



Report of *Sastroides besucheti* Medvedev (Coleoptera: Chrysomelidae) on Malabar nutmeg

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ABSTRACT: Massive infestation of *Sastroides besucheti* Medvedev (Coleoptera: Chrysomelidae), is reported on Malabar nutmeg *Myristica malabarica* Lam.(Myristicaceae), endemic to south India. All the 25 trees in the study area were infested; however, the intensity was lesser on male plants. Eggs, larvae, prepupae and pupae were observed. Pattern of egg laying, feeding habit of grubs and site of pupation were recorded. Infested female trees shed more than 70 per cent of the leaves and the branches dried up from tip downwards. Survival and regeneration of heavily infested female trees are doubtful. This is the first report of *S. besucheti* on *M. malabarica*.

KEY WORDS: Infestation, biology, native host, Western Ghats, India

The pantropical family Myristicaceae in India is represented by 20 species in five genera (Banik *et al.*, 2017; Govind *et al.*, 2020; Govind and Dan, 2020). The genus *Myristica* Gronov. comprises six species in India, including the introduced *M. fragrans* Houtt., the nutmeg of commerce (Banik *et al.*, 2017; Govind *et al.*, 2020). Of the six species of *Myristica* found in India, all except *M. andamanica* Hook., occur in south India. All the four native species in the mainland India *viz.* *M. beddomei* King, *M. magnifica* Beddome, *M. malabarica* Lamarck and *M. trobogarii* Govind & Dan are endemic to south India (Nayar *et al.*, 2014; Banik *et al.*, 2017; Govind *et al.*, 2020).

Myristica malabarica, commonly called Malabar nutmeg, false nutmeg or Bombay nutmeg, is an evergreen tree reaching a height of 25 – 30 m. Its seeds are harvested from the wild and are used as an adulterant of nutmeg of commerce (Khare,

2007). In homesteads, farmers retain stray plants as they yield seeds and aril, which is a source of additional income. The plant is placed in the IUCN Red List as ‘vulnerable’.

The leaf beetle *Sastroides besucheti* (Coleoptera, Chrysomelidae) was described by Medvedev (1999) based on 15 specimens collected at Periyar in Idukki District in Kerala. Prathapan and Balan (2016) reported *S. besucheti* as a pest of nutmeg, *M. fragrans* for the first time, from the same district. They observed heavy leaf shedding and drying up of branches, however, no immature stage of the beetle was observed. They also commented that nutmeg being an introduced plant; it is most likely that the beetle has other native plants as hosts.

Massive infestation of *S. besucheti* on *M. malabarica* was observed in Kootakkal, Kamakshi Panchayath, Idukki District, Kerala (N 9° 49' 26",

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E 77° 02' 20"). The infestation was noticed in a farm of nearly 15 acres. Main crops were cardamom, nutmeg, banana, mango, citrus, jack as well as a few subtropical fruit trees. Twenty five Malabar nutmeg trees (four 16-year old and twenty one 12-year old) were present in the field and they were widely spaced. Among the 25 trees in the study area, only two were male plants. Field visits were carried out on 10 and 28 July and 8 August, 2021 and the nature of damage and immature stages of the pest were observed.

At the time of our first observation on 10 July, 2021, several thousands of beetles were seen feeding on the leaves. The beetles were not active but had a tendency to move to the nearby plants when disturbed. All Malabar nutmeg trees were infested, however, the intensity was low on the two male plants. During our first observation, adults alone were seen feeding on the leaves by scraping the green matter, leaving characteristic scars (Fig. 6). Feeding scars were also seen on the tender stem. Almost all the beetles were in copula during the initial observation (Fig. 1). During the second visit on 28 July, 2021, 17 days after the first observation, adult population was reduced to about one tenth of the earlier, and they were not in copula (Fig. 2). However, immature stages such as eggs and larvae of various instars were observed. The number of egg masses on male trees was lesser than those on the females. The population of grubs was very high on each tree and all larval instars were observed feeding by scraping the green matter of the leaves. On 8 August 2021, 28 days after the first visit, the adult beetles had vanished, however, grubs of all instars were seen feeding on the remaining 10 % of the green leaves. Thousands of final instar grubs, which had stopped feeding, were also noticed in groups on the soil surface as well as on the nearby walls. Hundreds of quiescent grubs, in the prepupal stage were seen in soil (Fig. 12).

Plenty of egg masses were observed on the abaxial surface of leaves. A characteristic pattern of egg laying was noticed on the leaves. Round, creamy white eggs were closely packed. The egg masses were mostly attached to the side of the midrib and were covered with frass (Figs. 9 and 10). Frass

covering of the fresh egg masses were wood colored and later turned to black. Number of eggs per clutch was 12 - 16. In the heavily infested trees, 70% of the leaves had more than one egg mass on its abaxial surface.

First instar grubs were nearly 1.5 mm in length and started scraping the green matter on the adaxial surface of the leaves, soon after emergence. They were flat and remained in the feeding area in thickly packed aggregations. They continued feeding till the green matter was finished. Fecal pellets were attached to the posterior end as a thread, which on detachment formed a mass of thread behind the larval aggregations (Fig. 3). Size of the grubs ranged from 1.5 - 13 mm, depending on the instar (Fig. 11). Grubs were creamy white to dark gray. The size of grubs on the same leaf varied greatly. A few sluggish ones were observed among plenty of very small and large active grubs. Grubs feeding on the remaining green leaves on the trees were mostly early instars, however, those feeding on the fallen leaves were late instars. Final instar grubs measured 12 - 13 mm. Light green, C-shaped prepupae confined to specific small pockets, in earthen cells, were observed in soil at a depth of about 3 - 7 cm (Fig. 12). Within three days, the prepupae moulted to form pupae which were exarate, yellow, about 5 - 5.5 mm long and 3.5 - 4 mm wide (Figs. 13 and 14).

Trees shed more than 70% of the leaves and the branches dried up from tip downwards. Heavy leaf shedding and dried up feeding scars on the remaining leaves together presented a completely dried up appearance to the evergreen host trees (Figs 4, 5, 7 and 8). Survival and regeneration of the heavily infested female trees are doubtful.

The adults and larvae fed only on the Malabar nutmeg while the nearby crops in the field were left unscathed. Nutmeg plants, *M. fragrans*, present amongst the infested Malabar nutmeg trees in the study area also escaped the infestation. Previous report of *S. besucheti* Medvedev (Prathapan and Balan, 2016) on nutmeg plants in Idukki district may be an example of host shift from a native plant species to an introduced host. This is

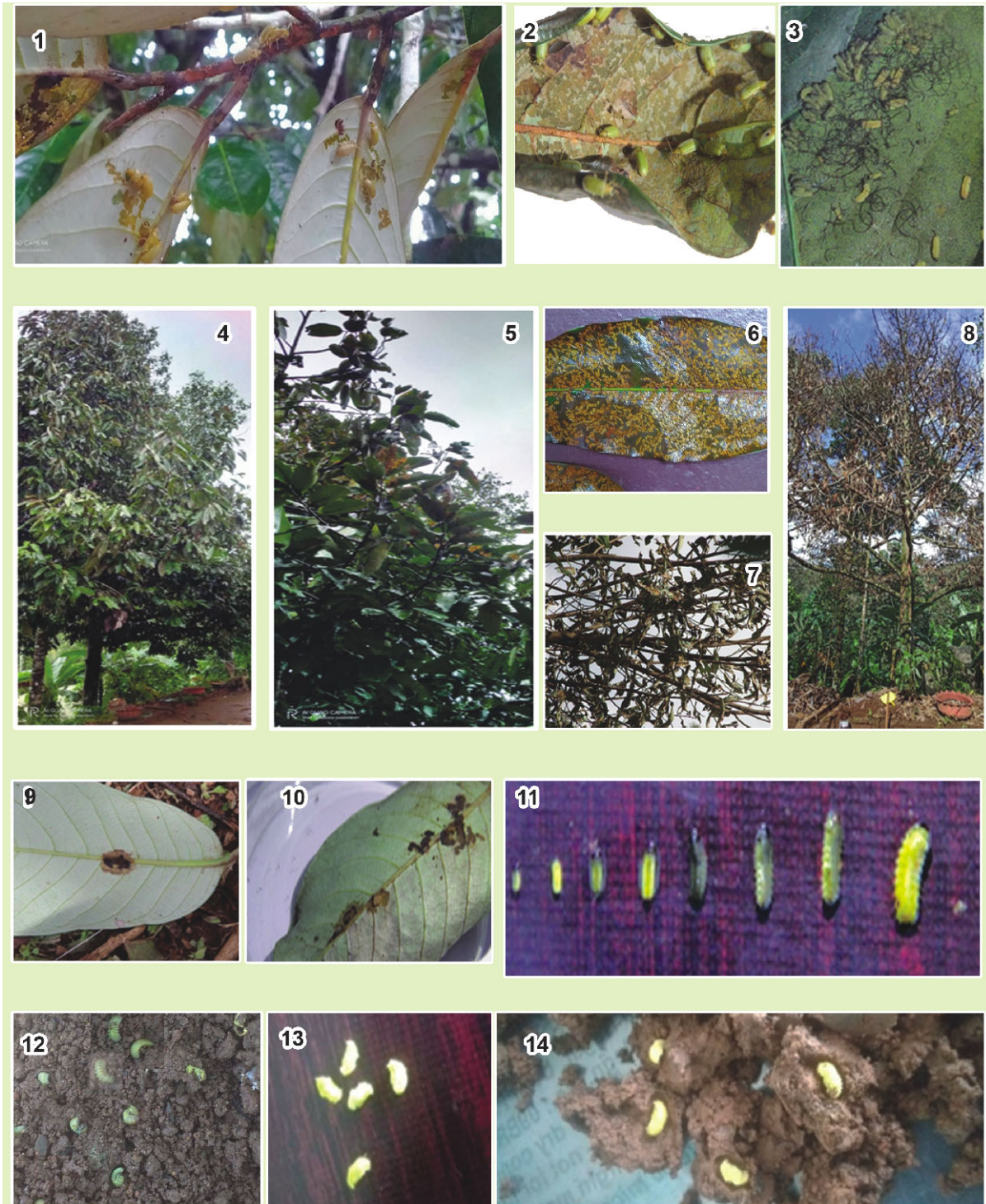


Fig. 1-14. *Sastroides basucheti* on *Myristica malabarica*. 1, 2. Adults feeding on leaves, 3. Feeding troughs of grubs, 4, 5. A female plant and its branches during first visit; 6. Adult feeding troughs, 7, 8. Heavily infested tree with dried up leaves, 9, 10. Egg masses on the abaxial surface of the leaves attached to the midrib, 11. Grubs, 12. Pre-pupae, 13, 14. Pupae

the first report of *S. besucheti* on its native host *M. malabarica* as well as its immature stages . Voucher specimens of *S. besucheti* are deposited in the Travancore Insect Collection, Kerala Agricultural University, Vellayani.

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