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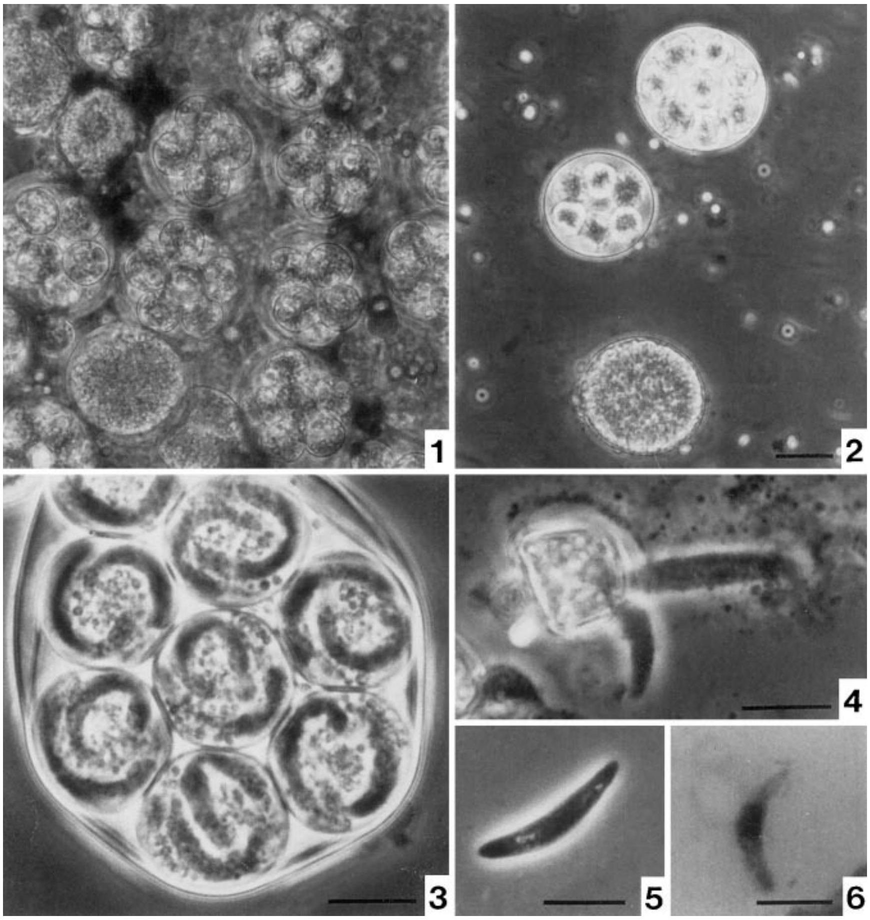
NOTE

An *Adelina* sp. (Apicomplexa: Coccidia) Found in *Anurogryllus muticus* (De Geer) (Orthoptera: Gryllidae)

Historically, different species of field crickets have been occasional agricultural pests in parts of Argentina (Cigliano and Lange, 1998). According to some farmers, the large increase of acreage under no-till practice that occurred in recent years in rural lands of the country favored a resurrection of crickets as pests. Simultaneously, in an event that some have linked with the wide use of fertilizers, crickets and mole crickets (Gryllotalpidae) also became a problem for lawns and sport fields in urbanized and suburbanized areas.

Small samples of living nymphs and adults of three sympatric species of field crickets, *Gryllodes laplatae* (n = 104), *Acheta assimilis* (n = 65), and *Anurogryllus muticus* (n = 145), were manually collected by landowners having damage in the outskirts of the city of La Plata, Buenos Aires province, and immediately



FIGS. 1–6. Oocysts, sporocysts, and sporozoites of *Adelina* sp. in fat tissue of *Anurogryllus muticus;* (1–5) fresh smears; (6) Giemsa-stained smear. Figs. 1 and 2. Mature oocysts with sporocysts inside and young oocysts containing granular material. Bar, 10 μm. Fig. 3. Oocyst showing eight sporocysts containing two sporozoites each. Bar, 5 μm. Fig. 4. Two sporozoites emerging from a disrupted sporocyst. Bar, 5 μm. Fig. 5. Emerged vermiform sporozoite. Bar, 5 μm. Fig. 6. Sporozoite showing one centrally located nucleus. Bar, 5 μm.

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sent to us for study. Each cricket was individually examined by dissection under a stereo zoom microscope.

A coccidian pathogen was discovered affecting two adults, a male and a female, of the burrowing or short-tailed cricket, *A. muticus,* a species known to have a wide geographical distribution in the Americas, from Louisiana in the United States to Bahía Blanca in southern Argentina (Liebermann, 1955; Weaver and Sommers, 1969). The affected insects appeared in moribund condition and had markedly distended abdomens at the time of dissection. The fat body of both insects was greatly hypertrophied and friable and showed a much more intense white coloration than that in healthy crickets. Although the life cycle of the coccidian could not be traced in full due to the advanced state of the infections, some diagnostic stages were observed in fresh and Giemsa-stained smears of fat tissue under phase-contrast and bright-field microscopy, respectively. The most prevalent stages observed were large, spherical mature and young oocysts (Figs. 1 and 2). Mature, thick-walled oocysts had a diameter of 24.8 ± 0.32 μm (mean $\pm$SE, $n = 50$) and the number of sporocysts observed per oocyst was variable, ranging from 3 to a maximum of 12 ($n = 50$) but most (90%) having five, six, or seven oocysts each. Immature or young oocysts contained a dense granular material instead of sporocysts. The diameter of the sporocysts was 8.49 ± 0.09 ($n = 50$). Each sporocyst had two dark, elongated sporozoites, which sometimes were spontaneously freed by the pressure of the coverslip (Figs. 3 and 4). Free sporozoites were vermiform and had one large nucleus centrally located (Figs. 5 and 6).

Although most coccidians are pathogens of vertebrates, six genera in the suborder Adeleina are known to be strictly entomogenous (Brooks, 1988): *Adelina, Barrouxia, Chagasella, Ithania, Legerella,* and *Rasajeyna.* The number of sporocysts contained in each oocyst and the number of sporozoites per sporocyst are considered diagnostic features at the generic level (Undeen and Vávra, 1997). Since the coccidian in the fat tissue of *A. muticus* normally has five to seven sporocysts per oocyst and two sporozoites per sporocyst it can be clearly assigned to the genus *Adelina.* None of the known neogregarine (Apicomplexa: Neogregarinida) genera (Levine, 1988; Undeen and Vávra, 1997), which also occur in insects and may have some superficial resemblance to coccidians in late stages of development, share these characteristics with *Adelina.* To our knowledge this is the first record of an *Adelina* sp. parasitizing a species of Gryllidae. However, further observational and experimental studies on the life cycle, host range, and transmission are envisaged before assigning it a specific status.

Key Words: Coccidia; *Adelina; Anurogryllus muticus;* field crickets orthoptera; Gryllidae.

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