

PAPAYA TREE (Carica papaya L.), A NEW HOST OF SYMPHYLAN

(Arthropoda, Symphyla)*

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ARAUJO (1) observed a termite Heterotermes tenuis (Hagen, 1858) under the semi-decaying stem of papaya tree, in the periphery of this stem and inside of superficial burrows of the adjacent soil at Novo Horizonte, State of São Paulo.

LORDELLO (5) verified heavy attack by root-knot nematode Meloidogyne javanica (Treub, 1855) Chitwood, 1949, in roots of papaya tree, collected at Piracicaba, State of São Paulo. To these principal soil pest of papaya tree, in Brazil, a symphylan Hansenella sp. is added.

For the first time in Brazil, LOUREIRO and GALVÃO (8) observed this symphylan as a pest of crops. This arthropod causes injuries to the coleoptiles and radicles of rice seedlings growing under sprinkler irrigation. As a consequence, emergence was reduced about 90 percent.

LOUREIRO and CRUZ FILHO (7) reported Hansenella sp. as pest of coffee roots, in nine counties of the southern zone of the State

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of Minas Gerais. Later on, LOUREIRO (6) described some symptoms of the roots of the coffee seedlings and plantings as old as 1 year old under field condition which were attacked by this symphytan.

Hansenella sp. as a soil borne pest of seed beds of rangpur lime (Citrus limonia Osbeck.), causing injuries to the seeds, coleoptiles and radicules was reported by LOUREIRO *et alii* (9).

On February 15, 1970, in the Department of Pomology of the Federal University of Viçosa, 237 seedlings of papaya tree, measuring about 10 to 15 cm. were planted at a spacing of 2 m. between plantings and 3 m. between rows, in a clayey soil, with a pH of 4.7, on a 23% slope. The objective was to use the forthcoming seedlings as a source of propagation material. Viçosa is situated at 20°45' Lat S., 42°51' Long W, in the Zona da Mata, the southeast part of the State of Minas Gerais, with an altitude about 600 to 700 m. above the sea level. The monthly temperature, rainfall and relative humidity, from February until November are presented in the table 1. As stated by MÉMORIA (10) the climate is BB'w according to Thornthwaite's classification and Cw according to Köppens's classification.

On October 1, 1970, the authors observed some plants which were retarded in their growth, with leaves turned light green or yellow and the apex of the plants smaller than normal. Examinations showed root systems to be scanty with the thin, surviving roots out or burrowed. Injuries so severe as to cause the stunting of papaya tree were attributed to Hansenella sp. (Scutigerellidae) which were observed under the thin roots or in the adjacent soil of the planting hole to a depth of about 75 cm.

A portion of the symphytan captured with entomological aspirator were preserved in liquid preservative and another portion is being maintained under laboratory condition in the Department of Zoology. The identification of Hansenella sp. was according to works of ATTEMS (2), BAGNALL (3) and EDWARDS (4).

On October 3, 1970, a study was begun in order to confirm that this arthropod was a serious, radicular pest of papaya. In this study 6 flint glass containers (capacity 900ml. and diameter 10 cm.) were filled with previously sterilized soil to within about 5cm. from the top, after which the soil was firmed. In each container, 30 seeds were spaced well apart on the firmed soil and then covered with 2.5 cm. of sterilized soil. Watering was done frequently enough to prevent the top 5cm. of soil from becoming dry, not so often that the soil became saturated. These jars remained under laboratory condition.

On October 29, 1970 the weaker seedlings in each container were removed leaving 10 in each jar having at least 4 leaves and over 5 cm. in height. Three containers were considered control and the other

TABLE 1 - The mean monthly temperature, rainfall and relative humidity from February until November, 1970, in Viçosa, State of Minas Gerais

	Mean Temperature C	Rainfall mm	Relative Humidity %
FEBRUARY	21.9	105.9	78.0
MARCH	21.9	47.3	80.0
APRIL	19.4	84.9	83.0
MAY	17.8	2.8	82.0
JUNE	16.6	12.1	83.0
JULY	15.6	12.0	79.0
AUGUST	16.9	42.7	74.0
SEPTEMBER	18.5	58.1	79.0
OCTOBER	19.7	191.2	82.0
NOVEMBER	20.1	221.2	81.0

3 received a lot of 25 Hanseniella sp. each. By November 12, 1970 more than 50 percent of the seedlings, in containers receiving symphytan, were dead (Figure 1) and 18 days later none remained alive. The first signs of the root attack appear on the leaves that wilt progressively. Subsequently the stem drops and falls prematurely. The seedlings are poor anchored in the soil and can be pushed over easily. These symptoms are also attributable to water deficiency, since the seedlings are unable to absorb it, as a result of the scanty root system (Figure 2).

On November 12, 1970, in the Department of Pomology, about 20 percent of the field plantings presented the following symptoms, which were attributed to symphyllans injuries:

- Height about 2/3 of the normal plantings (Figure 3 and 4)
- Mostly of the leaves were less than 1/2 as long as the leaves of the normal plantings (Figures 3, 4 and 5).
- The petioles were less than 1/2 as long as the normal ones (Figure 5)
- The lateral margins of the leaves rolled downward from the main vein (Figures 4, 5 and 6).
- Some leaves from top to the middle, became light green or yellowish in color.

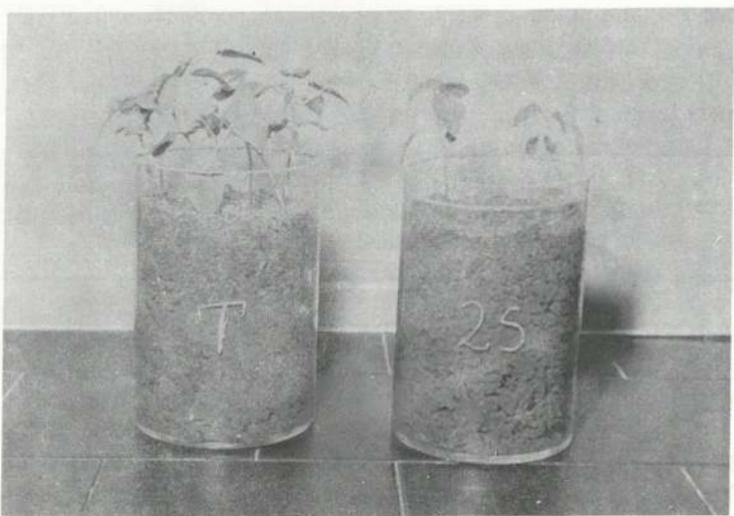


FIGURE 1 - Container holding 10 papaya seedlings considered control (T) and the infested jar, with a lot of 25 symphylan, showing less than 50% of the seedlings surviving. November 12, 1970.

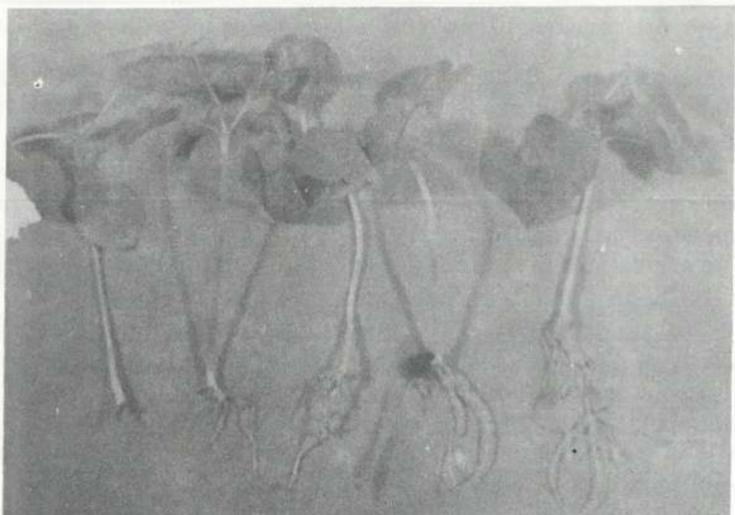


FIGURE 2 - On the right is a normal seedling from a control container. The 4 others from right to left, show the decreasing size of the root system. For this photograph the leaves were distended.



FIGURE 3 - Papaya trees growing under similar conditions. The infested one starts a downward slope of the lower petioles and the inferior leaves begins to roll downward the main veins and is shorter than the normal tree.

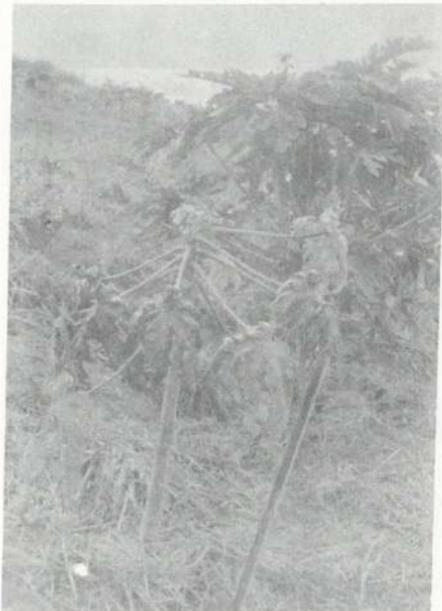


FIGURE 4 - Papaya tree growing under similar conditions. The infested one shows a downward slope of the petioles, the leaves rolled downward from the main veins and is shorter than the normal tree.

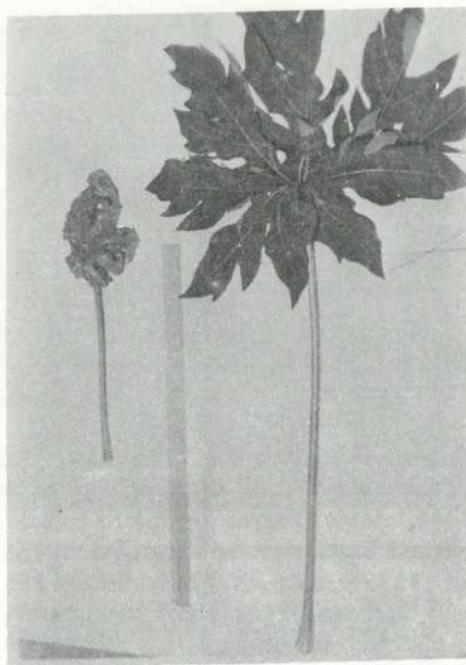


FIGURE 5 - The leaves and petioles of the infested papaya tree are less than half as long as the leaves and petioles of the normal planting.

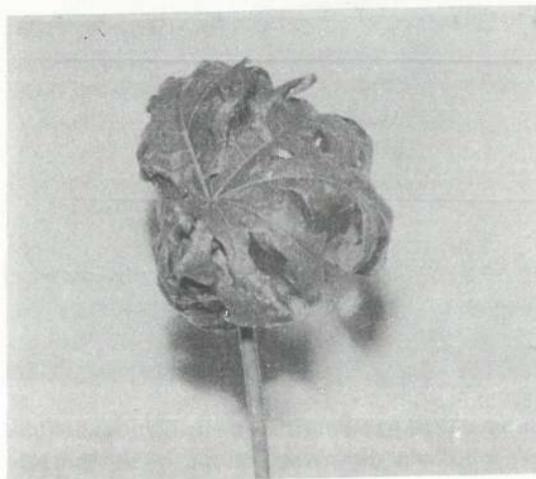


FIGURE 6 - The leaves of the heavily infested papaya tree wilted progressively and rolled downward from the midrib.

The symptoms described are also similar to these which develop due to lack of water and required nutritive elements.

Experiments are being carried out under field conditions, designed to investigate the effect of seven pesticides on Hansenella sp. These studies will be reported at a later time.

RESUMO

Hansenella sp. (Symphyla, Scutigerellidae) é registrada pela primeira vez no Brasil (Viçosa, Estado de Minas Gerais) como praga das raízes de mamoeiro (Carica papaya L.). Foram descritos os sintomas, resultantes do rizofagismo, em mudas mantidas em condições de laboratório e em culturas com sete meses de campo, onde todas as plantas examinadas estavam infestadas e 20% da cultura apresentava sintomas evidentes de sínfilose. Em ambos os casos, os sintomas são similares aos provenientes por deficiência de água e elementos nutritivos.

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ERRATA

Ceres, Vol. 18, Nº 96, pag. 134, Legenda da Figura 2; ler: "Quatro plantas da linhagem 775, submetidas a fotoperíodos de 14, 12, 10 e 8 horas (da esquerda para a direita)".