

Trigona pallens (Fabricius, 1798) (Hymenoptera: Apidae) strongly attracted to vanillin in northeastern Peru

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Since the late 1960's, when it was realized that male orchid bees (Hymenoptera: Apidae: Euglossina) are strongly attracted to synthetic scents that mimic floral fragrances of at least six plant families (Vogel, 1966; Dodson et al., 1969; Dressler, 1982), the use of chemical baits has become a powerful tool in ecological studies involving this group of Neotropical bees (e.g. Ackerman, 1983; Oliveira and Campos, 1996; Rasmussen, 2009; Nemésio, 2010, 2011, 2012). This practice, however, revealed that other organisms are also occasionally attracted to these scents. These include many arthropods such as spiders and insects and, among these latter, Diptera, Neuroptera and Coleoptera have already been reported, as well as several bees [e.g. *Acanthopus excellens* Schrottky, 1902 (Apidae: Ericrocidini), *Lestrimelitta* spp. (Apidae: Meliponini), *Ptiloglossa* spp. (Colletidae: Diphaglossinae), *Megalopta* spp. (Halictidae: Augochlorini)] (see Campos et al., 1989: 624; Melo, 1995: 283; Nemésio and Siqueira, 2011).

During an inventory in the region of Tarapoto (06°27' S, 76°20' W), Department of San Martín, northeastern Peru, in late July and early August, 2012, seventeen different scents were used to attract male orchid bees. These scents were exposed early in the morning (ca. 08:00 h) and taken off by 16:00 h in six different sites at different elevations (from 400 m to 1,000 m a.s.l.). One or two researchers actively collected all bees that attended to the baits with insect nets. The collected specimens were killed in ethyl acetate and pinned for posterior identification.

Contrary to most scents, which were displayed embedded in cotton waddings, vanillin (which is commercialized as a powder) was diluted in alcohol 92.8° and a piece of string was immersed in the resulting solution. The alcohol quickly evaporates and the result is a piece of string completely impregnated with vanillin (see Figure 1), powerfully attracting males of many orchid-bee species. Besides the orchid-bee males, in all six sampled sites female specimens of *Trigona pallens* (Fabricius, 1798) (Apidae: Meliponini) were strongly attracted to vanillin.

Two of us (AN and CR) have a large field experience handling these scents and collecting orchid bees. Although the odd specimen of Meliponini is always attracted to one or some of the used chemical baits, it is the first time we saw so many specimens attracted at once

and continuously (Figure 1). Females of *Trigona pallens* were attracted to vanillin from the beginning to the end of each sampling day and as they were usually left undisturbed (only some voucher specimens were collected), large aggregations - sometimes of tens of specimens - could be seen "collecting" vanillin at our "vanillin strings" (see Figure 1).

Due to the ability to rapidly recruit foragers to promising resources, stingless bees are able to gather in large number at food or nesting resources (e.g. Breed et al., 2002; Nieh et al., 2003, 2004). *Trigona pallens* is otherwise not notably for any aberrant biology. The nest has been found in several places around San Martín (C.R. pers. obs.) and the distribution includes most of the Amazonian region from northern South America and southward. Nests are usually in the ground, among roots, or base of trunks, frequently in association with termites (Rasmussen and Camargo, 2008).

Male orchid bees supposedly use these scents as precursors of sexual feromones to attract females in courtship behavior (Eltz et al., 1999). Engaged in orchid-bee collection activity as we were, it was not possible for us to detect how or for which purpose females *Trigona pallens* were involved in vanillin collection. Further

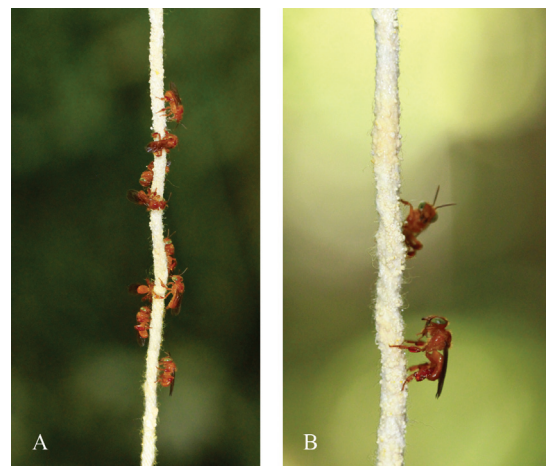


Figure 1 - String impregnated with vanillin placed inside the forest at a site situated at 600 m a.s.l. in the region of Tarapoto, San Martín, northeastern Peru. A: a group of female *Trigona pallens*. B: two female *Trigona pallens*.

studies are required to determine how attractive vanillin is to this species and which role it plays in its biology.

As Nemésio and Siqueira (2011) noted, bees and other arthropods attracted to scents commonly used in orchid-bee studies are usually not reported. Nevertheless, these data may have a heuristic importance, calling attention for previously unreported behaviors or aspects of the natural history of some bee species. Moreover, it may have a practical application in improving our ability to detect these species in the field by the use of these chemical attractants previously unknown to be attractive to species such as *Trigona pallens*.

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