NOVEL EXOCRINE GLANDS IN THE LEGS OF THE PONERINE ANT *AMBLYOPONE RECLINATA* (HYMENOPTERA, FORMICIDAE)

by

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ABSTRACT

The legs of workers of the ponerine ant *Amblyopone reclinata* harbour at least five different exocrine glands. The pretarsal arrolium gland is a common structure in the legs of all Hymenoptera, the pretarsal footprint gland is also found in the hindlegs of other *Amblyopone* species, while the epithelial metatibial gland is found in ants of the doryline section. Two novel glands are added to this repertoire: an epithelial gland surrounding a central reservoir space occurs in the tibia of the front- and hindlegs, and a cluster of three secretory cells was found in the distal part of the hindleg tibia adjacent to the metatibial gland, their accompanying duct cells open through the articulation membrane that connects the hindleg tibia and metatarsus. A possibly glandular epithelium was found in the tibial spur of the hindlegs.

**KEY WORDS**: *Amblyopone reclinata*, exocrine glands, morphology, Ponerinae, ultrastructure.

INTRODUCTION

The large variety of exocrine glands represents a well-known characteristic of social insects, with a correspondingly vast number of secretory products that form the cornerstone of the social organization and communication system of these insect societies (HÖLLODOBLER & WILSON, 1990). The number of known exocrine glands among the Formicidae has steadily increased in the past few decades, with the discovery of several novel glands made possible because of the use of plastic embedding and new sectioning techniques (BILLEN & MORGAN, 1998). This has also resulted in the finding of several previously unknown glands in the appendages such as the antennae (BILLEN, 2000; ISIDORO et al., 2000) and especially the legs.

We here report on at least two novel glands that occur in the legs of workers of the ponerine ant *Amblyopone reclinata.*

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MATERIAL AND METHODS

Amblyopone reclinata Mayr, 1879 colonies were collected in the Bogor Botanical Gardens, Indonesia, and kept in artificial plaster nest boxes. The various leg parts of worker individuals were fixed in cold 2% glutaraldehyde, buffered at pH 7.3 with 0.050 M Na-cacodylate and 0.150 M saccharose, and postfixed in 2% osmium tetroxide in the same buffer. Dehydration was carried out in a graded acetone series and preceded embedding in Araldite. Semithin 1 μm sections were stained with methylene blue and thionin and viewed in a Zeiss Axioskop microscope, double stained 70 nm thin sections were examined in a Zeiss EM900 electron microscope.

RESULTS

The legs of Amblyopone reclinata workers contain an impressive variety of exocrine glands (fig. 1). The pretarsus is characterised by the presence of the ventrally opening epithelial arolium gland in all six legs that is a common feature for all Hymenoptera, as well as a dorsally situated and

![Fig. 1. Schematical survey of the hindleg of an A. reclinata worker with indication of the various exocrine glands. The novel structures described here are shown in black. bt = basitarsus, c = claw, F = femur, pt = pretarsus, T = tibia, t = tarsomere.]