The Pharma Innovation Journal 2020; 9(1): 345-347

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(1): 345-347

www.thepharmajournal.com
Received: 12-11-2019
Accepted: 14-12-2019

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Screening of elephant foot yam varieties against collar rot of elephant foot yam caused by *Sclerotium rolfsii* Sacc

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Abstract
In the present study, Sixteen entries of Elephant foot yam available with AICRP on tubers at CES, Wakavali, were screened under natural conditions at during Aug-Sept, 2017-18. Field screening of Elephant foot yam cultivars against *Sclerotium rolfsii* Sacc. revealed that among the sixteen varieties, three varieties *viz.*, EFY DPL-2, EFY DPL-3 and BCA-4 were found to be resistant against *S. rolfsii*, up to 120 days.

Keywords: Elephant foot yam, *Sclerotium rolfsii*, collar rot, Screening

Introduction
Tuber crops are the third most important food crop for man after cereals and grain legumes. Among them Elephant Foot Yam (*Amorphophallus paeoniifolius)* is important commercial tuberous root crop of tropical and subtropical region of the world mainly grown for its tubers. The tubers are recommended to cure dysentery, tumor, asthma, swelling of lungs, vomiting, abdominal pain and also as blood purifier. The collar rot caused by *S. rolfsii* has been considered as one of constraints in successful cultivation of Elephant foot yam crop in India. (Sivapraksam *et al.*, 1982) [4]. The disease is more severe during rainy season, followed by warm dry weather (Sahoo *et al.*, 2016) [2]. In Konkan region, during recent years, this diseases has been found to occur at AICRP on Tubers, Central Experiment Station, Wakavali, Dr. BSKKV, Dapoli.

Material and Methods
Sixteen entries of Elephant foot yam available with AICRP on tubers at CES, Wakavali, were screened under natural conditions at during Aug-Sept, 2017-18.

Table 1: Experiment Details

Season	***Kharif*, 2017**	**Plants per cultivar**	**9**
Date of planting	15/6/2017	Plot size	4m × 3m
Design	RBD	Spacing	75cm × 75cm
Replication	3	Treatments	16

The Elephant Foot Yam entries were locally collected by the scientist of AICRP on tuber crops from the Konkan region were designated by the name of the farmers or name of locations by the person who collected the cultivar. For our study purpose these entries are named as give in table.

Table 2: Treatment details

Sr. No.	Varieties	Sr. No.	Varieties
1	EPY DPL-1	9	EPY DPL-6
2	EPY DPL-2	10	EPY DPL-7
3	EPY DPL-3	11	EPY DPL-8
4	BCA-4	12	EPY DPL-9
5	NDB-9	13	EPY DPL-10
6	EPY DPL-4	14	EPY DPL-11
7	Gajendra	15	EPY DPL-12
8	EPY DPL-5	16	EPY DPL-13

Observations on disease incidence

In each replication, plants were randomly selected to record the disease incidence. The selected plants were tagged and observations on disease incidence were recorded on the same plants, thrice at an interval of 1 month.

Disease reaction collar rot

On the basis of disease score each variety / cultivar was graded as Resistant, Moderately resistant, Moderately susceptible, Susceptible and Highly susceptible as per scale presented by Sinha and Prasad (1986) [3].

Table 3: Per cent mortality Reaction type

Sr. No.	Per cent mortality	Reaction type
1	Below 1	Resistant
2	1-10	Moderately resistant
3	11-20	Moderately susceptible
4	21-30	Susceptible
5	31-100	Highly susceptible

Per cent disease incidence

Total numbers of healthy and infected plants were counted and accordingly PDI was calculated.

Per cent disease incidence (PDI) was calculated by the formula given by Rao *et al.*, (2016) [1],

$$\text{PDI}: \frac{\text{Total Number of Infected Plant}}{\text{Total Number of Plants Assessed}} \times 100$$

Result and Discussion

It is apparent from the results in Table 5 that 13 varieties *viz.* EFY DPL-1, NDA-9, EFY DPL-4, Gajendra, EFY DPL-5, EFY DPL-6, EFY DPL-7, EFY DPL-8, EFY DPL-9, EFY DPL-10, EFY DPL-11, EFY DPL-12 and EFY DPL-13 exhibited collar rot symptoms, 2-3 months after planting.

Table 4: Reactions of Elephant foot yam varieties, against *S. rolfsii*

Vr. No.	Varieties	Disease reaction at DAP		
		60	90	120
V-1	EFY DPL - 1	-	+	+
V-2	EFY DPL - 2	-	-	-
V-3	EFY DPL - 3	-	-	-
V-4	BCA–4	-	-	-
V-5	NDB–9	+	+	+
V-6	EFY DPL - 4	+	+	+
V-7	Gajendra	+	+	+
V-8	EFY DPL - 5	-	+	+
V-9	EFY DPL - 6	+	+	+
V-10	EFY DPL - 7	-	+	+
V-11	EFY DPL - 8	-	+	+
V-12	EFY DPL - 9	-	+	+
V-13	EFY DPL - 10	+	+	+
V-14	EFY DPL - 11	+	+	+
V-15	EFY DPL - 12	+	+	+
V-16	EFY DPL - 13	+	+	+

+ Disease observed, - Disease not observed.

DAP: Days after planting

Table 5: Field reactions of Elephant foot yam varieties against *S. rolfsii*

Vr. No.	Varieties	% Mortality at DAP		Total % mortality	Reactions (90 DAP)
		60	90		
V-1	EPY DPL-1	11.11	44.44	55.55	HS
V-2	EPY DPL-2	0.00	0	0	R
V-3	EPY DPL-3	0.00	0	0	R
V-4	BCA-4	0.00	0	0	R
V-5	NDB-9	55.55	77.77	133.32	HS
V-6	EPY DPL-4	66.66	88.88	155.54	HS
V-7	Gajendra	22.22	44.44	66.66	HS
V-8	EPY DPL-5	11.11	22.22	33.33	S
V-9	EPY DPL-6	22.22	33.33	55.55	HS
V-10	EPY DPL-7	11.11	22.22	33.33	S
V-11	EPY DPL-8	11.11	33.33	44.44	HS
V-12	EPY DPL-9	11.11	33.33	44.44	HS
V-13	EPY DPL-10	55.55	77.77	133.32	HS
V-14	EPY DPL-11	33.33	55.55	88.88	HS
V-15	EPY DPL-12	44.44	66.66	111.11	HS
V-16	EPY DPL-13	55.55	77.77	133.32	HS

Out of 16 varieties screened three varieties *viz.*, EFY DPL-2, EFY DPL-3 and BCA-4 were found resistant, two varieties *viz.*, EPY DPL-5, EPY DPL-7, were found susceptible and Eleven varieties *viz*., EPY DPL-1, EPY DPL-4,EPY DPL-6,EPY DPL-8, EPY DPL-9, Gajendra, NDB-9, EPY DPL-13, EPY DPL-10, EPY DPL-11, EPY DPL-12 were found highly susceptible.

Summary and Conclusion

In vivo screening of some cultivars of Elephant Foot Yam against *Sclerotium rolfsii* Sacc., revealed that EFY DPL-1, NDA-9, EFY DPL-4, Gajendra, EFY DPL-5, EFY DPL-6, EFY DPL-7, EFY DPL-8, EFY DPL-9, EFY DPL-10, EFY DPL-11, EFY DPL-12 and EFY DPL-13 exhibited collar rot symptoms, 2-3 months after planting.

Out of 16 varieties screened three varieties *viz.*, EFY DPL-2, EFY DPL-3 and BCA-4 were found resistant, two varieties *viz.*, EPY DPL-5, EPY DPL-7, were found susceptible and Eleven varieties *viz*., EPY DPL-1, EPY DPL-4, EPY DPL-6, EPY DPL-8, EPY DPL-9, Gajendra, NDB-9, EPY DPL-13, EPY DPL-10, EPY DPL-11, EPY DPL-12 were found highly susceptible.

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