Reprinted from "Journal of Plantation Crops," Vol. 1, (Nos. 1 & 2), 1973.

INFLORESCENCE BLIGHT OF CASHEW (*ANACARDIUM OCCIDENTALE* L.)

K. K. N. NAMBIAR, Y. R. SARMA, AND G. B. PILLAI

Central Plantation Crops Research Institute, Kasaragod 670 124, *Kerala, India.*

ABSTRACT

The role of tea mosquito, *Helopeltis antonii* Sign. (Miridae: Heteroptera) and the fungi (*Gloeosporium mangiferae* P. Henn., and another nonsporulating fungus) in inciting inflorescence blight in cashew, *Anacardium occidentale* L., was studied. It was found that tea mosquito is the primary causal agent of the malady and the fungi are only secondary saprophytic colonizers.

INTRODUCTION

INFLORESCENCE blight is one of the major problems in cashew, *Anacardium occidentale* L., as it results in heavy losses due to blossom blight and subsequent reduction in yields. Incidence upto 30% has been reported from the Cashew Research Station, Ullal, Karnataka (Anonymous, 1966). Swaine (1959) reported the damage caused by *Helopeltis anacardii* Miller to leaves and developing cashew fruits in Tanganyika. Studies carried out at ullal have shown that inflorescence blight was caused by *H. antonii* Sign. in association with *Gloeosporium mangiferae* P. Henn. and *Phomopsis anacardii* (Anonymous, 1960 and Anonymous, 1965). Attack by *H. antonii* has been reported to result in drying up of tender shoots and inflorescences (Abraham, 1958; Basu Choudhury, 1967). *Fusarium* sp. has been isolated from the affected portions of blighted cashew inflorescence in Tamil Nadu (Anonymous, 1972). Thus, a perusal of the available literature shows that though tea mosquito and certain fungi are implicated with the blight, their exact role in causation of the malady has not been clearly understood. Hence studies were undertaken to fill this lacuna, so that effective plant protection schedules could be developed against the malady.

MATERIALS AND METHODS

Isolation of the fungi was made on potato sucrose agar medium from affected inflorescences collected from the C.P.C.R.I., Regional Station, Vittal (Karnataka), C.P.C.R.I., Kasaragod (Kerala), and the Government Cashew Plantations, Periye (Kerala). Inflorescences *in situ* on trees, either injured by pinpricks or uninjured, were inoculated with fungi by spraying spore or mycelial suspensions with glass atomizer. Soon after inoculation, the inflorescences were covered with cylindrical cages of muslin cloth (Fig. I). Cages were kept moistened to ensure proper humidity inside. Young healthy inflorescences were caged and three adult bugs

FIG. 1. Inflorescences bagged with cylindrical cages of muslin cloth.

freshly collected from field were released into each of the cages. The bugs were removed 24 hours after caging. Aureofungin sol 100 ppm and endosulfan (Thiodan) 0·05% were used for the fungicidal and insecticidal sprays, respectively.

RESULTS

Results of the treatments are given in Table I. In treatment 1, minute water-soaked lesions were discernible on main rachis

and secondary rachii, 5–6 hours after caging the inflorescence with *H. antonii*. The lesions turned pinkish brown within 24 hours, enlarged up to 13 mm and turned scabby in 2–3 days' time (Fig. 2*a* and *b*). The adjoining lesions coalesced together to form bigger lesions. As a result of this, the affected inflorescence became dry and presented a scorched appearance. No difference in terms of damage was noticed between treatments 1 and 2. No lesions were noticed on the inflorescence in treatments 3, 4, 7 and 8. However, in treatment 4, minute brownish spots, which did not enlarge in size, appeared at the points of pin pricks. Treatment 5 showed typical symptoms of blight while in treatment 6 no symptoms were observed and the tea mosquitoes were dead. Under open conditions (Treatment 9) fungal isolations were obtained only from old scabby lesions and not from lesions in early stages. But under caged conditions, no fungus could be isolated even from older lesions except from treatment 2.

TABLE I

Incidence of inflorescence blight of cashew with tea mosquito and fungi. (Mean of 3 replications)

S. No.	Treatments	Total no. of inflorescences treated	Total no. of affected inflorescences
1.	Caging the inflorescence with *H. antonii* alone	20	20
2.	Caging the inflorescence with *H. antonii* after inoculating with fungus		
	(*a*) *G. mangiferae* ..	20	20
	(*b*) Nonsporulating fungus	20	20
3.	Inoculating with fungus alone		
	(*a*) *G. mangiferae* ..	20	0
	(*b*) Nonsporulating fungus	20	20
4.	Inoculation of injured inflorescences with fungus		
	(*a*) *G. mangiferae* ..	20	0
	(*b*) Nonsporulating fungus	20	0
5.	Caging fungicide treated inflorescence with *H. antonii*	10	10
6.	Caging insecticide treated inflorescence with *H. antonii*	20	0
7.	Control—Inflorescence caged ..	20	0
8.	Control—Injured inflorescence caged	20	0
9.	Control—Inflorescence uncaged	20	18

DISCUSSION

Typical blight symptoms were noticeable only in treatments where the inflorescences were caged with tea mosquito, *H. antonii*. Neither of the fungal isolates could induce symptoms of inflorescence blight by artificial inoculation. The fact that the fungi could be isolated only from old scabby lesions and not from small young lesions indicated that the fungi isolated from the blight affected inflorescence were only secondary saprophytic colonizers which are non-pathogenic. Working with *H. bergrothi* Reut., infesting mango, Leach (1945) found that "no organism

FIG. 2 (*a*). Healthy inflorescence.

FIG. 2 (*b*). Initial and advanced stages of the blight.

RP-2

has been seen or isolated from the freshly affected tissues, and, pieces of this tissue applied to the cut or uncut surface of the healthy young stems, leaves or fruit have not transmitted the disease". He also opined that a toxic substance is introduced through the insect stylets which diffuses into the host tissues. In the present study also, the scabby lesions and quick drying of inflorescence observed beyond the focus of insect injury suggest the possible involvement of some toxic principle present in the saliva of the insect. Further studies on this aspect may elucidate the biochemical changes underlying the symptom development of the malady.

Recommendations for the control of the malady included spraying of cuman (0·1%) in combination with Dimecron (0·03%) (Anonymous, 1966) or DDT 0·2% (Damodaran and Nair, 1969). The present study clearly shows that *H. antonii* is the primary causative agent of the blight and spraying with a suitable insecticide alone at the appropriate time will help in controlling the malady.

ACKNOWLEDGEMENTS

The authors are grateful to Shri K. V. Ahamed Bavappa, Director, and Shri M. C. Nambiar, Project Coordinator, for evincing keen interest in the work. Thanks are due to Dr. D. N. Srivastava, Asst. Director General, ICAR, New Delhi, and Dr. Y. P. Rao, IARI, New Delhi, for useful suggestions during the course of the investigations.

REFERENCES

ABRAHAM, E. V. 1958. Pests of cashew (*Anacardium occidentale* L.) in South India. *Indian J. Agri. Sci.* **28**: 531–544.

ANONYMOUS, 1960. *Report of Indian Council of Agricultural Research*, 1957–58, pp. 7–57.

ANONYMOUS, 1965. *Annual Progress Report of the Central Cashew Research Station, Ullal*, for the period of 1st July 1964 to 30th June 1965. pp. 45.

ANONYMOUS, 1966. *Ibid.*: for the period of 1st July 1965 to 30th June 1966. pp. 48.

ANONYMOUS, 1972. Annual News Bulletin for the year 1971–72. *Indian Forester* **98**: 715–781.

BASU CHOUDHURY, J. C. 1962. Preliminary investigations on the insect pests of cashew plantations in Kerala. *Indian Forester* 88: 516–522.

DAMODARAN, V. K. AND BALAKRISHNAN NAIR, M. P. 1969. Studies on the insecticidal control of *Helopeltis antonii* Sign. on cashew. *Agric. Res. J. Kerala* **7**: 28–30.

LEACH, R. 1945. Insect injury stimulating fungal attack on plants. A stem canker, an angular leaf spot, a fruit scab and a fruit rot of mango caused by *Helopeltis bergrothi* Reut. (Capsidae). *Ann. Appl. Biol.* **22**: 525–537.

SWAINE, G. 1959. A preliminary note on *Helopeltis* spp. damaging cashew in Tanganyika territory. *Bull. Ent. Res.* **50**: 171–181.