Sociobiology
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Editorial

Special Issue on Taxonomy, morphology, and phylogeny of ants

Formicidae (ants), a family of ~13,000 described species, are a critically important component of biodiversity in nearly every terrestrial habitat. In the Neotropics, for example, ants are among the most abundant insect taxa, with a combined biomass greater than all vertebrates. They thus not only provide food for many vertebrates and invertebrates, but also play major roles in community organization and ecosystem processes.

They are abundant in subterranean, epigaeic, and arboreal habitats, with several species living in close symbiosis with plants or fungi. Ants fill virtually every important ecosystem function and every available niche. They influence bioturbation, superficial groundwater flow, nutrient cycling, seed dispersal, and decomposition, stabilize food webs, control and regulate pests, and form and modify habitats (ecosystem engineers). Some are major defoliators in natural and agroecosystems (e.g., leafcutter ants), whereas others are major predators of invertebrates and vertebrate prey (e.g., army ants). Several ant species are major agricultural pests, causing billions of dollars in losses annually. Ants are used as model organisms in many ecological and evolutionary studies, but they have also gained prominence in conservation biology since they are sensitive to anthropogenic disturbance,and can be also readily grouped into functional groups.

Unfortunately, the lack of taxonomic knowledge for many groups may limit their potential for use in the areas mentioned above, since many tropical species are undescribed or new to science, greatly slowing morphological species identification.

In this special issue, almost twenty articles provide a sampling of how important morphology-based studies and ant inventories really are. The origin of ant soldiers and the use of this term in ant literature are reviewed, underlining the distinction between “soldiers” and “major workers”. In another excellent contribution, twelve fossil ant species and an entirely new genus are described from the middle Eocene (ca. 46 myo), providing a new window into Eocene ant diversity and the tempo of ant early evolution.

In a series of very detailed and pleasingly illustrated contributions, authors describe five new ant species belonging to four different genera. Also, different castes and sexes are described for the first time for several known species. New records are made for a series of ant taxa, considerably extending their known distributions in different regions of the world.

Updated lists based on exhaustive ant surveys highlight the importance of South America as a megadiverse region, with more than 3,000 records and almost 1,000 ant species registered for different localities in Argentina, Brazil, and Ecuador. Other contributions examine in detail ant morphology, including exocrine glands and the effect of nematode infestation in ant phenotypes.

Assessing ant biodiversity at various levels will lay the baseline for continued monitoring of ecosystem health and biodiversity, especially under the present scenario of climate change, and may guide conservation decisions by allowing rapid and efficient appraisal of ecosystems. The study of ant morphology, diversity and distribution will also provide the framework for the identification of tropical pest species and thus will provide the basis for applied research of international importance.

Sociobiology, a recently reformulated journal, is aware of the importance of ant diversity for the different ecosystems of the world and thanks all authors and reviewers for this rich and important special issue.

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