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SCIENTIFIC NOTE

First Record and Flight Habits of *Dorysthetus fulgidus* (Waterhouse) (Scarabaeidae: Rutelinae) in the Brazilian Amazon Forest

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The scarab genus *Dorysthetus* Blanchard is composed of 28 valid species, of which 10 occur in Brazil (Soula 2003). Six of the species known to occur in Brazil are found in the Amazon rainforest in Amazonas and Pará states (Soula 2003). The genus was formerly placed within the subtribe Rutelina MacLeay, 1819, but today it is assigned to Anticheirina Lacordaire, 1856 (Smith 2006).

The vast majority of the literature on *Dorysthetus* deals with taxonomy or distribution (Serville 1825; Perty 1830; Burmeister 1844; Blanchard 1845; Waterhouse 1881; Arrow 1899; Ohaus 1903, 1905, 1912, 1922, 1926, 1938, 1952; Soula 1998, 2003, 2005, 2010). Very few articles report on aspects of the biology and ecology of *Dorysthetus* species. Larvae have been found in rotting logs in Costa Rica (Solís 1998), and adults probably feed on fruits (Ohaus 1905).

Dorysthetus fulgidus Waterhouse, 1881 is a metallic green species (Fig. 1). The sternal process is long and thick with a pronounced curvature (Soula 2003). The known distribution encompasses the Amazon rainforest of Peru (Waterhouse 1881), Ecuador (Ohaus 1903), Colombia (Soula 2003) and Brazil (Ohaus 1952). Despite the fact it is considered a relatively common species (Soula 2003), nothing is known of this species other than its description and some distributional data. Our objective here is to contribute information on some ecological aspects of *D. fulgidus*, namely to determine its flight height preference.

The study was conducted at the Adolfo Ducke Reserve, located on the outskirts of Manaus, Amazonas, Brazil (2°57′S 59°55′W) and covering ca. 10,000 ha. The vegetation is primary terra firme Amazon rainforest, and the climate of the area is of type Af, according to the classification of Köppen-Geiger (Kottek *et al*. 2006).

Beetles were trapped in single- and cross-vane panel flight intercept traps (modified from Berti Filho and Flechtmann 1986) baited with 95% ethanol. Traps were placed at 1 m, 3 m, 5 m, 7.5 m, and 10 m above ground. Traps were placed in transects containing five traps each, one at each of the five different heights of deployment, where one line of single-vane traps was intersected with a line composed of cross-vane traps. There were ten lines of traps with a total of 50 traps. Trap spacing within and between lines was 30 m. Beetles trapped were collected every 7 days, from March until September 1993, coinciding with the middle of the rainy season until the end of the dry season (Fig. 2). Trapped beetles were sexed initially by the examination of their genitalia.

The experimental design was a randomized complete block, where one block was composed of one line of five traps. To remove heteroscedasticity, beetle catches were transformed x + 0.5 (Phillips 1990). Beetle catches between trap types and

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Fig. 1. Male *Dorysthetus fulgidus*, dorsal view.

among the different trap heights were compared by PROC GLM and treatment means were separated by Tukey test (SAS Institute 1990).

Voucher specimens were deposited in the Museum of Entomology of UNESP (MEFEIS), Ilha Solteira, SP, Brazil.

Apparently this is the first record of *D. fulgidus* for the state of Amazonas, Brazil in the literature. A total of 218 specimens were collected during the seven-month trapping period, and the sex ratio was close to 1:1 (110 ♂: 108 ♀). Beetle abundance was highest during March and April when 65% of the specimens were captured, which coincided with the months of highest rainfall (Fig. 2).While removing the genitalia, we observed that males had two spurs on the protibia, and females had three (Fig. 3), which is an easy observed sexual dimorphism character. Soula (2003) remarked that females had these spurs shaped as “flames” pointing forwards, which was not clearly observable in our specimens.

There was no statistically significant difference in beetle catches between sing1e- or cross-vane traps ($F_{1,1069}$ = 1.66, α = 0.1981). Therefore, catches from these two trap types were lumped together for the analysis of trap height comparison. Significantly more beetles were captured in traps at 10 m height, followed by an intermediate trapping at 7.5 m and 5.0 m height, with the smallest catches observed at the lowest trap heights ($F_{4,\ 1069}$ = 16.35, α = 0.0001).

Although no lures other than ethanol were used in this experiment, the number of beetles trapped suggests that this alcohol might be a good attractant for *D. fulgidus*. Ethanol is typically produced by rotten fruits (Levey 2004), and there are reports of ruteline beetles having been captured in flight intercept traps baited with fruits (Solís 1998). It is possible that beetles were attracted to a by-product of the fermentation of rotting fruits, which is a likely food source for the adults (Ohaus 1905).

There are reports of adult Rutelinae activity in the forest canopy. Beetles of this subfamily were reported to feed on *Lecythis lurida* (Miers) (Lecythidaceae) flowers in a tabuleiro forest (lowland

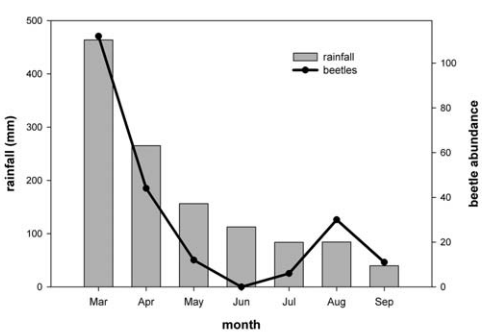

Fig. 2. Monthly rainfall and total number of *Dorysthetus fulgidus* trapped in ethanol-baited flight intercepts, Adolfo Ducke Reserve, Manaus, Amazonas, Brazil, March through October 1993.

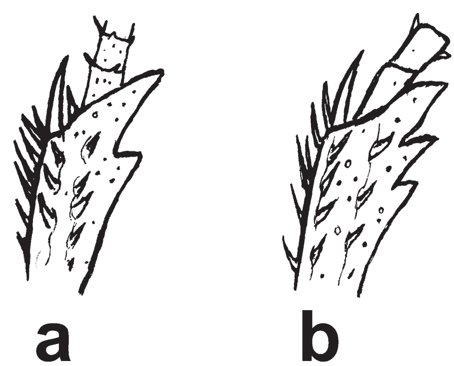

Fig. 3. Protibia of male (a) and female (b) *Dorysthetus fulgidus*.

Atlantic forest) in trees whose canopy was 14 m above ground (Aguiar and Gaglianone 2008). However, the average of the tree canopy height in the Amazon rainforest is over 30 m (Helmer and Lefsky 2006). At such heights, some Rutelinae are known to act as tree pollinators (Maués *et al*. 2004). It might be reasonable to assume that a number of fruits are retained by the canopy after abscission (Nadkami *et al*. 2004), or they rot without falling from trees (Tangah *et al*. 2004). As they begin to rot, the typically high humidity conditions in the Amazon rainforest favor anaerobic fermentation, producing ethanol, leading beetles to fly at high altitudes to find food.

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