

MORPHOLOGICAL ASPECTS OF THE HIND LEGS OF FOUR SPECIES OF THE MELIPONINI GROUP (HYMENOPTERA: APIDAE)

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The Meliponini, with the Euglossini, Bombini and Apini constitute the Apine clade [4] and are called the Corbiculate Apidae [2]. Pollen is its principal protein source. Several morphological characters are associated with activities of pollen harvesting, pollen carrying and pollen manipulating of the Corbiculate Apidae, all unique to females of this clade (or its branches) [3] and are considered synapomorphies of the clade [2]. The third pair of legs of the worker caste of the highly social bees as the Meliponini and Apini bear typical pollen-collecting structures. These structures are absent in parasitic and robber taxa. In the highly social groups, such structures are also absent in the males and in queens, the female caste and the sexual individual not involved in pollen foraging [1].

Continuing our previous research [1] of describing the characteristic pollen collecting structures of some species of the Meliponini group, worker bees of *Partamona cupira*, *Friesella schrotkyi*, *Scaptotrigona xanthotrica* and *Tetragonisca angustula* were collected inside their nests in the yard of the Bee Laboratory, IB, USP, São Paulo, SP. The bees were immobilised and killed at low temperature. The legs were removed, air dried for at least 12 hours and mounted in Scanning Electron Microscopy stubs. The stubs were coated with a 20 nm thick gold layer in a sputtering device and then observed in a Zeiss DSM940 Scanning Microscope, operating at 15kV, located in the Laboratory of Cell Biology of Microorganisms, Department of Ultrastructure, FIOCRUZ, Rio de Janeiro, RJ. Digital images were acquired in a IBC-PC compatible computer.

The corbicula is the smooth, concave or sometimes flat area on the outer surface of the hind tibia surrounded by long modified scopal hairs (Figures 1A, 1B, 4B). The rastellum is the comb of strong, usually blunt-tipped bristles across the inner surface of the apex of the hind tibia (Figures 1A, 1B, 3B, 4A). The basitarsi lack scopal hairs and pollen carrying function in the Meliponini and are articulated near the anterior end of the apex of the tibia, leaving room for the rastellum and the auricle. The auricle is the posterior expansion of the base of the hind basitarsus used for pushing pollen up into the corbicula. It is present in the Apini and Bombini but it is absent in the Meliponini. The penicillum is a compact tuft of strong, usually curved bristles arising near the front (or lower extremity) of the apical margin of the hind tibia. It is frequently directed posteriorly, sometimes almost parallel to the apical tibial margin. It is found only in the Meliponini (Figures 1A, 1B, 2, 3B, 4A). The inner side of the hind tibia has along its length an area covered with small and short bristles, the keirotichia (Figure 2, 3A, 3B, 4A). The extension and shape of this area is variable in different groups of the Meliponini genera and can be used as a helpful taxonomic character (Figures 2, 4 A).

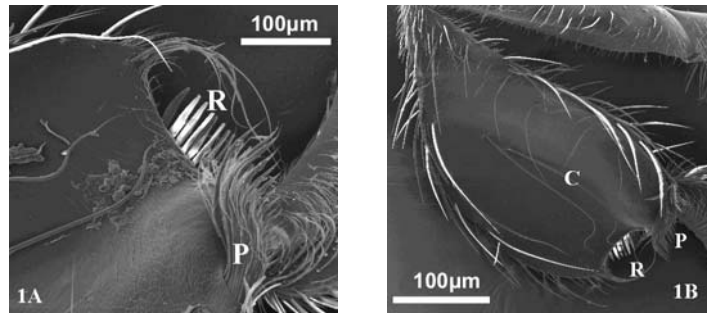
This work has been partially supported by FIOCRUZ.

Acknowledgements:

We thank Prof. V. L. Imperatriz-Fonseca for the bees collected at the Bee Laboratory (USP) SP

References:

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- [2] Michener, C.D. The Bees of the World (2000) 913 p. The John Hopkins University Press
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Figures 1A and 1B: Dorsal views (outer side) of the hind tibia of a *Partamona cupira* worker, showing the smooth surface of the corbicula (C), the rastellum (R), the penicillum (P) and the marginal long hairs

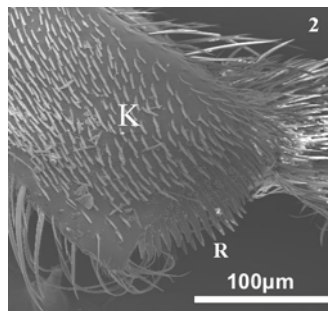


Figure 2: Inner side of the hind tibia of a *Friesella schrottkyii* worker, showing the surface almost completely covered with keirotichia (K).

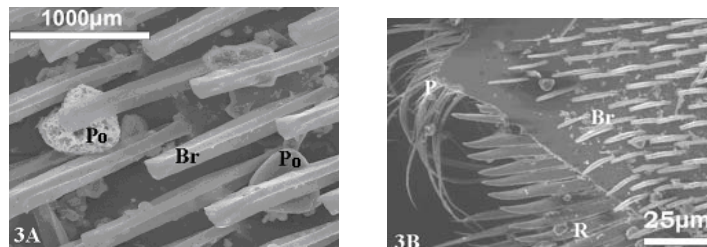


Figure 3A: Detail of the keirotichia tibial area and Figure 3B the inner side of the tibia of a *Scaptotrigona xanthotricha* worker.

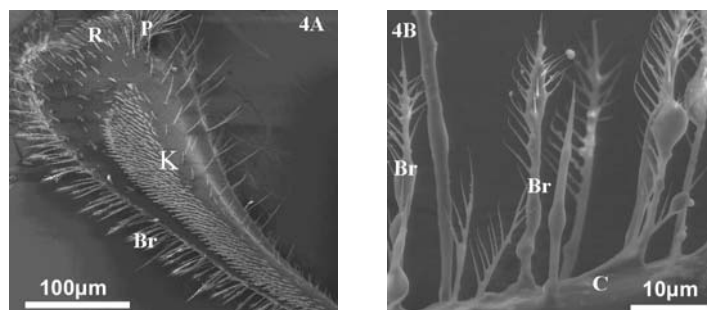


Figure 4A: Ventral view showing the tibial ridge covered with keirotichia and Figure 4B, the pined bristles in the border of the hind tibia of a *Tetragonisca angustula* worker .

For all the Figures: **Br**-bristle; **C**-corbicula; **K**-keirotichia; **P**-penicillum; **Po**-pollen grain;
R-rastellum