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## The histo structure of galls induced by aphids as a useful taxonomic character: the case of *Rectinasus* (Hemiptera, Aphididae, Eriosomatinae)

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### Abstract

Morphological differentiation of gall tissues induced on plants may play a role to characterize the real taxonomic position of the gall inducer. We verified this hypothesis with galls induced by *Rectinasus buxtoni* on *Pistacia palaestina*. There is controversy about the taxonomic localization of genus *Rectinasus*: in one classification it is situated with the genera *Forda* and *Paracletus* while in another it is linked to the genera *Geoica* and *Baizongia*. Histological examination of the walls of the galls reveals the presence of two opposed vascular bundles and an inner surface of the gall with cavities. These features place *Rectinasus* in the same group as *Geoica* and *Baizongia*, and not with *Paracletus* and *Forda*, whose galls have a different histological structure, as generally admitted.

**Key words:** *Rectinasus buxtoni*, gall, histology, Eriosomatinae, taxonomy

### Introduction

Gall morphology and anatomy can be used in insect taxonomy, considering that galls may play the role of an extended phenotype of the inducer insect (Stone & Schönrogge 2003). This was assumed in particular with gall inducing aphids (Stern 1995). For example in galls created on *Pistacia* trees by aphids of the superfamily Aphidoidea, the structure of the modified leaflet is diverse, in accordance with different gall shapes, under the influence of the inducer. In summary: (1) the walls of the galls induced by *Paracletus* and *Forda* have a single vascular bundle (phloem – xylem) and the inside is dimpled and without cavities (Álvarez *et al.* 2009); (2) the walls of the galls induced by *Geoica* and *Baizongia* have two vascular bundles facing each other (phloem – xylem / xylem – phloem) and the interior of the galls has conspicuous cavities (Álvarez 2012).

Two classifications of superfamily Aphidoidea are currently used, which have been named the “Remaudière, Stroyan and Quednau extended” and the “Heie and Wegierek revised” classifications by Nieto Nafría and Favret (Nieto Nafría *et al.* 2011). They mainly differ from each other in the ranks given to several family-group taxa, and also in the groups of some of them. A taxon structured around *Forda* (von Heyden, 1837) with a taxonomic width of 18 genera is present in both classifications: the tribe Fordini Acloque, 1897 (Aphididae Eriosomatinae) in the first mentioned classification and the subfamily Fordinae Acloque, 1897 in the second one, which is placed in Eriosomatidae (Favret 2013).

In the “Heie and Wegierek revised” classification the subfamily Fordinae is divided into two tribes: Melaphidini Baker (A.C.), 1920 and Fordini. The latter tribe is divided into three subtribes: Fordina, Baizongiina Börner, 1944 (1914) and Geoicina Mordvilko, 1921 (Heie & Wegierek 2009). In the “Remaudière, Stroyan and Quednau extended” classification the tribe Fordini is not divided, although Remaudière used subordinated taxa,

This disagreement about the taxonomic position of *Rectinasus* invites to conduct a thorough review of the genus and perhaps, in general, of all the Fordinae and even the Eriosomatinae (according to Remaudière, Stroyan and Quednau extended). In these future studies, the molecular, populational and morphological aspects of the different forms of the species (fundatrix, fundatrigeniae, virginogeniae, sexuparae) should be considered, as well as the macroscopic and microscopic characteristics of the galls.

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