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Metaperipatus inae sp. nov. (Onychophora: Peripatopsidae) from Chile with a novel ovarian type and dermal insemination

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Abstract

Metaperipatus inae **sp. nov.** (Onychophora: Peripatopsidae) from Chile is described and compared with the previously monotypic *M. blainvillei* by light, fluorescence, and scanning and transmission electron microscopy. The new species is distinguished from *M. blainvillei* by having (1) fixed number of legs in both sexes, (2) a characteristic color pattern of the integument, and (3) a larger body size. The structure of the ovaries in both species is different from that in other onychophorans. In contrast to other species of Peripatopsidae and South-East Asian Peripatidae, stalked oocytes are lacking. In addition, the absence of a germinal epithelium surrounding a central lumen contrasts with the organization of ovaries in the Neotropical Peripatidae. A distinct separation into a sterile and a fertile ovarian portion suggests that the novel type might be derived from an ovary with stalked oocytes characteristic of the Peripatopsidae and South-East Asian Peripatidae. The seminal receptacles in both members of *Metaperipatus* are small and either non-functional or short-term stores since they contained no sperm in the investigated females. The mode of sperm transfer is by dermal insemination, with spermatophores deposited on the female's body. Based on these observations, the evolutionary development of the ovaries and reproductive strategies in Onychophora are discussed. In addition, an identification key of onychophorans from Chile is provided.

Key words: Onychophora, Peripatopsidae, taxonomy, reproduction, ovary, insemination, Chile

Introduction

There are two highest ranking taxa of Onychophora or "velvet worms" comprising about 200 species: Peripatidae with an equatorial distribution in West Africa, Central America and South-East Asia, and the southerly distributed Peripatopsidae from South Africa, Australasia and Chile (Bouvier 1905; Clark 1915; Brinck 1957; Ruhberg 1985; Storch & Ruhberg 1993; Monge-Nájera 1995; Reid 1996). The main characteristics distinguishing the two taxa include (1) the position of the genital opening between the last (Peripatopsidae) or penultimate leg pair (Peripatidae), (2) the presence (Peripatidae) or absence of a diastema (Peripatopsidae) on the inner blades of the jaws, (3) the structure of the primary dermal papillae with (Peripatidae) or without a constriction (Peripatopsidae), (4) the solubility (Peripatidae) or dissolubility of body pigments (Peripatopsidae) in ethanol, and (5) the number of leg pairs ranging from 13 to 29 in Peripatopsidae and from 19 to 43 in Peripatidae (reviewed by Ruhberg 1985; Storch & Ruhberg 1993; Monge-Nájera 1995; Reid 1996).

A further distinguishing feature of both onychophoran taxa is the structure of the ovary since most members of the Peripatopsidae have "grape-like" ovaries with stalked, "exogenous" oocytes whereas most species of Peripatidae bear ovaries with non-stalked, "endogenous" oocytes (Moseley 1874; Gaffron 1885; Kennel 1885; Sheldon 1890; Dendy 1902; Evans 1903; Manton 1938a; Gabe 1959; Pflugfelder 1968; Anderson & Manton 1972; Herzberg *et al.* 1980; Walker 1992; Storch & Ruhberg 1993; Huebner & Lococo 1994; Reid 1996; Brockmann *et al.* 1997, 1999, 2001; Walker & Campiglia 1998; Sherbon & Walker 2004; Walker & Tait

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