

**SCREENING OF BETELVINE CULTIVARS FOR HOST RESISTANCE
AGAINST LEAF SPOT PATHOGEN *XANTHOMONAS BETLICOLA*
PATEL, KULKARNI AND DHANDE**

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The bacterial leaf spot caused by *Xanthomonas betlicola* Patel *et al.* is a serious disease of betelvine in Kerala. This disease is prevalent in all the betelvine growing areas of the State throughout the year and severely affect the leaves and to a lesser extent, stems. In view of the serious crop losses due to this disease, a study was carried out to locate a cultivar of betelvine having resistance against the leaf spot pathogen *Xanthomonas betlicola* Patel *et al.*

Materials and Methods

Seven locally popular cultivars of betelvine were screened for resistance against the disease. They were 'Chelanthivella' (T₁), 'Pramuttan' (T₂), 'Malamkodi' (T₃) 'Pannivella' (T₄), 'Chelanthikarpuran' (T₅), Tulasivettilla, (T₆) and Karilanchikarpuran' (T₇). The experiment was laid out in completely randomised design with five replications. Ten pathogenic isolates of the bacterium were collected from various betelvine growing areas of the State and used for inoculation. Two months old plants were inoculated with a mixed culture of all the available isolates of the bacterium. The technique for the inoculation was to smear a sterile water suspension of the mixed culture (OD 0.03) of the pathogen on both the surfaces of pin-pricked leaves. The plants were kept under shade and irrigated to ensure high humidity in the microenvironment of the plant. Observations were taken for a period of 30 days. Grading of the intensity of the disease was carried out on a 0-5 scale. Extent of defoliation was also included as a criterion for evaluating the intensity of the disease.

Results and Discussion

The results are presented in Table 1. In all cultivars of betelvine, the disease symptoms were initiated (Plate 1) within 5-7 days. It was observed that the maximum disease severity occurred on the cultivar Pannivella and minimum on Tulasivettilla. There was absolutely no defoliation within 10 days after inoculation in all cultivars. Within a period of 20 days after inoculation, minimum defoliation occurred on cultivar Karilanchikarpuran and Tulasivettilla and maximum on Malamkodi. Observation within 30 days after inoculation showed lesser defoliation in the case of cultivars Karilanchikarpuran and Tulasivettilla and maximum on Pannivella.

Statistical analysis of the disease index revealed that the cultivar Tulasivettilla showed significantly less disease incidence than Malamkodi, Chelanthivella, Chelanthikarpuran and Pannivella. Significantly less defoliation was recorded within 20 days after inoculation in the case of cultivar Karilanchikarpuran and

Table 1

Relative resistance of betelvine cultivars to infestation by *Xanthomonas betlicola*

Cultivars		* Percentage of defoliation			Disease index
		Within 10 days after inoculation	Within 20 days after inoculation	Within 30 days after inoculation	
Chelanthivella	(T ₁)	0	47.33	74.31	3.34
Pramuttan	(T ₂)	0	43.55	57.05	2.86
Malamkodi	(T ₃)	0	55.94	75.00	3.14
Pannivella	(T ₄)	0	25.05	78.00	3.60
Chelanthikarpuran	(T ₅)	0	40.16	61.03	3.46
Tulasivettila	(T ₆)	0	20.75	43.84	2.10
Karilanchikarpuran	(T ₇)	0	10.13	43.84	2.56
CD (P = 0.05)		0	25.01	17.99	0.46

* Values transformed into angles

Tulasivettila than in other cultivars. Evaluation based on the percentage of defoliation within 30 days after inoculation revealed that the cultivar Karilanchikarpuran and Tulasivettila were on par with and Pramuttan and Chelanthikarpuran and these showed significantly less defoliation than other cultivars.

It was thus found that of the seven cultivars of betelvine screened for resistance against the pathogen, none was found to be absolutely resistant to the disease. Minimum disease severity was observed in the cultivar Tulasivettila and maximum in the cultivar Pannivella and comparatively less defoliation in the cultivars Karilanchikarpuran and Tulasivettila within a period of 20 days and 30 days after inoculation. Thus the cultivars Tulasivettila and Karilanchikarpuran were found to be less susceptible to the disease. Patel *et al.* (1953) had reported that all cultivars of betelvine were susceptible to the disease with varying degrees of intensity. Singh and Chand (1971) observed that this disease was widely prevalent in betelvine gardens in Jabalpur and that the Bangala variety was the most susceptible. In general to get a cultivar with genetic resistance against a bacterial disease is considered to be difficult and the leaf spot of betelvine appears to be no exception to this.

Summary

Seven cultivars of betelvine were screened for host resistance against the leaf spot pathogen *Xanthomonas betlicola*. The study revealed that none of

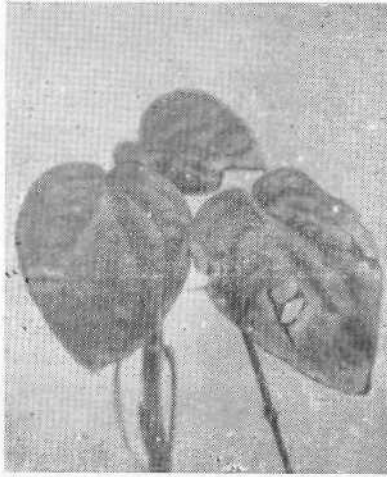


Plate 1 Betel vine leaves showing symptoms of leaf spots on artificial inoculation with *Xanthomonas betlicola*

the cultivars were absolutely resistant to the disease, but the minimum disease severity was observed in the cultivar Tulasivettilla. The minimum defoliation within 20 and 30 days after inoculation were observed in the cultivars Karilanchikarpuran and Tulasivettilla.

സംഗ്രഹം

വെറിലക്കൊട്ടിയിനങ്ങളിൽ സാന്തോമോണാസ് ബെറ്റിലിക്കോളാ എന്ന ബാക്ടീരിയ നീമിത്തമുണ്ടാകുന്ന ഇലപ്പുള്ളി രോഗത്തിനെതിരെയുള്ള പ്രതിരോധശക്തി സംബന്ധിച്ച പരീക്ഷണങ്ങളിൽ തുളസിവെറില, കരിലാഞ്ചികർപ്പൂരൻ എന്നീ ഇനങ്ങളിൽ രോഗബാധ താരതമ്യേന കുറവായിരുവെന്നു കാണുകയുണ്ടായി.

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