



Cladistic analysis of *Megachile* (*Chrysosarus*) Mitchell and revalidation of *Megachile* (*Dactylomegachile*) Mitchell (Hymenoptera, Megachilidae)

SILVANA DURANTE & NORA CABRERA

División Entomología, Museo de La Plata, Paseo del Bosque s/n, B1900dng La Plata, Argentina. E-mail:sdurante@fcnym.unlp.edu.ar

Abstract

Megachile is the largest genus of the family Megachilidae, being widely distributed throughout temperate and tropical areas of the world. The validity of *M. (Chrysosarus)* and *M. (Dactylomegachile)* was investigated based on a cladistic analysis of 63 characters of adult morphology of 14 taxa. The single most parsimonious tree (181 steps, CI=0.60; RI=0.63) resulting from an implied weighting analysis recovered *M. (Chrysosarus)* and *M. (Dactylomegachile)* as monophyletic groups. Both subgenera are redescribed and the value of the most frequently used characters in the taxonomy of *Megachile* is discussed.

Key words: Leaf-cutter bees, Megachilinae, cladistic analysis, Neotropical

Introduction

Megachile Latreille is the largest genus of Megachilidae, containing about 913 described species (Michener 2000). This genus, widely distributed in temperate and tropical areas of the world, has its greater diversity in the Neotropical region. The study of *Megachile* is of great interest, both due to its diversity and their role as pollinators.

Mitchell (1934–1937) revised the species of *Megachile* with emphasis on the nearctic taxa and subdivided the genus into numerous subgenera, some of which also contained some neotropical species. Mitchell (1943) listed 16 of these subgenera to the Neotropical Region and described five new subgenera including *Chrysosarus* and *Dactylomegachile*. Later, the same author (1980) published an elaborate reexamination of the diagnostic characters for the subgenera of *Megachile* and elevated *Chrysosarus* to genus level including in it, besides *Chrysosarus s.str.*, three subgenera: *Dactylomegachile*, *Zonomegachile* Mitchell, 1980, and *Stelodides* Moure, 1953.

Michener (2000, 2007) proposed a different arrangement for the subgenera; he recognized a single genus *Megachile* and grouped the subgenera into three informal groups. Michener assigned *Chrysosarus* to “group 1” based on the shape of the metasoma, the possession of 5-toothed mandibles without cutting edge in females, the shape of sternum 6 in both sexes, and the number of exposed sterna the absence of marginal hairs on S8 and the shape of the male volsella. Michener (2000) also synonymized *M. (Dactylomegachile)* under *M. (Chrysosarus)*. This taxonomic decision was followed by Raw (2002, 2007), Lopes de Carvalho & Raw (2005), Moure *et al.* (2007) and González (2008); the latter author also synonymized *Stelodides*, *Zonomegachile*, and *Austrosarus* Raw under *Chrysosarus*. Silveira *et al.* (2002) considered both, *M. (Chrysosarus)* and *M. (Dactylomegachile)*, as valid separate subgenera.

The phylogenetic relationships within *Megachile* are poorly understood, except by González (2008) who has undertaken a cladistic analysis of the tribe Megachilini with emphasis on *Megachile*. In that study, González recovered the genus *Chrysosarus* (*sensu* Mitchell 1980) as a monophyletic lineage among the seven previously recognized lineages of *Megachile s.l.* (Mitchell 1980).