

SCIENTIFIC NOTES

INFECTION OF *MONONYCHELLUS TANAJOA* (ACARI: TETRANYCHIDAE) BY THE FUNGUS *NEOZYGITES* SP. (ENTOMOPHTHORALES) IN NORTHEASTERN BRAZILI. DELALIBERA JR.¹, D. R. SOSA GOMEZ², G. J. DE MORAES³,J. A. DE ALENCAR¹ AND W. FARIAS ARAUJO¹¹CPATSA/EMBRAPA, 56300 - Petrolina-PE, Brazil²CNPDS/EMBRAPA, 80001 - Londrina-PR, Brazil³CNPDA/EMBRAPA, 13820 - Jaguariuna- SP, Brazil

In 1988, an extensive survey was initiated in northeastern Brazil to look for prospective natural enemies for the control of the exotic cassava green mite, *Mononychellus tanajoa* (Bondar) in Africa (Moraes et al. 1990). In August 1988, a considerable number of cassava green mites infected with a fungus tentatively identified as *Neozygites* sp. was found in a cassava field in the central part of the state of Bahia. The identification of this fungus has not been completed because of unsettled taxonomic problems within the group (Humber et al. 1981). Voucher specimens were deposited at Centro Nacional de Pesquisa de Defesa da Agricultura (CNPDA) of Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), Jaguariuna, Sao Paulo, Brazil.

Infection of cassava green mite by *Neozygites* (= *Triplosporium*) species has been previously reported in Venezuela (Agudelo-Silva 1986) and Colombia (Alvarez Afanador 1990). Considering the potential of fungal pathogens as effective natural enemies of phytophagous mites (van der Geest 1985), further investigations were conducted to determine the distribution of *Neozygites* sp. within populations of the cassava green mite in northeastern Brazil.

Ninety-seven cassava fields, predominantly from 4 regions (eastern coastal strip, eastern Maranhao / western Piaui, southern Ceara / western Pernambuco and central Bahia), were surveyed. Those regions were chosen because of their similarities with areas where the cassava green mite is of major concern in Africa. Cassava green mites are normally present on cassava plants all year in northeastern Brazil, although their population levels vary with rainfall patterns. The survey was accomplished during intermittent missions conducted between February 1989 and June 1990. Sampling was done by randomly collecting 50 cassava leaves from each field. In the laboratory, any dead mites were collected from the leaves, mounted in Hoyer's medium and observed under a stereomicroscope at 400 magnification for the presence of *Neozygites* sp..

Cassava green mites were found in 82 of the 97 cassava fields surveyed. Of the fields with mites, about 84% contained up to 25, 9% contained 25 to 200, and 7% contained over 200 mites per leaf. *Neozygites*-infected cassava green mites were found in 41 fields, spread throughout the regions surveyed (Fig. 1). In some regions in Maranhao, part of Piaui and coastal areas of Rio Grande do Norte, Paraiba, Alagoas and Sergipe, cassava green mite populations were low when the survey was conducted, thus reducing the chances of finding *Neozygites* sp.. Therefore, the range of the fungus was probably underestimated in this study.

The predominant fungal reproductive structures found in infected hosts were primary conidia, secondary conidia and capilloconidia. A few mites containing resting spores were also found in 8 fields, all located between 5 and 13° S latitude. Resting spores were not found in *Neozygites* sp. associated with cassava green mite in Colombia (Alvarez Afanador 1990).

Almost 75% of the fields where *Neozygites* sp. was found were located in areas with average annual rainfall between 700 and 1300 mm (Hargreaves 1973). In several of those

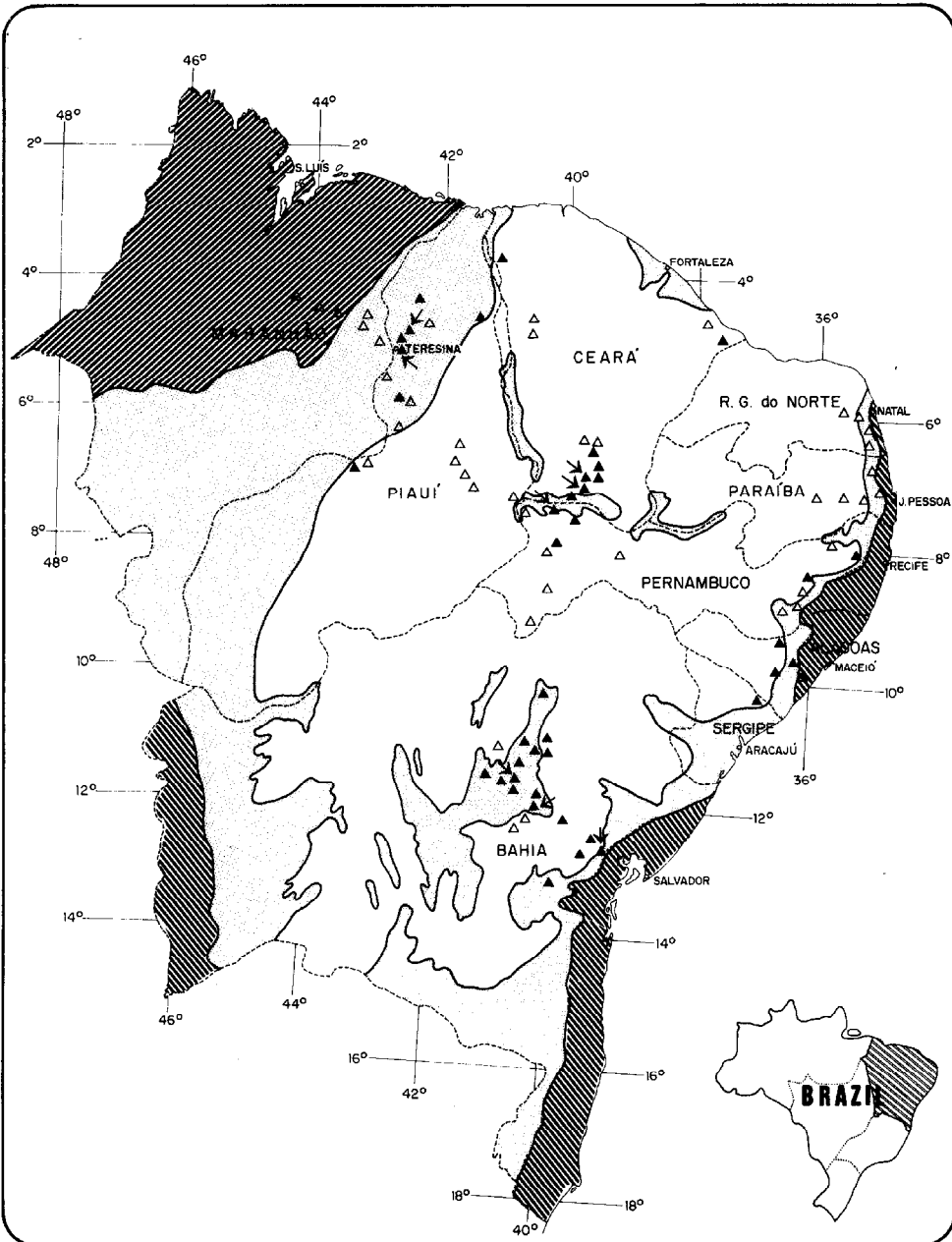


Fig. 1. *Neozygites* sp. infecting *Mononychellus tanajoa* (Bondar) in northeastern Brazil. Dark triangles indicate places where infection was observed; white triangles indicate places where *M. tanajoa* was found, but not infected; arrows indicate places where resting spores were found. White, dotted and hatched areas correspond to average annual precipitations of less than 700, 700-1300 and above 1300 mm, respectively (after Golfari & Caser 1976).

fields the last rainfall had occurred a month or more before the survey. The approximate boundaries of regions with those levels of precipitation are indicated in Figure 1 (Golfari & Caser 1976). The region with the lowest rainfall in which *Neozygites* was found is Ouricuri, in the state of Pernambuco, with average annual precipitation of 640 mm

(Hargreaves 1973). Of the 5 fields harboring high populations of the cassava green mite (over 200 mites per leaf), 4 were located in areas with average annual rainfall lower than 750 mm. No *Neozygites* sp. infection was detected in those fields. Repeated surveys at different times of the year in the arid interior of the state of Pernambuco, where the average annual rainfall is lower than 500 mm, have not detected infection of cassava green mites by *Neozygites* sp., despite the high incidence of the mite. A *Neozygites* species was reported by Humber et al. (1981) infecting *Tetranychus evansi* Baker & Pritchard on irrigated tomatoes grown in Petrolina, Pernambuco, where the average annual precipitation is about 400 mm.

Considering the widespread occurrence of *Neozygites* sp. in northeastern Brazil and in other regions in South America, studies to determine strain variability in relation to pathogenicity seem to be the logical next step in the effort towards the possible use of this pathogen for biological control of the cassava green mite.

We are thankful to Dr. R. A. Humber, USDA, Agricultural Research Service, Ithaca, New York, for the identification of the fungus. This project was supported by the EMBRAPA /IITA (International Institute of Tropical Agriculture) agreement.

REFERENCES CITED

- AGUDELO-SILVA, P. 1986. A species of *Triplosporium* (Zygomycetes: Entomophthorales) infecting *Mononychellus progressivus* (Acari: Tetranychidae) in Venezuela. Florida Entomol. 69: 444-446.
- ALVAREZ AFANADOR, J. M. 1990. Estudios de patogenicidad de un hongo asociado con *Tetranychus urticae* Koch y *Mononychellus tanajoa* (Bondar), acaros plaga de la yuca *Manihot esculenta* Crantz. Undergrad. thesis submitted to Univ. Nac. de Bogota, Colombia, Facultad de Agronomia, 113 p.
- DE MORAES, G. J., J. A. DE ALENCAR, F. WENZEL NETO, AND S. M. R. MERGULHAO. 1990. Explorations for natural enemies of the cassava green mite in Brazil, pp. 351-353 in Howeler, R. H. [ed.], Proceedings of the Eighth Symposium International Society of Tropical Root Crops. Bangkok, Thailand, Oct. 30 - Nov. 5, 1988.
- GOLFARI, L., AND R. L. CASER. 1976. Zoneamento Ecologico da Regiao Nordeste para Experimentacao Florestal. PRODEPEF. PNUD/FAO/IBDF/BRA-45. Centro Pesq. Florestal da Regiao do Cerrado. Belo Horizonte. Serie Tecnica 10: 116 p.
- HARGREAVES, G. H. 1973. Monthly precipitation probabilities for northeastern Brazil. Department of Agricultural and Irrigation Engineering, Utah State University. Contract AID/csd 2167. 423 p.
- HUMBER, R. A., G. J. DE MORAES, AND J. M. DOS SANTOS. 1981. Natural infection of *Tetranychus evansi* (Acarina: Tetranychidae) by a *Triplosporium* sp. (Zygomycetes: Entomophthorales) in northeastern Brazil. Entomophaga 26: 421-425.
- VAN DER GEEST, L. P. S. 1985. Pathogens of spider mites, pp. 247-257 in Helle, W. and M. W. Sabelis [eds.], World crop pests. Spider mites. Their biology, natural enemies and control. Vol. 1B.