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The Costa Rican *Systemus* Loew (Diptera: Dolichopodidae): rich local sympatry in an otherwise rare genus

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Abstract

The Costa Rican *Systemus* Loew (Diptera: Dolichopodidae: Medeterinae) are described, illustrated and keyed, and comprise nine new species: *Systemus divericatus* sp. nov., *S. eboritibia* sp. nov., *S. emusorum* sp. nov., *S. flavifemoratus* sp. nov., *S. maculipennis* sp. nov., *S. naranjensis* sp. nov., *S. parkeri* sp. nov., *S. tenorio* sp. nov., and *S. zurqui* sp. nov. Eight species are known only from Malaise traps at a locale in Guanacaste Province, in contrast to a single species collected as part of the long running INBio survey of the Costa Rican insect fauna. On a global scale, *Systemus* is uncommon in collections, possibly the result of its known larval tree hole habitat and adult arboreal associations, making the genus less likely to be captured by ground-level trapping. This makes the high level of sympatry at one site even more remarkable and suggesting that more cryptic species-rich arboreal faunas await discovery.

Key words: Diptera, Dolichopodidae, *Systemus*, Costa Rica, rare taxa, local endemism

Introduction

Compared to many other dolichopodid genera, adults of the genus *Systemus* Loew are rather rare in collections. Prior to this study, some 27 species were known worldwide, the majority from the Holarctic region. Yet the genus is well known in its larval stage as an inhabitant of wet debris-filled tree holes (*dendrotelmata*) and sap fluxes, and it has been the subject of several studies in Europe and North America (Wirth 1952; Krivosheina 1973; Vaillant 1978; Diestelhorst & Lunau 2001).

This paper describes nine new species of *Systemus* from Costa Rica, which in itself is not remarkable in such a biodiverse country. However, it is notable that eight of these species are known only from Malaise traps set near Rio Naranjo in Guanacaste Province, indicating a high level of local sympatry.

Material and methods

Material cited in this work is housed at the following institutions:

EMUS Entomological Museum, Utah State University, Logan, Utah, USA.
INBIO Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica.
LACM Los Angeles County Museum, California, USA.

The Rio Naranjo specimens were originally housed in the Utah State University Entomological Museum, where I sorted Dolichopodidae in 2003. All Neotropical Diptera from that collection have since been transferred to the Los Angeles County Museum.

The left lateral view of the hypopygium or male genital capsule is illustrated for all species. In describing the hypopygium, ‘dorsal’ and ‘ventral’ refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom