934b: 444 Papua New Guinea
  14. *ruficollis* Pascoe, 1874: 72 Indonesia, Papua  
New Guinea
  - 14a. *ruficollis* var. *eremothocus* Guenther, 1934b: 442 Papua New Guinea
  - 14b. *ruficollis* var. *burgersi* Guenther, 1934b: 442 Papua New Guinea
  15. *sanguinivittis* Heller, 1929b: 137 Indonesia
  16. *sanguinosus* Heller, 1915c: 527 Papua New Guinea
  17. *sannio* Pascoe, 1874: 72 Indonesia, Papua  
New Guinea
  18. *seminitidus* Chevrolat, 1883: 571 Scotland (United  
Kingdom)
  19. *semitomentosus* (Chevrolat) Scotland (United  
*Barystethus semitomentosus* Chevrolat, 1883: Kingdom)  
571; Heller, 1914a: 143
  20. *sternuous* Pascoe, 1874: 72 Indonesia, Papua  
New Guinea
  21. *testardi* (Montrouzier) Scotland (United  
*Sphenophorus testardi* Montrouzier, 1861: Kingdom)  
909; Chevrolat, 1883: 571

22. *vittaticolis* Heller, 1914b: 311 Indonesia
- a. ***Diathetes (Diathetes)***  
*Diathetes (Diathetes)* Pascoe, 1874: 73; Chevrolat, 1880c: 333  
*(Diasthetus)* [NA=L]; Heller, 1924c: 179 (*Diasthetus*) [NA=L];  
 Alonzo-Zarazaga and Lyal, 1999: 67
1. *morio* Pascoe, 1874: 73 Australia,  
*Barystethus hemiscotus* Chevrolat, 1881a: 8; Indonesia, Papua  
 Heller, 1914a: 142 New Guinea
2. *species 1* Zimmerman, 1993: 82 Australia
3. *species 2* Zimmerman, 1993: 82 Australia
- b. ***Diathetes (Calodiasthetus)*** Heller  
*Diathetes (Calodiasthetus)* Heller, 1924c: 179; *Calodiasthetus*  
 Guenther, 1941: 29 [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 67  
 Type specie: *Diathetes marshalli* Heller, 1924c: 179
1. *marshalli* Heller, 1924c: 179 Philippines
2. *crassiusculus* Heller, 1924b: 301 Philippines
- c. ***Diathetes (Listrodiathetes)*** Zimmerman  
*Diathetes (Listrodiathetes)* Zimmerman, 1993: 83  
 Type specie: *Diathetes signaticollis* Faust, 1899b: 120
1. *signaticollis* (Faust) Australia, Papua  
*Diathetes signaticollis* Faust, 1899b: 120; New Guinea  
 Zimmerman, 1993: 83
- d. ***Diathetes (Megadiathetes)*** Zimmerman



*Diathetes (Megadiathetes)* Zimmerman, 1993: 84

Type specie: *Sphenophorus schoenherri* Gyllenhal in Schoenherr, 1838: 875

1. *schoenherri* (Gyllenhal in Schoenherr) Philippines  
*Sphenophorus schoenherri* Gyllenhal in  
Schoenherr, 1838: 875; Zimmerman, 1993:  
84
2. *crassiusculus* Heller, 1924b: 301 Philippines

**LXXVII. *Disodontogenus* Marshall**

*Disodontogenus* Marshall, 1909: 231

Type specie: *Disodontogenus wollastoni* Marshall, 1909: 231

1. *wollastoni* Marshall, 1909: 231 Costa Rica

**LXXVIII. *Dolichopisthen* Kolbe**

*Dolichopisthen* Kolbe, 1899: 89

Type specie: NYD

1. *rufofemorum* (Thomson) Cameroon, Gabon  
*Oxypisthen rufofemorum* Thomson, 1858:  
142; Kolbe, 1899: 91  
*Ichthyopisthen convexicollis* Aurivillius,  
1891: 367; Kolbe, 1899: 91
2. *togoense* (Faust) Togo  
*Ichthyopisthen togoense* Faust, 1895a: 254;  
Kolbe, 1899: 94

**LXXIX. *Foveolus* Vaurie**

*Foveolus* Vaurie, 1968b: 4

Type specie: *Sphenophorus austerus* Gyllenhal in Schoenherr, 1838: 916

1. *anomalus* Vaurie, 1968b: 9 Brazil
2. *aterpes* Vaurie, 1968b: 13 Cayenne, French Guiana
3. *atratus* (Gyllenhal in Schoenherr) Brazil, French Guiana, Venezuela  
*Sphenophorus atratus* Gyllenhal in Schoenherr, 1838: 916; Vaurie, 1968b: 11
4. *austerus* (Gyllenhal in Schoenherr) French Guiana  
*Sphenophorus austerus* Gyllenhal in Schoenherr, 1838: 916; Vaurie, 1968b: 7
5. *maculatus* O'Brien, 2003: 329 Brazil

**LXXX.** *Gnamptorrhinus* Marshall

*Gnamptorrhinus* Marshall, 1949: 848

Type specie: *Gnamptorrhinus tamsi* Marshall, 1949: 849

1. *tamsi* Marshall, 1949: 849 India

**LXXXI.** *Haplorhynchus* Aurivillius

*Haplorhynchus* Aurivillius, 1886: 95; Aurivillius, 1891: 362  
(*Haplorrhynchus*) [NA=L]; Aurivillius, 1891: 369 (*Cyrtopisthen*);  
Faust, 1895a: 255

Type specie: *Haplorhynchus valdai* Aurivillius, 1886: 96

1. *aurivillianus* Kolbe, 1899: 68 Cameroon
2. *bipindicus* Kolbe, 1899: 67 Cameroon
3. *camerunus* Kolbe, 1899: 70 Cameroon
4. *conradti* Kolbe, 1899: 64 Cameroon
5. *dissidens* Kolbe, 1899: 66 Cameroon
6. *kraatzi* Faust, 1895a: 255 Togo
7. *lolous* Kolbe, 1899: 73 Cameroon
8. *mimicus* Kolbe, 1899: 57 Cameroon

- |     |  |                 |
|-----|--|-----------------|
| 9.  | <i>patruelis</i> Kolbe, 1899: 75         | Cameroon        |
| 10. | <i>praecox</i> Kolbe, 1899: 69           | Togo            |
| 11. | <i>preussi</i> Kolbe, 1899: 69           | Cameroon        |
| 12. | <i>propinquus</i> Kolbe, 1899: 72        | Cameroon        |
| 13. | <i>rubicundus</i> Aurivillius, 1891: 369 | Cameroon, Gabon |
| 14. | <i>valdau</i> Aurivillius, 1886: 96      | Cameroon        |
| 15. | <i>zenkeri</i> Kolbe, 1899: 55           | Cameroon        |

**LXXXII. *Heterotoxus* Lacordaire**

*Heterotoxus* Lacordaire, 1866: 283; Champion, 1910: 10 (*Heteroxus*)  
[NA=L]; Alonso-Zarazaga and Lyal, 1999: 67

Type specie: *Heterotoxus gratus* Lacordaire, 1866: 284

- |    |  |            |
|----|--|------------|
| 1. | <i>gratus</i> Lacordaire, 1866: 284    | Indonesia  |
| 2. | <i>miniocerus</i> Chevrolat, 1883: 568 | Bangladesh |

**LXXXIII. *Ichthyopisthen* Aurivillius**

*Ichthyopisthen* Aurivillius, 1891: 363

Type specie: NYD

- |     |  |                 |
|-----|--|-----------------|
| 1.  | <i>acutum</i> Kolbe, 1899: 110   | Togo            |
| 1a. | <i>acutum</i> var. <i>obscuripes</i> Kolbe, 1899: 118<br><i>albolineatum</i> Aurivillius, 1891: 366 see <i>nitidium</i><br>(Roelofs)   | Guinea          |
| 2.  | <i>bimaculatum</i> Aurivillius, 1891: 365  | Cameroon, Gabon |
| 3.  | <i>buettikoferi</i> (Roelofs)<br><i>Oxyopisthen buettikoferi</i> , Roelofs, 1891a:<br>118; Kolbe, 1899: 113<br><i>calvatum</i> (Roelofs) transferred to <i>Anoxyopisthen</i><br>Kolbe, 1899: 119 | Liberia         |

*linea-alba* (Thomson) transferred to  
*Cryptocordylus* Faust, 1895c: 222

4. *nitidum* (Roelofs) Gabon

*Oxyopisthen nitidum* Roelofs, 1891c: 168;  
Kolbe, 1899: 110

*albolineatum* Aurivillius, 1891: 366; Kolbe,  
1899: 111

*pygidiale* (Simpson in Jameson) transferred to  
*Anoxyopisthen* Kolbe, 1899: 119

*togoense* (Faust) transferred to *Dolichopisthen*  
Kolbe, 1899: 89

*vittatus* (Roelofs) transferred to *Cryptocordylus*  
Faust, 1895c: 222

**LXXXIV. *Ipthimorhinus* Roelofs**

*Ipthimorhinus* Roelofs, 1892e: 207; Heller, 1901: 18  
(*Flamingorhynchus*); Bovie, 1903: 306 (*Flamingorrhynchus*) [NA=L];  
Alonzo-Zarazaga and Lyal, 1999: 67

Type specie: *Ipthimorhinus australasiae* Roelofs, 1892e: 208

1. *australasiae* Roelofs, 1892e: 208 Australia

**LXXXV. *Korotyaevius* Alonzo-Zarazaga and Lyal**

*Korotyaevius* Alonzo-Zarazaga and Lyal, 1999: 67; Lacordaire, 1866:  
279 (*Oxyopisthen*) [NA=MI]; Quedenfeldt, 1889: 303 (*Oxyopisthen*)  
[NA=L]; Alonzo-Zarazaga and Lyal, 1999: 67

Type specie: *Rhynchophorus funebris* Illiger, 1802: 177; PD

*buettikoferi* (Roelofs) transferred to  
*Ichthyopisthen* Aurivillius, 1891: 363

*calvatum* (Roelofs) transferred to *Anoxyopisthen*  
Kolbe, 1899: 119

*depressum* (Roelofs) transferred to *Anoxyopisthen*  
Kolbe, 1899: 119

*deplanatum* (Roelofs) transferred to  
*Anoxyopisthen* Kolbe, 1899: 119

1. *funebri* (Illiger) Cameroon,  
*Rhynchophorus funebri* Illiger, 1802: 177; Democratic  
Lacordaire, 1866: 279 (*Oxyopisthen*); Kolbe, Republic of the  
1899: 81; Alonzo-Zarazaga and Lyal, 1999: Congo, Gabon,  
67 Sierra Leone, Togo
- 1a. *funebri* var. *illigeri* Faust, 1894d: 568; Alonzo-  
Zarazaga and Lyal, 1999: 67
2. *kolbei* (Hartmann) Democratic  
*Oxyopisthen kolbei* Hartmann, 1900: 123; Republic of the  
Alonzo-Zarazaga and Lyal, 1999: 67 Congo
- linea-alba* (Thomson) transferred to  
*Cryptocordylus* Faust, 1895c: 222
- nitidum* (Roelofs) transferred to *Ichthyopisthen*  
Aurivillius, 1891: 363
- pygidiale* (Simpson in Jameson) transferred to  
*Anoxyopisthen* Kolbe, 1899: 119
- rufofemoratum* (Thomson) transferred to  
*Dolichopisthen* Kolbe, 1899: 89
- suturale* (Roelofs) transferred to *Platyopisthen*  
Roelofs, 1892c: 134
- vittatus* (Roelofs) transferred to *Cryptocordylus*  
Faust, 1895c: 222
3. *westermanni* (Aurivillius) Cameroon,  
*westermanni* Aurivillius, 1886: 97; Alonzo- Democratic  
Zarazaga and Lyal, 1999: 67 Republic of the

Congo      Guinea,  
Togo

**LXXXVI. *Liocalandra* Chevrolat**

*Liocalandra* Chevrolat, 1881b: 92; Lacordaire, 1866: 286 (*Cyrtorhinus*) (non Fieber, 1858); Chevrolat, 1885a: 95 (*Polyoulax*); Gemminger and Harold, 1871: 2646 (*Cyrtorhinus*) [NA=L]; Csiki, 1936: 36 (*Cyrtorhinus*) [NA=L]; Marshall, 1939: 583

Type specie: *Liocalandra nuda* Chevrolat, 1881b: 92 (= *Sphenophorus castaneipennis* Bohemann in Schoenherr, 1838: 249)

- |    |  |   |
|----|--|---|
| 1. | <i>castaneipennis</i> (Bohemann in Schoenherr)   | Central African   |
|    | <i>Sphenophorus castaneipennis</i> Bohemann in Schoenherr, 1838: 249; Chevrolat, 1885a: 95 ( <i>Polyoulax</i> ); Csiki, 1936: 36 ( <i>Cyrtorhinus</i> ); Marshall, 1939: 583 | Republic, Democratic Republic of Congo, Kapland*, South Africa, Sudan, Zanzibar |
|    | <i>Cyrtorhinus baridioides</i> Lacordaire, 1866: 293; Csiki, 1936: 36 ( <i>Cyrtorhinus</i> ); Marshall, 1939: 583  |   |
|    | <i>Cyrtorhinus caffer</i> Fahraeus, 1871: 282; Csiki, 1936: 36 ( <i>Cyrtorhinus</i> ); Marshall, 1939: 583   |   |
| 2. | <i>hovanus</i> Fairmaire, 1902a: 242   | Madagascar  |
| 3. | <i>nuda</i> Chevrolat, 1881b: 92   | Zanzibar  |
| 4. | <i>squamiger</i> (Faust)   | Ghana   |
|    | <i>Cyrtorhinus squamiger</i> Faust, 1895a: 257; Marshall, 1939: 583  |   |

**LXXXVII. *Megastethus* Faust**

*Megastethus* Faust, 1899a: 426

Type specie: *Megastethus lacordairei* Faust, 1899a: 427

1. *lacordairei* Faust, 1899a: 427 Democratic  
Republic of Congo

**LXXXVIII. *Meroplus* Chevrolat**

*Meroplus* Chevrolat, 1885a: 97; Chevrolat, 1895: 95 (*Meraphus*)  
[NA=L]; Csiki, 1936: 21

Type specie: *Meroplus serrirostris* Chevrolat, 1885a: 96

1. *alternans* Chevrolat, 1885a: 97 Indonesia  
*geniculatus* Chevrolat, 1885a: 98; Guenther,  
1937b:: 182
2. *cinereiventris* Chevrolat, 1885a: 96 Indonesia
3. *denticulatus* Chevrolat, 1885a: 96 Indonesia  
*flavolineatus* Chevrolat, 1885a: 99 transferred to  
*Metaprodioces* Guenther, 1937b:: 182  
*geniculatus* Chevrolat, 1885a: 98 see *alternans*  
Chevrolat, 1885a: 97  
*haematicus* Chevrolat, 1885a: 99 transferred to  
*Metaprodioces* Guenther, 1937b:: 182  
*lineanigra* Chevrolat, 1885: 98 transferred to  
*Metaprodioces* Guenther, 1937b:: 182  
*nigrocinctus* Chevrolat, 1885a: 98 transferred to  
*Metaprodioces* Guenther, 1937b:: 182
4. *serrirostris* Chevrolat, 1885a: 96 Indonesia
5. *similis* Heller, 1900: 43 Indonesia  
*subscutellaris* Chevrolat, 1885a: 99 transferred to  
*Metaprodioces* Guenther, 1937b:: 182

**LXXXIX. *Metamasius* Horn**

*Metamasius* Horn, 1873: 408; Chevrolat, 1880b: 316 (*Odontorhynchus*)  
(non Pelzeln, 1868); Kirby, 1881: 79 (*Odontorrhynchus*); Champion,

1910: 100 (*Metamasiopsis*); Blatchley, 1922b: 127 (*Metamesius*) [NA=L]; Marshall, 1943: 118 (*Odontomycter*) [NA=NT] (RN for *Odontorhynchus*); Voss, 1954: 333 (*Subphyllerythrurus*); Kuschel, 1958: 750 (*Paramasius*); Vannin, 1998: 117 (*Cyrtomasius*); Anderson, 2002: 44

Type specie: *Calandra sericea* Olivier, 1807: 84

*alternans* Hustache, 1936: 104 see *dasyurus*  
Champion, 1910: 111

1. *alveolus* Vaurie, 1968a: 4 Costa Rica, Panama  
*amoenus* (Guenther) transferred to *Cactophagus*  
LeConte, 1876: 331
2. *anceps* (Gyllenhal in Schoenherr) Bolivia, Brazil,  
*Sphenophorus anceps* Gyllenhal in Colombia, Ecuador,  
Schoenherr, 1838: 894; Vaurei, 1966: 245 Mexico, Peru  
*bilobus* Hustache, 1936: 99; Vaurei, 1966:  
245  
*Sphenophorus rubrotesselatus* Blanchards,  
1846: 204; Vaurei, 1969: 27
- 2a. *anceps* var. *amplicollis* (Hustache) Ecuador  
*bilobus* var. *amplicollis* Hustache, 1936:  
100; Vaurei, 1966: 245  
*annulatus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
3. *applicatus* Hustache, 1938: 231 Bolivia, Brazil,  
Colombia, Mexico,  
Venezuela
4. *atwoodi* Anderson, 2002: 50 Costa Rica  
*aurocinctus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331



- aurofaciatus* (Breme) transferred to  
*Cactophagus* LeConte, 1876: 331
5. *barbatulus* Vaurie, 1968a: 7 Ecuador
6. *basilaris* Vaurie, 1966: 258 Argentina, Brazil,  
Colombia, Ecuador,  
Peru
7. *bellorum* Anderson, 2002: 53 Panama
8. *benoisti* Hustache, 1936: 93 Ecuador
- biguttatus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
- bilobus* Hustache, 1936: 99 see *anceps*  
(Gyllenhal in Schoenherr)
- bilobus* var. *amplicollis* Hustache, 1936: 100 see  
*anceps* var. *amplicollis* (Hustache)
9. *bisbisignatus* (Gyllenhal in Schoenherr) Brazil, Paraguay,  
*Sphenophorus bisbisignatus* Gyllenhal in Venezuela  
Schoenherr, 1838: 894; Csiki, 1936: 40  
(*Metamasiopsis*)<sup>9</sup>; Vaurie, 1966: 247
- brevinasus* Hustache, 1936: 103 see  
*tuberculipectus* Hustache, 1936: 102
- bolivari* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
10. *bromeliadicola* Champion, 1913: 5 Costa Rica
11. *bruneri* Buchanan, 1941: 169 Cuba, Jamaica
12. *burcheri* Anderson, 2002: 55 Costa Rica
13. *callizona* (Chevrolat) Guatemala, Mexico,  
*Sphenophorus callizona* Chevrolat, 1883: Panama  
578; Champion, 1910: 105; Chevrolat,

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<sup>9</sup> For some inexplicable reason, this species appears in the Junk catalogue (Csiki, 1936, p. 40) with the genus *Metamasiopsis*, a procedure followed by Blackwelder (1947), but Champion (1910) did not link it in any way with his new genus *Metamasiopsis*.

- 1885a: 92 (*Phyllerythrurus*); Champion,  
1910: 105
- 14.** *canalipes* (Gyllenhal in Schoenherr) Bolivia, Brazil, India  
*Sphenophorus canalipes* Gyllenhal in  
Schoenherr, 1838: 927; Chevrolat, 1885a:  
101 (*Trochorhopalus*); ; Vaurie, 1966: 297  
*carinipyga* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
- 15.** *cerasinus* Vaurie, 1966: 300 French Guiana,  
Panama, Trinidad,  
Venezuela
- 16.** *ciliatus* (Champion) Mexico, Veracruz,  
*Cactophagus ciliatus* Champion, 1910: 85; Yucatan  
Vaurie, 1966: 261
- 17.** *cincinnatus* Champion, 1910: 105 Costa Rica, Ecuador,  
Nicaragua, Panama
- 18.** *cinnamominus* (Perty) Bolivia, Brazil,  
*Calandra cinnamominus* Perty, 1830: 82; British Guiana,  
Champion, 1910: 177 Colombia, Ecuador,  
*Sphenophorus obsulatus* Gyllenhal in French Guiana,  
Schoenherr, 1838: 895; Gemminger and Honduras, Peru,  
Harold, 1871: 2647 Trinidad, Venezuela  
*Sphenophorus spadiceus* Gyllenhal, 1838:  
906; Vaurie, 1966: 278  
*cinnamomeus* Gemminger and Harold,  
1871: 2647<sup>10</sup>; Vaurie, 1966: 278  
*connexus* Champion, 1910: 111 see  
*dimidiatipennis* (Jekel)

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<sup>10</sup> Error in spelling

- circumdatus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
- circumjectus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
- condylus* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
19. *crinitus* Vaurie, 1970: 53 Costa Rica, Panama
20. *cristulatus* (Vannin) Brazil  
*Paramasius cristulatus* Vannin, 1998: 111;  
Anderson, 2002: 44
- conicicollis* Hustache, 1936: 98 see *hebetatus*  
(Gyllenhal in Schoenherr)
21. *cornurostris* (Chevrolat) Guadeloupe  
*Odontorhynchus cornurostris* Chevrolat,  
1880b: 316; Vaurie, 1966: 283  
*Odontorhynchus puncticollis* Chevrolat,  
1880b: 316; Vaurie, 1966: 283
22. *crustosus* Vaurie, 1966: 301 Peru  
*dasygnemmis* Guenther, 1936c: 192 see *pygidialis*  
Guenther, 1935c: 223
23. *dasyurus* Champion, 1910: 111 Bolivia, Brazil,  
*alternans* Hustache, 1936: 104; Vaurie, Colombia, Costa  
1966: 31 Rica, Ecuador,  
French Guiana,  
Honduras, Mexico,  
Panama, Peru,  
Venezuela
24. *difficilis* Guenther, 1941: 45 Costa Rica, Ecuador,  
Honduras
25. *dimidiatipennis* (Jekel) Brazil, British  
Guiana, Colombia,

- Sphenophorus dimidiatipennis* Jekel, 1858: 359; Champion, 1910: 106  
Costa Rica, Ecuador, French Guiana,
- Cactophagus consularis* Hustache, 1936: 89; Guenther, 1941: 43  
Guatemala, Mexico, Nicaragua, Panama,
- connexus* Champion, 1910: 111; Vaurie, 1966: 275  
Peru, United States of America
- nigromaculatus* Voss, 1954: 331; Vaurie, 1966: 275
- 25a.** *dimidiatipennis waehneri* Guenther, 1941: 44  
Brazil, Ecuador, Peru
- 25b.** *dimidiatipennis congener* (Voss)  
Ecuador
- nigromaculatus congener* Voss, 1954: 331;  
Vaurie, 1966: 275
- 26** *distortus* (Gemminger and Harold)  
Brazil
- Sphenophorus distortus* Gemminger and Harold, 1871: 2648; Guenther, 1941: 53; Kuschel 1958: 750 (*Paramasius*); Anderson, 2002: 44
- duplocinctus* (Champion) transferred to *Cactophagus* LeConte, 1876: 331
- elegantulus* (Hustache) transferred to *Cactophagus* LeConte, 1876: 331
- 27.** *ensirostris* (Germar)  
Argentina, Brazil, Colombia, Mexico, Paraguay, Venezuela
- Calandra ensirostris* Germar, 1824: 296; Champion, 1910: 103
- Sphenophorus dispar* Gyllenhal in Schoenherr, 1838: 892; Csiki, 1936: 41
- Curculio purpurascens* Panzer, 1798: 52; Csiki, 1936: 41
- fahraei* (Gyllenhal in Schoenherr) transferred to *Cactophagus* LeConte, 1876: 331

28. *fasciatus* (Olivier) Costa Rica, Panama,  
*Curculio fasciatus* Olivier, 1790: 474; Venezuela  
 Olivier, 1807: 83 (*Calandra*); Herbst, 1795:  
 25 (*Rhynchophorus*); Champion, 1910: 109  
*ochreofasciatus* Champion, 1910: 113;  
 Vaurie, 1966: 266  
*Sphenophorus sanguinolentus* Geminger  
 and Harold, 1871: 2648; Champion, 1910:  
 109
29. *flavopictus* (Champion) Guatemala, Mexico  
*Metamasiopsis flavopictus* Champion, 1910:  
 101; Vaurie, 1966: 268  
*Metamasiopsis decempunctatus* Champion,  
 1910: 102; Vaurie, 1966: 268
30. *foveolatus* (Guenther) Colombia  
*Cactophagus foveolatus* Guenther, 1941: 34;  
 Vaurie, 1966: 297  
*fractelineatus* Hustache, 1936: 100 see  
*sanguinipes* (Hustache)
31. *gallettae* Anderson, 2002: 55 Panama  
*graphipterus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
32. *guentheri* Vaurie, 1966: 311 Ecuador
33. *hebetatus* (Gyllenhal in Schoenherr) Bolivia, Costa Rica,  
*Sphenophorus hebetatus* Gyllenhal in Ecuador, French  
 Schoenherr, 1838: 919; Champion, 1910: Guiana, Nicaragua,  
 109 Panama, Peru,  
*conicicollis* Hustache, 1936: 98; Kuschel, Venezuela  
 1955: 281
34. *hemipterus* (Linnaeus) Antigua, Argentina,  
 Barbados, Bolivia,

- Curculio hemipterus* Linnaeus, 1764: 44; Brazil, British  
 Fabricius, 1801a: 433 (*Calandra*); Herbst, Guiana, Colombia,  
 1795: 9 (*Rhynchophorus*); Champion, 1910: 105  
 105  
*Curculio rufofasciatus* DeGeer, 1781: 271; Guadeloupe, India,  
 Gyllenhal in Schoenherr, 1838: 890 Lesser Antilles,  
*Curculio variegatus* Panzer, 1798: 57; Panama, Peru,  
 Gyllenhal in Schoenherr, 1838: 890 Surinam, Trinidad,  
*Sphenophorus hemipterus* var. *inscripta*, Uruguay, Venezuela  
 Gyllenhal in Schoenherr, 1838: 891  
*Sphenophorus decorates* Gyllenhal in  
 Schoenherr, 1838: 888; Champion, 1910:  
 105  
*Sphenophorus ambiguus* Gyllenhal in  
 Schoenherr, 1838: 899; Champion, 1910:  
 105  
*Sphenophorus sacchari* Gyllenhal in  
 Schoenherr, 1838: 891; Champion, 1910:  
 105
- 34a.** *hemipterus sericeus* (Olivier) Cuba, Colombia,  
*Calandra sericea* Olivier, 1807: 84; Costa Rica,  
 Gyllenhal in Schoenherr, 1838: 896 Dominican Republic,  
 (*Sphenophorus*); Kuschel, 1956: 324 Ecuador, Greater  
 Antilles, Haiti,  
 Jamaica, Nicaragua,  
 Panama, Venezuela
- 34b.** *hemipterus carbonarius* (Chevrolat) British Honduras, El  
*Rhynchophorus carbonarius* Chevrolat, Salvador, Guatemala,  
 1833: 20; Boheman in Schoenherr, 1845: Honduras, Mexico,  
 238 (*Sphenophorus*); Kuschel, 1956: 324 Veracruz
- 35.** *hooveri* Anderson, 2002: 60 Costa Rica

- hoppi* Voss, 1954: 334 see *tuberculipectus*  
Hustache, 1936: 102
36. *illusionis* Vaurie, 1968a: 1 Colombia  
*imitator* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
37. *inaequalis* (Gyllenhal in Schoenherr) Brazil, British  
*Sphenophorus inaequalis* Gyllenhal in Guiana, Colombia,  
Schoenherr, 1838: 926; Guenther, 1941: 53 Costa Rica, Ecuador,  
French Guiana,  
Mexico, Nicaragua,  
Panama, Peru,  
Surinam, Trinidad,  
Venezuela
- incisus* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
- laetus* (Erichson) transferred to *Cactophagus*  
LeConte, 1876: 331
38. *laticrus* Vaurie, 1966: 307 Ecuador
39. *leopardinus* Anderson, 2002: 62 Costa Rica, Panama  
*limulus* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
40. *liratus* (Gyllenhal in Schoenherr) Dominica,  
*Sphenophorus liratus* Gyllenhal in Guadeloupe,  
Schoenherr, 1838: 914; Guenther, 1941: 53 Martinique  
*lojanus* (Heller) transferred to *Cactophagus*  
LeConte, 1876: 331
41. *maculiventris* Champion, 1910: 115 Costa Rica, Ecuador,  
*dentirostris* Hustache, 1936: 96; Vaurie, Nicaragua  
1966: 308
42. *marluciae* (Vannin) Brazil

- Cyrtomasius marluciae* Vannin, 1998: 117;  
Anderson, 2002: 44
43. *maurus* (Gyllenhal in Schoenherr) Dominica,  
*Sphenophorus maurus* Gyllenhal in Guadeloupe,  
Schoenherr, 1838: 912; Guenther, 1941: 53 Martinique  
*Sphenophorus fossor* Gyllenhal in  
Schoenherr, 1838: 909; Vaurie, 1966: 281
44. *melancholicus* (Gyllenhal in Schoenherr) Brazil, Mexico, Peru  
*Sphenophorus melancholicus* Gyllenhal in  
Schoenherr, 1838: 917; Champion, 1910:  
103  
*Sphenophorus polygrammus* Gyllenhal in  
Schoenherr, 1838: 917; Kuschel, 1958: 751  
*mesomelas* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
45. *metamasioides* (Guenther) Bolivia, Colombia  
*Cactophagus metamasioides* Guenther,  
1941: 35; Vaurie, 1966: 295  
*Cactophagus impressipectus* Voss, 1953:  
26; Kuschel 1955: 280; Vaurie, 1966: 295  
*monilis* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
46. *mosieri* Barber, 1920: 151 Cuba, Dominican  
Republic, United  
States of America
47. *nudiventris* Champion, 1910: 114 Costa Rica, Mexico,  
*scutatus* Champion, 1910: 114; Vaurie, Nicaragua, Panama  
1966: 271
48. *murdiei* Anderson, 2002: 65 Costa Rica  
*nigromaculatus* Voss, 1954: 331 see  
*dimidiatipennis* (Jekel)



- nigromaculatus* congener Voss, 1954: 331 see  
*dimidiatipennis* congener (Voss)
49. *notandus* (Olliff) Ecuador  
*Sphenophorus notandus* Olliff, 1891: 79;  
Vaurie, 1978: 5  
*ochreofasciatus* Champion, 1910: 113 see  
*fasciatus* (Olivier)
50. *octonotatus* Champion, 1910: 116 Colombia, Costa  
Rica, Panama, Peru  
*ohausi* (Guenther) transferred to *Cactophagus*  
LeConte, 1876: 331  
*orizabaensis* (Chevrolat) transferred to  
*Cactophagus* LeConte, 1876: 331  
*ornatus* (Champion) transferred to *Cactophagus*  
LeConte, 1876: 331  
*pallisteri* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331  
*personatus* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331
51. *peruanus* Hustache, 1936: 96 Bolivia, Peru
52. *planatus* Anderson, 2013: 396 Dominica  
*pruinus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
53. *puncticeps* Hustache, 1936: 97 Bolivia, Colombia,  
Ecuador  
*pulcherrimus* (Chevrolat) transferred to  
*Cactophagus* LeConte, 1876: 331
54. *pygidialis* Guenther, 1935c: 223 Costa Rica, Ecuador,  
*dasynemis* Guenther, 1936c: 192; Vaurie, Panama  
1966: 310

55. *quadrilineatus* Champion, 1910: 107 El Salvador,  
Guatemala, Mexico
56. *quadrisignatus* (Gyllenhal in Schoenherr) Dominica,  
*Sphenophorus quadrisignatus* Gyllenhal in Guadeloupe, Lesser  
Schoenherr, 1838: 907; Champion, 1910: Antilles, Martinique,  
107 Montserrat, Panama  
*Metamasius quadripilotus*<sup>11</sup> “Chevrolat”  
Csiki, 1936: 42; Vaurie, 1966: 277  
*Sphenophorus tetraspilosus* Chevrolat,  
1880a: 32; Vaurie, 1966: 277  
*Sphenophorus tetraspilotus*<sup>12</sup> Chevrolat,  
1880b: 315; Vaurie, 1966: 277
- 56a. *quadrisignatus* var. *bisignatus* Hustache, 1932: Guadeloupe  
130  
*rectistriatus* (Champion) transferred to  
*Cactophagus* LeConte, 1876: 331
57. *richdeboeri* Anderson, 2002: 67 Costa Rica, Panama
58. *rimoratus* (Gyllenhal in Schoenherr) Colombia, Ecuador  
*Sphenophorus rimoratus* Gyllenhal in  
Schoenherr, 1838: 893; Champion, 1910:  
107
59. *ritchiei* Marshall, 1916: 197 Cuba, Jamaica  
*rudeli* (Voss) transferred to *Cactophagus*  
LeConte, 1876: 331
60. *rugipectus* (Champion) Costa Rica, Mexico,  
*Metamasiopsis rugipectus* Champion, 1910: Panama  
101; Vaurie, 1966: 289

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<sup>11</sup> Error for *tetraspilosus* Chevrolat.

<sup>12</sup> Typographical error for *Sphenophorus tetraspilosus* Chevrolat, 1880a.

61. *sanguinipes* (Hustache) Brazil, Colombia,  
*Cactophagus sanguinipes* Hustache, 1936: Ecuador, French  
88; Vaurie, 1966: 293 Guiana, Peru  
*fractelineatus* Hustache, 1936: 100; Vaurie,  
1966: 293  
*sanguinolentus* (Olivier) transferred to  
*Cactophagus* LeConte, 1876: 331  
*scutatus* Champion, 1910: 114 see *nudiventris*  
Champion, 1910: 114
62. *scutellatus* Hustache, 1936: 101 Bolivia, Ecuador,  
*Cactophagus hustachei* Guenther, 1941: 31; French Guiana,  
Kuschel, 1955: 281 Nicaragua
63. *scutiger* Champion, 1910: 114 Panama
64. *sellatus* Champion, 1910: 108 British Honduras,  
Costa Rica,  
Guatemala, Mexico,  
Nicaragua, Panama
65. *shchepaneki* Anderson, 2002: 70 Costa Rica, Panama
66. *sierrakowskyi* (Gyllenhal in Schoenherr) Columbia, Costa  
*Sphenophorus sierrakowskyi* Gyllenhal in Rica, Nicaragua,  
Schoenherr, 1838: 887; Chevrolat, 1883: Panama  
580 (*Cactophagus*); Vaurie, 1966: 289  
*Cactophagus rufocinctus* Champion, 1910:  
86; Vaurie, 1966: 289  
*Cactophagus rufomaculatus* Champion,  
1910: 86; Vaurie, 1966: 289  
*Cactophagus cirratus* Champion, 1910: 87;  
Vaurie, 1966: 289
67. *signiventris* (Kirsch) Bolivia, Brazil,  
*Sphenophorus signiventris* Kirsch, 1889: 36; Colombia, Ecuador,  
Champion, 1910: 103

- French Guiana, Peru,  
Venezuela
- 67a.** *signiventris* sub sp *rubrum* Voss, 1954: 333; Ecuador, Peru  
Vaurie, 1966: 301  
*sinuatus* (Champion) transferred to *Cactophagus*  
LeConte, 1876: 331  
*spurius* (Vaurie) transferred to *Cactophagus*  
LeConte, 1876: 331  
*strigosus* (Erichson) transferred to *Cactophagus*  
LeConte, 1876: 331
- 68.** *submaculatus* Champion, 1910: 112 Colombia, Costa  
Rica,  
Ecuador, Nicaragua,  
Panama, Venezuela
- 69.** *sulcirostris* Champion, 1910: 110 Ecuador, Guatemala,  
Nicaragua, Panama
- 70.** *tectus* Vaurie, 1966: 304 Bolivia, Brazil,  
British Guiana,  
Colombia, Ecuador,  
French Guiana, Peru
- 71.** *tibialis* (Waterhouse) Colombia  
*Sphenophorus tibialis* Waterhouse, 1879c:  
426; Vaurie, 1966: 291  
*transatlanticus* (Kirsch) transferred to  
*Cactophagus* LeConte, 1876: 331
- 72.** *tuberculipectus* Hustache, 1936: 102 Bolivia, Brazil,  
*brevinasus* Hustache, 1936: 103; Vaurie, Colombia, Ecuador,  
1966: 317 French Guiana,  
*hoppi* Voss, 1954: 334; Vaurie, 1966: 317 Venezuela

*Subphyllerythrurus tuberculipectus* f. n.  
*consimilis* Voss, 1954: 334; Vaurie, 1966:  
 317

73. *vaurieae* Anderson, 2002: 73 Costa Rica
74. *vicarius* Vaurie, 1966: 317 Bolivia, Colombia,  
Ecuador
75. *vicinus* Hustache. 1936: 95 Bolivia, Peru  
*viduus* (Hustache) transferred to *Cactophagus*  
 LeConte, 1876: 331
76. *yunquensis* Vaurie, 1966: 261 Puerto Rico
77. *wolfensohni* Anderson, 2002: 75 Costa Rica, Panama

**XC. *Metaprodiocetes* Guenther**

*Metaprodiocetes* Guenther, 1937a: 281

Type specie: *Prodiocetes dux* Faust, 1894c: 337

1. *bellus* Guenther, 1937b: 183 India, Myanmar
2. *dux* (Faust) Myanmar  
*Prodiocetes dux* Faust, 1894c: 337; Guenther,  
 1937b: 182
3. *flavolineatus* (Chevrolat) Philippines  
*Meroplus flavolineatus* Chevrolat, 1885a: 99;  
 Faust, 1894c: 342 (*Prodiocetes*); Guenther,  
 1937b: 182
4. *formosanus* (Heller) Formosa  
*Prodiocetes formosanus* Heller, 1931: 110;  
 Guenther, 1937b: 182
5. *frunstroferi* (Faust) Indonesia  
*Prodiocetes frunstroferi* Faust, 1895b: 109;  
 Guenther, 1937b: 182
6. *haematicus* (Chevrolat) India, Sri Lanka

- Meroplus haematicus* Chevrolat, 1885a: 99;  
Faust, 1894c: 342 (*Prodiocetes*); Guenther,  
1937b: 182
- Prodiocetes singhalensis* Faust, 1895b: 106;  
Guenther, 1937b: 182
7. *lineanigra* (Chevrolat) Indonesia  
*Meroplus lineanigra* Chevrolat, 1885: 98; Borneo, Indonesia,  
Faust, 1894c: 342 (*Prodiocetes*); Guenther, Malaysia  
1937b: 182  
*Prodiocetes borneanus* Faust, 1895b: 108;  
Guenther, 1937b: 182
8. *nigrocinctus* (Chevrolat) Philippines  
*Meroplus nigrocinctus* Chevrolat, 1885a: 98;  
Faust, 1894c: 342 (*Prodiocetes*); Guenther,  
1937b: 182
9. *pavoninus* (Pascoe) Borneo, Indonesia,  
*Prodiocetes pavoninus* Pascoe, 1874: 67; Malaysia  
Guenther, 1937b: 182
10. *rubrovittatus* (Heller) Philippines  
*Prodiocetes rubrovittatus* Heller, 1915b: 234;  
Guenther, 1937b: 182
11. *sphenocorynoides* Guenther, 1937b: 183 India, Vietnam
12. *subscutellaris* Chevrolat, 1885a: 99 China, Vietnam  
*Meroplus subscutellaris* Chevrolat, 1885a:  
99; Faust, 1894c: 342 (*Prodiocetes*); Guenther,  
1937b: 182  
*Meroplus subscutellatus* Chevrolat, 1885a:  
96; Faust, 1894c: 342
13. *surigaonis* (Heller) Philippines  
*Prodiocetes surigaonis* Heller, 1924: 298;  
Guenther, 1937b: 182

- 13a.** *surigaonis* var. *nigripennis* (Heller) Philippines  
*Prodiectes surigaonis* var. *nigripennis* Heller,  
 1924: 298; Guenther, 1937b: 182
- 14.** *tenuigrisellus* Guenther, 1937b: 184 Borneo, Indonesia,  
 Malaysia
- 15.** *tristis* (Faust) India  
*Prodiectes tristis* Faust, 1894c: 337;  
 Guenther, 1937b: 182
- 16.** *unicolor* (Heller) Philippines  
*Prodiectes unicolor* Heller, 1924: 299;  
 Guenther, 1937b: 182

**XCI.** *Nassophasis* Waterhouse

*Nassophasis* Waterhouse, 1879a: 17; Haly, 1890: 157 (*Naessophasis*)  
 [NA=L]; Desbrochers, 1891: 360 (*Hilipomorphus*); Faust, 1894c: 338;  
 Alonso-Zarazaga and Lyal, 1999: 67

Type specie: *Nassophasis foveata* Waterhouse, 1879a: 18

- 1.** *aspericollis* Heller, 1941: 160 Cambodia
- 2.** *foveata* Waterhouse, 1879a: 18 India, Sri Lanka
- 3.** *gunturi* Heller, 1941: 159 Indonesia
- 4.** *morreni* (Roelofs) Sri Lanka  
*Sphenophorus morreni* Roelofs, 1885: 10;  
 Kuschel, 1955: 281  
*pictipes* Pascoe, 1887: 378; Kuschel, 1955:  
 281  
*pictipes* Pascoe, 1887: 378 see *morreni* (Roelofs)
- 5.** *quadripunctata* Heller, 1941: 160 Indonesia
- 6.** *subfasciata* Desbrochers, 1891: 12 Myanmar

**XCII.** *Neos* Marshall

*Neos* Marshall, 1943: 118 (RN for *Nea*); Heller, 1900: 42 (*Nea*) (non Billberg, 1828); *Neos* Marshall, 1943: 118

Type specie: *Nea princeps* Heller, 1900: 42

1. *princeps* Heller, 1900: 42 Indonesia

**XCIII. *Odoiporus* Chevrolat**

*Odoiporus* Chevrolat, 1885b: 288

Type specie: *Calandra longicollis* Olivier, 1807: 86

1. *longicollis* (Olivier) Bhutan, China,  
*Calandra longicollis* Olivier, 1807: 86; India, Indonesia,  
 Chevrolat, 1882a: 140 (*Rhynchophorus*); Japan, Malaysia,  
 Chevrolat, 1885b: 288 Myanmar, Nepal,  
*Sphenophorus glabridiscus* Walker, 1859: Pakistan,  
 218; Csiki, 1936: 65 Philippines,  
*Sphenoporus planipennis* Gyllenhal in Singapore, Sri  
 Schoenherr, 1838: 911; Chevrolat, 1885b: 288 Lanka, Taiwan,  
*Sphenophorus glabricollis* Gyllenhal in Thailand, Vietnam  
 Schoenherr, 1838: 913; Chevrolat, 1885b: 288  
*Rhynchophorus gages* Herbst, 1795: 17;  
 Csiki, 1936: 65  
*longicollis* var. *major* Heller, 1898: 33; Csiki,  
 1936: 65

**XCIV. *Oresciorrhinus* Voss**

*Oresciorrhinus* Voss, 1975: 9

Type specie: *Oresciorrhinus montivagans* Voss, 1975: 9

1. *montivagans* Voss, 1975: 9 Tanzania

**XCV. *Oryctorhinus* Scudder**



*Oryctorhinus* Scudder, 1893: 149; Handlirsch, 1925: 244  
(*Oryctorrhinus*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 67

Type specie: *Oryctorhinus tenuirostris* Scudder, 1893: 149

1. *tenuirostris* Scudder, 1893: 149 Fossil (Oligocene)

**XCVI. *Perissoderes* Waterhouse**

*Perissoderes* Waterhouse, 1879b: 362

Type specie: *Perissoderes ruficollis* Waterhouse, 1879b: 363

1. *collaris* Faust, 1894c: 328 Madagascar
2. *oblongus* Hustache, 1922: 416 Madagascar
3. *ruficollis* Waterhouse, 1879b: 363 Comoros,  
Madagascar

**XCVII. *Phacecorynes* Schoenherr**

*Phacecorynes* Schoenherr, 1845: 228; Agassiz, 1846: 123  
(*Phacecorynus*) [NA=L]; Alonso-Zarazaga and Lyal, 1999: 67

Type specie: *Calandra sommeri* Burmeister, 1837: 19

1. *sommeri* (Burmeister) Kapland (South  
*Calandra sommeri* Burmeister, 1837: 19; Africa)  
Boheman in Schoenherr, 1845: 229
2. *variegatus* (Fabricius) Mauritius, South  
*Curculio variegatus* Fabricius, 1781: 163; Africa  
Fabricius, 1801a: 434 (*Clandra*); Herbst,  
1795: 22 (*Rhynchophorus*); Chevrolat, 1883:  
575  
*Curculio varius* Fabricius, 1790: 223;  
Chevrolat, 1883: 575  
*Sphenophorus zamiae* Gyllenhal in  
Schoenherr, 1838: 963; Lacordaire, 1866: 290

**XCVIII. *Platyopisthen* Roelofs**

*Platyopisthen* Roelofs, 1892c: 134; Csiki, 1936: 28 (*Plagiopisthen*) (non Thomson, 1856) [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 67

Type specie: *Oxyopisthen suturale* Roelofs, 1891c: 170

1. *albopectorale* Roelofs, 1893d: 242 Gabon

2. *suturale* (Roelofs) Gabon

*Oxyopisthen suturale* Roelofs, 1891c: 170;

Roelofs, 1892c: 134

*Stenophida trilineatum* Aurivilius, 1891: 370;

Roelofs, 1892d: 136

**XCIX. *Pleurothorax* Chevrolat**

*Pleurothorax* Chevrolat, 1883: 566

Type specie: *Cercidocerus eximius* Guerin-Meneville 1844: 180

1. *carinensis* Faust, 1895b: 113 Myanmar

*Prodiocetes carinensis* Faust, 1895b: 113;

Guenther, 1937b: 183

2. *dehaani* (Gyllenhal in Schoenherr) Borneo, Indonesia,

*Sphenophorus dehaani* Gyllenhal in Malaysia, Myanmar

Schoenherr, 1838: 880; Pascoe, 1874: 67

(*Prodiocetes*); Faust, 1893a: 151 (*Anapygus*);

Guenther, 1937b: 183

3. *eximius* (Guerin-Meneville) Indonesia,

*Cercidocerus eximius* Guerin-Meneville Myanmar

1844: 180;

Chevrolat, 1883: 567; Kraatz, 1893: 320

(*Cercidocerus*); Faust, 1894c: 335

(*Anapygus*); Guenther, 1937b: 183

4. *fallax* (Faust) Malaysia  
*Prodiocetes fallax* Faust, 1895b: 113;  
 Guenther, 1937b: 183  
*Prodiocetes gemellus* Faust, 1895b: 113;  
 Guenther, 1937b: 183
5. *geminus* (Faust) Indonesia  
*Prodiocetes geminus* Faust, 1895b: 112;  
 Guenther, 1937b: 183
6. *heydeni* (Faust) Papua New Guinea  
*Prodiocetes heydeni* Faust, 1895b: 114;  
 Guenther, 1937b: 183
7. *kirschi* (Faust) Indonesia  
*Prodiocetes kirschi* Faust, 1895b: 110;  
 Guenther, 1937b: 183
8. *pagdeni* Guenther, 1937b: 182 Cameroon\*
9. *trisignatus* (Kirsch) Malaysia  
*Megaproctus trisignatus* Kirsch, 1875b: 44;  
 Guenther, 1937b: 183  
*Prodiocetes interjectus* Faust, 1895b: 114;  
 Guenther, 1937b: 183

C. *Poteriophorus* Schoenherr

*Poteriophorus* Schoenherr, 1838: 845; White, 1848: 107  
 (*Hyposarothra*); Chevrolat, 1883: 576 (*Eugithopus*); Faust, 1896: 162;  
 Csiki, 1936: 35

Type specie: *Poteriophorus niveus* Gyllenhal in Schoenherr, 1838: 846

1. *andamanensis* Roelofs, 1893e: 247 India: Andaman
2. *angulicollis* Heller, 1915: 525 Papua New Guinea
3. *bilineatus* Heller, 1934: 303 Philippines
4. *bowringi* Waterhouse, 1886a: 499 Indonesia

5. *congestus* Pascoe, 1874: 70 Malaysia
6. *elegans* Roelofs, 1891b: 145 Philippines
7. *fuscovarius* Waterhouse, 1886a: 499 Borneo, Indonesia,  
Malaysia
8. *imperatrix* (White) Philippines  
*Hyposarothra imperatrix* White, 1848: 108;  
Chevrolat, 1883: 576
9. *isabellinus* Faust, 1896: 160 Indonesia  
*lugubris* Faust, 1896: 160 see *vittatus* Bohemann  
in Schenherr, 1845: 227
10. *monilifasciatus* (Chevrolat) Bangladesh  
*Eugithopus monilifasciatus* Chevrolat, 1883:  
577; Faust, 1896: 162
11. *nesaeus* Guenther, 1935c: 214 Indonesia
12. *niveus* Gyllenhal in Schoenherr, 1838: 846 Indonesia
13. *nobilis* Roelofs, 1892a: 7 Borneo, Indonesia,  
Malaysia
14. *ochreatus* Eydoux, 1839: 266 Philippines
- 14a. *ochreatus* var. *albiventris* (Chevrolat) Philippines  
*Eugithopus ochreatus* var. *albiventris*  
Chevrolat, 1883: 576; Faust, 1896: 162
15. *opacus* Guenther, 1936: 193 Indonesia
- 15a. *opacus javanicus* Guenther, 1937c:: 329 Indonesia
16. *ornatus* Roelofs, 1893a: 29 Philippines
17. *plagiatus* Roelofs, 1893a: 30 Philippines
18. *sellatus* Roelofs, 1890: 239 Malaysia
19. *stellatus* Heller, 1908: 188 Borneo, Indonesia,  
Malaysia
20. *uhlemanni* Schultze, 1922: 591 Philippines
21. *vandepolli* Roelofs, 1890: 238 Indonesia
22. *vittatus* Bohemann in Schoenherr, 1845: 227 Indonesia

*lugubris* Faust, 1896: 160; Csiki, 1936: 35

**CI. *Procosmopolites* Hustache**

*Procosmopolites* Hustache, 1922: 415

Type specie: *Sphenophorus picirostris* Fairmaire, 1897: 195

1. *picirostris* (Fairmaire) Madagascar  
*Sphenophorus picirostris* Fairmaire, 1897:  
 195; Hustache, 1922b: 415

**CII. *Prodioctes* Pascoe**

*Prodioctes* Pascoe, 1874: 66

Type specie: *Prodioctes quinarius* Pascoe, 1874: 67; SD: Voss, 1958: 120

1. *amoenus* Pascoe, 1885: 300 Borneo
2. *borneanus* Faust, 1895b: 108 Borneo  
*carinensis* Faust, 1895b: 113 transferred to  
*Pleurothorax* Chevrolat, 1883: 566  
*dehaani* (Gyllenhal in Schoenherr) transferred to  
*Pleurothorax* Chevrolat, 1883: 566  
*dux* Faust, 1894c: 337 transferred to  
*Metaprodioctes* Guenther, 1937a: 281  
*fallax* Faust, 1895b: 113 transferred to  
*Pleurothorax* Chevrolat, 1883: 566  
*flavolineatus* Chevrolat, 1885a: 99 transferred to  
*Metaprodioctes* Guenther, 1937a: 281  
*formosansis* Heller, 1931: 110 transferred to  
*Metaprodioctes* Guenther, 1937a: 281  
*frunstroferi* Faust, 1895b: 109 transferred to  
*Metaprodioctes* Guenther, 1937a: 281

- geminus* Faust, 1895b: 112 transferred to  
*Pleurothorax* Chevrolat, 1883: 566
3. *geniculatus* Chevrolat, 1885a: 98 Indonesia
- 3a. *geniculatus* var. *austerus* Faust, 1895b: 105 Indonesia  
*haematicus* Chevrolat, 1885a: 99 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281  
*heydeni* Faust, 1895b: 114 transferred to  
*Pleurothorax* Chevrolat, 1883: 566  
*kirschi* Faust, 1895b: 110 transferred to  
*Pleurothorax* Chevrolat, 1883: 566  
*lineanigra* Chevrolat, 1885: 98 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281  
*nigrocinctus* Chevrolat, 1885:98 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281  
*octopustulatus* Faust, 1895b: 107 transferred to  
*Sphenocorynes* Schoenherr, 1938: 866  
*pavoninus* Pascoe, 1874: 67 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281
4. *quinarius* Pascoe, 1874: 67 Borneo
5. *quinquepustulatus* Faust, 1895: 109 Indonesia
6. *rubricosus* Faust, 1894c: 335 Myanmar  
*rubrovittatus* Heller, 1915b: 234 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281
7. *singhalensis* Faust, 1895b: 106 Sri Lanka  
*subscutellaris* Chevrolat, 1885a: 99 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281  
*surigaonis* Heller, 1924: 298 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281  
*tristis* Faust, 1894c: 337 transferred to  
*Metaprodiocetes* Guenther, 1937a: 281

*unicolor* Heller, 1924: 299 *Metaprodiocetes*  
Guenther, 1937a: 281

a) ***Prodiocetes (Paraprodiocetes)*** Voss

*Prodiocetes (Paraprodiocetes)* Voss, 1958: 121

Type specie: *Prodiocetes chinensis* Voss, 1958: 120

1. *chinensis* Voss, 1958: 120 China

**CIII. *Pseudacanthorrhinus*** Heller

*Pseudacanthorrhinus* Heller, 1924: 303

Type specie: *Pseudacanthorrhinus bipodex* Heller, 1924: 304

1. *bipodex* Heller, 1924: 304 Philippines

**CIV. *Rhabdoscelus*** Marshall

*Rhabdoscelus* Marshall, 1943: 119 (RN for *Rhabdocnemis*); Faust,  
1893a: 150 (*Rhabdocnemis*) (non Pomel, 1872); Marshall, 1943: 119;  
Zimmerman, 1993: 82; Alonzo-Zarazaga and Lyal, 1999: 68

Type specie: *Sphenophorus maculatus* (Gyllenhal in Schoenherr); SD: Faust,  
1894c: 348

1. *eucnemis* (Heller) Indonesia  
*Rhabdocnemis eucnemis* Heller, 1898: 33;  
Marshall, 1943: 119
2. *fausti* (Gahan) Christmas Island  
*Rhabdocnemis fausti* Gahan, 1900: 13;  
Marshall, 1943: 119
3. *interstitialis* (Boheman) Australia, Papua  
*Calandra interstitialis* Boheman, 1859: 148; New Guinea  
Zimmerman, 1993: 82

4. *lineatocollis* (Heller) Philippines  
*Rhabdocnemis lineatocollis* Heller, 1912b:  
 395; Marshall, 1943: 119
5. *maculatus* (Gyllenhal in Schoenherr) Indonesia, Sri Lanka  
*Sphenophorus maculatus* Gyllenhal in  
 Schoenherr, 1838: 881; Faust, 1894c: 348  
 (*Rhabdocnemis*); Marshall, 1943: 119
6. *obscurus* (Boisduval) Indonesia, Papua New Guinea, Samoa, United States of America  
*Calandra obscurus* Boisduval, 1835: 448; Fairmaire, 1849: 474; Faust, 1894c: 348  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus beccarii* Pascoe, 1885: 301; Faust, 1893a: 150  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus insularis* Boheman, 1859: 148; Csiki, 1936: 66; Faust, 1894c: 348  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus nudicollis* Kirsch, 1877: 156; Faust, 1893a: 150 Faust, 1894c: 348  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus promissa* Pascoe, 1885: 300; Faust, 1893a: 150; Faust, 1893a: 150  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus interruptecostatus* Schauffus, 1885: 204; Faust, 1894c: 348  
 (*Rhabdocnemis*); Marshall, 1943: 119  
*Sphenophorus tincturatus* Pascoe, 1885: 301; Faust, 1894c: 348 (*Rhabdocnemis*); Marshall, 1943: 119
7. *pygidialis* (Faust) Myanmar  
*Rhabdocnemis pygidialis* Faust, 1894c: 348; Marshall, 1943: 119



8. *similis* (Chevrolat) Philippines  
*Cercidocerus similis* Chevrolat, 1883: 573;  
 unknown<sup>13</sup>
9. *stillata* (Heller) Borneo, Indonesia,  
*Rhabdocnemis stillata* Heller, 1908: 193; Malaysia  
 Marshall, 1943: 119
10. *tricolor* (Heller) Papua New Guinea  
*Rhabdocnemis tricolor* Heller, 1915c: 527;  
 Marshall, 1943: 119
- CV. *Rhinocles* Dohrn**  
*Rhinocles* Dohrn, 1875: 86  
 Type specie: *Rhinocles nasica* Dohrn, 1875: 88
1. *modestus* Heller, 1904: 199 Cameroon  
 2. *nasica* Dohrn, 1875: 88 Liberia
- CVI. *Rhinogrypus* Roelofs**  
*Rhinogrypus* Roelofs, 1893a: 32; Sharp, 1894: 169 (*Rhinogryphus*) (non  
 Baird and Brewer, 1874) [NA=L]; Csiki, 1936: 35 (*Rhynogryphus*)  
 [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 68  
 Type specie: *Rhinogrypus velutinus* Roelofs, 1893b: 33
1. *velutinus* Roelofs, 1893b: 33 Philippines
- CVII. *Rhodobaenus* LeConte**  
*Rhodobaenus* LeConte, 1876: 332; Chevrolat, 1885b: 287  
 (*Homalostylus*); Vaurie, 1967a: 179  
 Type specie: *Curculio tredecimpunctatus* (Illiger); SD: Vaurie, 1967b: 13

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<sup>13</sup> The details of author regarding the change of name is not available

1. *aduncus* (Erichson) Brazil, Bolivia,  
*Sphenophorus aduncus* Erichson, 1847: 137; Peru  
Vaurie, 1980: 18  
*Homalostylus geniculatus* Hustache, 1936: 93;  
Kuschel<sup>14</sup>, 1950: 20  
*Homalostylus ruficollis* Hustache, 1938: 233;  
Vaurie, 1980: 18
2. *adpersus* (Gyllenhal in Schoenherr) Guatemala,  
*Sphenophorus adpersus* Gyllenhal in Mexico  
Schoenherr, 1838: 924; Chevrolat, 1885b: 283
- 2a. *adpersus* var. *impressus* Chevrolat, 1885b: 283 Mexico
3. *albopunctatus* Champion, 1910: 138 Mexico  
*alboscuteatus* Chevrolat, 1885b: 284 see  
*pustulosus* (Gyllenhal in Schoenherr)
4. *andreae* Chevrolat, 1885b: 279 Mexico
5. *apicalis* Hustache, 1936: 109 Ecuador, Paraguay
6. *arcuatus* Champion, 1910: 134 Mexico, Nicaragua
7. *aterrimus* (Champion) Mexico  
*Sphenophorus aterrimus* Champion, 1910:  
156; Vaurie, 1978: 5; Vaurie, 1981: 182
8. *auctus* Chevrolat, 1885b: 278 British Honduras,  
*elegans* Chevrolat, 1885b: 278; Vaurie, 1981: Colombia, Costa  
175 Rica, El Salvador,  
*corniculatus* Chevrolat, 1885b: 280; Vaurie, Guatemala,  
1981: 175 Honduras, Mexico,  
*tredecimpunctatus* var. *graphicus* Champion, Nicaragua, Panama  
1910: 150; Vaurie, 1981: 175
9. *augustinus* Guenther, 1941: 48 Colombia

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<sup>14</sup> Kuschel synonymized it to *Sphenophorus aduncus* (Erichson)

10. *auriculatus* (Chevrolat) Costa Rica,  
*Cactophagus auriculatus* Chevrolat, 1883: Guatemala,  
580; Champion, 1910: 127 Mexico,  
Nicaragua,  
Veracruz
11. *bellus* Vaurie, 1981: 159 Costa Rica,  
Panama
12. *bicinctus* Chevrolat, 1885b: 282 Brazil, Columbia,  
Costa Rica, French  
Guiana,  
Guatemala,  
Trinidad, Uruguay,  
Venezuela
- bipunctatus* Chevrolat, 1885b: 282 see *suturalis*  
(Gyllenhal in Schoenherr)
13. *bisignatus* Champion, 1910: 143 Costa Rica,  
Guatemala,  
Mexico
14. *biundulatus* Champion, 1910: 128 Mexico
15. *bivittatus* Vaurie, 1980: 19 Bolivia, Peru  
*boliviensis* Hustache, 1936: 107 see *melanurus*  
(Kirsch)
16. *brevirostris* Champion, 1910: 133 Guatemala,  
*veraepacis* Champion, 1910: 133; Kuschel, Mexico  
1955: 281
17. *buchanani* Vaurie, 1981: 143 Mexico
18. *cariniventris* Champion, 1910: 144 Guatemala,  
Mexico
- centromaculatus* Chevrolat, 1885b: 276 see  
*maculifer* (Fahraeus)

19. *cinctus* (Gyllenhal in Schoenherr) Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama  
*Sphenophorus cinctus* Gyllenhal in Schoenherr, 1838: 921; Champion, 1910: 141  
*Sphenophorus cinctus* var. *rubellus* Gyllenhal in Schoenherr, 1838: 921; Champion, 1910: 141  
*obliquus* Chevrolat, 1885b: 287; Champion, 1910: 141  
*funerarius* Chevrolat, 1885b: 287; Champion, 1910: 141  
*maculipes* Champion, 1910: 147; Vaurie, 1981: 168
20. *cinereiventris* Champion, 1910: 138 El Salvador, Guatemala, Mexico
21. *confusus* Chevrolat, 1885b: 285 Mexico  
*cordifer* Voss, 1954: 336 see *schnusei* Guenther, 1941: 49  
*corniculatus* Chevrolat, 1885b: 280 see *auctus* Chevrolat, 1885b: 278  
*crucicollis* Chevrolat, 1885b: 281 see *suturalis* (Gyllenhal in Schoenherr)  
*crassipes* Champion, 1910: 131 see *melanocardius* (Linnaeus)
22. *cuneatus* Champion, 1910: 124 Costa Rica, Nicaragua, Panama  
*stigmaticus* var. *cuneatus* Champion, 1910: 124; Vaurie, 1967b: 19
23. *curvus* Vaurie, 1980: 29 Colombia
24. *cylindricollis* Champion, 1910: 132 Mexico
25. *deliciosus* (Champion) Colombia

- Sphenophorus deliciosus* Champion, 1910:  
145; Vaurie, 1980: 17
- 26.** *deltoides* Chevrolat, 1885b: 279 British Honduras,  
Costa Rica, El  
Salvador,  
Guatemala,  
Honduras, Mexico,  
Nicaragua, Panama
- dentifer* Champion, 1910: 126 see *incertus*  
(Champion)
- dentirostris* Hustache, 1936: 96 see *maculiventris*  
Champion, 1910: 115
- 27.** *dentirostris* (Champion) Costa Rica,  
*Homalostylus dentirostris* Champion, 1910: Ecuador, Mexico  
118; Vaurie, 1967a: 179
- elegans* Chevrolat, 1885b: 278 see *auctus*  
Chevrolat, 1885b: 278
- femoralis* Chevrolat, 1885b: 277 see *lebasii*  
(Gyllenhal in Schoenherr)
- 28.** *fortirostris* Champion, 1910: 127 Guatemala,  
Mexico
- funerarius* Chevrolat, 1885b: 287 see *cinctus*  
(Gyllenhal in Schoenherr)
- 29.** *guttatus* (Fahraeus in Schoenherr) Mexico  
*Sphenophorus guttatus* Fahraeus in Schoenherr,  
1845: 247; Champion, 1910: 140  
*unidentatus* Champion, 1910: 139; Vaurie,  
1981: 140
- haematidus* Chevrolat, 1885b: 278 see *sanguineus*  
(Gyllenhal in Schoenherr)
- 30.** *howelli* Anderson, 2002: 85 Costa Rica

- implicatus* Chevrolat (non Gyllenhal), 1885: 279  
see *suturalis* (Gyllenhal in Schoenherr)
31. *incertus* (Champion) Costa Rica,  
*Homalostylus incertus* Champion, 1910: 118; Guatemala,  
Vaurie, 1967a: 179 Mexico  
*dentifer* Champion, 1910: 126; Vaurie, 1981:  
148
32. *inopinatus* Vaurie, 1981: 151 Mexico
33. *interruptus* Champion, 1910: 125 Costa Rica,  
*tesselatus* Champion, 1910: 125; Vaurie, Guatemala,  
1967b: 26 Mexico, Panama
34. *labrecheae* Anderson, 2002: 87 Costa Rica  
*laetus* (Erichson) transferred to *Cactophagus*  
LeConte, 1876: 331
35. *latens* Vaurie, 1981: 145 Guatemala,  
Mexico
36. *laticapus* (Kirsch) Bolivia, Colombia,  
*Sphenophorus laticapus* Kirsch, 1869: 221; Ecuador  
Chevrolat, 1885b: 287 (*Homalostylus*);  
Vaurie, 1967a: 179
37. *lebasii* (Gyllenhal in Schoenherr) Brazil, British  
*Sphenophorus lebasii* Gyllenhal in Honduras,  
Schoenherr, 1838: 901; Chevrolat, 1885b: Columbia, Costa  
277; Vaurie, 1980: 37 Rica, El Salvador,  
*Sphenophorus variabilis* Gyllenhal in Guatemala,  
Schoenherr, 1838: 901; Gyllenhal in Honduras,  
Schoenherr, 1845: 239; Vaurie, 1980: 37 Nicaragua,  
*Sphenophorus implicatus* Gyllenhal in Panama, Trinidad,  
Schoenherr, 1838: 901; Gyllenhal in Venezuela  
Schoenherr, 1845: 239; Vaurie, 1980: 37

- femoralis* Chevrolat, 1885b: 277; Vaurie, 1980: 37
- tredecimpunctatus* var. *vittatipennis* Champion, 1910: 150; Vaurie, 1980: 37
- tredecimpunctatus* var. *immaculatus* Champion, 1910: 151; Vaurie, 1980: 37
- 38.** *leucographus* (Fahraeus in Schoenherr) Mexico  
*Sphenophorus leucographus* Fahraeus in Schoenherr, 1845: 247; Champion, 1910: 141
- 39.** *lineiger* Chevrolat, 1885b: 282 Bolivia, Colombia, Ecuador, Panama, Peru
- 40.** *longicollis* Hustache, 1936: 108 Colombia, Ecuador, Paraguay
- 41.** *maculifer* (Fahraeus in Schoenherr) France, Guatemala, Mexico  
*Sphenophorus maculifer* Fahraeus in Schoenherr, 1845: 243; Champion, 1910: 129  
*centromaculatus* Chevrolat, 1885b: 276; Champion, 1910: 129  
*maculipes* Champion, 1910: 147 see *cinctus* (Gyllenhal in Schoenherr)
- 42.** *maior* Voss, 1954: 336 Ecuador  
*Rhodoaenus v-nigrum* f. n. *maior* Voss, 1954: 336; Vaurie, 1967b: 24
- 43.** *mas* Vaurie, 1981: 144 Mexico
- 44.** *melanocardius* (Linnaeus) Colombia, Costa Rica, Ecuador, French Guiana, Panama, Peru  
*Curculio melanocardius* Linnaeus, 1764: 45; Guenther, 1941: 51  
*crassipes* Champion, 1910: 131; Kuschel, 1955: 281

45. *melanurus* (Kirsch) Bolivia, Ecuador,  
*Sphenophorus melanurus* Kirsch, 1875a: 278; Peru  
 Csiki, 1936: 45  
*boliviensis* Hustache, 1936: 107; Guenther,  
 1941: 48  
*v-nigrum* f. *intermedia* Voss, 1954: 336
46. *melas* Vaurie, 1981: 161 Costa Rica, Mexico  
*mesomelas* (Champion) transferred to *Cactophagus*  
 LeConte, 1876: 331  
*miniatus* Chevrolat, 1885b: 281 see *suturalis*  
 (Gyllenhal in Schoenherr)
47. *mundus* (Champion) Mexico  
*Sphenophorus mundus* Champion, 1910: 156;  
 Vaurie, 1978: 5; Vaurie, 1981: 182
48. *nawradii* (Kirsch) Columbia, Costa  
*Sphenophorus nawradii* Kirsch, 1869: 233; Rica, Ecuador  
 Chevrolat, 1883: 579 (*Cactophagus*);  
 Champion, 1910: 123
49. *nebulosus* Champion, 1910: 135 Costa Rica,  
 Mexico, Panama,  
 Fiji Ins.
50. *nigripennis* Champion, 1910: 151 Guatemala,  
*tredecimpunctatus* var. *nigripennis* Champion, Mexico  
 1910: 151; Vaurie, 1981: 179
51. *nigripes* Hustache, 1936: 108 Bolivia, Peru  
*nigricornis* Chevrolat, 1885b: 281 see *suturalis*  
 (Gyllenhal in Schoenherr)
52. *nigrofasciatus* (Champion) Colombia, Costa  
*Homalostylus nigrofasciatus* Champion, 1910: Rica, Panama  
 117; Vaurie, 1967a: 179



53. *nigrolineatus* Chevrolat, 1885b: 285 Guatemala,  
*suturellus* Chevrolat, 1885b: 285; Champion, Mexico  
 1910: 140
54. *nigropictus* Champion, 1910: 146 Panama
55. *nigrosignatus* Champion, 1910: 132 Costa Rica, El  
 Salvador,  
 Guatemala,  
 Honduras, Mexico,  
 Nicaragua, Panama
56. *nivosus* Vaurie, 1980: 32 Venezuela  
*obliquus* Chevrolat, 1885b: 287 see *cinctus*  
 (Gyllenhal in Schoenherr)
57. *octocostatus* (Champion) Mexico  
*Sphenophorus octocostatus* Champion, 1910:  
 157; Vaurie, 1978: 5; Vaurie, 1981: 182
58. *olivaceus* Champion, 1910: 122 Costa Rica,  
 Honduras, Panama
59. *pantherinus* Champion, 1910: 147 Costa Rica,  
 Guatemala,  
 Mexico
60. *patriciae* Anderson, 2002: 89 Costa Rica
61. *pinguis* Chevrolat, 1885b: 283 Mexico
62. *plicatus* Champion, 1910: 122 Costa Rica
63. *pulchellus* (Gyllenhal in Schoenherr) Costa Rica,  
*Sphenophorus pulchellus* Gyllenhal in Guatemala,  
 Schoenherr, 1838: 898; Champion, 1910: 148 Mexico, Panama  
*tredecimpunctatus* var. *duodecimmaculatus*  
 Chevrolat, 1885b: 276; Champion, 1910: 148  
*tredecimpunctatus* var. *metropolitanus*  
 Chevrolat, 1885b: 277; Champion, 1910: 148

- pulchellus* var. *niger* Champion, 1910: 148;  
Vaurie, 1981: 170
- pulchellus* var. *niger* Champion, 1910: 148 see  
*pulchellus* (Gyllenhal in Schoenherr)
64. *pullus* Vaurie, 1980: 31 Ecuador
65. *pustulosus* (Gyllenhal in Schoenherr) United States Of  
*Sphenophorus pustulosus* Gyllenhal in America  
Schoenherr, 1885: 247; Champion, 1910: 137  
*Sphenophorus punctatus* Gyllenhal in  
Schoenherr, 1838: 923; Champion, 1910: 137  
*pustulosus* var. *puncticollis* Chevrolat, 1885b:  
283; Champion, 1910: 137  
*alboscuteatus* Chevrolat, 1885b: 284;  
Champion, 1910: 137  
*pustulosus* var. *puncticollis* Chevrolat, 1885b: 283  
see *pustulosus* (Gyllenhal in Schoenherr)
66. *quadrus* Vaurie, 1980: 23 Ecuador, Peru  
*quinquemaculatus* Chevrolat, 1885b: 285 see  
*suturalis* (Gyllenhal in Schoenherr)
67. *quinquepunctatus* (Say) Canada, Mexico,  
*Calanadra quinquepunctatus* Say, 1824: 9; United States Of  
Vaurie, 1981: 172 America  
*tredecimpunctatus* var. *triangularis*  
Champion, 1910: 150; Vaurie, 1981: 144
68. *quintus* Vaurie, 1981: 144 Mexico
69. *quadripunctatus* (Chevrolat) Columbia,  
*Cactophagus quadripunctatus* Chevrolat, Ecuador, Panama  
1883: 581; Champion, 1910: 131
70. *rhinopilus* Vaurie, 1980: 36 Costa Rica,  
Ecuador, Paraguay

71. *riparius* Vaurie, 1980: 35 Colombia,  
Ecuador, Peru
72. *rubicundus* Champion, 1910: 142 Costa Rica,  
Panama
73. *rufirostris* (Hustache) Bolivia, Brazil,  
*Homalostylus rufirostris* Hustache, 1936: 92; Ecuador, Peru  
Vaurie, 1967a: 179  
*Homalostylus goyaensis* Hustache, 1936: 93;  
Vaurie, 1980: 18
74. *rufus* (Hustache) Bolivia, Peru  
*Homalostylus rufus* Hustache, 1938: 233;  
Vaurie, 1967a: 179
75. *rubrovittatus* Champion, 1910: 142 Guatemala,  
Mexico
76. *saginitus* Champion, 1910: 125 Guatemala
77. *sanguineus* (Gyllenhal in Schoenherr) Costa Rica,  
*Sphenophorus sanguineus* Gyllenhal in Guatemala,  
Schoenherr, 1845: 240; Champion, 1910: 142 Mexico, Nicaragua  
*Sphenophorus sanguineus* var. *lineatocollis*  
Gyllenhal in Schoenherr, 1845: 240;  
Champion, 1910: 142  
*haematidus* Chevrolat, 1885b: 278; Champion,  
1910: 142
78. *schnusei* Guenther, 1941: 49 Bolivia, Peru  
*cordifer* Voss, 1954: 336; Vaurie, 1980: 27
79. *sexguttatus* Champion, 1910: 130 Mexico
80. *stigmaticus* (Fahraeus in Schoenherr) Costa Rica,  
*Sphenophorus stigmaticus* Fahraeus in Guatemala,  
Schoenherr, 1845: 244; Champion, 1910: 123 Honduras, Mexico,  
Nicaragua, Panama

- stigmaticus* var. *cuneatus* Champion, 1910: 124 see  
*cuneatus* Champion, 1910: 124
81. *subcristatus* Champion, 1910: 124 Costa Rica,  
Nicaragua
82. *subcylindricus* (Champion) El Salvador,  
*Homalostylus subcylindricus* Champion, Guatemala  
1910: 119; Vaurie, 1967a: 179
83. *suturalis* (Gyllenhal in Schoenherr) Argentina, Brazil,  
*Sphenophorus suturalis* Gyllenhal in Costa Rica,  
Schoenherr, 1838: 904; Chevrolat, 1885b: 281 Guatemala,  
*Sphenophorus saucius* Gyllenhal in Mexico, Paraguay,  
Schoenherr, 1838: 905; Vaurie, 1980: 33 Venezuela  
*implicatus* Chevrolat (non Gyllenhal), 1885:  
279; Vaurie, 1980: 33  
*crucicollis* Chevrolat, 1885b: 281; Vaurie,  
1980: 33  
*miniatus* Chevrolat, 1885b: 281; Vaurie, 1980:  
33  
*nigricornis* Chevrolat, 1885b: 281; Vaurie,  
1980: 33  
*bipunctatus* Chevrolat, 1885b: 282; Vaurie,  
1980: 33  
*quinquemaculatus* Chevrolat, 1885b: 285;  
Vaurie, 1980: 33  
*suturellus* Chevrolat, 1885b: 285 see *nigrolineatus*  
Chevrolat, 1885b: 285
84. *tenorio* Anderson, 2002: 91 Costa Rica
85. *tenuiscapus* Champion, 1910: 128 Costa Rica  
*tesselatus* Champion, 1910: 125 see *interruptus*  
Champion, 1910: 125

86. *thoracicus* (Gyllenhal in Schoenherr) Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama
- Sphenophorus variabilis* var. *thoracicus* Gyllenhal in Schoenherr, 1838: 900
87. *tredecimpunctatus* (Illiger in Schneider) Columbia, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, United States of America
- Curculio tredecimpunctatus* Illiger in Schneider, 1794: 613; Herbst, 1795: 10 (*Rhynchophorus*); Fabricius, 1801a: 434 (*Clandra*); Schoenherr, 1838: 898 (*Sphenophorus*); Chevrolat, 1885b: 275
- Curculio cribrarius* Fabricius, 1798: 165; Fabricius, 1801a: 434 (*Calandra*); Gyllenhal in Schoenherr, 1838: 900
- Curculio quatuordecimpunctatus* Panzer, 1798: 54; Gyllenhal in Schoenherr, 1838: 900
- Curculio leptocerus* Panzer, 1798: 57; Gyllenhal in Schoenherr, 1838: 900
- tredecimpunctatus* var. *duodecimmaculatus* Chevrolat, 1885b: 276 see *pulchellus* (Gyllenhal in Schoenherr)
- tredecimpunctatus* var. *graphicus* Champion, 1910 see *auctus* Chevrolat, 1885b: 278
- tredecimpunctatus* var. *immaculatus* Champion, 1910: 151 see *lebasii* (Gyllenhal in Schoenherr)
- tredecimpunctatus* var. *metropolitanus* Chevrolat, 1885b: 277 see *pulchellus* (Gyllenhal in Schoenherr)
- tredecimpunctatus* var. *nigripennis* Champion, 1910: 151 see *nigripennis* Champion, 1910: 151

*tredecimpunctatus* var. *triangularis* Champion,

1910: 150 see *quinquepunctatus* (Say)

*tredecimpunctatus* var. *vittatipennis* Champion,

1910: 150 see *lebasii* (Gyllenhal in Schoenherr)

88. *tornowii* (Brethes) Argentina, Bolivia

*Sphenophorus tornowii* Brethes, 1910: 226;

Kuschel, 1950: 20 (*Homalostylus*); Vaurie,

1967a: 179

*unidentatus* Champion, 1910: 139 see *guttatus*

(Fahraeus in Schoenherr)

89. *valens* Champion, 1910: 136 Mexico

90. *varieguttatus* Chevrolat, 1885b: 284 Costa Rica,

Guatemala,

Mexico

*veraepacis* Champion, 1910: 133 see *brevirostris*

Champion, 1919: 133

91. *v-nigrum* Champion, 1910: 131 Nicaragua

92. *ypsilon* Chevrolat, 1885b: 280 Costa Rica, El

Salvador,

Guatemala,

Honduras, Mexico,

Nicaragua, Panama

**CVIII. *Schlaginhaufenia* Heller**

*Schlaginhaufenia* Heller, 1910: 37

Type specie: *Schlaginhaufenia valida* Heller, 1910: 37

1. *valida* Heller, 1910: 37 Papua New Guinea

**CIX. *Sciabregma* Scudder**

*Sciabregma* Scudder, 1893: 146

Type specie: *Sciabregma rugosum* Scudder, 1893: 146

1. *rugosum* Scudder, 1893: 146 Fossil (Eocene)  
USA

**CX.** *Scoliopisthen* Hartmann

*Scoliopisthen* Hartmann, 1900: 121; Hustache, 1928: 445  
(*Oxyrhynchoides*); Marshall, 1952b: 269 (*Oxyrrhynchoides*) [NA=L];  
Alonso-Zarazaga and Lyal, 1999: 68

Type specie: *Scoliopisthen sordidum* Hartmann, 1900: 122

1. *sordidum* Hartmann, 1900: 122 Cameroon, Congo  
*Oxyrhynchoides ellenbergeri* Hustache, 1928:  
445; Marshall, 1952b: 269

**CXI.** *Scyphophorus* Schoenherr

*Scyphophorus* Schoenherr, 1838: 855

Type specie: *Scyphophorus acupunctatus* Gyllenhal in Schoenherr, 1838: 857

1. *acupunctatus* Gyllenhal in Schoenherr, 1838: 857 Brazil, Colombia,  
*interstitialis* Gyllenhal in Schoenherr, 1838: Costa Rica, Cuba,  
856; LeConte, 1876: 331 Dominican  
*anthracinus* Gyllenhal in Schoenherr, 1838: Republic, El  
858; LeConte, 1876: 331 Salvador, Greece,  
*robustior* Horn, 1873: 409; LeConte, 1876: Guatemala, Haiti,  
331 Honduras, Italy,  
Jamaica, Mexico,  
Portugal, Puerto  
Rico, Spain, United  
States of America,  
Venezuela

*anthracinus* Gyllenhal in Schoenherr, 1838: 858

see *acupunctatus* Gyllenhal in Schoenherr, 1838:  
857

*interstitialis* Gyllenhal in Schoenherr, 1838: 856

see *acupunctatus* Gyllenhal in Schoenherr, 1838:  
857

*robustior* Horn, 1873: 409 see *acupunctatus*

Gyllenhal in Schoenherr, 1838: 857

2. *yuccae* Horn, 1873: 410 United States of  
America

**CXII.** *Sipalomimus* Voss

*Sipalomimus* Voss, 1958: 125

Type specie: *Sipalomimus singularis* Voss, 1958: 125

1. *singularis* Voss, 1958: 125 China

**CXIII.** *Sparganobasis* Marshall

*Sparganobasis* Marshall, 1915: 531

Type specie: *Sparganobasis subcruciata* Marshall, 1915: 532

1. *subcruciata* Marshall, 1915: 532 Papua New Guinea

**CXIV.** *Sphenocorynes* Schoenherr

*Sphenocorynes* Schoenherr, 1938: 866; Lacordaire, 1866: 280

(*Sphaenocorynus*) [NA=L]; Gemminger and Harold, 1871: 2643

(*Sphenocorynus*) [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 68

Type specie: *Curculio quadripunctatus* Weber, 1801: 93 (non Goeze, 1777)

= *Rhynchophorus cinereus* Illiger, 1800: 115



1. *cinereus* (Illiger in Wiedemann) Borneo, Indonesia,  
*Rhynchophorus cinereus* Illiger in Malaysia, Myanmar  
Wiedemann, 1800: 115; Schoenherr, 1938:  
866
- 1a. *cinereus* var. *quadripunctatus* (Weber) Indonesia  
*Curculio quadripunctatus* Weber, 1801: 93;  
Fabricius, 1801a: 431 (*Calandra*); Gyllenhal  
in Schoenherr, 1838: 867
2. *conformis* Pascoe, 1887: 376 Philippines
3. *fausti* Hartmann, 1899: 32 Malaysia
4. *femoratus* Heller, 1924: 290 Philippines
5. *impluviatus* Faust, 1894c: 334 Myanmar
6. *irroratus* Chevrolat, 1883: 566 Philippines
7. *marginalis* Guenther, 1936b: 99 Indonesia
8. *melanaspis* Pascoe, 1885: 298 Indonesia
9. *melagris* Pascoe, 1887: 375 Borneo, Indonesia,  
Malaysia
10. *mentaweiensis* Guenther, 1935c: 212 Mentawai\*
11. *minimus* Guenther, 1936b: 99 Indonesia
12. *ocellatus* Pascoe, 1887: 376 Taiwan (Formosa)
13. *octopustulatus* Faust, 1895b: 107 Borneo  
*Prodiectes octopustulatus* Faust, 1895b: 107;  
Guenther, 1937b: 197
14. *perelagans* Fairmaire, 1898b: 15 Japan
15. *posthumus* Guenther, 1937b: 195 India
16. *pygidialis* Chevrolat, 1883: 566 Malaysia
17. *rufescens* Pascoe, 1887: 375 Indonesia
18. *scutellatus* Faust, 1892b: 227 Indonesia
19. *seminudus* Faust, 1896: 159 Indonesia
20. *tenuirostris* Guenther, 1935b: 165 Borneo, Indonesia,  
Malaysia

**CXV. *Sphenophorus* Schoenherr**

*Sphenophorus* Schoenherr, 1826: 327; Clairville, 1798: 62 (*Calendra*<sup>15</sup>); Clairville, 1798: 2pl. (*Calandra*) [NA=S]; Blanchard, 1846: 204 (*Sphaenophorus*) [NA=L]; Gistel, 1856: 369 (*Sitonobia*); Chevrolat, 1885: 290 (*Merothricus*); LeConte, 1876: 426 (*Trichischius*); Petri, 1912: 330 (*Spenophorus*) [NA=L]; Voss, 1943: 234 (*Nesorthognathus*); Solervicens, 1973: 152 (*Spherophorus*) [NA=L]; Kuschel, 1955: 281; Vaurie, 1951: 18; Alonzo-Zarazaga and Lyal, 1999: 68

Type specie: *Curculio abbreviatus* Fabricius, 1787: 99

1. *abbreviatus* (Fabricius) Albania, Andorra,  
*Curculio abbreviatus* Fabricius, 1787: 99; Armenia, Azerbaijan,  
 Fabricius, 1801a: 436 (*Calandra*); Bosnia and  
 Gyllenhal in Schoenherr, 1838: 929 Herzegovina,  
*Curculio decurtata* Gmelin in Linnaeus, Bulgaria, Croatia,  
 1790: 1747; Csiki, 1936: 50 Gibraltar (United  
*Curculio brachypterus* Olivier, 1790: 561; Kingdom), Georgia,  
 Csiki, 1936: 50; Csiki, 1936: 50 Greece, Italy, Iran,  
*Curculio proculus* Fabricius, 1798: 16; Kazhakstan,  
 Csiki, 1936: 50 Kyrgyzstan,  
*Calandra scotina* Germar, 1824: 298; Macedonia, Malta,  
 Csiki, 1936: 50 Montenegro,  
*Calandra denominata* Chevrolat, 1885a: Portugal, San  
 106; Csiki, 1936: 51 Marino, Serbia,  
 Slovenia, Spain,  
 Vatican City, Austria,  
 Germany, Hungary,  
 Poland, Russia,

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<sup>15</sup> Rejected and invalid name, 1959

Slovakia, Slovenia,  
Tajakistan, The  
Czech Republic,  
Turkey,  
Turkmenistan,  
Uzbekistan

*abrasus* Chittenden, 1905a: 54 see *australis*  
*abrasus* (Chittenden)

*adpersus* Gyllenhal in Schoenherr, 1838: 924  
transferred to *Rhodobaenus* LeConte, 1876:  
332

*aduncus* Erichson, 1847: 147 transferred to  
*Rhodobaenus* LeConte, 1876: 332

**2.** *aequalis* Gyllenhal in Schoenherr, 1838: 941

**2a.** *aequalis aequalis* (Gyllenhal in Schoenherr) Canada, United

*aequalis* Gyllenhal in Schoenherr, 1838: States of America  
941; Vaurie, 1951: 174

*aequalis* var. *univittata* Chittenden, 1924:  
146; Vaurie, 1951: 174

*aequalis* var. *scripi* Chittenden, 1924: 147;  
Vaurie, 1951: 174

**2b.** *aequalis discolor* (Mannerheim) United States of

*discolor* Mannerheim, 1843: 293; Vaurie, America  
1951: 177

**2c.** *aequalis ochreus* (LeConte) Mexico, United

*ochreus* LeConte, 1858: 80; Vaurie, 1951: States of America  
175

*ochreus* var. *atrovittatus* Chittenden, 1924:  
147; Vaurie, 1951: 175

**2d.** *aequalis pictus* (LeConte) United States of

America

- pictus* LeConte, 1858: 80; Vaurie, 1951: 176
3. *alfurus* Heller, 1914b: 313 Indonesia
- anceps* Gyllenhal in Schoenherr, 1838: 894 transferred to *Metamasius* Horn, 1873: 408
4. *angustus* Boheman in Schoenherr, 1845: 250 Mexico
5. *apicalis* LeConte, 1878: 432 United States of America
6. *argillacea* Faust, 1892c: 521 Vietnam
7. *arizonensis* Horn, 1873: 428 Mexico, United States of America
- fallii* Chittenden, 1905b: 170; Vaurie, 1951: 83
8. *asper* Vaurie, 1978: 14 Brazil, Bolivia, Peru
9. *asperipennis* Fairmaire, 1871: 281 Palau
- aterrimus* Champion, 1910: 156 transferred to *Rhodoabaenus* LeConte, 1876: 332
10. *atomarius* Pascoe, 1885: 301 Indonesia
- atratus* Gyllenhal in Schoenherr, 1838: 916 transferred to *Foveolus* Vaurie, 1968b: 4
11. *atricolor* Chevrolat, 1880c: 198 France (Martinique)
- aurofaciatus* (Breme) transferred to *Cactophagus* LeConte, 1876: 331
- austeris* Gyllenhal in Schoenherr, 1838: 916 transferred to *Foveolus* Vaurie, 1968b: 4
12. *australis* (Chittenden)
- 12a. *australis abrasus* (Chittenden) United States of America
- abrasus* Chittenden, 1905a: 54; Vaurie, 1951: 169
- 12b. *australis australis* (Chittenden) Canada, Cuba, Puerto Rico, United States of America
- pertinax* Horn, 1873: 418; Vaurie, 1951: 168

- pertinax* var. *australis* Chittenden, 1905a:  
53; Vaurie, 1951: 168
- pertinax* var. *typhae* Chittenden, 1905a:  
53; Vaurie, 1951: 168
- 13.** *bartramiae* Chittenden, 1924: 154 United States of  
America
- 14.** *basilanus* Heller, 1922b: 624 Philippines  
*bifasciatus* (Sturm) transferred to *Cactophagus*  
*spinolae* (Gyllenhal in Schoenherr)  
*bilineatus* (Montrouzier) transferred to  
*Rhynchophorus* Herbst, 1795: 3  
*bisbisignatus* Gyllenhal in Schoenherr, 1838:  
894 transferred to *Metamasius* Horn, 1873: 408
- 15.** *blanchardi* Chittenden, 1905b: 179 United States of  
America  
*blatchleyi* Chittenden, 1924: 149 see *zeae*  
Walsh, 1867: 117  
*borassi* (Fairmaire) transferred to *Dynamis*  
Chevrolat, 1883: 563
- 16.** *brasiliensis* Hustache, 1936: 111 Argentina, Brazil  
*bruchi* Hustache, 1936: 112 see *rusticus*  
Gyllenhal in Schoenherr. 1838: 937
- 17.** *brunnipennis* (Germar) Argentina, Australia,  
*Calandra brunnipennis* Germar, 1824: Bolivia, Brazil,  
297; Boheman in Schoenherr, 1845: 260 Chile, New Zealand,  
*signaticollis* Gyllenhal in Schoenherr, Uruguay  
1838: 955; Gyllenhal in Schoenherr, 1845:  
260  
*punctatostratus* Gyllenhal in Schoenherr,  
1838: 956; Vaurie, 1978: 8
- 18.** *brutus* Gyllenhal in Schoenherr, 1838: 948 Bolivia, Chile, Peru

- crudus* Erichson, 1847: 137; Kuschel, 1955: 280
- canaliculatus* Boheman in Schoenherr, 1845: 253 see *pertinax pertinax* (Olivier)
- callizona* (Chevrolat) transferred to *Metamasius* Horn, 1873: 408
- 19.** *callosus* (Olivier) Mexico, United States of America  
*Calandra callosa* Olivier, 1807: 92; Gyllenhal in Schoenherr, 1838: 942  
*jugosus* Chittenden, 1924: 151; Vaurie, 1951: 143  
*callosus* var. *sublaevis* Blatchley and Leng, 1916: 568 see *destructor* Chittenden, 1905b: 174  
*canalipes* (Gyllenhal in Schoenherr) transferred to *Metamasius* Horn, 1873: 408
- 20.** *cariosus* (Olivier) Canada, Guatemala, Mexico, United States of America  
*Calandra cariosa* Olivier, 1807: 91; Schoenherr, 1938: 941  
*Calandra larvalis* Germar, 1824: 301; Schoenherr, 1938: 941  
*Rhynchophorus cicatricosus* Say, 1831: 22; Horn, 1873: 420  
*flexuosus* Gyllenhal in Schoenherr, 1838: 940; Horn, 1873: 420  
*sculptilis* Uhler, 1885: 416; Horn, 1873: 424  
*carmelita* (Germar) transferred to *Belopoeus* Schoenherr, 1838: 872
- 21.** *caroli* Vaurie, 1967c: 141 United States of America

- castaneipennis* (Bohemann in Schoenherr)  
transferred to *Liocalandra* Chevrolat, 1881b:  
92
- caviscutatus* Fairmaire, 1878c: 282 transferred  
to *Diathetes* Pascoe, 1874: 7
22. *cazieri* Vaurie, 1951: 98 United States of  
America
23. *championi* Vaurie, 1951: 81 Mexico
24. *charlesi* Vaurie, 1954: 1 Mexico
25. *chittendeni* Blatchley, 1916: 565 United States of  
America
- cicatripennis* Fahraeus in Schoenherr, 1845:  
262 see *cicatristriatus* Fahraeus in Schoenherr,  
1838: 958
26. *cicatristriatus* Fahraeus in Schoenherr, 1838: Canada, Mexico,  
958 United States of  
America
- cicatripennis* Fahraeus in Schoenherr, 1845: 262; Champion, 1910: 169
- ulkei* Horn, 1873: 413; Champion, 1910:  
169
- variolosa* LeConte, 1876: 424; Vaurie,  
1951: 84
- cinctus* (Gyllenhal in Schoenherr) transferred to  
*Rhodobaenus* LeConte, 1876: 332
- cinctus* Montrouzier, 1857: 55 see  
*circumscriptus* Gemminger and Harold, 1871:  
123
27. *cincticollis* Gyllenhal in Schoenherr, 1838: 954 Argentina, Brazil,  
*defrictus* Boheman in Schoenherr, 1845: Paraguay, United  
261; Vaurie, 1978: 10 States of America  
Uruguay

- cinerascens* (Motschulsky) transferred to  
*Trochorhopalus* Kirsch, 1877: 156
- cinnamominus* (Perty) transferred to  
*Metamasius* Horn, 1873: 408
28. *circumscriptus* Gemminger and Harold, 1871: Papua New Guinea  
123
- cinctus* Montrouzier, 1857: 55;  
    Gemminger and Harold, 1871: 123
- coactorum* Chittenden, 1904b: 136 see  
    *hoegbergii* Boheman in Schoenherr, 1845: 254
29. *coesifrons* Gyllenhal in Schoenherr, 1838: 959 Mexico, United  
    *oblitus* LeConte, 1876: 425; Vaurie, 1951: States of America  
    93
- lutulentus* Champion, 1910: 162; Vaurie,  
    1951: 93
- Calendra oblita* Satterthwait, 1931: 161;  
    Vaurie, 1951: 93
- colossus* (Olivier) transferred to *Protocerius*  
    Schoenherr, 1838: 828
- compressirostris* Germar, 1824: 300 see  
    *germari* Horn, 1873: 430
30. *compressirostris* Say, 1823: 319 United States of  
    *cultrirostris* Gyllenhal in Schoenherr, 1838: America  
    951; Horn, 1973: 429
- compressirostris* var. *obscuripennis*  
    Chittenden, 1924: 158; Vaurie, 1951: 97
- confluens* Chittenden, 1904b: 133 see *venatus*  
    *confluens* (Chittenden)
- confusa* Gyllenhal in Schoenherr, 1838: 944 see  
    *venatus venatus* (Say)



- contractus* Gyllenhal in Schoenherr, 1838: 953  
see *inaequalis* (Say)
31. *coronus* Vaurie, 1954: 3 Mexico
32. *costicollis* Chittenden, 1919: 269 United States of  
*costicollis* var. *callosipennis* Chittenden, America  
1919: 269; Vaurie, 1951: 158  
*costicollis* var. *callosipennis*, 1919: 269 see  
*costicollis* Chittenden, 1919: 269
33. *costipennis* Horn, 1873: 420 Canada, United  
*laevigatus* Chittenden, 1905a: 58; Vaurie, States of America  
1951: 155  
*medoraensis* Satterthwait, 1925: 270;  
Vaurie, 1951: 155
34. *crassus* Blanchard, 1843: 204 Argentina, Bolivia,  
*crassus* var. *rufa* Chevrolat, 1885a: 109; Chile, Paraguay,  
Kuschel, 1955: 280 Uruguay  
*Nesorthognathus pedestris* Voss, 1943:  
234; Kuschel, 1955: 280  
*crassus* var. *rufa* Chevrolat, 1885a: 109 see  
*crassus* Blanchard, 1843: 204  
*crenatus* (Billberg) transferred to *Cactophagus*  
LeConte, 1876: 331
35. *crenatus* (Leconte) United States of  
*Trichischius crenatus* Leconte, 1876: 426; America  
Vaurie, 1951: 68
36. *cruda* Erichson, 1847: 137 Peru  
*cruentatus* (Fabricius) transferred to  
*Rhynchophorus* Herbst, 1795: 3  
*cruciger* (Motschulsky) transferred to *Aplotes*  
Chevrolat, 1885a: 100

37. *cubensis* Buchanan, 1936: 150 Cuba, Jamaica, United States of America
38. *cultellatus* Horn, 1873: 429 United States of America  
*cultrirostris* Gyllenhal in Schoenherr, 1838: 951  
 see *compressirostris* Say, 1823: 319
39. *cumingi* Waterhouse, 1886b: 318 Philippines
40. *deficiens* Chittenden, 1920: 313 United States of America  
*omissa* Blatchley, 1920: 176; Vaurie, 1951: 89  
*defrictus* Boheman in Schoenherr, 1845: 261  
 see *cincticollis* Gyllenhal in Schoenherr, 1838: 954  
*deliciosus* Champion, 1910: 145 transferred to *Rhodobaenus* LeConte, 1876: 332  
*delumbatus* Boheman in Schoenherr, 1845: 241 transferred to *Temnoschoita* Chevrolat, 1885b: 289
41. *destructor* Chittenden, 1905b: 174 United States of America  
*sublaevis* Chittenden, 1905b: 176; Vaurie, 1951: 142  
*callosus* var. *sublaevis* Blatchley and Leng, 1916: 568; Vaurie, 1951: 142
42. *dietrichi* Satterthwait, 1933: 210 United States of America  
*dimidiatipennis* (Jekel) transferred to *Metamasius* Horn, 1873: 408  
*discolor* Mannerheim, 1843: 293 see *aequalis* *discolor* (Mannerheim)

- distichlidis* Chittenden, 1904a: 130 see *mormon*  
Chittenden, 1904a: 128
- distortus* Gemminger and Harold, 1871: 2648  
transferred to *Metamasius* Horn, 1873: 408
43. *diversus* Chittenden, 1905b: 170 United States of  
*Calendra eugenia* Satterthwait, 1943: 52; America  
Vaurie, 1951: 112
44. *dolosus* Vaurie, 1978: 10 Argentina, Brazil
45. *doriae* Pascoe, 1885: 301 Borneo, Indonesia,  
Malaysia
46. *elionensis* Vitale, 1906: 133 Italy
- elongata* Roelofs, 1875: 187 transferred to  
*Diocalandra* Faust, 1894c: 353
- ensirostris* (Germar) transferred to *Metamasius*  
Horn, 1873: 408
- fahraei* (Gyllenhal in Schoenherr) transferred to  
*Cactophagus* LeConte, 1876: 331
- fallax* Boheman in Schoenherr, 1845: 236 see  
*venatus venatus* (Say)
- fallii* Chittenden, 1905b: 170 see *arizonensis*  
Horn, 1873: 428
- fasciatus* Olivier, 1790: 474 transferred to  
*Metamasius* Horn, 1873: 408
- flexuosus* Gyllenhal in Schoenherr, 1838: 940  
see *cariosus* (Olivier)
- ferruginea* Boheman in Schoenherr, 1845: 235  
see *sumatranus* Chevrolat, 1882a: 139
- ferrugineus* (Olivier) transferred to  
*Rhynchophorus* Herbst, 1795: 3
47. *foveatus* Vaurie, 1978: 12 Argentina, Brazil,  
Paraguay, Uruguay

- frumenti* (Fabricius) transferred to *Diocalandra*  
Faust, 1894c: 353
- fuliginosa* (Pascoe) transferred to *Microspathe*  
Faust, 1899b: 122
48. *gagatinus* Gyllenhal in Schoenherr, 1838: 952 United States of  
America
- gages* (Faimaire) transferred to *Aeetes* Alonso-  
Zarazaga and Lyal, 1999: 66
49. *geminata* Chevrolat, 1880a: 32 Chile, Peru
50. *gentilis* LeConte, 1860: 58 United States of  
America
51. *germari* Horn, 1873: 430 United States of  
*Calandra compressirostris*<sup>16</sup> Germar, America  
1824: 300; Boheman in Schoenherr, 1845:  
258 (*Sphenophrus*); Horn, 1873: 430 United States of  
*germari* var. *pinguis* Chittenden, 1924: America  
156; Vaurie, 1951: 102
- germari* var. *pinguis* Chittenden, 1924: 156 see  
*germari* Horn, 1873: 430
- glabripes* Chevrolat, 1885a: 110 see *incurrens*  
Gyllenhal in Schoenherr, 1838: 957
- glyceriae* Chittenden, 1919: 270 see *venatus*  
*glyceriae* (Chittenden)
52. *graminis* Chittenden, 1905b: 168 United States of  
*subopacus* Chittenden, 1905b: 169; America  
Vaurie, 1951: 75  
*monterensis* Chittenden, 1905b: 169;  
Vaurie, 1951: 75

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<sup>16</sup> Preoccupied name by Say

- granarius* (Linnaeus) transferred to *Sitophilus*  
Schoenherr, 1838: 967
- guerini* (Kulg) transferred to *Aphiocephalus*  
Lacordaire, 1866: 277
- guttatus* Fahraeus in Schoenherr, 1845: 247  
transferred to *Rhodobaenus* LeConte, 1876:  
332
- haemorrhoidalis* (Wiedemann) transferred to  
*Ommatolampes* Schoenherr, 1838: 837
- hebetatus* (Gyllenhal in Schoenherr) transferred  
to *Metamasius* Horn, 1873: 408
- helvetica* Stierlin, 1882: 400 see  
*striatopunctatus* Goeze, 1777: 410
- hemipterus* (Linnaeus) transferred to  
*Metamasius* Horn, 1873: 408
53. *hoegbergii* Boheman in Schoenherr, 1845: 254 Mexico  
*coactorum* Chittenden, 1904b: 136;  
Vaurie, 1951: 124
54. *holosericus* Chittenden, 1924: 153 United States of  
*Calendra lucedalensis* Satterthwait, 1933: America  
212; Vaurie, 1951: 89
55. *imus* Gyllenhal in Schoenherr, 1838: 936 Mexico, United  
States of America  
*impressicollis* (Quedenfeldt) transferred to  
*Diocalandra* Faust, 1894c: 353  
*inaequalis* (Gyllenhal in Schoenherr)  
transferred to *Metamasius* Horn, 1873: 408
56. *inaequalis* (Say) United States of  
*Rhynchophorus inaequalis* Say, 1831: America  
23; Horn, 1873: 414

- contractus* Gyllenhal in Schoenherr, 1838: 953; Csiki, 1936: 58
- 57.** *incongruus* Chittenden, 1905a: 61 United States of America  
*incongruus* var. *elephantula* Chittenden, 1924: 151; Vaurie, 1951: 151
- 58.** *incurrens* Gyllenhal in Schoenherr, 1838: 957 Costa Rica,  
*glabripes* Chevrolat, 1885a: 110; Guatemala, Mexico,  
 Champion, 1910: 164 Panama  
*monilis* Gyllenhal in Schoenherr, 1838: 946; Champion, 1910: 164  
*interstitialis* Boheman, 1859: 148 transferred to  
*Rhabdoscelus* Marshall, 1943: 119  
*jugosus* Chittenden, 1924: 151 see *callosus* (Olivier)
- 59.** *kamerunensis* Guenther, 1943: 94 Cameroon  
*laetus* Erichson, 1847: 136 transferred to  
*Cactophagus* LeConte, 1876: 331  
*laevigatus* Chittenden, 1905a: 58 see  
*costipennis* Horn, 1873, 420
- 60.** *lateritius* Gyllenhal in Schoenherr, 1838: 920 Sierra Leone
- 61.** *latinasus* Horn, 1873: 421 United States of America  
*laticapus* Kirsch, 1869: 221 transferred to  
*Rhodobaenus* LeConte, 1876: 332  
*lebasii* (Gyllenhal in Schoenherr) transferred to  
*Rhodobaenus* LeConte, 1876: 332
- 62.** *leprosus* Fahraeus in Schoenherr, 1845: 248 Indonesia  
*leucographus* Fahraeus in Schoenherr, 1845: 247 transferred to *Rhodobaenus* LeConte, 1876: 332

63. *levis* Vaurie, 1978: 13 Argentina, Brazil,  
Uruguay  
*limbatus* (Olivier) transferred to *Aphiocephalus*  
Lacordaire, 1866: 277
64. *lineatus* Champion, 1910: 166 Mexico  
*liratus* Gyllenhal in Schoenherr, 1838: 914  
transferred to *Metamasius* Horn, 1873: 408  
*longicollis* (Olivier) transferred to *Odoiporus*  
Chevrolat, 1885b: 288  
*lucedalensis* Satterthwait, 1933: 212 see  
*holosericus* Chittenden, 1924: 153  
*ludovicianus* Chittenden, 1905a: 59 see  
*pertinax ludovicianus* (Chittenden)  
*lutulenta* Champion 1910: 162 see *coesifrons*  
Gyllenhal in Schoenherr, 1838: 959  
*maculatus* (Gyllenhal in Schoenherr)  
transferred to *Rhabdoscelus* Marshall, 1943:  
119  
*maculifer* Fahraeus in Schoenherr, 1845: 243  
transferred to *Rhodobaenus* LeConte, 1876:  
332
65. *maidis* Chittenden, 1905a: 59 United States of  
America
66. *marinus* Chittenden, 1905b: 166 United States of  
America  
*maurus* Gyllenhal in Schoenherr, 1838: 912  
transferred to *Metamasius* Horn, 1873: 408  
*medoraensis* Satterthwait, 1925: 270 see  
*costipennis* Horn, 1873: 420  
*melancholicus* Gyllenhal in Schoenherr, 1838:  
917 transferred to *Metamasius* Horn, 1873: 408

- melanocardius* Linnaeus, 1764: 45 transferred to *Rhodobaenus* LeConte, 1876: 332
- 67.** *melanocephalus* Fabricius, 1801a: 435 Canada, United States of America  
*Calandra melanocephalus* Fabricius, 1801a: 435; Horn, 1873: 425  
*nubilus* Gyllenhal in Schoenherr, 1838: 938; Horn, 1873: 425  
*melanurus* (Kirsch) transferred to *Rhodobaenus* LeConte, 1876: 332  
*mellenborgi* (Geminger and Harold) transferred to *Polytus* Faust, 1894c: 353
- 68.** *memnonius* Gyllenhal in Schoenherr, 1838: 935 Mexico, United States of America
- 69.** *meridionalis* Gyllenhal in Schoenherr, 1838: 934 France, Greece, Italy, Spain  
ab. *uniseriata* Stierlin, 1882: 401; Reitter, 1883: 233 Italy  
Algeria, France  
*sanguinipennis* Chevrolat, 1885a: 107; Csiki, 1936: 51
- 70.** *mimelus* Vaurie, 1978: 21 Argentina, Paraguay, Uruguay
- 71.** *minimus* Hartmann, 1890: 65 Canada, United States of America
- 72.** *missouriensis* (Chittenden) United States of America (Missouri)  
*glyceriae* var. *missouriensis* Chittenden, 1919: 270; Vaurie, 1851: 125  
*monachus* (Olivier) transferred to *Eugnoristus* Schoenherr, 1838: 848  
*monilis* Gyllenhal in Schoenherr, 1838: 946 see  
*incurrens* Gyllenhal in Schoenherr, 1838: 957



- monterensis* Chittenden, 1905b: 169 see  
*graminis* Chittenden, 1905b: 168
- 73.** *mormon* Chittenden, 1904a: 128 Canada, United  
*distichlidis* Chittenden, 1904a: 130; States of America  
 Vaurie, 1951: 64  
*morreni* Roelofs, 1885: 10 transferred to  
*Nassophasis* Waterhouse, 1879a: 17  
*multilineatus* Satterthwait, 1925: 270 see  
*robustus* Horn, 1873: 419
- 74.** *multipunctatus* Champion, 1910: 158 Mexico  
*mundus* (Champion) transferred to  
*Rhodoaenus* LeConte, 1876: 332
- 75** *napoanus* Hustache, 1936: 112 Ecuador
- 76.** *nebulosa* Macleay, 1887: 192 Papua New Guinea
- 77.** *necydaloides* (Fabricius) United States of  
*Calandra necydaloides* Fabricius, 1801a: America  
 435; Chittenden, 1924: 155  
*retusus* Gyllenhal in Schoenherr, 1838:  
 949; Chittenden, 1924: 155  
*retusa* Satterthwait, 1931: 162; Vaurie,  
 1951: 92
- 78.** *neomexicanus* Chittenden, 1904b: 134 Mexico, United  
 States of America
- 79.** *nevadensis* Chittenden, 1905b: 172 United States of  
 America  
*nigroplagiatus* (Quedenfeldt) transferred to  
*Temnoschoita* Chevrolat, 1885b: 289
- 80.** *nigrovittatus* Heller, 1924: 304 Philippines  
*notandus* Olliff, 1891: 79 transferred to  
*Metamasius* Horn, 1873: 408

- nawradii* (Kirsch) transferred to *Rhodobaenus*  
LeConte, 1876: 332
- nubilus* Gyllenhal in Schoenherr, 1838: 938 see  
*melanocephalus* Fabricius, 1801a: 435
- 81.** *obliquevittatus* Taschenberg, 1870: 190 Ecuador  
*oblitus* LeConte, 1876: 425 see *coesifrons*  
Gyllenhal in Schoenherr, 1838: 959  
*obscurus* (Boisduval) transferred to  
*Rhabdoscelus* Marshall, 1943: 119  
*ochreus* LeConte, 1858: 80 see *aequalis*  
*ochreus* (LeConte)  
*octocostatus* Champion, 1910: 157 transferred  
to *Rhodobaenus* LeConte, 1876: 332
- 82.** *octomaculatus* Heller, 1934: 302 Philippines  
*omissa* Blatchley, 1920: 176 see *deficiens*  
Chittenden, 1920: 313  
*opaca* Stierlin, 1882: 399 see *piceus* (Pallas)  
*orizabaensis* (Chevrolat) transferred to  
*Cactophagus* LeConte, 1876: 331  
*oryzae* (Linnaeus) transferred to *Sitophilus*  
Schoenherr, 1838: 967  
*palmarum* (Linnaeus) transferred to  
*Rhynchophorus* Herbst, 1795: 3
- 83.** *parumpunctatus* Gyllenhal in Schoenherr, Albania, Andorra,  
1838: 931 Bosnia and  
*sicula* Stierlin, 1876: 476; Ciski, 1936: 52 Herzegovina,  
Bulgaria, Croatia,  
Gibraltar (United  
Kingdom), Greece,  
Italy, Macedonia,  
Malta, Montenegro,

- Portugal, San  
Marino, Serbia,  
Slovenia, Spain,  
Vatican City, (Asia  
Minor) Armenia,  
Azerbaijan, Georgia,  
Iran, Iraq, Syria,  
Turkey (Western  
Palearctic)
- 83a.** *parumpunctatus* var. *opaca* Gyllenhal in Italy, France  
Schoenherr, 1838: 932
- 84.** *parvulus* Gyllenhal in Schoenherr, 1838: 961 United States of  
*Calendra parvula* Satterthwait, 1931: 159; America  
Vaurie, 1961: 106  
*Calendra parvulus* Bruhn, 1947: 19;  
Vaurie, 1961: 106  
*pumilis* Gyllenhal in Schoenherr, 1838:  
960; Vaurie, 1961: 106  
*peninsularis* Chittenden, 1905a: 56 see *pertinax*  
*peninsularis* (Chittenden)  
*peninsularis* var. *nasuta* Chittenden, 1924: 148  
see *pertinax pertinax* (Olivier)  
*pertinax* Horn, 1873: 418 see *australis australis*  
(Chittenden)
- 85.** *pertinax* (Olivier)  
*Calandra pertinax* Olivier, 1807: 90;  
Gyllenhal in Schoenherr, 1838: 938  
*Rhynchophorus truncatus* Say, 1831: 22;  
Vaurie, 1951: 163
- 85a.** *pertinax pertinax* (Olivier) Canada, United  
States of America

- Calandra pertinax* Olivier, 1807: 90;  
Gyllenhal in Schoenherr, 1838: 938  
*Rhynchophorus truncatus* Say, 1831: 22;  
Vaurie, 1951: 163  
*canaliculatus* Boheman in Schoenherr,  
1845: 253; Vaurie, 1951: 163  
*setiger* Chittenden, 1924: 55; Vaurie,  
1951: 163  
*setiger* var. *intervallata* Chittenden, 1924:  
148; Vaurie, 1951: 163  
*peninsularis* var. *nasuta* Chittenden, 1924:  
148; Vaurie, 1951: 163
- 85b.** *pertinax ludovicianus* (Chittenden) United States of  
*ludovicianus* Chittenden, 1905a: 59; America  
Vaurie, 1951: 164
- 85c.** *pertinax peninsularis* (Chittenden) United States of  
*peninsularis* Chittenden, 1905a: 56; America  
Vaurie, 1951: 165  
*phoenicis* (Fabricius) transferred to  
*Rhynchophorus* Herbst, 1795: 3
- 86.** *phoeniciensis* Chittenden, 1904b: 135 United States of  
*Calendra sequoia* Van Dyke, 1930: 165; America  
Vaurie, 1951: 129  
*picrostris* (Fairmaire) transferred to  
*Procosmopolites* Hustache, 1922: 415
- 87.** *piceus* (Pallas) Albania, Algeria,  
*Curculio picea* Pallas, 1776: 464; Olivier, Andorra, Armenia,  
1790: 475 (*Curculio*); Gyllenhal in Austria, Azerbaijan,  
Schoenherr, 1838: 928; Herbst, 1795: 20 Bosnia and  
(*Rhynchophorus*); Gyllenhal in Herzegovina,  
Schoenherr, 1838: 928 Bulgaria, Croatia,

*opaca* Stierlin, 1882: 399; Csiki, 1936: 52 France,  
*striatopunctata* Reitter, 1883: 233; Gibraltar (United  
 Hustache, 1930: 256 Kingdom), Greece,  
 Italy, Iran, Iraq,  
 Kyrgyzstan,  
 Macedonia, Malta,  
 Montenegro, Poland,  
 Portugal, Russia, San  
 Marino, Serbia,  
 Slovenia, Spain,  
 Syria, Turkey,  
 Vatican City,  
 Germany, Hungary,  
 Slovakia, Slovenia,  
 The Czech Republic,  
 (Asia Minor),  
 (Corsica) , (Western  
 and Central  
 Palearctic)

*pictus* LeConte, 1858: 80 see *aequalis pictus*  
 (LeConte)

**88.** *pontederiae* Chittenden, 1905a: 63 United States of  
 America

*pulchellus* (Gyllenhal in Schoenherr)  
 transferred to *Rhodobaenus* LeConte, 1876:  
 332

*pulcherrimus* (Chevrolat) transferred to  
*Cactophagus* LeConte, 1876: 331

*pumilis* Gyllenhal in Schoenherr, 1838: 960 see  
*parvulus* Gyllenhal in Schoenherr, 1838: 961

- punctatostratus* Gyllenhal in Schoenherr, 1838: 956 see *brunnipennis* Germar, 1824: 297
- pustulosus* (Gyllenhal in Schoenherr) transferred to *Rhodobaenus* LeConte, 1876: 332
- quadripustulatus* (Fabricius) transferred to *Temnoschoita* Chevrolat, 1885b: 289
- quadrisignatus* Gyllenhal in Schoenherr, 1838: 907 transferred to *Metamasius* Horn, 1873: 408
- quadripunctatus* (Webber) transferred to *Sphenocorynes* Schoenherr, 1938: 866
89. *quadrivittatus* Gyllenhal in Schoenherr, 1838: Mexico 962
- quinquepunctatus* (Say) transferred to *Rhodobaenus* LeConte, 1876: 332
90. *rectus* (Say) Mexico, United States of America  
*Rhynchophorus rectus* Say, 1831: 23; Horn, 1873: 426
- reticulatus* Chittenden, 1924: 154 see *terricola* Champion, 1910: 161
- reticulata* (Quedenfeldt) transferred to *Diocalandra* Faust, 1894c: 353
- reticulaticollis* Boheman in Schoenherr, 1845: 257 see *venatus reticulaticollis* (Boheman in Schoenherr)
- reticulaticollis*<sup>17</sup> Horn, 1873: 426 see *venatus glyceriae* (Chittenden)
- retusa* Satterthwait, 1931: 162 see *necydaloides* (Fabricius)

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<sup>17</sup> New name by Chittenden for *reticulaticollis* (non Boheman), so *glyceriae*

- retusus* Gyllenhal in Schoenherr, 1838: 949 see  
*necydaloides* (Fabricius)
- rimoratus* Gyllenhal in Schoenherr, 1838: 893  
transferred to *Metamasius* Horn, 1873: 408
91. *robustus* Horn, 1873: 419 United States of  
*multilineatus* Satterthwait, 1925: 270; America  
Vaurie, 1951: 148  
*robustus* var. *rectistriata* Chittenden, 1924:  
148; Vaurie, 1951: 148
92. *robustior* Chittenden, 1905a: 62 United States of  
*robustior* var. *costifer* Chittenden, 1924: America  
152; Vaurie, 1951: 148  
*robustior* var. *costifer* Chittenden, 1924: 152 see  
*robustior* Chittenden, 1905a: 62  
*robustus* var. *rectistriata* Chittenden, 1924: 148  
see *robustus* Horn, 1873: 419  
*roelofsi* (Chevrolat) transferred to *Aplotes*  
Chevrolat, 1885a: 100  
*rubiginea* (Wiedemann) transferred to  
*Paratasis* Chevrolat, 1883: 564  
*rugosus* (Boisduval) transferred to  
*Trigonotarsus* Guerin-Meneville, 1833: 39pl.
93. *rusticus* Gyllenhal in Schoenherr. 1838: 937 Argentina, Brazil,  
*Merothricus campestris* Chevrolat, 1885b: Colombia, French  
291; Kuschel, 1955: 281 Guiana. Guadeloupe,  
*Merothricus nigroscutellatus* Chevrolat, Guiana, Paraguay,  
1885b: 291; Vaurie, 1951: 18 Surinam, Trinidad,  
*bruchi* Hustache, 1936: 112; Vaurie, 1951: Uruguay, Venezuela  
18

- sanguinipennis* Chevrolat, 1885a: 107 see  
*meridionalis* Gyllenhal in Schoenherr, 1838:  
 934
- sanguinolentus* (Olivier) transferred to  
*Cactophagus* LeConte, 1876: 331
94. *sationis* Heller, 1925b: 243 Indonesia
95. *sayi* Gyllenhal in Schoenherr, 1838: 943 Canada, Mexico,  
*subcarinata* Mannerheim, 1843: 294; United States of  
 Horn, 1873: 425 America
- schoenherri* Gyllenhal in Schoenherr, 1838:  
 875 transferred to *Daithetes* (*Megadiathetes*)  
 Zimmerman, 1993: 73
96. *schwarzii* Chittenden, 1924: 145 United States of  
 America
97. *scoparius* Horn, 1873: 424 United States of  
 America
- sculptilis* Uhler, 1885: 416 see *cariosus*  
 (Olivier)
- securifer* (Gaede) transferred to *Cercidocerus*  
 Guerin-Meneville, 1833: 39
- sericans* (Wiedemann) transferred to  
*Tetratopos* Chevrolat, 1883: 562
- sericeus* (Olivier) transferred to *Metamasius*  
 Horn, 1873: 408
98. *seriepunctatus* Gyllenhal in Schoenherr, 1838: Chile, Peru, United  
 950 States of America,  
 Uruguay
- serriroetris* (Fabricius) transferred to  
*Omotemnus* Chevrolat, 1883: 559
99. *serratipes* Chittenden, 1924: 149 Canada, United  
 States of America



- setiger* Chittenden, 1924: 55 see *pertinax*  
*pertinax* (Olivier)
- setiger* var. *intervallata* Chittenden, 1924: 148  
 see *pertinax pertinax* (Olivier)
- sicula* Stierlin, 1876: 476 see *parumpunctatus*  
 Gyllenhal in Schoenherr, 1838: 931
- sierrakowskyi* Gyllenhal in Schoenherr, 1838:  
 887 transferred to *Metamasius* Horn, 1873: 408
- signatella* (Fairmaire) transferred to  
*Myocalandra* Faust, 1894c: 354
- signiventris* Kirsch, 1889: 36 transferred to  
*Metamasius* Horn, 1873: 408
- 100.** *simillima* Kolbe, 1883: 35 Benin, Burkina Faso,  
 Gambia, Ghana,  
 Guinea-Bissau, Ivory  
 Coast, Liberia, Mali,  
 Mauritania, Nigeria,  
 Niger, Senegal,  
 Sierra Leone, Togo
- 101.** *simplex* LeConte, 1859: 79 Mexico, United  
 States of America
- 102.** *soltavii* Chittenden, 1905b: 178 United States of  
 America
- sommeri* (Burmeister) transferred to  
*Phacecorynes* Schoenherr 1845: 228
- sordidus* (Germar) transferred to *Cosmopolites*  
 Chevrolat, 1885b: 289
- 103** *spangleri* Anderson, 2014: 437 Mexico
- spinolae* (Gyllenhal in Schoenherr) transferred  
 to *Cactophagus* LeConte, 1876: 331
- 104.** *squamosus* Boheman in Schoenherr, 1845: 245 Guinea

- stigmaticus* (Fahraeus in Schoenherr)  
transferred to *Rhodobaenus* LeConte, 1876:  
332
- strangulatus* (Gyllenhal in Schoenherr)  
transferred to *Trochorhopalus* Kirsch, 1877:  
156
- 105.** *striatipennis* Chittenden, 1905b: 180 Canada, United  
States of America
- striatoforatus* (Gyllenhal in Schoenherr)  
transferred to *Cactophagus* LeConte, 1876: 331
- 106.** *striatopunctatus* Goeze, 1777: 410 Austria, France,  
*Curculio mutilata* Laicharting, 1781: 216; Germany, Hungary,  
Gyllenhal in Schoenherr, 1838: 933 Italy, Poland,  
*Curculio fimbriate* Gmelin, 1790: 1804; Slovakia, Slovenia,  
Csiki, 1936: 53 Spain, The Czech  
*Rhynchophorus abbreviate* Herbst, 1795: Republic  
11; Clairville, 1798: 64 (*Calandra*); Csiki,  
1936: 53  
*Calandra ardesia* Olivier, 1807: 92;  
Schoenherr, 1838: 966  
*helvetica* Stierlin, 1882: 400; Csiki, 1936:  
53
- striatopunctata* Reitter, 1883: 233 see *piceus*  
(Pallas)
- strigosus* Erichson, 1847: 137 transferred to  
*Cactophagus* LeConte, 1876: 331
- sublaevis* Chittenden, 1905b: 176 see  
*destructor* Chittenden, 1905b: 174
- subcarinata* Mannerheim, 1843: 294 see *sayi*  
Gyllenhal in Schoenherr, 1838: 943
- 107.** *subnitidus* Harold, 1879: 152 Angola

- subopacus* Chittenden, 1905b: 169 see  
*graminis* Chittenden, 1905b: 168
- 108.** *subulatus* Chittenden, 1905b: 173 Mexico, United States of America
- 109.** *sulcifrons* Chevrolat, 1885a: 110 Mexico
- 110.** *sulcipes* Karsch, 1881: 11 Marshall Islands
- 111.** *sumatranus* Chevrolat, 1882a: 139 Indonesia  
*ferruginea* Boheman in Schoenherr, 1845: 235; Csiki, 1936: 54  
*suturalis* (Gyllenhal in Schoenherr) transferred to *Rhodobaenus* LeConte, 1876: 332
- 112** *taboa* Vannin, 1990: 697 Brazil  
*taitensis* (Guerin-Meneville) transferred to *Diocalandra* Faust, 1894c: 353
- 113.** *tardus* Fall, 1901: 269 United States of America
- 114.** *tenuis* Vaurie, 1978: 23 Argentina, Brazil, Chile
- 115.** *tenuivittatus* (Buchanan) Cuba, Dominican Republic, Haiti  
*Calendra tenuivittata* Buchanan, 1936: 149; Vaurie, 1978: 26  
*terebrans* (Olivier) transferred to *Temnoschoita* Chevrolat, 1885b: 289  
*testardi* (Montrouzier) transferred to *Diathetes* Pascoe, 1874: 7
- 116.** *terricolus* Champion, 1910: 161 Mexico, United States of America  
*reticulatus* Chittenden, 1924: 154; Vaurie, 1951: 87
- 117.** *tetraspilotus* Chevrolat, 1880a: 32 France (Guadeloupe)
- 118.** *tetricus* Gyllenhal in Schoenherr, 1838: 945 Brazil, French Guiana

- thoracicus* (Gyllenhal in Schoenherr)  
transferred to *Rhodobaenus* LeConte, 1876:  
332
- tibialis* Waterhouse, 1879c: 426 transferred to  
*Metamasius* Horn, 1873: 408
- 119.** *tomentosus* Vaurie, 1978: 19 Bolivia, Ecuador,  
Venezuela
- tornowii* Brethes, 1910: 226 transferred to  
*Rhodobaenus* LeConte, 1876: 332
- 120.** *torridus* Pascoe, 1885: 301 Indonesia, Papua  
New Guinea
- tredecimpunctatus* (Illiger in Schneider)  
transferred to *Rhodobaenus* LeConte, 1876:  
332
- 121.** *tremolerasi* Hustache, 1937: 11 Argentina, Brazil,  
Uruguay
- ulkei* Horn, 1873: 413 see *cicatristriatus*  
Fahraeus in Schoenherr, 1838: 958
- validirostris* (Gyllenhal in Schoenherr)  
transferred to *Cactophagus* LeConte, 1876: 331
- validus* LeConte, 1858: 80 transferred to  
*Cactophagus* LeConte, 1876: 331
- variegatus* (Fabricius) transferred to  
*Phacecorynes* Schoenherr, 1845: 228
- variolosa* LeConte, 1876: 424 see  
*cicatristriatus* Fahraeus in Schoenherr, 1838:  
958
- variolosus* (Klug) transferred to *Crepidotus*  
Schoenherr, 1838: 859
- 122.** *velutinus* LeConte, 1876: 424 United States of  
America

- 123.** *venatus* (Say) United States of  
*Rhynchophorus venatus* Say, 1831: 22; America  
Horn, 1873: 426; Vaurie, 1951: 118
- 123a.** *venatus confluens* (Chittenden) United States of  
*confluens* Chittenden, 1904b: 133; Vaurie, America  
1951: 123
- 123b.** *venatus glyceriae* (Chittenden) Mexico, United  
*reticulaticollis*<sup>18</sup> Horn, 1873: 426; States of America  
Chittenden, 1919: 270; Vaurie, 1951: 122  
*glyceriae* Chittenden, 1919: 270; Vaurie,  
1951: 122
- 123c.** *venatus retulaticollis* (Boheman in Mexico  
Schoenherr)  
*retulaticollis* Boheman in Schoenherr,  
1845: 257; Vaurie, 1951: 123
- 123d.** *venatus venatus* (Say) United States of  
*Rhynchophorus venatus* Say, 1831: 22; America  
Horn, 1873: 426; Vaurie, 1951: 118  
*Rhynchophorus immunis* Say, 1831: 23;  
Vaurie, 1951: 119  
*Rhynchophorus placidus* Say, 1831: 23;  
Gyllenhal in Schoenherr, 1838: 947;  
Vaurie, 1951: 119  
*confusa* Gyllenhal in Schoenherr, 1838:  
944; Vaurie, 1951: 119  
*fallax* Boheman in Schoenherr, 1845: 236;  
Vaurie, 1951: 119
- 123e.** *venatus vestitus* (Chittenden) United States of  
America, West Indies

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<sup>18</sup> New name by Chittenden for *reticulaticollis* (non Boheman), so *glyceriae*

- vestitus* Chittenden, 1904: 134; Vaurie, 1951: 120
- vestitus* Chittenden, 1904: 134 see *venatus vestitus* (Chittenden)
124. *vilis* Hustache, 1936: 114 Argentina, Brazil, Paraguay, Uruguay
125. *villosiventris* Chittenden, 1905a: 58 United States of America
126. *vitticollis* Quendenfeldt, 1888: 194 Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo, Sao Tome and Principe
127. *vomerinus* LeConte, 1858: 81 United States of America  
*vomerinus* var. *baridioides* Horn, 1873: 413; Vaurie, 1951: 77
128. *zeae* Walsh, 1867: 117 Canada, United States of America  
*blatchleyi* Chittenden, 1924: 149; Vaurie, 1951: 138

**CXVI. *Stenophida* Pascoe**

*Stenophida* Pascoe, 1886: 336

Type specie: *Stenophida linearis* Pascoe, 1886 = *Liocalandra pygialis* Fairmaire, 1884: 148

*linearis* Pascoe, 1886: 336 see *pygialis* (Fairmaire)

1. *pygialis* (Fairmaire) Burundi,  
*Liocalandra pygialis* Fairmaire, 1884: 148; Democratic  
 Marshall, 1906: 958 Republic of the  
*linearis* Pascoe, 1886: 336; Roelofs, 1892c: Congo, Djibouti,  
 135 Ethiopia, Eritrea,  
*Megaproctus zanzibarica* Desbrochers, 1891: Kenya, Rwanda,  
 353; Heller, 1925b: 242 South Africa,  
 Sudan, Tanzania,  
 Uganda, Zanzibar
2. *rufipes* Roelofs, 1893c: 129 Zimbabwe

**CXVII. *Tapinosthetus* Faust**

*Tapinosthetus* Faust, 1894a: 532; Csiki, 1936: 32 (*Tapinostethus*)  
 [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 68

Type specie: NYD

1. *nitidicollis* Faust, 1894a: 533 Gabon, Sierra Leone

**CXVIII. *Temnoschoita* Chevrolat**

*Temnoschoita* Chevrolat, 1885b: 289; Hoffmann, 1968: 21  
 (*Temnoschoitea*) [NA=L]; Alonzo-Zarazaga and Lyal, 1999: 68

Type specie: *Curculio quadripustulatus* Fabricius, 1775: 144

1. *basipennis* Duvivier, 1892: 166 Democratic  
 Republic of Congo
2. *congoana* Hustache, 1928: 446 Democratic  
 Republic of Congo
3. *delumbatus* (Boheman in Schoenherr) Angola,  
*Sphenophorus delumbatus* Boheman in Democratic  
 Schoenherr, 1845: 241; Marshall, 1938: 325 Republic of Congo

- Sphenophorus cruciatus* Quedenfeldt, 1888:  
306; Marshall, 1938: 325
4. *erudita* Duvivier, 1892: 166 (=eruditus) Benin, Burkina  
*pygidialis* Faust, 1894a: 534; Marshall, 1938: Faso, Democratic  
325 Republic of Congo,  
Gambia, Ghana,  
Guinea-Bissau,  
Ivory Coast,  
Liberia, Mali,  
Mauritania,  
Nigeria, Niger,  
Senegal, Sierra  
Leone, Togo
- herbsti* Chevrolat, 1882a: 138 see *quadripustulata*  
(Fabricius)
5. *maynei* Hustache, 1925: 393 Democratic  
Republic of Congo
6. *nigroplagiatus* (Quedenfeldt) Angola, Uganda  
*Sphenophorus nigroplagiatus* Quedenfeldt,  
1889: 305; Marshall, 1928a: 424  
*pygidialis* Faust, 1894a: 534 see *erudita* Duvivier,  
1892: 166
7. *quadripustulatus* (Fabricius) Democratic  
*Curculio quadripustulatus* Fabricius, 1775: Republic of Congo,  
144; Olivier, 1790: 494 (*Curculio*); Herbst, Guinea, Kaplandd\*  
1795: 27 (*Rhynchophorus*); Olivier, 1807: 88  
(*Calandra*); Marshall, 1928a: 424  
*Sphenophorus quadrimaculatus* Gyllenhal in  
Schoenherr, 1838: 910; Chevrolat, 1885b: 289  
*Sphenophorus quadrivulneratus* Thomson,  
1858: 143; Faust, 1899a: 428



*herbsti* Chevrolat, 1882a: 138; Marshall,  
1938: 325

8. *subulirostris* Kolbe, 1883: 35 Benin, Burkina  
Faso, Democratic  
Republic of Congo,  
Gambia, Ghana,  
Guinea-Bissau,  
Ivory Coast,  
Liberia, Mali,  
Mauritania,  
Nigeria, Niger,  
Senegal, Sierra  
Leone, Togo
9. *terebrans* (Olivier) Senegal

*Calandra terebrans* Olivier, 1807: 89;  
Lacordaire, 1866: 296  
*Sphenophorus hanetii* Quedenfeldt, 1889:  
305; Marshall, 1938: 325

**CXIX. *Tetratopos* Chevrolat**

*Tetratopos* Chevrolat, 1883: 562; Csiki, 1936: 29 (*Tetratopus*) (UE of  
*Tetratopos*); Alonzo-Zarazaga and Lyal. 1999: 68

Type specie: *Calandra sericans* (Wiedemann) 1823: 120; SD: Pascoe, 1885:  
300

1. *fae* Faust, 1894c: 332 Myanmar
2. *femoralis* Heller, 1924: 301 Philippines
3. *longicollis* Faust, 1894c: 332 India
4. *scabrirostris* Heller, 1924: 300 Philippines
- 4a. *scabrirostris* var. *monomorphus* Heller, 1924: 300 Philippines
5. *semiruber* Faust, 1898b: 331 India

6. *sericans* (Wiedemann) Indonesia,  
*Calandra sericans* Wiedemann, 1823: 120; Myanmar  
 Boheman in Schoenherr, 1845: 235  
 (*Sphenophorus*); Faust, 1894c: 330  
*Sphenophorus hypocrita* Gyllenhal in  
 Schoenherr, 1838: 879; Csiki, 1936: 29
7. *sternalis* Chevrolat, 1883: 569 Indonesia

**CXX. *Trigonotarsus* Guerin-Meneville**

*Trigonotarsus* Guerin-Meneville, 1833: 39pl.

Type specie: *Trigonotarsus calandroides* Guerin-Meneville, 1833: 39pl

*calandroides* Gyllenhal in Schoenherr, 1838: 844

see *rugosus* (Boisduval)

1. *rugosus* (Boisduval) Australia  
*Calandra rugosus* Boisduval, 1835: 445;  
 Guerin-Meneville, 1833: 39pl.  
*calandroides* Gyllenhal in Schoenherr, 1838:  
 844; Lacordaire, 1866: 289

**CXXI. *Trochorhopalus* Kirsch**

*Trochorhopalus* Kirsch, 1877: 156; Chevrolat, 1885a: 101  
 (*Trachorhopalon*) [NA=L]; Chevrolat, 1885a: 101 (*Glyptocnemis*)  
 [NA=SYN]; Rye, 1879: 74 (*Trochorrhupalus*) (UE of *Trochorhopalus*);  
 Champion, 1914: 492 (*Trochorrhupalus*) (non Rye, 1879) (UE of  
*Trochorhopalus*); Alonso-Zarazaga and Lyal, 1999: 68

Type specie: *Sphenophorus strangulatus* Gyllenhal, 1838: 882

*canalipes* Gyllenhal in Schoenherr, 1838: 927

transferred to *Metamasius* Horn, 1873: 408

1. *cincticauda* Chevrolat, 1885a: 103 Malaysia

2. *cinerascens* (Motschulsky) Myanmar  
*Sphenophorus cinerascens* Motschulsky,  
1858: 69; Faust, 1892a: 50
3. *corpulentus* Heller, 1900: 43 Indonesia
4. *dipteroearpi* Marshall, 1928b: 553 Myanmar  
*discicollis* Chevrolat, 1885a: 101 see *humeralis*  
Chevrolat, 1885a: 103
5. *fisicauda* Chevrolat, 1885a: 104 Indonesia
6. *horsfieldi* Chevrolat, 1885a: 104 Indonesia
7. *humeralis* Chevrolat, 1885a: 103 China, Cambodia  
*Calandra discifer* Walker, 1859: 218; Sri Lanka  
Chevrolat, 1885a: 101; Csiki, 1936: 64  
*discicollis*<sup>19</sup> Chevrolat, 1885a: 101; Csiki,  
1936: 64
8. *inversicornis* Chevrolat, 1885a: 105 India
9. *leucogrammus* Chevrolat, 1885a: 103 Sri Lanka
10. *lineolatus* Chevrolat, 1885a: 104 Indonesia
11. *reflexus* Chevrolat, 1885a: 102 Indonesia
12. *sacchari* Marshall 1932: 213 Myanmar
13. *strangulatus* (Gyllenhal in Schoenherr) Borneo, Indonesia,  
*Sphenophorus strangulatus* Gyllenhal in Malaysia,  
Schoenherr, 1838: 882; Kirsch, 1877: 156 Mauritius, Papua  
New Guinea,  
Philippines,  
Seychelles,  
Singapore
- 13a. *strangulatus* var. *albolineolatus* Chevrolat, 1885a: Malaysia  
102
14. *sumatranus* Faust, 1892b: 227 Indonesia

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<sup>19</sup> Non Walker-error by Chevrolat

**CXXII. *Trymatoderus* Fairmaire**

*Trymatoderus* Fairmaire, 1889: 55; Heller, 1901: 18 (*Trymatoderes*)  
[NA=L]; Alonso-Zarazaga and Lyal, 1999: 68

Type specie: *Trymatoderus spongiicollis* Fairmaire, 1889: 55

1. *spongiicollis* Fairmaire, 1889: 55 China

**CXXIII. *Tyndides* Pascoe**

*Tyndides* Pascoe, 1874: 68; Chevrolat, 1883: 567 (*Tendides*) [NA=L];  
Csiki, 1936: 22

Type specie: NYD

1. *laetus* Guenther, 1937b:: 194 Borneo, Indonesia,  
Malaysia
2. *lineatus* Pascoe, 1874: 68 Borneo, Indonesia,  
Malaysia
3. *luctuosus* Pascoe, 1887: 379 Borneo, Indonesia,  
Malaysia
4. *pustulosus* Pascoe, 1874: 68 Indonesia, Malaysia

**CXXIV. *Zetheus* Pascoe**

*Zetheus* Pascoe, 1874: 68; Pascoe, 1887: 378 (*Neoxides*); Guenther,  
1937b: 193

Type specie: *Zetheus electilis* Pascoe, 1874: 69

1. *electilis* Pascoe, 1874: 69 Indonesia, Malaysia  
*Neoxides bilineatus* Pascoe, 1887: 378;  
Guenther, 1937b:: 193
2. *minor* Guenther, 1937b:: 193 Borneo

## *Discussion*

## 5. DISCUSSION

The results of the present study on the economically important Rhynchophorinae, viz., *Cosmopolites sordidus*, *Diocalandra frumenti*, *Odoiporus longicollis*, *Rhynchophorus ferrugineus* and *Sitophilus oryzae* are discussed here with concept of the species, their status related to the close relatives, taxonomic characters, key to species and their distribution.

### 5.1 ANNOTATED CHECKLIST OF WORLD RHYNCHOPHORINAE

The checklist of species prepared here is mainly based on the extensive review of available literatures rather than on extensive taxonomic studies. Csiki (1936) firstly in Junk's "Coleopterum Catalogous" gave a detailed catalogue of species under subfamily Rhynchophoirinae and Cossoninae. Later many authors independently listed out the species under Rhynchophorinae from their concerned area. These checklist were lacking a review world level for detailed bibliography and not catalogued at international level after Csiki (1936). Alonzo-Zarazaga and Lyal (1999) catalogued only the name of genera, were they listed 128 genera and 6 tribes under the subfamily Rhynchophorinae. Thus the extensive review was carried out for all the species coming under the subfamily Rhynchophorinae.

The result revealed that, the Rhynchophorinae of world are represented by 955 species distributed under 124 genera and 6 tribes. While going through the literatures for the checklist it had been observed that, the members of Rhynchophorinae are distributed over all zoogeographic regions of world (Table 6; Figure 1), but group is more concentrated in Oriental region (362 species) and Neotropical region (313 species), followed by Ethiopian (144 species), Nearctic (86 species), Australian (51 species), Palearctic (47 species) and Oceanic region (5 species). Along with this four fossil species had also been reported.

The assay of world rhynchophorine fauna (Table 7; Figure 2) indicates that, only 22 species were described during 1758 to 1800; 145 species were described from 1801 to 1850; the majority of species were described during the time period 1851 to 1900 (374 species) and 1901 to 1950 (300 species). Thereafter work on the

Rhynchophorinae declined and during the time period 1951-2000 only 76 species had been reported while after 2001, Robert S. Anderson is the only coleopterists, presently working on these weevils and contributed 38 species during time period of 2001-2015. Anderson (2003) proposed new genera *Daisya* from Costa Rica and Panama, where he described 4 species in the genus. Analysis made on the contribution of coleopterists (Table 8) reveals that, Heller had described 89 species followed by Chevrolat (76 species), Faust (75 species), Champion (68 species), Guenther (60 species) and Gyllenhal (59 species); a detailed list of contribution of Coleopterists is discussed under Table 8.

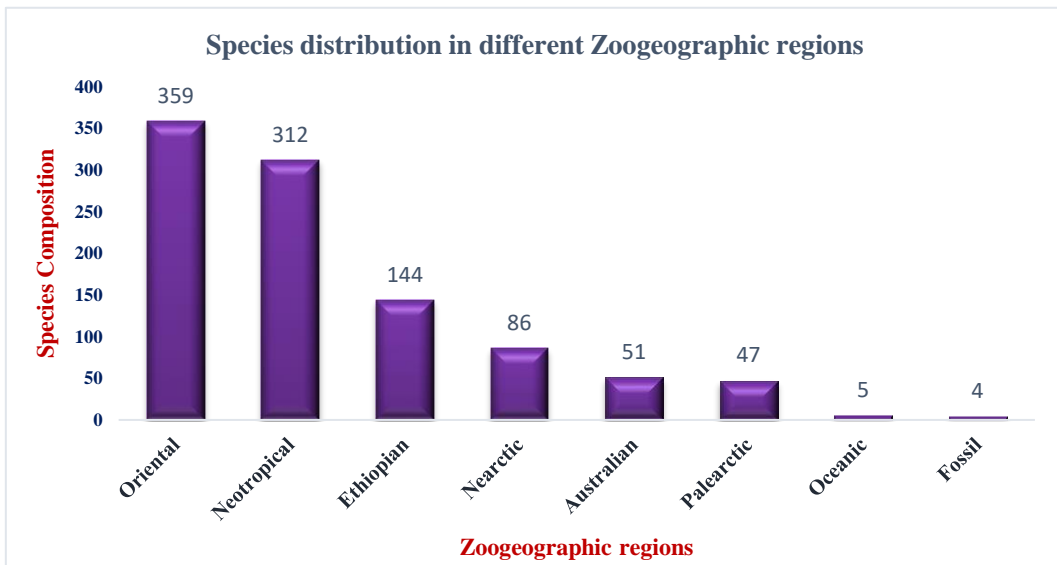
In conclusion, the results shows that no work had been carried out on these insects after 1950 in India, and an extensive taxonomic study is necessary for this group and the present checklist is a comprehensive list of Rhynchophorinae distributed in world.

**Table 6. Species distribution in different Zoogeographic regions**

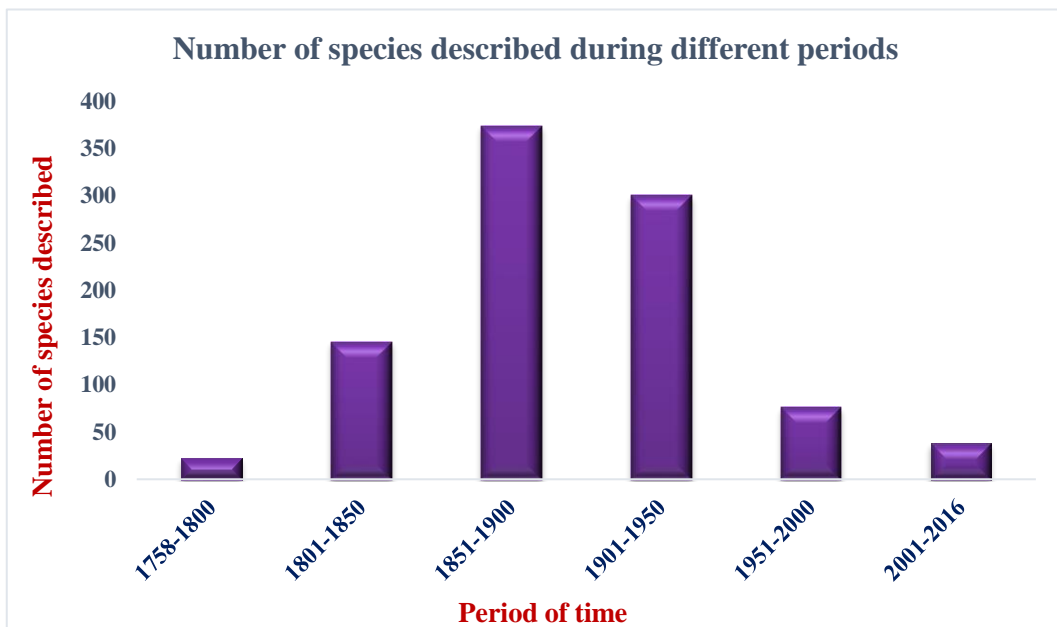
Serial Number	Zoogeographic area	Species composition
1	Oriental	359
2	Neotropical	312
3	Ethiopian	144
4	Nearctic	86
5	Australian	51
6	Palaearctic	47
7	Oceanic	5
8	Fossil	4

**Table 7. Number of species described during different periods**

Serial Number	Period		Number of species described
	From	To	
1	1758	1800	22
2	1801	1850	143
3	1851	1900	371
4	1901	1950	300
5	1951	2000	76
6	2001	2016	38



**Figure 1. Species distribution in different Zoogeographic regions**



**Figure 2. Number of species described during different period**



**Table 8. Contribution of coleopterists to world Rhynchophorinae**

<b>Serial Number</b>	<b>Contributing coleopterists</b>	<b>Number of species described</b>
1	Anderson	36
2	Arrow	1
3	Aurivillius	6
4	Baquet	1
5	Barber	1
6	Billberg	1
7	Blanchard	2
8	Blatchley	1
9	Bohemann	13
10	Boisduval	2
11	Bondar	1
12	Bovie	1
13	Breme	1
14	Brethes	1
15	Buchanan	3
16	Burmeister	1
17	Casey	1
18	Champion	68
19	Chevrolat	76
20	Chittenden	25
21	Desbrochers	2
22	Dohrn	4
23	Drury	1
24	Duvivier	2
25	Erichson and Burmeister	1
26	Erichson	4
27	Eydoux	1
28	Fabricius	12
29	Fahraeus	7
30	Fairmaire	24
31	Fall	1
32	Faust	75
33	Fursov	1
34	Gaede	1
35	Gahan	1
36	Gemminger and Harold	2
37	Geoze	1

38	Germer	4
39	Guenther	60
40	Guerin-Meneville	11
41	Gyllenhall	59
42	Harold	1
43	Hartmann	15
44	Heller	89
45	Herbst	1
46	Horn	8
47	Huchstetter	1
48	Hustache	27
49	Illiger	3
50	Jekel	1
51	Jordan	6
52	Karsch	1
53	Kirsch	7
54	Klug	2
55	Kolbe	28
56	Lacordaire	5
57	LeConte	6
58	Linnaeus	6
59	Macleay	1
60	Marshall	18
61	Montrouzier	2
62	Morimoto	2
63	Motschulsky	3
64	O'Brien	1
65	Olivier	12
66	Olliff	1
67	Pallas	1
68	Passcoe	51
69	Perty	1
70	Quendenfeldt	6
71	Ritsema	4
72	Roelofs	22
73	Satterthwait	1
74	Say	5
75	Schultze	1
76	Scudder	3
77	Simpson in Jameson	1

78	Taschenberg	1
79	Thomson	2
80	Thunberg	1
81	Vannin	4
82	Vaurie	49
83	Vitale	1
84	Vollenhoven	1
85	Voss	7
86	Walker	1
87	Walsh	1
88	Waterhouse	8
89	Wattanapongsiri	10
90	White	1
91	Wiedemann	5
92	Zherikhin	1
93	Zimmerman	3

## 5.2 COSMOPOLITES SORDIDUS

At present only two species are described in the genus. The species *Cosmopolites sordidus* can be distinguished with its close ally *C. pruinus* that: the elytral striae well impressed (elytral striae feebly impressed in *C. pruinus*), some striae fade up in middle, giving vittae like appearance (elytral intervals uniform, not giving any vittae appearance *C. pruinus*); some elytral intervals raised in between, distinctly polished, bare of punctures (not polished in *C. pruinus*); pronotum with central smooth region (pronotum evenly punctate and pruinose *C. pruinus*).

Zimmerman (1968b) illustrated the genitalia characters of both the species and provided the key for them. Ayri (2013) redescribed *C. sordidus* including morphometric observations but proper illustration and genitalia photographs were not supplemented. Present study incorporates and supplements the morphometric observations and key photographs. Additionally few characters which were observed from the samples collected from different localities are also added. They are:

*Femur*: femur laterally compressed, curved, distal end widened, ventrally inflated at middle, emarginated beyond, bilobed apically, with groove, providing base of tibial insertion (Plate 2, A, B, C). *Tibia*: tibia grooved beneath and provided with a row of setae on each side of groove; premucro in addition to uncus arising from outer apical margin, premucro more prominent in protibia.

Study also includes the presence of different variations found among the species collected from different regions of Kerala. Four distinct Groups were observed under this species, which differ in one or another way. Morphological characters described by Germar (1824), Chevrolat (1885b) and Ayri (2013) were found in Group A, in addition to it, the variations were observed in Groups are compared in Table 1 and is discussed as follows:

*Variation in general body colour*: There are no much variations noticed in general colour except that Group A and B. the present study is in agreement with that of earlier findings of Chevrolat (1885b) and Ayri (2013) who described the general body colour only as black. But variations noticed such as Group B was differ from other Groups in colour, shiny ferrugineus whereas Group A, black to slightly ferrugineus and Group C, dull black; Group D black in colour (Plate 7, A-I).

*Variation in micropilose setae*: Group C observed under the study was distinct in bearing micropilose setae all over the body. Prothoracic punctures devoid of setae in Group D. While Group A and Group B bears very few micropilose setae arising from the punctures (Plate 5, A, B, C; Plate 7, A-I).

*Variation in size*: Group D was very small in size, ranging from 5.74–6.31 mm in total length (Plate 7, G, H, I).

Among all four group no difference were observed in genitalia characters. These particular coloured morphological variations may be recorded due to differential feeding or available food material (host plants). Variations may be due to the environmental variations in different zones of collection and the

microclimatic conditions within the soil/underground zone as this particular weevil is a poor flier and thus unable to move frequently to long distance.

### 5.3 *DIOCALANDRA FRUMENTI*

The species *D. frumenti* can be distinguished with the other species by the characters such as: head with fovea; head and rostrum not on same plane on lateral view; head separated from rostrum by weak transverse depression at interocular region.

Zimmerman (1993) discussed about the characters of *D. frumenti* but the description lacks the detailed illustrations and morphometric observations. The species were lack of detailed taxonomic and genitalia illustrations. The present study corroborate the views of Fabricius (1801a), Faust (1894c) and Zimmerman (1993) while rectifying the ambiguities and by covering descriptions, correcting line diagrams, in addition by giving genitalia characters, illustrations with detailed morphometric observations and photographs.

Morimoto (1978) provided the key to nine species were not adequate, causing confusion in identification because of overlapping characters for more than one species. In present study key to eight valid species being proposed rectifying the errors of Morimoto, along with genitalia illustrations including morphometric observations. Additionally few characters added:

*Rostrum*: dorsally and laterally dense deep punctures near base; dorsal punctures arranged in two rows on either side, lined parallel to central shiny region, extending upto apex, punctures finer and shallower towards apex; row of punctures extending backward, meets at interocular region forming transverse depression; in lateral view one row of punctures arranged on each side (Plate 8, A, B, C, D).  
*Femur*: all femur laterally compressed, curved on outer side, distal end widened, bilobed apically, with groove, coarsely punctured, apically denser in arrangement (Plate 9, B, C, D).

Two different group were observed among the specimens collected from different regions of Kerala. Two groups were distinct from each other on the basis

of the colouration of pronotum. Variation among groups are compared in Table 2 and can be discussed as follows: Group A with triangular cum semi-rounded black spot basally, extending upto  $0.6\times$  length of pronotum from base; while Group B with dull black pronotum along with few small yellow to ferrugineous spots apically (Plate 13, A-F). Variation among the groups may be due to the availability of food, host plants and environmental factors (mean temperature, rainfall and relative humidity).

#### 5.4 *ODOIPORUS LONGICOLLIS*

The species *O. longicollis* is characterized with: elongated, flattened body; funicular segments with rounded anterior edges; basal  $0.35\times$  antennal club pubescent; pronotum uniformly punctuate laterally, disc smooth with two short transverse punctations medially; apically elytra truncated.

Ayri (2013) redescribed the species but description lacks morphometric comparisons and photographs of genitalia were not taken. The present study, detailed morphological morphometric and genitalia characters were loaded and few additional taxonomic important characters are added such as:

*Tibiae*: punctures not aligned into striae, grooved beneath and provided with a row of setae of more or less equal length on each side of groove internally from base to apex; bears premucro at outer apical angle in addition of uncus, two additional spine in between uncus and premucro; third spine and premucro more prominent in protibia (Plate 17, D-F) .

Study also includes the presence of different variations found within the species collected from different regions of Kerala. Three different groups were observed among the collected specimens separated out on the basis of morphological variations. General morphological characters described by Olivier (1807), Chevrolat (1885) and Ayri (2013) were found in Group A, addition to that variations were also observed in different group are compared in Table 3, as discussed follows:.

*Variation in general body colour:* Group A, itself varies by having general body colour black to ferrugineus; Group B shiny black, whereas Group C shiny ferrugineus (Plate 20, A-I).

*Variation in rostrum characters:* The Group A is having laterally more prominent rugose punctures at base, extending upto scrobe, apex to scrobe the rugose punctures not arranged in row in males. While Group B with rostrum, shiny from apex to scrobe centrally on dorsal view, in males shallow rugose punctures run along the length in one row each of side upto apex laterally, demarking shiny region centrally. In Group C rostrum smooth from apex to scrobe, very few punctures in basal region (Plate 14, A- F; Plate 15, A- F).

*Variation in pronotum characters:* Prothorax shows variation in punctations on dorsum. In Group A less rugose punctures laterally, basal row of rugose punctation does not join with lateral one; Group B with flanks uniformly punctate, disc smooth with very few shallow punctures, basal rugose joins with lateral row of rugose punctations; Group C with very few rugose punctations laterally in apical 0.60× of pronotal length (Plate 17, A, B, C).

*Variation in protibia characters:* Protibia shows the major difference in all three group. In Group A third spine and premucro is prominent. While in Group B have sharper third spine and elongated premucro. Group C with three spines on protibia, spine between third and premucro rudimentary, blunted third spine (Plate 17, D, E, F).

*Variation in spiculum ventrale characters* Spiculum ventrale shows minor difference between Group A and B as it is slender and apodeme is pointed in case of Group A while in the Group B its globous and apodeme swollen apically. Spiculum ventrale in case of Group C shows significant difference from other two groups, additional loop, 0.52× as long as VIII<sup>th</sup> sternite, basal bifurcated arm slender and not globous (Plate 19, A, B, C; Plate 21, A, B, C).

More morphological study coupled with molecular study is needed to assure the confirmation of new species if any. This report corroborates in line with Shukla

(2010) as many morphological variants appear to be reported but still the genus had been reported with single species, which suggests that many species are yet to be discovered under the genus.

### 5.5 *RHYNCHOPHORUS FERRUGINEUS*

The species *R. ferrugineus* can be distinguished with the other species by the characters such as: Pre-gular suture with elongate-oval shape before narrowing to the base; mandible tridentate; submentum truncately concave with narrowly elongate median depression, extending throughout its length; body black or ferrugineus, usually with a broad black stripe or spots on pronotum.

The species shows higher level of morphological variations, due to which many authors have described the same as separate species, thus causing confusion in identification. Wattanapongsiri (1966) redescribed the species and gave a detailed description of all the life stages of species along with key, he also reported the morphological variations of *R. ferrugineus* and *R. vulneratus* and reported them as separate species from Oriental region. Hallet *et al.* (2003) synonymised *R. vulneratus* with *R. ferrugineus*. The present study corroborate with study of Wattanapongsiri (1966). The Present study includes the detailed morphometric observations along with the genitalia description using the standard taxonomic terms. Few additional taxonomic important characters are added such as:

*Rostrum*: dorsally female have three carina, median carina starts at base of rostrum, lateral one on each side originates at scrobe, parallel to middle carina; additional two carina laterally; upper carina longer, starts near scrobe, lower carina starts at middle of rostrum, joint together near to apex (Plate 22, A-F; Plate 23, D-F). *Scutellum*: hump may or may not be present on the dorsal view of rostrum. If present, runs parallel to length, narrowing towards apex, prominent towards apex (Plate 27, B). *Tibiae*: tibiae uncinata with uncus arising from inner apical margin, apically curved downwards, small tooth like spine preceding uncus (Plate 24, E, F, G).



Study also includes the demonstration of different variation found within the species collected from different regions of Kerala. Total of 427 specimens collected from different regions of Kerala, either by pheromone trap or by personal collection, were examined and grouped under three different groups on the basis of their morphological variations. General morphological characters described by Olivier (1790), Wattanapongsiri (1966) and Hallett *et al.* (2003) were found in Group A, additional characters mentioned above; the variations found among the different groups are compared in Table 4 and can be discussed as follows::

*Variation in rostrum characters:* Group A and Group C with prominent median carina and does not fades in groove of setae while B have less prominent row of tubercles laterally compared to other two group and median carina light in texture which fades in groove of setae in male. While in case of female laterally two carina on each side in case of Group A and B whereas Group C bears a single carina laterally; upper carina in case of Group A and B starts at 0.20× and 0.28× of rostrum length from base while in case of Group C starts at 0.35× of rostrum length from base (Plate 22, A-F; Plate 23, D-F).

*Variation in pronotum characters:* Group A with smaller black marks as compared to other two groups. Group A and B have six markings on pronotum but the size of markings are smaller in case of Group A, while group C with three larger markings covering the major area of pronotum (Plate 26, A-C).

*Variation in spermatheca characters:* Spermatheca 'C' shaped with more curvature and nodulus with many folds in case of Group B as compared to Group A and C (Plate 28, D-F; Plate 30, D-F).

Variation among the groups may be due to the environmental conditions of insect habitat (minimum, maximum and mean temperature; relative humidity). Variations may also be due to the availability of food, feeding behaviour and age of the plant on which they are feeding. As suggested by Wattanapongsiri (1966), weevils feeding on the old or decaying palms are smaller in size while those feeding on the young palms are larger in size and darker in complexion.

## 5.6 *SITOPHILUS ORYZAE*

The characters which separates it from other species of genus are: prothorax and elytra with more alutaceous; dorsum dull; aedeagus convex throughout length, without two distinct longitudinal impressions.

The study carried out by Kuschel (1961) lacks the detailed morphometric observation. Ayri (2013) redescribed the species, but description lacks few morphometric comparison and genitalia characters. In present study detailed morphometric observations, proper illustrations and genitalia description along with photographs are achieved. Due to unavailability of original literature, key for species of *Sitophilus* is not included here. Few additional taxonomic important characters are added such as:

*Rostrum*: dorsally punctures arranged in two rows on either side from base to apex, either of row meets at base, forming distinct groove; outer groove meet in between eyes; grooves in males more prominent (Plate 33, A, B). *Elytral*: punctures continuous in interstriae, not clearly separated from each other, small setae arising from punctures; setae, very fine and inconspicuous and similar to that on pronotum, more toward apical end; red to yellow spots of varying size on each elytron, may vary in size (Plate 37, A-F)

Study also includes the demonstration of different variation found within the species collected from household and stored rice of different regions of Kerala. Collected specimens were grouped under two groups on the basis of their morphological characters. Two groups are differ only in the body colour and elytral markings. Variation among groups are compared in Table 5 and discussed as follows:

*Variation in general body colour*: Group B black to dull brown in colour, with darker antennae and tarsi than group A (Plate 37, A-F).

*Variation in elytral colour and spots*: yellow spots on elytron is prominent in case of Group A (Plate 37, A-F).

Variation among the groups may be due to the temperature under the storage facility as well as in the field conditions (for on field infestation). Variations may also be due to the composition of food material or host plants (rice, wheat, maize, cowpea, pulses, etc.) on which they fed.

Thus the present study is a complete revision of economically important pest species of subfamily Rhynchophorinae and it is unique as far as the species are concerned, as it compiles all the information about the species and their different variations together with keys for four of genera to separate out all the known species. Further an attempt is made to generate the detailed description of all the five economically important pest species from Kerala. The most significant feature of the study is the compilation of checklist along with the detailed bibliographic detail of world Rhynchophorinae, which will serve as a useful platform for the future studies.

# *Summary*

## 6. SUMMARY

Members of the subfamily Rhynchophorinae are one of the very large, diversely distributed to all geographical regions of world including India. Subfamily Rhynchophorinae is the largest group among the family Dryophthoridae, which includes 956 described species under 124 genera out of which 60 species under 27 genera have been reported from India. Weevils of this group majorly associated to palms, banana and other agriculturally important crops. Among these, the species *Cosmopolites sordidus*, *Diocalandra frumenti*, *Odoiporus longicollis*, *Rhynchophorus ferrugineus*, and *Sitophilus oryzae* are serious pests of economically important crops in Kerala and are present interest of study.

The only substantial work on these had been carried out by Wattanapongsiri (1966) and Zimmerman (1968a; 1968b; 1993). The available information on Rhynchophorinae is limited and lacking in essential diagnostic characters especially genitalia, taxonomic terminology and require redefinition. Even in those where detailed descriptions are available, these are lacking in morphometrics and need for more material and information. The morphological variations are not well documented which leads to confusion in identifying the pests under subfamily Rhynchophorinae. Hence the present study was undertaken with objectives of survey and collection of rhynchophorines from different region of Kerala, study of morphological characters and variations, redescription of species, preparation of checklist of world Rhynchophorinae and formulation of keys for the identification of the species.

The present study was based on collections of Malabar Insect Repository (MIR), laboratory collection of Indian Council of Agricultural Research (ICAR)-Central Plantation Crop Research Institute (CPCRI), Regional station, Kayamkulam, Kerala. Collections were made through surveys and commercially available pheromone trap installed in seven different regions of Kerala viz., RARS Pilicode, RARS Ambalavayal, RARS Pattambi, BRS Kannara, RARS Kumarakom, ORARS Kayamkulam and RARS Vellayani.

The study ultimately narrowed down to focus upon approximately on 770 specimens belonging to five species, each one of five different genera. All these species redescribed by incorporating the morphometric ratios, morphological characters, modern taxonomic terminologies and genitalia characters along with their photographs. These studies had led to the 230 illustrations including 149 line diagrams.

The significant findings accrued from the study based on the specimens collected from different regions of Kerala and from the museum specimens can be summarized as:

1. The description of all the five species studied are supplemented with taxonomic characters of genitalia, standardised to a uniform format and incorporated with morphometric ratios.
2. All the morphological variations along with their differential distinguishing characters along with tier illustrations are depicted in study for all the five species.
3. Detailed illustrations of taxonomic characters like head, rostrum (dorsal and lateral, antennae, pronotum, elytra, femur, tibia, tarsus, venter and their genitalic characters are studied and provided with line diagrams.
4. An annotated checklist of world Rhynchophorinae had been prepared were, all the 956 known species under 124 genera of world Rhynchophorinae distributed under six tribe had been reviewed and catalogued along with synonyms and bibliographic details. While 60 species distributed under 27 genera and six tribes had been reported from India. The distribution of all the 956 species had been documented and characterized by taking into account of upto date literature available.
5. Taxonomic key of all the known species from world is prepared for genera *Cosmopolites*, *Diocalandra*, *Odoiporus* and *Rhynchophorus*.

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\*Literature details not available

# *Abstract*

**TAXONOMY OF RHYNCHOPHORHINAE (COLEOPTERA:  
DRYOPHTHORIDAE) OF KERALA**

*by*

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**ABSTRACT**

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## ABSTRACT

The taxonomy of weevils under the subfamily Rhynchophorinae (Coleoptera: Dryophthoridae) was carried at the College of Agriculture Padannakkad, Kasargod, Kerala and seven different agro ecological zones of Kerala during 2014-2016. Study was based on survey carried out in agro and forest ecosystems of Kerala and the samples collected from these ecosystems. Commercially available pheromone traps for the collection of red palm weevil, banana pseudostem weevil and banana rhizome weevil were installed in five agroclimatic regions viz., Northern Zone, (RARS, Pilicode); High range (RARS, Ambalavayal); Central Zone (RARS, Pattambi); Problem zone (RARS, Kumarakom) and Southern Zone (RARS, Vellayani). Traps were also installed in the fields of BRS, Kannara and ORARS, Kayamkulam. The other two weevils, i.e. *Diocalandra frumenti* and *Sitophilus oryzae* were collected from households and fields of the aforesaid seven regions. The study also includes specimen stored in Malabar Insect Repository (MIR) and the specimens of *Rhynchophorus ferrugineus* collected from CPCRI regional station, Kayamkulam, Kerala.

An annotated checklist of world Rhynchophorinae was prepared and results revealed that the subfamily Rhynchophorinae includes 955 species under 124 genera and 6 tribes. The distribution of these weevils is more concentrated in Oriental and Neotropical regions (70%). Maximum number of species was described during the 1851-1950. Highest contribution from coleopterists was by Heller (89 species) followed by Chevrolat (76 species), Faust (76 species), Guenther (68 species).

Taxonomy ultimately narrowed down to focus on the 770 specimens of five species under five genera viz., *Cosmopolites sordidus*, *Diocalandra frumenti*, *Odoiporus longicollis*, *Rhynchophorus ferrugineus* and *Sitophilus oryzae*. Collected specimens of individual species were segregated into different populations according to the morphological variations within the species. The present study of economically important five species had 249 illustrations and 149 line diagrams.

Detailed description of all the taxonomic characters like head, rostrum, (dorsal and lateral), antennae, pronotum, elytron, femur, tibia, tarsus, venter and genitalia were studied and presented with line diagrams. Taxonomic description of all the five species were supplemented with standard taxonomic terminology along with genital characters and loaded with the morphometric ratios. The taxonomic key was prepared for all the known species under genera *Cosmopolites*, *Diocalandra*, *Odoiporus* and *Rhynchophorus*.

Based on the morphological characters all five species were segregated in different groups. The taxonomic study revealed that, morphological variations present among the groups may be due to environmental conditions, availability of food, and life stage of the plant on which they are feeding on. All the variations within the species were depicted with the differential distinguishing characters along with line diagrams. Among all five species, major difference was observed within the three groups of *Odoiporus longicollis* which may be a new species. More morphological and molecular level studies are needed for the confirmation of new species if any.