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Studies on *Megachile* Latreille subgenus *Callomegachile* Michener (Hymenoptera: Megachilidae) from Chandigarh and Haryana plains, India

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Abstract

Floral associations of three species of *Megachile* (*Callomegachile*) from NW India are provided: *M. (C.) disjuncta*, *M. (C.) cephalotes* and *M. (C.) lerma*. Morphological characters of both sexes and the male genitalia of each species are presented and illustrated. All three species are new records for Union Territory (Chandigarh) and Haryana in India.

Key words: Megachilini, floral relationships

Introduction

Solitary bees are of much economic value because of their role in pollination of natural, urban and agricultural vegetation (Berenbaum *et al.*, 2006, Gonzalez *et al.*, 2012). The majority of the species of *Megachile* Latreille fly more energetically and more frequent in the reproductive structures of flowers to gather pollen as compared to *Apis* Linnaeus (Apidae), presumably making them more efficient pollinators (pers. obs.). Species in subgenus *Megachile* (*Callomegachile*) Michener use mud and plant resin for building their nests instead of leaf pieces (Michener, 2000).

Michener (1962) originally placed *Callomegachile* Michener as a subgenus of *Chalicodoma* Lepelletier. Male genitalia and sterna were later illustrated by Michener (1965). Michener (2000) updated the classification of tribe Megachilini by placing all of the non-parasitic Megachilini in the genus *Megachile* Latreille and thus designating *Callomegachile* as a subgenus of *Megachile*. Michener (2007) described this subgenus as consisting of ‘elongate species, often with brightly colored (red, yellow or black) hair pattern, perhaps properly called heriadiform or hoplitiform, female mandible 3–4 toothed, female clypeus varies from quite ordinary to greatly modified; in the latter case the mandible may be long and parallel sided, carina on the tergum 6 of the male is weakly bilobed and or lacks a median emargination, largely tropical subgenus widespread in sub-Saharan Africa, eastward through southern Asia to China and Japan; southwards it reaches South Africa and northern Queensland, Australia’.

Material and methods

Specimens of three different species belonging to *M. (Callomegachile)* were studied. These were collected in fields, botanical gardens, and parks around Chandigarh (Union Territory; 30.73331°N, 76.77942°E); Sarangpur (30.77695°N, 76.75962°E) and Dhanash (30.77011 76.748081°E) in the outskirts of Chandigarh; and Hisar (29.14919°N, 75.72165°E) and Panchkula (30.69421°N, 76.86056°E) in Haryana, all in northern India, between September 2011 and August 2013. Collections were done with the help of sweep nets from plants while the bees were foraging. After collection they were killed with ethyl acetate. Keys for the oriental fauna by Bingham (1897), Gupta (1999) and Michener (2000, 2007) were first followed and then tentatively identified by the Indian Agricultural Research Institute, New Delhi, India. Final identification was done by Stephan Risch, Germany. Adult specimens were photographed with Canon 60D. Male genitalia were dissected out after treating the abdominal tip

Discussion

This tribe has two generations per annum for the areas studied in NW India (pers. obs.) and emergence starts from late February or early March till May and again at the start of August until November. *Megachile cephalotes* shows gregarious nesting and foraging behavior (pers. obs.) and could be used for pollination.

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