

## OCCURRENCE OF *FUSARIUM OXYSPORUM* SCHLECHT AND ITS PATHOGENICITY ON GUAVA SCALE *CHLOROPULVINARIA PSIDII* MASKELL (HEMIPTERA: COCCIDAE)

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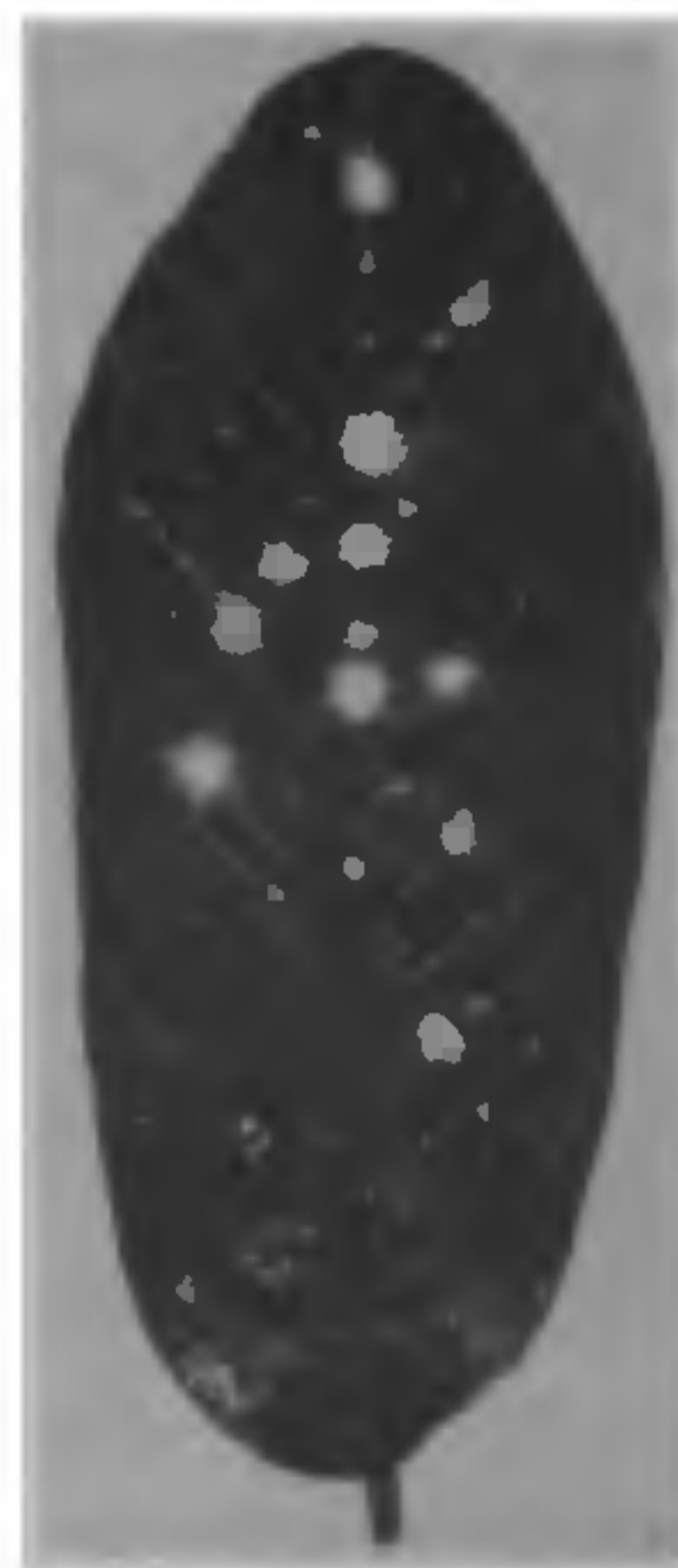
*CHLOROPULVINARIA PSIDII*, commonly called the guava soft scale, is one of the commonest scale insects in South India and is a serious pest on guava, mango and sapota. The insect infestation usually starts from April and remains till December. During a survey for entomopathogens on guava scales in the guava orchards located at this research farm, in July and August, 1987, fungal-infected dead and dried scale insects adhering on to the leaves and stems were observed. The infected scales were brought to the laboratory and kept in the moist chamber for mycelial growth and sporulation. White mycelial growth was noticed around the scale insects with profuse sporulation.

The fungal pathogen was isolated and grown in pure culture on Sabouraud dextrose agar medium, where it grew well and sporulated profusely at 25–28°C. Pathogenicity tests were conducted by spraying the aqueous spore suspension of the fungus at four different concentrations on the healthy scale insects. The fungus proved to be a virulent pathogen inflicting 100% mortality of the inoculated insects at  $4.8 \times 10^8$  spores/ml concentration after 3–5 days (table 1). However, decrease in percentage mortality and increase in incubation period were noticed with decrease in spore concentration. The fungal infected scales become hard and tough (figure 1) and produced white mycelial growth with profuse sporulation around the dead insects (figure 2).

The fungus was identified as *Fusarium oxysporum* Schlecht. and the material has been deposited, under

**Table 1** Results of pathogenicity tests with *Fusarium oxysporum* on *Chloropulvinaria psidii*

Treatments	No. of scales treated	No. of scales dead	Per cent mortality	Incubation period (days)
$4.8 \times 10^8$ spores/ml	58	58	100.00	3–5
$4.8 \times 10^7$ spores/ml	53	47	89.30	4–6
$4.8 \times 10^6$ spores/ml	55	44	80.00	4–7
$4.8 \times 10^5$ spores/ml	53	36	68.40	4–7
Control	55	—	00.00	—



**Figure 1.** *F. oxysporum* infected scale insects become hard and tough before mycelial growth.



**Figure 2.** White mycelial growth of the fungus around the dead insects.

No. IMI 318632. Though the occurrence of *F. oxysporum* has been reported on brown plant hopper, *Nilaparvata lugens*<sup>1</sup> and green horned caterpillar, *Melanitis leda ismene* Cramer<sup>2</sup> on rice, *Chloropulvi-*

*naria psidii*, it constitutes another new host for the above fungus.

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### CYCLIC NOCTURNAL OPENING AND ABCISSION OF NYCTANTHES FLOWERS WITH A NOTE ON VISITING THRIPS SPECIES

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*NYCTANTHES ARBOR-TRISTIS* (family Oleaceae) is a small, much branched tree that attains a height of about 5 m. A preliminary observation of the flowers showed that they are inhabited by several species of thrips. It was of interest to find out whether the thrips are casual visitors or have a specific role in pollination. There are several reports of pollination effected by thrips<sup>1-12</sup>.

Under Delhi conditions the plant is laden with flower buds and open flowers during October and November (observations made in the years 1985-1987). The first flowers appear at the tips of upper branches in the first week of September and

flowering progresses in a basipetal manner. The basal flowers mature and wither around the middle of December. Thus the main flowering period lasts for three months. Six trees growing in the college campus were selected for studying the possible role of thrips in pollination.

A fully opened flower is 2.5 cm in diameter. The inflorescence consists of a whorl of five flowers surrounded by a bract. The order of flower bud initiation was studied. For convenience, four stages of bud development were recognized on the basis of length. The measurements of various parts of four stages of buds are given in table 1.

The time taken for a bud to advance from one stage to the next was calculated in hours. It takes 48 h for a bud primordium to change to stage I and another 48 h are required for stage I bud to change to stage II. Stage II bud is transformed to stage III in another 24 h and finally stage IV bud is reached after 24 h. Stage IV bud is converted into a fully open flower the next day, i.e., after 24 h. Thus it takes seven days for a bud primordium to develop into a fully open flower. The plant blooms in the evening and spreads its fragrance. At this time the adult thrips migrate to open flower corolla from the neighbouring plants or from the soil as freshly emerged adults.

The exact time of flower opening was recorded daily during the entire flowering period. In September, October and beginning of November, the time of flower opening is between 18.00 h and 18.30 h. From mid-November to mid-December the time of opening of flowers is delayed by 3-4 h. The flowers abscise between 5.30 h and 6.30 h during October and November. However, by the end of November and December open flowers were observed to be intact even as late as 11.30 h.

To ascertain whether opening time is affected by

Table 1 Dimensions of buds\* (different stages)

Parameter	Stage I	Stage II	Stage III	Stage IV
	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.
Length of bud	7.00 ± 0.8	9.5 ± 0.5	12.00 ± 1.3	16.2 ± 1.3
Length of calyx	6.9 ± 3.08	6.7 ± 2.29	7.6 ± 3.39	7.5 ± 3.35
Length of corolla (petal)	4.3 ± 1.92	4.4 ± 1.96	6.2 ± 2.77	6.4 ± 2.82
Length of anther	1.981 ± 0.66	2.38 ± 1.06	2.6 ± 1.16	2.06 ± 0.92
Diameter of pollen grain	0.04 ± 0.02	0.05 ± 0.02	0.04 ± 0.02	0.065 ± 0.02
Diameter of ovary	1.104 ± 0.49	1.129 ± 0.5	1.125 ± 0.5	1.247 ± 0.55
Length of style	1.071 ± 0.48	1.31 ± 0.58	1.56 ± 0.69	2.2 ± 0.98
Diameter of stigma	0.51 ± 0.23	0.49 ± 0.22	0.69 ± 0.3	0.567 ± 0.25

\*Measurements in mm; Mean of 10 replicates with ± SE; SE = Standard Error.