

## Research Communication

**Record of the brown slug, *Mariella dussumieri* Gray, 1855 (Gastropoda: Ariophantidae) in marigold (*Tagetes* sp.)***S. Onkara Naik, M. Jayashankar, V. Sridhar and A. K. Chakravarthy\**

Division of Entomology and Nematology, Indian Institute of Horticultural Research, Hessaraghatta Lake Post, Bengaluru – 5600 89, Karnataka, India

\*E-mail: chakravarthyakshay@gmail.com

Malacofauna have increasingly drawn attention of pest managers in recent times due to their emergence as agricultural pests (Barker, 2002). Snails and slugs as pests on ornamental and agricultural crops have been reported in Bengaluru and Kolar, South India (Jayashankar *et al.*, 2010; Sridhar *et al.*, 2012). The brown slug, *Mariella dussumieri* Gray, 1855 (Gastropoda: Ariophantidae) is reported feeding voraciously on the succulent buds and leaves of vanilla plants in the Western Ghats (Mavinkurve *et al.*, 2004). It is reported to be pestiferous on coffee in South India (Bhat and Shamanna, 1972), young rubber plants, green and wing beans in Sri Lanka (Naggs *et al.*, 2003), areca palms at Kasargod, Kerala (CPCRI, 2007), *Hibiscus rosa-sinensis*, *Anthurium andraeanum*, *Piper nigrum*, *Theobroma cacao* and *Musa* sp. in Dakshina Kannada, Karnataka (Daniel and Vanavasan, 2009). Incidence of *M. dussumieri* inflicting damage to Marigold (*Tagetes* sp.) var. RR Gold, was recorded in Puttaswamayyana Palya, Tumkur district (13° 20' N, 77° 6' E), Karnataka during *rabi* 2013. Observations on pests of marigold were recorded on 45 DAT and 60 DAT on 60 randomly selected plants.

The incidence was observed for the second year and a two fold increase in the density of slugs with damage to crops was observed. Feeding damage up to 30% loss was recorded in young plants (n=60 plants) in 2013 compared to 15 % loss (n=60 plants) observed during 2012. Feeding by slugs on buds, flowers, growing shoot tips and foliage was recorded (Fig.1 & 2). The mucus secreted by slug crawling on apical shoots had dried forming a silvery slime, distinguishing from insect damage and this unsightly slime trails reduced marketability of flowers. Slugs continued to be active at night and on cloudy, rainy days. During day, they descended to soil surface and shaded, resting locations mainly around the crevice of the supporting Eucalyptus stakes to avoid heat and bright light (Fig. 3). The dependence of land pulmonates on a moist environment is greater in slugs than snails; since the latter derive a certain amount of protection from their shell. Slugs enter a period of suspended activity during unfavourable conditions and reappear with the onset of favourable conditions (rainfall and sustained moisture), causing resurgence of the slugs in the following seasons as well. Interaction with farmers revealed that slug infestation in the area was due to the nursery material. Hence, inspection of the source of

nursery seedlings 4 km from the village was undertaken. The slugs were detected congregating in damp microhabitats under polythene covers and corners of the nursery beds with debris. Egg masses (Fig. 4) were also detected indicating the favorable condition for the slug's persistence. Ten adults were collected and transferred in a plastic tub (diameter=0.8 cm) along with soil and plant material to the laboratory to

undertake morphometric measurements using Absolute Digimatic Calipers. Mean  $\pm$  Standard error of total length, width, mantle length was found to be  $39.57 \pm 1.99$ ,  $9.46 \pm 0.34$  and  $14.48 \pm 2.37$  mm, respectively. A positive correlation between total length with width ( $r=+0.56$ ), mantle length (0.06) and width with mantle length (0.11) was recorded.

**Table 1: Incidence of the three pests (mean number  $\pm$  S.D/Plant) during first and second visits**

Pest species	First visit (45 DAT)	Second visit (60 DAT)
<i>Mariella dussumeri</i>	1.47 $\pm$ 0.72	0.20 $\pm$ 0.40
<i>Spodoptera litura</i>	0.27 $\pm$ 0.44	1.47 $\pm$ 0.62
<i>Helicoverpa armigera</i>	0.13 $\pm$ 0.34	0.20 $\pm$ 0.40

Application of lanate powder (Methomyl) (90 SP, 1g/L of water) minimized the incidence and damage incurred by slugs. However, during the second visit (60 DAT) incidence of *Spodoptera litura* Fab. and *Helicoverpa armigera* Hub larvae feeding on marigold head was higher compared to *M.dussumeri*. Slug infestations decreased by 68 % while the incidence of *S. litura* and *H .armigera* increased by 64 % and 4 % respectively (Table 1). A Wilcoxon Signed Ranks test showed statistically significant change in the incidence of *M. dussumeri* ( $z= -6.550$ ,  $p=0.00$ ) and *S. litura* ( $z= -6.555$ ,  $p=0.00$ ) but non-significant with the incidence of *H. armigera* ( $z= -1.155$ ,  $p=0.248$ ) between the two visits. Incidence of *M. dussumeri* on Marigold is reported for the first time in this

article. The slug is an endemic species suited to Indian weather conditions and its report as pest in new areas needs tightening of domestic quarantine measures. Earlier, reports of the giant African snail, *Achatina fulica* (Bowdich), indicated accidental passage of the former through horticultural goods in Bangalore (Veeresh *et al.*, 1979) and Kolar (Sridhar *et al.*, 2012). Most terrestrial snails and slugs are not pests; they either feed on algae/fungi or act as predators. However, there are several species that are pests and require management. Since, nurseries of ornamental plants are major source points and increasing ornamental culture in peri-urban areas, careful monitoring of pest spread needs to be undertaken.



Fig.1: *Mariella dussumieri* creeping on leaf



Fig.2: Slug damage on pedicel



Fig. 3: Slug retreating cum refuge spot



Fig.4: Egg mass of the slug

## REFERENCES

Barker, G. M. 2002. Preface. In: Barker G.M (ed.), Mollusc as crop pests. *CABI Publishing, Wallingford*, 55-114.

Bhat, K. P and Shamanna, H.V. 1972. *Mariella dussumieri*- a new pest of coffee in South India. *J. Coffee Res.*, 2 (4) : 28-29.

CPCRI. 2007. Annual Report 2006-07, Central Plantation Crops Research Institute, Kasaragod - 671 124, Kerala, India, 124 p.

Daniel, M. and Vanavasan, N. K . 2009. The slug, *Mariaella dussumieri* Gray - an

economically important pest of arecanut palms. *Journal of Plantation Crops*, 37(1):88-90.

Jayashankar, M.,Veeresh G.K., Rajagopal D and Reddy, M.S. 2010. Evaluation of management strategies of the global pest, giant African snail *Achatina fulica* (Bowdich). *Proc. Intl. Conf. Env. Agriculture and Food Security in India*,180-186.

Mavinkurve, R. G., Shanbhag S. P. and Madhyastha N. A., 2004. Checklist of terrestrial gastropods of Karnataka, India. *Zoos' Print Journal*, 19(11):1684-1686.

Naggs, F., Raheem, D. C., Mohan, P. B., Grimm, B., Ranawana, K. B., Kumburegama, N. B. S. 2003. Ancient relicts and contemporary exotics: Faunal changes and survivorship in Srilanka's Snail fauna. Slugs and Snails: Agricultural, Veterinary and Environmental perspectives. 2003 BCPC Symposium Proceedings No. 80:103-108

Sridhar, V., M. Jayashankar., L. S. Vinesh and Verghese, A. 2012. Severe occurrence of the giant African snail, *Achatina fulica* (Bowdich)

(Stylommatophora: Achatinidae) in Kolar District, Karnataka. *Pest Management in Horticultural Ecosystems*, 18 (2):228-230.

Veeresh, G. K., Rajagopal, D. and Puttarudraiah, M. 1979. First record of African giant snail, *Achatina fulica* (Bowdich) (Mollusca: Gastropoda) as a serious pest of ornamental crops in Bangalore. *Current Research*, 8: 202-20.

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