

Taxonomical and Behavioral Studies on *Megachile bicolor* (Fabricius) Belonging to Genus *Megachile*

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Abstract—*Megachile bicolor* is a gregarious living bee species which belongs to genus *Megachile*. Bees belonging to *Megachile* are mostly solitary bees in which a single female makes her nest without the help of others, provisions her nest and then lays eggs. They are also known to forage singularly without company of other bees. *M. bicolor* provides an exception where they forage in little groups gregariously. Taxonomically important morphological characters were studied, observed and photographed. *M. bicolor* is basically a large bodied bee, females are bigger in size as compared to males, fulvous colored, mandibles are with distinct cutting edges in both second and third interspace; coarse mandibular surface with no brush. Male sternal and genital slides were prepared, photographed and are presented. Their preferred flora included *Milletia pinnata*, *Agave americana*, *Ocimum sanctum* and *Cajanus cajan*. Their zoogeographic distribution along with the material examined is also documented.

Keywords: *Megachile bicolor*, Collection, morphology, male genitalia

1. INTRODUCTION

Megachile bicolor is placed under genus *Megachile* which mostly contains large bodied bees which have strong transverse postgranular grooves. This genus contains mainly nonmetallic bees, which are black and robust in appearance, tergum broadly concave, in females mandibles 4-5 dentate, sternum 6th covered with scopal hair, males are more parallel sided and small in size as compared to females. *Megachile bicolor* is solitary bee species but can be found in a small group on flowers while foraging over flowers at daytime. Males emerge some days before females; they are very actively involved in cutting the leave tips. Both males and females are important contributors in effective pollination as they are very fast fliers in the reproductive structures of flowers [4,5]. They are ineffective in carrying pollen in scopa so they have to make repeated visits to flowers and thus in this process aid in pollination.

2. MATERIAL AND METHODS

Collections were done with collection nets during day time between 10am to 4 pm. Bees were collected while they were foraging on the flowers. *M. bicolor* was collected from Chandigarh, Panchkula, Hoshiarpur and Ludhiana. After collecting, bees were stretched with proper techniques and then proceeded for preservation. Keys given by eminent workers for Oriental fauna by [1,2 and 3] were used for identification. Canon D60 was used for photographing adult specimens and Leica microscope was used for photography of genitalic and sternal slides.

3. RESULTS

Megachile bicolor Fabricius

FEMALE

Diagnosis- Integument black, apices of tarsi, bottom of claws, 1-3 terga, sterna 2-5 fulvous and tawny. Pubescence white and unpigmented on face, vertex, gena, sides of scutum and propodeum.

Head- Clypeus depressed and cambered apically and medially; apical margin bent inwards, supra clypeal area sloping at the sides and flattened medially, paraocular area also declivous at the sides, raised subocellar area, strong and big mandibles, 4 dentate with cutting edges in both interspaces.

Mesosoma- Curved scutum, punctate closely; subcarinated pronotal lobe, dense black pubescence, scutellum convex broadly; hanging roughly over the metanotum; very closely and finely punctate, wings hyaline; both recurrent veins subequally distant from the base and apex of second submarginal cell in forewing, punctate tegulae, unmodified forelegs; spines directed posteriorly; base of claws swollen with short spines, tarsi elongated.

Metasoma- Subcarinate margin concave on basal tergum, punctures present on pre granular area coarse, parallel

vertical fold, postgrandular area minutely convex, median width of tergum 6 greater than median length, slightly concave, basal sternum elevated in the middle, sloping sideways and laterally, scopal bristles present on sternum, sternum 6 convex, apically rounded and covered with small setae.

MALE

Femur, tibia and tarsi of forelegs cutaneous bearing testa, clypeus punctate minutely and largely pubescent; protruding apically with median mild bending, mandibles 4 dentate with no cutting edges; second recurrent vein is close to base than the second vein which ends near the second submarginal cell, wing dull and pale in color, veins black in color, long and extended anteroposteriorly, narrow tarsi 2-4, tarsus 5 prolonged, subapical tooth present on claws.

Specimen examined- 2♂, Panchkula, 24 February, 2014, 3♀, Panchkula, 7 March, 2014, 4♀, Ludhiana, 13 October, 2014, 1♂, Ludhiana, 13 October, 2014, 1♀, 12 March, 2015, 2♂, 3 April 2015, 2♂ 22 April 2015.

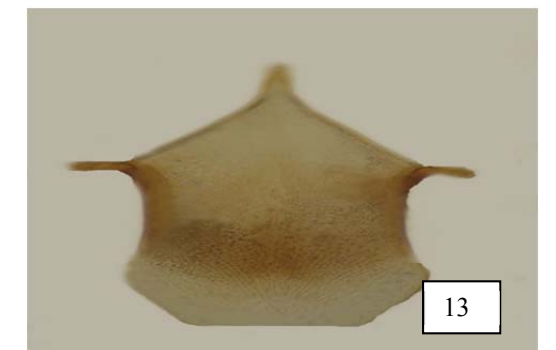
Behavioral discussions- *Megachile bicolor* unlike other solitary bees are found to forage gregariously. They mostly forage plants of family Leguminosea. They are reported here from Panchkula and Ludhiana. The biodiversity and behavior of these bees has not been studied in detail so far. Males come out of the nests before the females as the cells most near the openings develop into males. They efficiently trip the flowers, mates with the females and die. All the parenting duties are carried out solely by the females. Both male and female are efficient pollinators as they fly very energetically in the reproductive parts of the flowers aiding in pollination.

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Megachile bicolor, (Female) : 1. Habitus, dorsal view 2. Head and Mesosoma, dorsal view

4. METASOMA, DORSAL VIEW 4 . WINGS 5.
STERNA (SCOPAE) VENTRAL VIEW



Megachile bicolor, (Male): 6 . Habitus, dorsal view 7. Head and Mesosoma, dorsal view 8. Metasoma, dorsal view 9 . Wing 10 Sterna 6 ventral view.11 Genitalia 12. Sterna 6 13. Sterna 8

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