

Ant and termite diversity of the Colombian Amazon soils

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INTRODUCTION

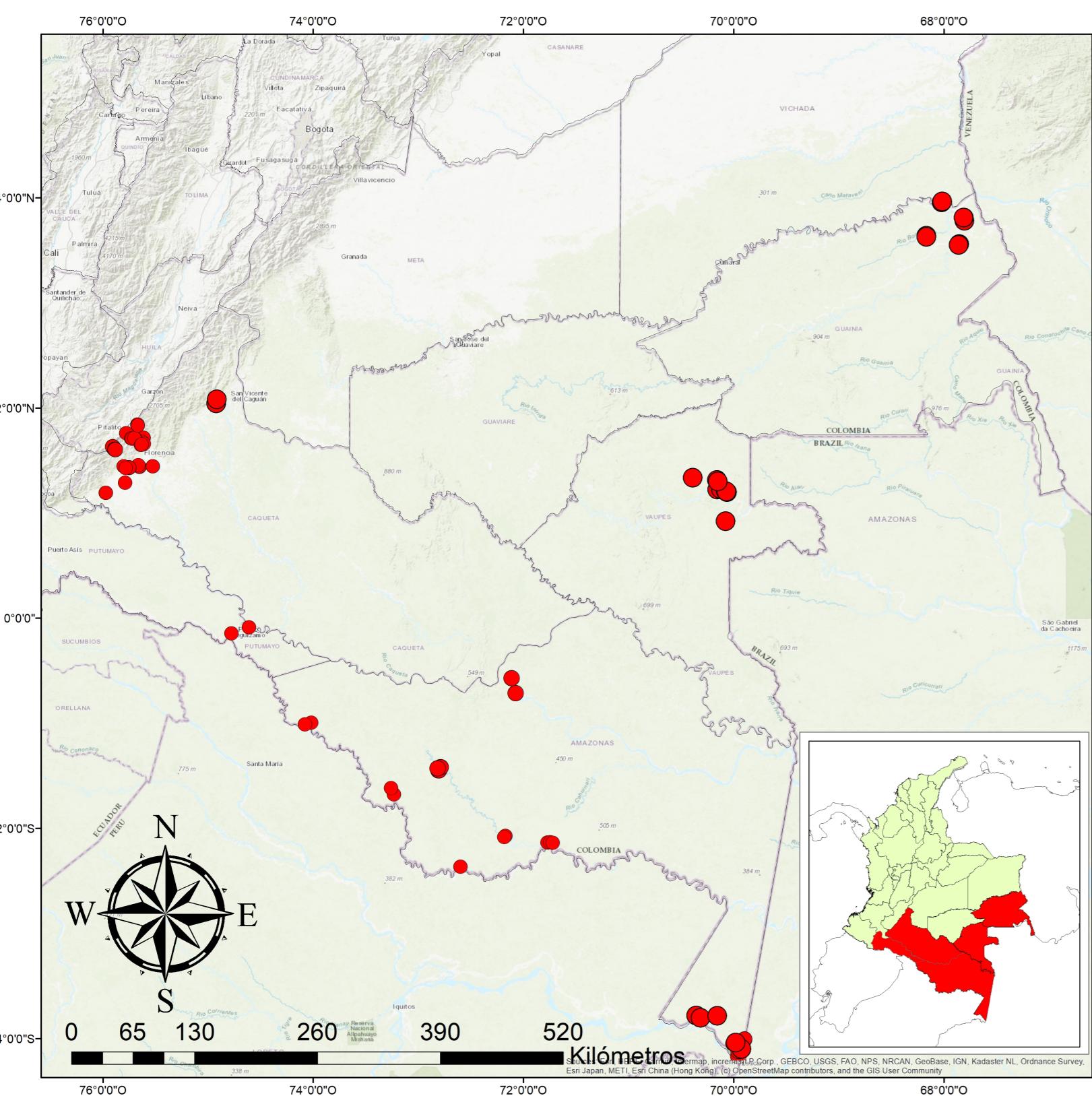
From all components of soil macrofauna, ants, termites and earthworms are the most conspicuous. These organisms are called “ecosystem engineers” for their contribution to soil composition and structure (Culliney, 2013; Lavelle, 1997).

For decades the importance of their role in the structuring and physical conformation of the soil profile has been recognized, as well as their function in organic matter decomposition process (Decaëns et al., 2004; Lavelle et al., 1994).

Although the importance of these groups in tropical ecosystems, the knowledge about their diversity is limited. In this study, we offer new information about soil ant and termite diversity in the Amazon region of Colombia.

MATERIALS AND METHODS

The study area (fig. 1) goes from the Andean-Amazonian transition in the northern part of the Colombian Amazon to the southern part in limits with Peru and Brazil. The area crosses the Amazon, Caquetá, Inirida, Vaupes, and Putumayo river basins, and including altitudes from 78 to 2275 meters above sea. There, 116 sampling localities in 15 municipalities were studied.



Ants and termites specimens were collected from soil monoliths following the methodology of TSBF (Anderson and Ingram, 1993). All specimens were identified using recent taxonomic keys, verifying species, and in some cases, comparing samples with type material from the AntWeb (for ants), and from the University of Florida termite collection and Museu de Zoologia da USP (for termites).

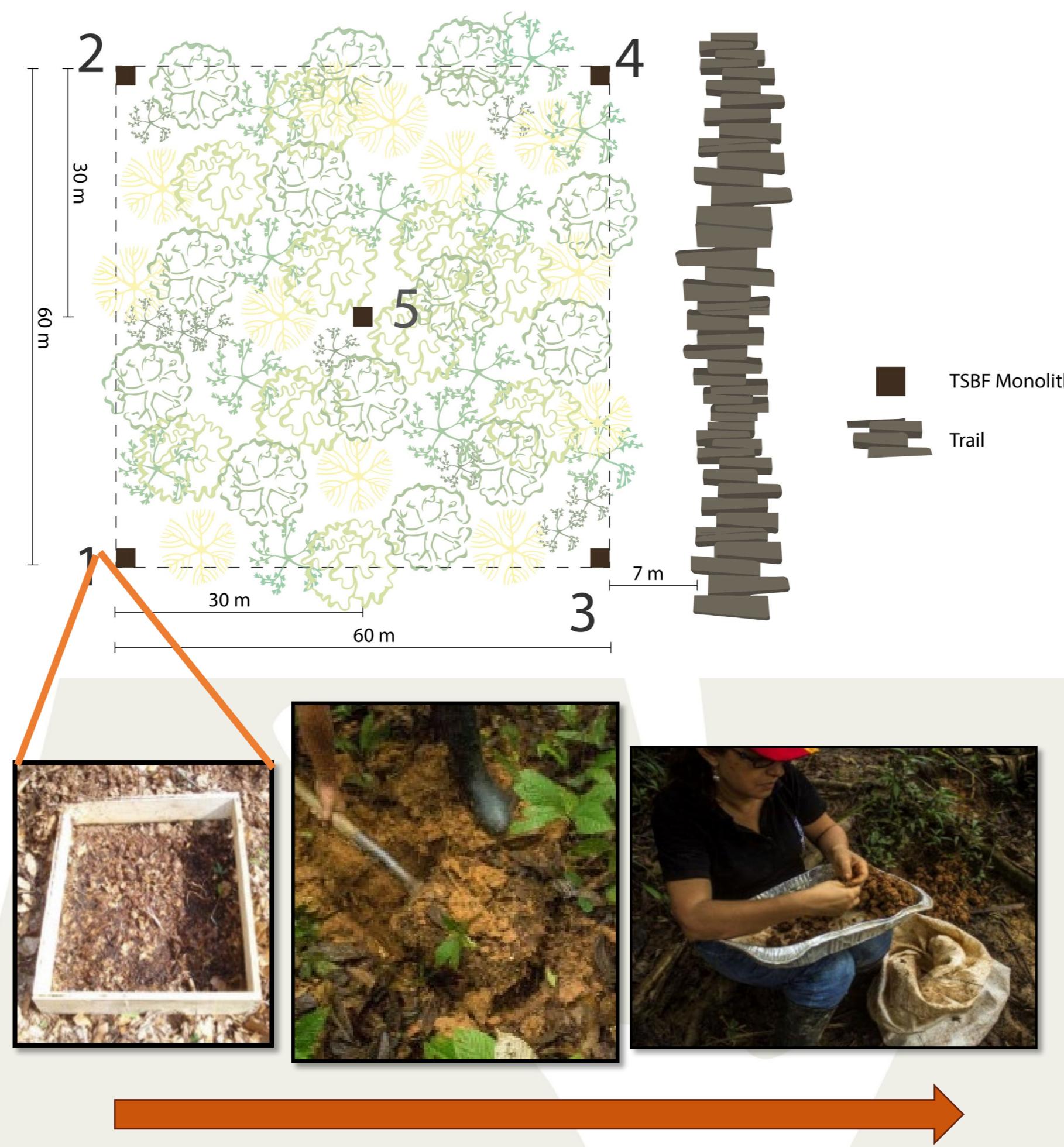


Fig. 2. Sampling method.

MAIN RESULTS

Ants (Hymenoptera: Formicidae): 5126 individuals were identified from 257 species in 71 genera and 10 subfamilies. The subfamily with the highest number of species was Myrmicinae (108), followed by Ponerinae (55) and Formicinae (33). The genera with the highest number of species were *Pheidole*, (27 species) and *Crematogaster* (16). Termites (Blattodea: Isoptera): 10846 individuals of 98 termite species were identified. They were distributed in two families, seven subfamilies and 36 genera. The richest family was Termitidae (91 species). The subfamily with the number of species was Apicotermitinae (37 species) followed by Syntermitinae (24 species). Nasutitermes Dudley, 1890 is the richest genus with 10 species, followed by Syntermes Holmgren, 1909 with eight species.

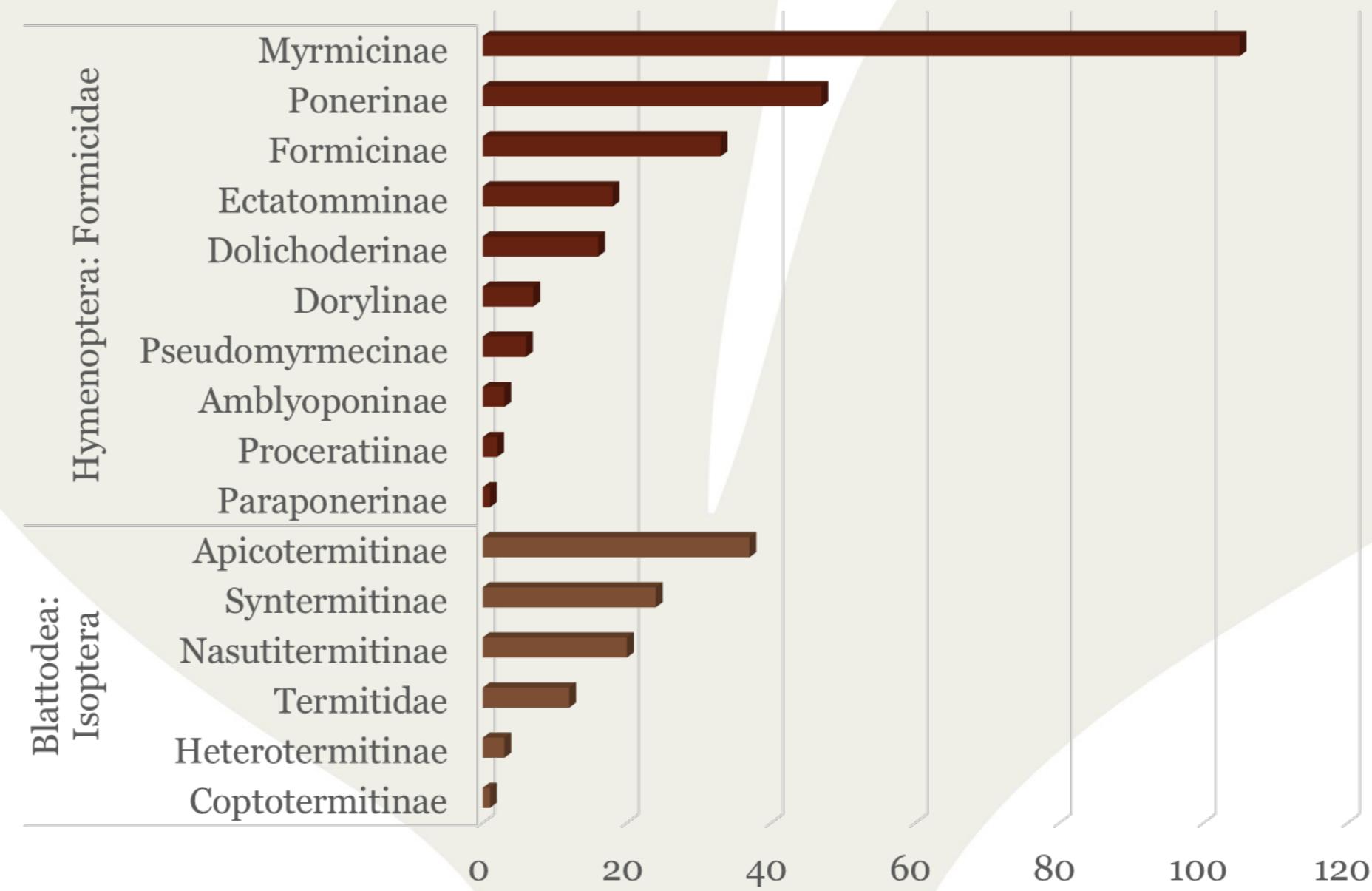


Fig. 3. Ant and termite species richness per subfamily

Ants were the most dense organisms in the upper Amazon region of Colombia (Caquetá state). Termites exceeded ants density in the Putumayo and Amazonas states. Differences in ant and termite densities might reflect the land use in each state. Termites tend to be more abundant in less disturbed ecosystems (Mboukou-Kimbatsa et al., 1998; Velásquez et al., 2012) such as forests and shifting agriculture plots in the Putumayo and Amazonas states. Ants tend to be more abundant in highly disturbed ecosystems such as introduced pastures for cattle ranching in the Caquetá state.

We found four new ant species for science from the genera *Pheidole*, *Typhlomyrmex* and *Syscia*; and 13 new termite genera and 18 new termite species for science, from the genera *Ruptitermes*, *Disjunctitermes*, *Anoplotermes* and *Humutermes*.



Fig. 4: New species for science: A) *Pheidole* sp.n., B) *Typhlomyrmex* sp.n., C) *Syscia* sp.n., D) *Myrmicocrypta* sp.n., E) New genus sp.1, F) New genus sp.2.

CONCLUSIONS

This study shows that soil ant and termite inventories from the Amazon region are still incomplete, being ant and termite diversity greater than reported before. Sampling effort combined different collecting methods are recommended for better estimations of soil ant and termite diversity.

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