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SEASONAL OCCURRENCE OF FUNGI ON WATER HYACINTH [*EICHHORNIACRASSIPES*(MART) SOLMS] IN KERALA

Water hyacinth is an important aquatic weed growing in India. It belongs to the family Pontideriaceae. It was introduced to India from Brazil in 1896 as an ornamental pond plant. It later spread on the slow moving fresh water tanks and thus became a noxious weed. Biological control of weeds has been suggested as the most efficient method as it is long lasting and less costly (Charudattan, 1986). Therefore, the use of microorganisms in weed control has been gaining importance now a days. In the work conducted by Aneja and Sreenivas (1990) to isolate naturally occurring fungal pathogens of water hyacinth, they reported *Cercospora rodmanii* from the diseased water hyacinth leaves. In another study, Aneja *et al.* (1990) obtained three pathogenic fungi from water hyacinth viz., *Fusarium chlamydosporium* Wollenoo and Reinking, *Epicoccum nigrum* Link and *Phoma sorghina*. Therefore, the present study aims to find the naturally occurring fungal pathogens of water hyacinth.

In the present study, surveys were conducted in three locations in Trivandrum viz., Veli, Ambalathara and Akulam from April 1992 to July 1993. The water hyacinth populations in different locations were found to be infected by leaf spots and blighting of leaves. Periodical isolation of fungal pathogens was done from diseased specimens once in a month from April 1992 to July 1993 covering the summer season (February-March) and rainy season (June-November). The fungi isolated were maintained in potato dextrose agar slants. The pathogenicity of various fungi isolated from water hyacinth was tested by artificially inoculating with culture bits from 7 day old cultures of the fungi on water hyacinth plants.

The data obtained during the study were statistically analysed and correlation and regressions were also worked out to find out the relation between disease incidence and weather parameters.

During the survey, seven fungi were isolated viz.,

1 *Colletotrichum gloeosporioides* (Penzig) Penzig and Sacc.
2 *Curvularia lunata* (Wakker) Boedjin.
3 *Fusarium equiseti* (Corda) Sacc.
4 *Fusarium semitectum* Berk and Rao
5 *Fusarium solani* (Mart) Sacc.
6 *Rhizoctonia solani* Kuhn.
7 Sterile fungus

Pathogenicity tests revealed that all the fungi isolated from water hyacinth were found to be pathogenic to the weed.

The seasonal occurrence of various fungi infesting water hyacinth was studied (Table 1). *Fusarium* spp. were present throughout the year in all the three locations viz., Veli, Ambalathara and Akulam. *Colletotrichum gloeosporioides* was present during the rainy season in all the three locations viz., Veli, Ambalathara and Akulam. *Curvularia lunata* was present during the summer season only in Veli. *Rhizoctonia solani* was also isolated during the rainy season from Veli, whereas the sterile fungus was isolated during the summer and rainy season but the frequency of occurrence was low in both the locations, Ambalathara and Akulam. In similar works, Jamil and Rajagopal (1986) revealed that species of *Fusarium*, *Alternaria* and *Helminthosporium* appeared in the winter season. *Aspergillus, Penicillium* and a sterile fungus were associated on the leaves of water hyacinth in the early days of summer only. In the present study the presence of *Fusarium* spp., throughout the period of observation leads to the conclusion that this pathogen can survive in the off-season and make its presence during the rainy season, when the host plants have a thick vegetative growth. Also this fungus has the capacity to thrive in moist conditions for a long time. Observations indicate that rainfall is the most important factor affecting the natural occurrence of

Table 1. Seasonal occurrence of fungi on water hyacinth

Season	Location	Temp. °C		RH %		No. of rainy days	Rainfall, mm	Fungi isolated
		Max.	Mill.	Mor.	Eve.			
Summer season (Feb-March)	Veli	32.34	25.47	92.39	69	5	22.8	*Fusarium semitectum, F. equiseti, Curvularia lunata, F. solani*
	Arnbalathara	31.33	24.99	90.57	83.5	10	175.5	*F. semitectum F. equiseti, F, solani*
	Akulam	32.65	23.20	87	64	2	36.20	*F. semitectum, F. equiseti, F. solani and sterile fungus*
Rainy season (June-July)	Veli	30.19	24.16	90.65	78	21	500.4	*C. gloeosporioides, F. semitectum, R.. solani, F. equiseti, F. solani*
	Ambalathara	28.34	22.50	86.58	80.95	18	160.20	*F. semitectum, F. equiseti, F. solani,*
	Akulam	30.32	23.80	89.8	78.14	25	171.60	*F. semitectum, F. solani, F. equiseti, C. gloeosporioides*
Rainy season (Oct.-Nov.)	Veli	30.78	24.89	88.83	74.43	13	56.4	*C. gloeosporioides, F. semitectum, F. equiseti, F. solani*
	Amhalathara	30.56	24.51	88.32	76.74	13	415.00	*F. semitectum, F. solani, F. equiseti, •C. gloeosporioides*
	Akulam	28.70	23.03	91.90	75.03	10	270.70	*F. semiteclum, F. solani, F, equiseti, sterile fungus*

Colletotrichum gloeosporioides and *R. solani*. Butler (1951) observed that anthracnose of Bathurst burr (*Xanthium spinosum* L.) caused by *CoUetotrichum xanthii* Halst was present during the rainy season.

On statistical analysis of the data, it was observed that values of correlation coefficients between the occurrence of fungi and weather parameters viz., temperature, relative humidity, number of rainy days and rainfall were not significant although 93% of the variation in the occurrence of fungi was attributed to weather parameters.

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