



Well, what about intraspecific variation? Taxonomic and phylogenetic characters in the genus *Synoeca* de Saussure (Hymenoptera, Vespidae)

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Abstract

Cely and Sarmiento (2011) took issue with the cladistic analysis of relationships among species of the genus *Synoeca* by Andena *et al.* (2009a), and presented a reanalysis. They claimed that intraspecific variation in the genus is meaningful, and proper consideration yields a conclusion different from that of Andena *et al.* Both their critique and reanalysis are vitiated by numerous errors, as is shown in the present paper.

Key words: Epiponini, cladistics, Neotropics

Introduction

Synoeca de Saussure is a small genus of the Epiponini, with five species widely distributed in Central and South America. Andena *et al.* (2009a) presented the first study of phylogenetic relationships among the species, combining 38 characters of adult morphology, male genitalia, and nest architecture in a cladistic analysis and fully resolving relationships among the species as *S. chalibea* + (*S. virginea* + (*S. septentrionalis* + (*S. surinama* + *S. cyanea*))) (Fig. 1). Cely and Sarmiento (2011) were dissatisfied with that study, and offered their own "detailed analysis of morphologic character variation in *Synoeca* species in the search for sound taxonomic characters for separating species of the genus and studying the effect of variation on their proposed phylogenetic relationships" (p. 44). Much of the paper by Cely and Sarmiento (2011) was devoted to a geometric morphometric analysis, but this was irrelevant to their conclusions, with the authors themselves (p. 52) characterizing their procedure as having "little use for an every day practice". Cely and Sarmiento's (2011) cladistic analysis was their main result, with their favored cladogram being less resolved than that of Andena *et al.* (2009a), and showing as sister-species *S. chalibea* + *S. virginea* (Fig. 2). As we shall show, the results of Cely and Sarmiento (2011) are spurious.

Material and methods

In this section we first point out deficiencies in the arguments advanced by Cely and Sarmiento (2011) as grounds for their reanalysis of relationships within *Synoeca* de Saussure. We then list errors in their paper, *seriatim*, concerning characters, taxon identification and analytical procedures. Corrections to these errors and the results of analyses of the corrected data are detailed in the following section. We consider only the cladistic analysis offered by Cely and Sarmiento (2011), as those authors did not treat their geometric morphometric analysis as of any consequence.