



# The slug *Mariaella dussumieri* Gray - an economically important pest of arecanut palms

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Slugs, which belong to the Phylum Mollusca along with the shelled snails, are important pests of plants. They damage tender parts of plants by rasping away the surface tissues. Adults can chew holes in leaves and flower buds. Slugs prefer damp conditions and rotting humus. They damage plants of economic importance like beans, barley, maize, rice, potatoes, strawberries, soybeans, and ornamental plants in many countries (Dussart, 1989; Byers and Calvin, 1994). In India, Gangwar (1992) reported *Girasia hookeri* Gray from the medium altitude hills in Meghalaya causing damage to cabbage. Tandon *et al.* (1975) had reported *Mariaella dussumieri* Gray from Bangalore as damaging potted cabbage plants by scraping the epidermis of leaves and biting holes. Slugs and snails are most important non-insect pests of rubber trees. The common species of slugs that damage rubber in India are *M. dussumieri* and *Semperula maculata* (Templeton) (Jayarathnam and Rajendran, 1979). They rasp the tender terminal and axillary buds and feed on latex that oozes out from the wound. On mature rubber trees, in addition to this damage, they feed on the latex from tapped trees and cross over the trapping cut, contaminating the latex while moving to hiding places (RRII, 1980).

The slug, *M. dussumieri* (Class: Gastropoda, Order: Stylommatophora, Family: Ariophantidae) (Fig 1.) is considered as an indirect pest of arecanut palms as the damage caused by them on the spathes of spadices can be a predisposing factor leading to the infestation by the spadix moth, *Tirathaba mundella* Walk. (Lepidoptera: Pyralidae). These are found to feed mainly on the tender spathe covering and little on the inner tissues of the spadix. The feeding sites facilitate the entry of *T.mundella* caterpillars into the spadices. The highest incidence of

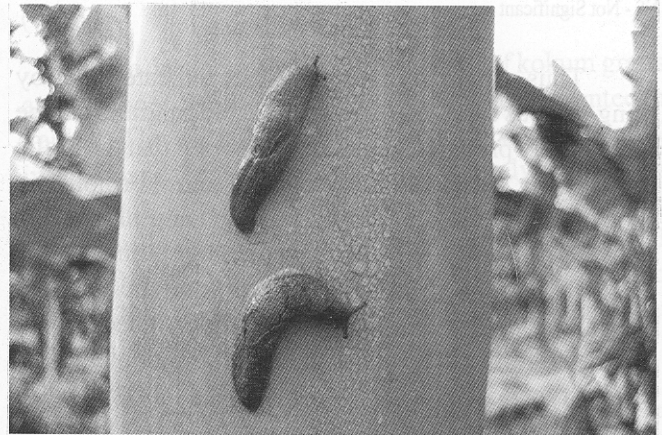


Fig. 1. *M. dussumieri* on the tender trunk portion of *A. catechu*

*T.mundella* and slug is noticed during October and the lowest during April. The incidence of inflorescence caterpillar in arecanut plantations usually ranges between 0.5 to 4.1 per cent and that of slug between 0.5 to 3.5 per cent. A positive correlation ( $r=0.55$ ) exists between the incidence of *T. mundella* and the slug *M. dussumieri* on arecanut palms (CPCRI, 1982).

In recent times, there were reports of slugs causing severe damage to tender spadices of arecanut palms. Based on these reports, field observations were carried out in the last few years on the incidence and damage by *M.dussumieri* on the palms and also on other plants that are grown in and around these plantations, mainly in Dakshina Kannada district of Karnataka.

Arecanut plantations in different parts of Karnataka were surveyed at random. In a plot with severe incidence of slug, all the palms were checked for damage including counting the number of spadices present and damaged spadices. Observations were also taken on the

nature of damage caused by the slug to arecanut palms and to other plants in the locality.

Observations in the main arecanut growing districts of Karnataka had indicated that the population of *M.dussumieri* was more in Karkala, Moodubidri, Nellyyadi, Puttur, Sullia, Sampaje and Vittal of Dakshina Kannada; Madikeri areas of Kodagu, Sringeri and Balehonnur areas of Chikmagalur and Thirthahalli and Sagara areas of Shimoga. Feeding and damage by this slug to spadices of palms was more in Karkala, Moodubidri, Nellyyadi and Sagara. Slug population was more in plantations adjoining forests and rubber plantations. Population of *M. dussumieri* started building up during the wet months of the year, after the initiation of the South West monsoon rains in May/June and continued till February. Heavy morning dew during December to February months also favoured their abundance in arecanut plantations. The slugs were found hiding during day time in cooler areas of the host palm i.e., the inner surface of leaf sheaths of mature fronds, behind the spadices, inside the shed spathes left in the plots, and even inside the leaves tied around the stems of palms as protection against sun scorch and also in the shaded cool areas of the garden. The moist environment of irrigated arecanut plantations also gave refuge for the slugs throughout the year. Where pepper vines were trailed on arecanut palms, slugs were found hiding beneath the new leaves and shoots of pepper plants. An indication of the activity of slugs was the shining slime tracts seen in the morning hours on the trunk of palms, on any smooth surfaces on the roads and other tracts of the areas where the slugs have moved. This was formed by the colourless mucous produced by the slugs to move and free itself from any hindrance. The watch-spring like faecal matter left on leaf lamina of arecanut palm, pepper, and cocoa was also a sure sign of their presence in the habitat.

*M.dussumieri* was found feeding mainly on the tender spathes and tender parts of the spadices of arecanut palm feeding from the attached side of the spadix. Feeding on very tender spadices resulted in their weakening and cessation of further growth. Occasionally, severe damage to spadices was seen in some plantations resulting in total loss of yield. In one such plantation of about 500 young arecanut palms, out of the 157 spadices present in 32 palms, 96 (61.2%) were severely damaged. This plantation was newly raised (four to five year old palms, flowering for the last two years) and was bordered on one side by bushy shrubs and trees. The population of *M.dussumieri* was abundant in this plot and the feeding resulted in the

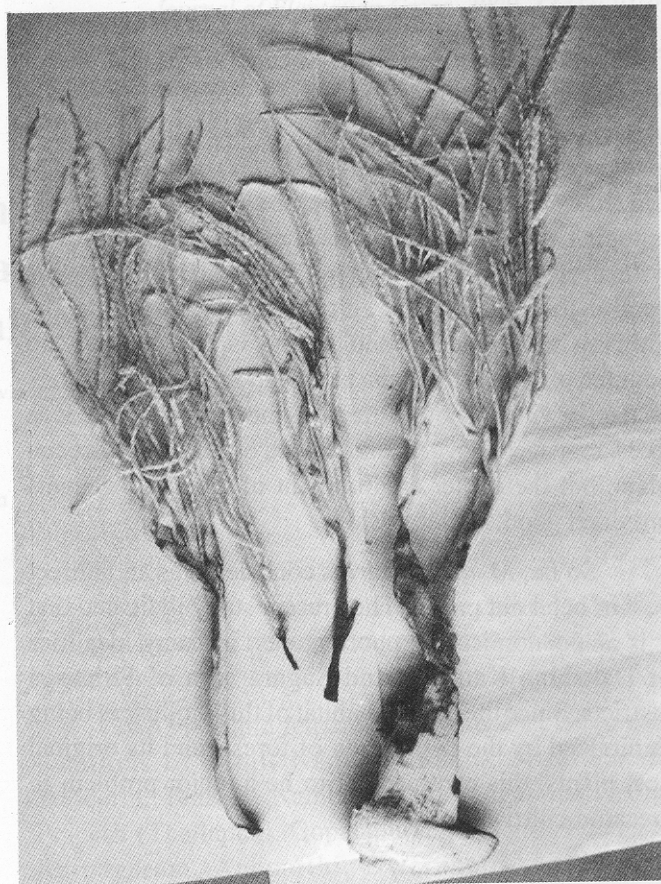


Fig. 2. Damage by *M. dussumieri* on tender inflorescence of *A. catechu*

complete destruction of spadices (Fig. 2). The slugs, while feeding on the main rachillae of spadices, severed them from the stem, making them weak and hanging down. Very tender female flowers were also eaten away in this case. The spadices did not develop further since the nutrient supply was cut due to the meandering feeding by the slugs. Ragged holes also were seen on the spadix surface. There was no incidence of the inflorescence caterpillar in this case. This indicated that *M.dussumieri* can cause direct damage to arecanut palms. This is the first report of *M.dussumieri* as a primary pest of arecanut palm.

Adults of *M.dussumieri* measured about 4.3 to 6.0 cm in length and 1.0 to 1.3 cm in width. Though the slug damage was present on arecanut palms throughout the year, the incidence was more in the months of August - February. The least activity and damage were seen from March to May. The slugs are active during night hours, and they stopped feeding once the day temperature went up. The retreating slugs could be seen in the morning hours before they hide in damp, cooler areas. The number of slugs hiding in the loose-leaf sheaths or between the stem and spadix during the day time ranged from one to six or more in areas of its abundance.

Other host plants of this slug noticed during the field studies included other species of palms, many ornamentals including succulents. Spadices of *Areca triandra* Roxb., flower buds of *Hibiscus* spp. and the bracts and buds of anthurium, *Anthurium andreanum* Linden were also damaged by these slugs. When multiple cropping systems were practised in arecanut plantations with crops like black pepper, banana, and cocoa as combination crops, this slug was seen damaging the growing buds of pepper and banana. Upto 20 slugs were counted on a single banana plant and more than 10 slugs on pepper vines. Though the slugs moved freely on cocoa trees, they were never found to feed on any part of cocoa plant, but the cooler environment of cropping systems provided good shelter to slugs.

So far, *M. dussumieri* is considered as an indirect pest of betel nut palms. The present study indicated that it is an economically important pest in many localities of Dakshina Kannada and Sagara area of Shimoga districts. Since the natural habitat of this mollusc is being minimized by the destruction of forests and its original host plants, this can turn out to be a major problem in arecanut cultivation.

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CPCRI, Regional Station, Vittal- 574 243  
Dakshina Kannada, Karnataka

Mariamma Daniel\*,  
N.K. Vanavasn\*\*

\* Corresponding author [mdvtl@yahoo.co.in](mailto:mdvtl@yahoo.co.in)

\*\* Research Scholar, Entomology Section, CPCRI, Regional Station, Vittal