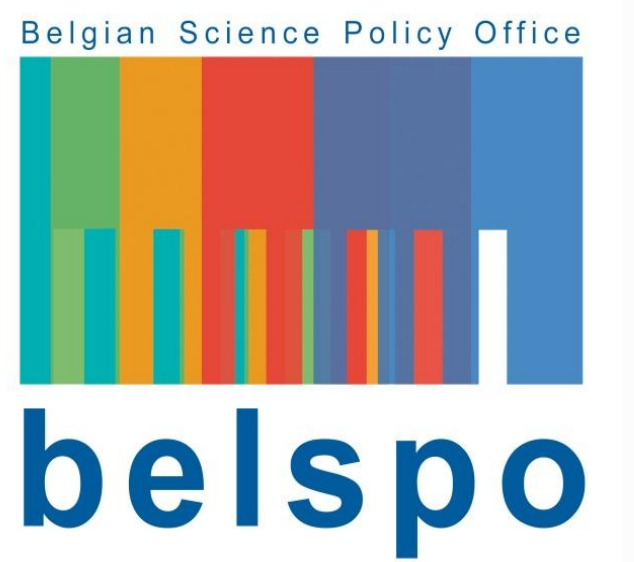


# DNA barcoding of fire and thief ants (genus *Solenopsis*) of the Ecuadorian Andes as a tool for biodiversity research

SONET, G.<sup>1</sup>, NAGY, Z. T.<sup>1</sup>, JACQUEMIN, J.<sup>2</sup>, WAUTERS, N.<sup>2</sup>, DELSINNE, T.<sup>2</sup> & M. LEPONCE<sup>2</sup>

<sup>1</sup> JOINT EXPERIMENTAL MOLECULAR UNIT, ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES, BRUSSELS & ROYAL MUSEUM FOR CENTRAL AFRICA, TERVUREN, BELGIUM. WEBSITE: <http://jemu.myspecies.info/>. E-MAIL: gontran.sonet@naturalsciences.be

<sup>2</sup> BIOLOGICAL EVALUATION SECTION, ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES & UNIVERSITÉ LIBRE DE BRUXELLES, BRUSSELS, BELGIUM

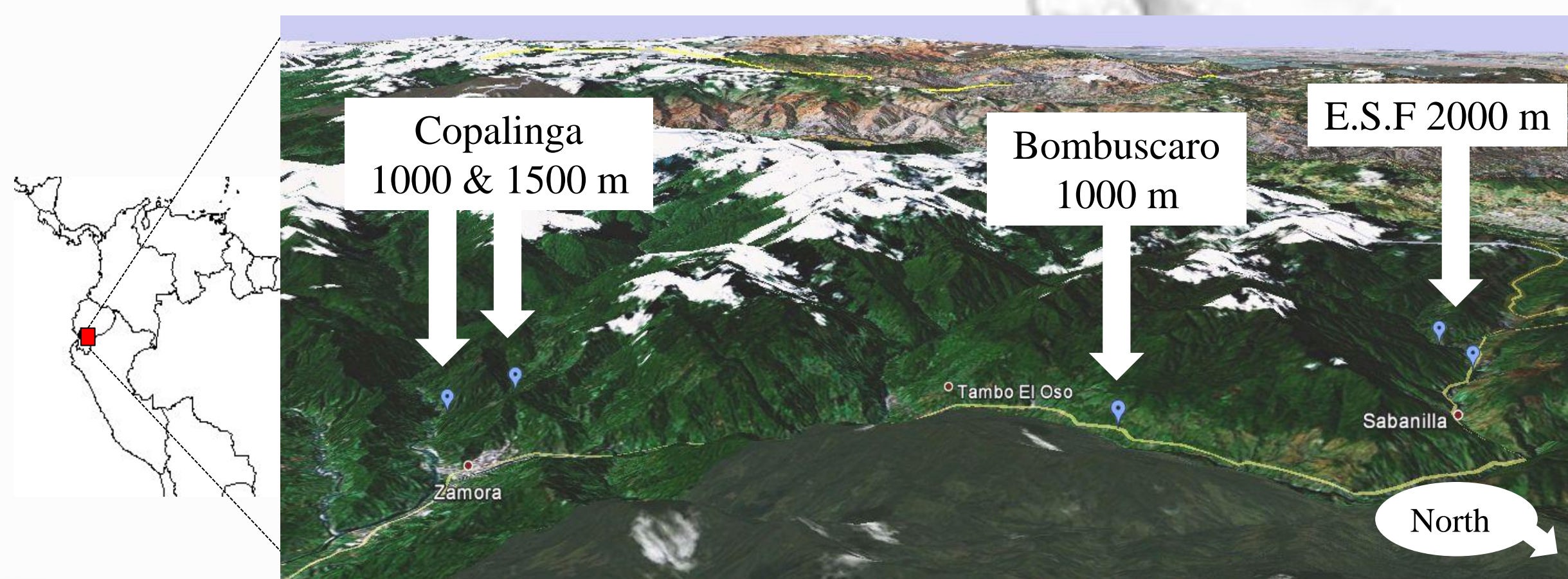


**INTRODUCTION:** Ants of the genus *Solenopsis* are:

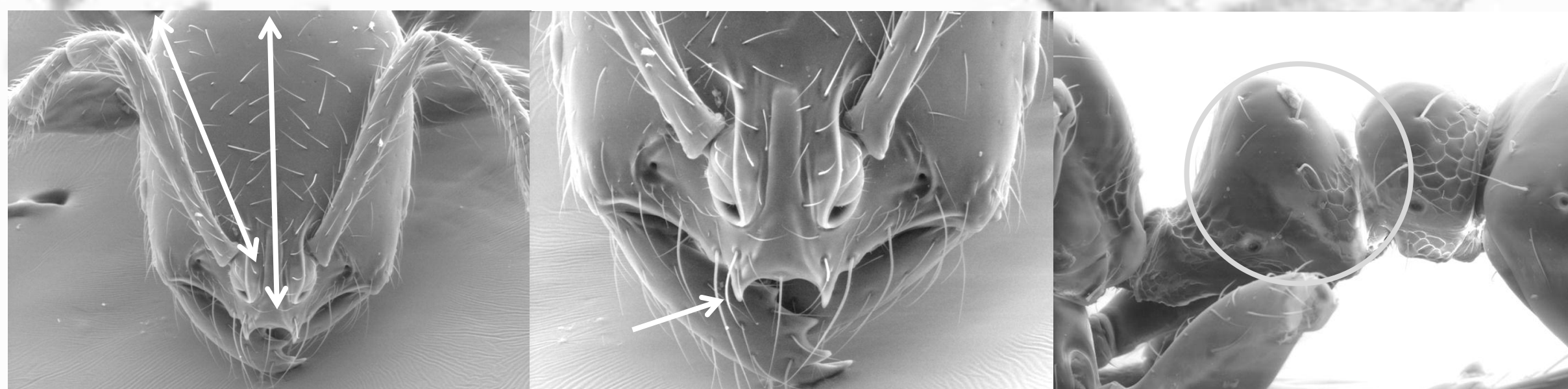
- among the most abundant ants in tropical rainforests,
- represented by more than 200 described species worldwide and
- include dreadful invasive species.

➔ Often used in biodiversity inventories BUT species identification is hampered by a dearth of diagnostic morphological characters.

**OBJECTIVE:** As a pilot study, we tried to set up and validate a procedure to identify *Solenopsis* spp. using the DNA barcoding approach.



**MATERIAL & METHODS:** 1036 ants collected in the Podocarpus National Park (Ecuadorian Andes) at altitudes 1000, 1500 and 2000 m and classified in 12 morpho-species.



In total, 22 **Morphological characters** were used to separate morpho-species: Among them are the scape length / head length ratio, presence and shape of the clypeal teeth and the shape of the petiole.



**Preservation of voucher specimens:** Microscopic examination of specimens that were used for DNA extraction confirmed that anatomical features useful for species determination were preserved.

**RESULTS:** 107 COI sequences of 200-658 bp were produced and can distinguish 18 molecular operational taxonomic units (MOTU) separated by each other by a distance of > 5%.

- All sequences are highly divergent from publicly available sequences.
  - 9/12 morpho-species are well delimited by DNA barcodes. The 3 remaining morpho-species belong to 9 genetically distinct clades.
- Endosymbionts were detected in 62% of the specimens but results obtained with COI were confirmed by a nuclear marker (*Wingless* gene).

**CONCLUSION:** DNA barcoding confirms that morphological identifications are based on accurate diagnostic characters. Moreover, the DNA barcoding approach shows a better resolution in delimiting species.

**ACKNOWLEDGEMENTS:** We thank Isabelle Bachy, Julien Cillis and Yves Laurent for the digitization of the ants.

