



Short Communication

FIRST REPORT OF TWO INSECTS, *MEGACHILE* SP. AND *ARMADILLIDIUM* SP., AS NEW PESTS ON *FLEMINGIA* SPP. IN THRISSUR, KERALA

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ABSTRACT

A project entitled "Conservation of Lac Insect Genetic Resources" is underway at the Kerala Forest Research Institute (KFRI) at Peechi, Thrissur, Kerala, India. This project includes the maintenance of both a lac insect gene bank and a lac insect host plant gene bank. Two types of host plants, *Flemingia semialata* (*F. semialata*) and *Flemingia macrophylla* (*F. macrophylla*), are cultivated to support the lac insect, *Kerria* spp. In the month of May, it was observed that *Megachile* bees were cutting the leaves of *F. semialata* and using them to construct nests. Roly-poly (*Armadillidium* spp) insects were also found affecting the young leaves of seedlings of *F. semialata* and *F. macrophylla* at KFRI. These two insects, *Megachile* and *Armadillidium*, are newly reported for the first time on the plants of *F. semialata* and *F. macrophylla* in Kerala.

Keywords: *Flemingia semialata*, *Flemingia macrophylla*, Conservation, Kerala.

In 1984, Philip F. Ganter and Wilma Kane Hanton at the University of North Carolina reported that more than 80 percent of pillbugs (*Armadillidium vulgare*) in local populations were female. Referring to electron micrographs revealing bacteria in pillbug ovaries, they hypothesized that an intracellular bacterial parasite skewed sex ratios by transforming male pillbugs into females. Pillbugs are somewhat unusual in this regard as they are photopositive except at high temperatures and humidity. However, Warburg (1968) concluded from his studies that "light is mainly a token stimulus important more as a clue for other factors." Damaging populations of pillbugs (*A. vulgare*) occur in Kansas, resulting in reduced soybean (*Glycine max*) stands with few reliable control measures. Combinations of cultural and chemical controls were examined to effectively maintain soybean stands in the presence of pillbug feeding. Further research is needed to examine their distribution and feeding behaviors to better

understand the likelihood of damage to stands (Johnson *et al.*, 2013).

A. vulgare has found an adequate environment for its development and reproduction and it has become one of the most important pests in sunflower crops in Buenos Aires, Cordoba and Entre Ríos provinces, Argentina. This species causes damage to plants at sowing and immediately after germination. The mixture of thiamethoxam and lambda-cyhalothrin (Cruiser Opti) treatment reduced *A. vulgare* in numbers (Umina, 2019). The isopod, *A. vulgare* (Latreille) (Isopoda: Armadillidiidae), and the millipede, *Ommatoiulus moreletii* (Lucas) (Diplopoda: Iulidae), are increasingly being reported as pests of emerging broad acre crop seedlings in southern Australia (Josh Douglas *et al.*, 2017).

The pill bug is an ecological bio-indicator of soil health that is widely distributed around the world (Wang *et al.*, 2023). Pill bugs are considered to be detritivores, eating

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decaying dead leaves and the remains of small invertebrates, and having important functions in soil fertility maintenance, plant nutrient supply, and soil purification, while also feeding on the fine roots and young leaves of plants (Le *et al.*, 2013). They recycle nutrients back into the ecosystem with important ecological significance (Nannoni *et al.*, 2015).

Kaestner (1970) states that if *A. vulgare* is collected at low temperatures and kept for two weeks at a temperature of 30 °C, they will survive for thirty minutes at 41 °C, whereas non-heat-adapted animals will die immediately. The family Megachilidae (Class: Insecta Order: Hymenoptera Family: Megachilidae Genus: *Megachile*) has ca. 3900 described species reported from all over the world, with 1478 of these species in the genus *Megachile* (Michener 2007).

Based on the recent survey materials and backlog collections deposited in the Hymenoptera section, Zoological Survey of India, Kolkata, seven *Megachile*

species, four belonging to subgenus *Eutricharaea* and one species each of *Aethomegachile*, *Callomegachile*, *Creightonella* and *Pseudomegachile*, are reported for the first time from different states of India (Sardar *et al.*, 2021)

The relative importance as pollinators of alfalfa of each of the 14 species of *Megachile* that occur in southern Alberta has been assessed on the basis of Alberta distribution, frequency and abundance in mixed prairie, nesting habits, pollen preferences, and flight period; two ground-nesting species of the subgenus *Xanthosarus* Rob., *Megachile perihirta* Ckll. and *M. dentitarsus* Slad., were judged the principal pollinators (Hobbs and Lilly, 1954). Studies revealed a wide diversity of Megachilid bees, in different parts of Jammu division of Jammu and Kashmir, India. Many of Megachilid bees were hitherto unknown and constitute the first record from this region. Large abundance and wide range of host plants serve as reservoirs and enable this solitary bee group as a potential pollinator guild of crops (Abrol and Chatterjee, 2022).



Armadillidium spp with *F.semialata* seedling



F.semialata leaf roll constructed by *Megachile* spp. bees

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