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RESEARCH NOTE

Sporadic outbreak of curry leaf tortoise beetle, *Silana farinosa* (Boheman) (Coleoptera: Chrysomelidae) in Shivamogga, Karnataka, India

SHASHANK R. PATHOUR[1], N. N. RAJGOPAL[2*], S. N. BHAGYASREE[1] and KOLLA SREEDEVI[3]**

[1]Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi-110012, India

[2]Quality and Productivity Improvement Division, ICAR-Indian Institute of Natural Resins and Gums, Namkum, Ranchi-834010, Jharkhand, India

[3]Division of Germplasam collection and characterization, ICAR-National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru- 560 024, Karnataka, India

[*]**E-mail**: raju924rg@gmail.com ; **kolla.sreedevi@gmail.com

ABSTRACT: *Murraya koenigii* (L.), an indigenous spice plant that belongs to family Rutaceae is highly valued for its aroma and medicinal value and is a basic ingredient in the southern culinary. Present study reports the infestation of white tortoise beetle, *Silana farinosa* (Boheman) (Coleoptera: Chrysomelidae) on curry leaf at Kappanahalli village, Shivamogga, Karnataka. This is the first report of the sporadic outbreak of *S. farinosa* causing considerable economic damage to the plants. Besides, a brief note on different life stages and nature of damage on curry leaf is also provided with photographic illustrations.

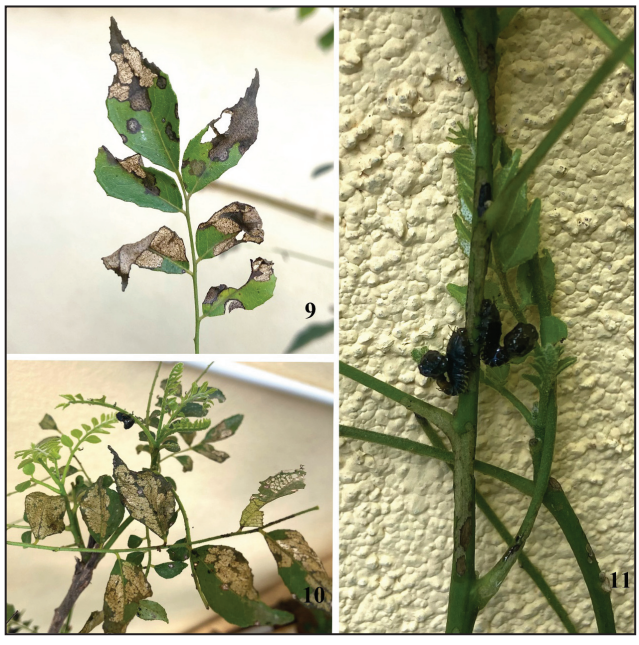
Keywords: Curry leaf, incidence, *Murraya koenigii* outbreak*, Silana farinosa,* tortoise beetle

India is known for its rich biodiversity in spices and medicinal plants. *Murraya koenigii* (L.), commonly known as curry leaf, belongs to family Rutaceae which represent more than 150 genera and 1600 species. It is used as spice in seasoning and possesses vast natural/folk medicinal properties (Nishan and Subramanian, 2015; Saini and Reddy, 2015). *Murraya koenigii,* valued for its aroma and medicinal value, is used as food enhancer in many Indian delicacies. The white tortoise beetle, *Silana farinosa* (Boheman) (Coleoptera: Chrysomelidae) is one among a few insects reported to feed on this indigenous plant. It feeds on almost all green parts of plant causing complete defoliation. This species was described by Boheman in 1856 from Ceylon (now Sri Lanka) as *Cassida farinosa*, later in 1914, Sapaeth erected the genus *Silana* as monotypic for this species. Maulik (1919) in his monograph of the Cassidinae recorded this beetle from Sri Lanka. These beetles are commonly called as white tortoise beetles for their appearance and are known to feed on curry leaf and have only a few reports from Sri Lanka and Malaysia for inflicting economic damage to the plant (Peries, 1926 and Ahmad *et al*., 1997). Takizawa (1980 and 1985) reported the occurrence of this beetle on *Ziziphus* sp. from Tamil Nadu, India. Till now, only a few anecdotal reports on feeding of *S. farinosa* on *M. koenigii* are available from India (Anonymous, 2020 and 2021). Hence, here in this paper, sporadic occurrence of *S. farinosa* on *M. koenigii* from Karnataka, India is being reported with a note on its different life stages and nature of damage on curry leaf.

During the survey, the pest outbreak was encountered in sporadic pockets on curry leaf trees during August, 2021 at Kappanahalli village, Shivamogga, Karnataka, India. The samples were collected for identification and reference. The images of different insect stages and damage symptoms were documented using Canon 70D camera attached with 100mm lens. The species was identified as *Silana farinosa* (Boheman) (Coleoptera: Chrysomelidae: Cassidinae) (Figures 3-8). Specimens collected were deposited in the National Pusa Collection (NPC), Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi, India.

This beetle was reported to occur in Sri Lanka, South India on *Ziziphus* sp. (Rhamnaccae) and Malaysia (Maulik 1919; Peries 1926; Takizawa 1980 & 1985; Ahmad *et al*., 1997 and Mohamedsaid 2006). The occurrence of *S. farinosa* feeding on *M. koenigii* was not reported from India apart from some website reports (Anonymus, 2020 and 2021). Presently, sporadic outbreak of this pest was observed at Kappanahalli village, Shivamogga, Karnataka, India causing considerable economic damage to the plants.

Figures 1-8. Developmental stages of *Silana farinosa* (Boheman). 1, Egg case; 2, Newly hatched grubs; 3, Early instar grubs ; 4, Later stage grubs feeding on leaf; 5, Aggregation behavior of grubs; 6, Pupa; 7, Adult beetle (dorsal view); 8, Adult beetle (ventral view).



Figures 9-11. *Silana farinosa* damage symptoms on leaves and tender shoots

The adult female beetle lays eggs in groups, implanted in to the frothy substance which is produced during oviposition, which later turn into a hard, shining dome shaped reddish brown ootheca (Figure 1-2). On hatching, early-stage grubs feeds gregariously, remaining on the undersurface of the leaves. The feeding behaviour in aggregated form exhibits the sub-social behavior which is common in this group of insects. However, in later instars they disperse in to small groups of 2-3 or sometimes individually feed on the leaves. The early instar grubs are yellowish green (Figures 2-3) and turns to greenish black in later instars (Figures 4-5). Grubs are elongated with tapering body towards anal end, the caudal appendages consists of urogomphi which always bent upwards (Fig. 3). Fecal matter and molted skin are gathered and accumulated on the urogomphi to form a black ball like structure called as fecal shield which is used as defense mechanism against natural enemies by holding like an umbrella over the body (Fig. 5) (Chaboo, 2011). Pupa is brownish in colour with black markings, pronotum covering the head portion and lateral spines on the abdominal segments (Fig. 6), the molted skin of last instar grub is attached to the caudal segments of the pupa and looks like a bird droppings and sometimes camouflaged with dry leaves, even with a slight disturbance, pupae moves their body. Adults look like a tortoise with orange brown body covered with white waxy coating on dorsal side of the body (Figures 7-8).

Nature of Damage: Both grubs and adults are known to feed on the plant parts and damage the tree. The early stage larva feeds on the underside of the leaves in gregarious manner by scraping the epidermal layer by leaving a thin upper layer intact (Fig. 1). In later stages, the larva will feed on both lower and upper surface of the leaves by scraping the tissues leading to skeletonization of leaves (Figures 9-10). The grubs also feed on the tender shoots by scrapping (Fig. 11). Adults feed on entire leaves from the margins or in the middle of the leaf leaving irregular holes. Severe infestation by the insect in successive generations leads to drying up of shoots followed by wilting of the plants where the plant cannot cope up with the damage caused by beetles. As the beetle feeds on leaves, which is the economic part of the plant, the appropriate management strategies need to be followed.

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