

Acanthopus excellens Schrottky, 1902
(Hymenoptera: Apidae: Ericrocidini)
attracted to eugenol in southeastern Brazil

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Abstract. Chemical baits are commonly used in studies in the Neotropical Region to attract male orchid bees (Hymenoptera: Apidae: Euglossina). Occasionally these scents also attract other insects, including other bees. In this paper we report for the first time the capture of a specimen of Ericrocidini, a female *Acanthopus excellens* (Hymenoptera: Apidae: Ericrocidini), in an eugenol bait trap in a gallery forest in Paracatu, western portion of the state of Minas Gerais, southeastern Brazil.

Keywords. *Acanthopus*, chemical baits, Ericrocidini, eugenol.

Most male orchid bees (Hymenoptera: Apidae: Euglossina) are attracted to floral fragrances produced by at least six different plant families (see review in Dressler 1982). The chemical composition of many of these fragrances was elucidated and the active compounds artificially synthesized (see Dodson et al. 1969), allowing many different field studies involving male orchid bees (e.g. Ackerman 1983, Oliveira & Campos 1995, Nemésio & Silveira 2006a,b, 2007, 2010). In some studies these bees were collected in bait traps, usually modified from traps used to collect fruit flies (see Campos et al. 1989, Nemésio & Morato 2004, 2006). This practice revealed that other bees [e.g. *Lestrimelitta* spp. (Apidae: Meliponina), *Ptiloglossa* spp. (Colletidae: Diphaglossinae), *Megalopta* spp. (Halictidae: Augochlorini)] and even other insects (such as Diptera, Neuroptera, Coleoptera) and arthropods (such as spiders) are attracted to the scents and get trapped (see Campos et al. 1989: 624, Melo 1995: 283). One of us (AN) has also observed *Xylocopa* spp. (Apidae: Xylocopini), several species of wasps and even hummingbirds visiting the scents in the field.

Acanthopus Klug, 1807 (Apidae: Apini: Ericrocidini) is a genus of cleptoparasitic bees endemic in South America [Snelling & Brooks 1985, Silveira et al. 2002, Moure & Melo 2007 – although Michener (2007: 764) mentions a doubtful report from Panama], which hosts are apparently restricted to *Centris* (*Ptilotopus*) spp. (see Rozen Jr. 1969, Gaglianone 2001). Snelling & Brooks (1985) recognized five species of *Acanthopus* [*A. excellens* Schrottky,

1902, *A. jheringi* Friese, 1904, *A. palmatus* (Olivier, 1789), *A. splendidus* (Fabricius, 1793), and *A. urichi* Cockerell, 1926], whereas Silveira et al. (2002) recognized three species (*A. excellens*, *A. palmatus* and *A. modestior* Ducke, 1908) and Moure & Melo (2007) recognized only two species (*A. excellens* and *A. palmatus*, treating *A. splendida*, *A. modestior*, and *A. urichi* as junior synonyms of *A. palmatus* – but not mentioning *A. jheringi*). Nevertheless, Snelling & Brooks (1985) pointed out that this group of bees has received scant attention from taxonomists, maybe due to their rarity in collections. According to Silveira et al. (2002) and Moure & Melo (2007), *A. excellens* is restricted to eastern Brazil (Atlantic Forest and “cerrado” areas) and *A. palmatus* is restricted to western Brazil (Amazon Basin), French Guiana and Trinidad and Tobago.

During an inventory of the melissofauna of gallery forests and different “cerrado” physiognomies in the western portion of the state of Minas Gerais, southeastern Brazil, four bait traps containing cineole, eugenol, methyl salicylate, or vanillin were exposed to attract and collect orchid bees from September 2007 to July 2008. These traps were exposed early in the morning (ca. 07:00h) and taken off by 17:00 h. The traps were left unattended but were checked every hour in order to avoid or minimize the attempts of escape. All collected bees are currently deposited at the Entomological Collection of the Universidade Federal de Minas Gerais (UFMG). During one routine check of the bait traps, on 14th of February, 2008, at 10:30h, one female *Acanthopus excellens*



Figure 1. Dorsal view of female *Acanthopus excellens* Schrottky, 1902 captured in a bait trap containing eugenol in Paracatu, state of Minas Gerais, Brazil.

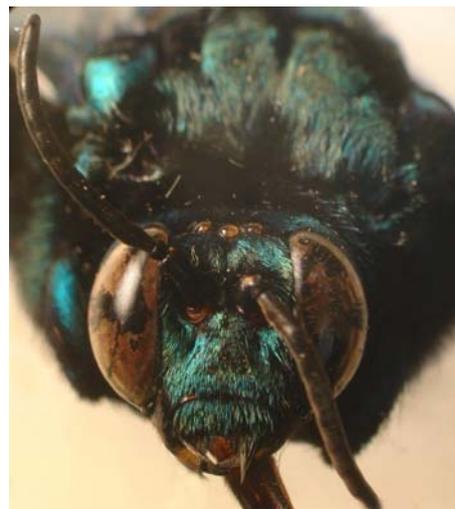


Figure 2. Frontal view of face of female *Acanthopus excellens* Schrottky, 1902 captured in a bait trap containing eugenol in Paracatu, state of Minas Gerais, Brazil.

(Figs 1 & 2) was found in the trap containing eugenol at Fazenda Pau D'Óleo, in the municipality of Paracatu.

This is the first record of Ericrocidini being attracted to one of the scents commonly used in orchid bee inventories. Eugenol ($C_{10}H_{12}O_2$) is an allyl chain-substituted guaiacol and a member of the phenylpropanoid class of chemical compounds. It is a clear to pale yellow oily liquid extracted from certain essential oils, especially from clove oil, nutmeg, cinnamon, and bay leaf. Eugenol is slightly soluble in water and soluble in organic solvents. These oily properties of eugenol are noticeable because Ericrocidini are believed to be closely related to their Centridini hosts (see Michener 2007) and females belonging to Centridini are known to be oil collectors (Buchmann 1987). Eugenol is also one of the most powerful attractants to male orchid bees (*e. g.* Rebêlo & Garófalo 1991, Nemésio 2008).

The fact that this female (Figs 1 & 2) entered the trap should be stressed, because it strongly suggests that it probably spent some time trying to enter the trap (as most orchid bees do) and actively entered it searching for eugenol. It has been suggested that the closely-related oil-collecting Centridini bees use oily resources to aid in nest construction and also as food (Vogel 1974, Neff & Simpson 1981, Buchmann 1987, Vinson et al. 1997). As *A. excellens* is a cleptoparasitic species, the nest-

building function should be discounted. On the other hand, phenylpropanoids (such as eugenol) are usually not used as food by animals (Hahlbrock & Scheel 1989) and oils collected by Centridini bees from many plant species (reviewed by Martins 2009) are usually lipids. Further studies are needed to determine how attractive eugenol is to *A. excellens* and what role eugenol plays in its biology.

Although only one specimen of *Acanthopus excellens* was attracted to eugenol in this study, it should be noted that bees and other arthropods captured in bait traps in orchid bee studies are usually not reported. Thus, the present report is important in that additional strategies of sampling can be for some rarely collected bees such as *A. excellens*.

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