

## Establishment of the Exotic Mite *Orthogalumna terebrantis* Wallwork on water Hyacinth in Bangalore, India

K.P. JAYANTH and P.N. GANGA VISALAKSHY

Division of Entomology and Nematology, Indian Institute of Horticultural Research, Bangalore 560 089

Water hyacinth (*Eichhornia crassipes*) is the most serious among the 140 species of aquatic weeds recorded in India (Gupta 1979). For biological control trials against this weed, the oribatid mite *Orthogalumna terebrantis* Wallwork (Acarina : Galumnidae) was introduced from U.S.A. in March 1982 along with two weevils *Neochetina eichhorniae* Warner and *N. bruchi* Hustache (Coleoptera : Curculionidae). Releases of *N. eichhorniae* have already brought about successful control of water hyacinth under field conditions in Bangalore (Jayanth, 1987, 1988) and encouraging results have been obtained with *N. bruchi* also.

*O. terebrantis* is native to South America and also occurs in Florida and Louisiana in the United States (Cordo and De Loach, 1976). Host-specificity tests with the mite, obtained from Florida, under quarantine conditions in Bangalore confirmed its safety to cultivated crops in India (Jayanth and Nagarkatti, 1987). Permission of the Plant Protection Adviser to Government of India was obtained in November 1985 for conducting field trials with *O. terebrantis*.

*O. terebrantis* was mass multiplied by releasing adults on water hyacinth plants placed in 120 x 60 cm plastic fishing pools filled with water. Field releases were carried out during September 1986 in a 20 ha water hyacinth infested tank at Agram in Bangalore, in which *N. bruchi* was released in 1984. At the time of releases, *N. bruchi* had brought about a 50 per cent reduction in weed cover and all the available plants were infested by the weevil. This tank was selected for releases as earlier reports had indicated that a synergistic relationship existed between the weevils and the mite (Del Fosse, 1978). A total of 5000 adults of *O. terebrantis* were released at different spots on water hyacinth in the tank. Observations on establishment and dispersal of the mite were taken at intervals of two months.

The first signs of establishment of *O. terebrantis* in the Agram tank, as evidenced by gallery formation on water hyacinth laminae, was noticed in December 1986. Initially mites were present only in a few patches of water hyacinth in the weed mass. At these sites, upto 100 galleries could be observed on the peripheral leaves of each plant. By March 1987, the mites were present on 25 per cent of the plants in the tank. However, the population of water hyacinth was under stress due to the action of *N. bruchi*. As a result, the weed cover was reduced by about 90 per cent by September 1987. Subsequently an increase in the population of *O. terebrantis* was noticed.

Observations in October 1987 revealed that *O. terebrantis* was present throughout the tank. Adult mites were found congregated on the young central leaves where they oviposited, and galleries were present on the older leaves. The number of galleries per leaf varied between 1722 and 3650 ( $\bar{X} = 2828.5$ ) and 25-60 galleries ( $\bar{X} = 46.9$ ) were present per sq.cm of leaf area.

The presence of large number of galleries brought about browning of water hyacinth leaves. However, the effect of this browning on plant growth and multiplication could not be estimated as the plants were already under stress due to the severe attack by *N. bruchi*. Earlier reports had indicated that 10,000 galleries of *O. terebrantis* per plant caused serious damage to water hyacinth under field conditions, but such damage was sporadic and confined to small areas (Cordo and De Loach, 1976). However, combination of the mite with the weevils has been reported to reduce size and density of water hyacinth. In addition, *O. terebrantis* is also reported to open water hyacinth to increased attack by phytopathogens like *Acremonium zonatum* (Saw.) Gams. and saprophytes (Del Fosse, 1978). Hence, release of *O. terebrantis* along with *N. eichhorniae* and *N. bruchi* is recommended as it is likely to increase the stress load on the weed and improve the overall control of water hyacinth.

## ACKNOWLEDGEMENTS

The authors are grateful to the Director, Indian Institute of Horticultural Research, Bangalore for the encouragement given and to Mr. N. Chandrasekhar for technical assistance.

KEY WORDS : *Orthogalumna terebrantis*, water hyacinth, field establishment

## REFERENCES

- Cordo, H.A. and De Loach, C.J. 1976. Biology of the water hyacinth mite in Argentina. *Weed Sci.*, 24, 245-249.
- Del Fosse, E.S. 1978. Effect on water hyacinth of *Neochetina eichhorniae* (Col. : Curculionidae) combined with *Or-*

- thogalumna terebrantis* (Acari. : Galumnidae). *Entomophaga*, 23, 379-387.
- Gupta, O.P. 1979. *Aquatic weeds*. Today and tomorrow Printers and Publishers, New Delhi 272 pp.
- Jayanth, K.P. 1987. Suppression of water hyacinth by the exotic insect *Neochetina eichhorniae* in Bangalore India. *Curr. Sci.*, 56, 494.
- Jayanth, K.P. 1988. Successful biological control of water hyacinth (*Eichhornia crassipes*) by *Neochetina eichhorniae* (Coleoptera : Curculionidae) in Bangalore, India. *Trop. Pest Mgmt.*, (In press).
- Jayanth, K.P. and Nagarkatti, S. 1987. Host specificity of *Orthogalumna terebrantis* Wallwork (Acarina : Galumnidae) introduced for biological control of water hyacinth in India. Paper presented at the 1st National Seminar on Biological Control, 29 June to 2 July 1987, Gujarat Agricultural University, Anand.