



A new genus of oak gallwasp, *Cyclocynips* Melika, Tang & Sinclair (Hymenoptera: Cynipidae: Cynipini), with descriptions of two new species from Taiwan

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Abstract

A new genus of cynipid oak gallwasp—*Cyclocynips* Melika, Tang, & Sinclair (Hymenoptera: Cynipidae: Cynipini), with two new species—*C. uberis* and *C. tumorvirgae*—reared from galls on oaks of the *Quercus* subgenus *Cyclobalanopsis* is described from Taiwan. Descriptions of asexual generation adults and their diagnostic characters are presented. The likelihood of yet undiscovered sexual generations and the evolution of host-plant associations in these species are discussed.

Key words: Cynipidae, oak gallwasp, *Cyclocynips*, cytochrome *b*

Introduction

The oak gallwasps (Hymenoptera: Cynipidae: Cynipini) are endophytophagous herbivores whose larvae induce complex galls upon the Fagaceae. The vast majority of the approximately 1000 currently recognized species are associated with oaks of the *Quercus* subgenus *Quercus* in the Nearctic and Palearctic (Stone *et al.* 2002, Abe *et al.* 2007), but a surge of recent descriptions of East Asian species indicates that the current taxonomy is far from complete. East Asia is the centre of diversity for several Fagaceae taxa including the genera *Lithocarpus* and *Castanopsis* and the *Quercus* subgenus *Cyclobalanopsis* (Manos & Stanford 2001), all of which have recently been shown to host Cynipini species (Tang *et al.* 2011a, Melika *et al.* 2011, Ide *et al.* 2010, Tang *et al.* 2011b). The extent of Cynipini diversity associated with these plant taxa remains unclear, but raises important questions concerning the evolution of gallwasp-plant relationships.

Phylogenetic studies of the cynipid family (Ronquist & Liljeblad 2001), and of the Cynipini tribe in particular (Stone *et al.* 2009), have suggested that gallwasp evolution is characterized by a high degree of phylogenetic conservatism in host-plant associations, with infrequent shifts between pre-existing host-plant taxa. Under such a model, it can be expected that novel oak gallwasp species from East Asia will represent a series of distinct host-associated lineages, although the relationships of these lineages with established *Quercus* associated genera from the Palearctic and Nearctic remain unclear. In order to achieve a taxonomy within which genera represent monophyletic natural groups, it may be necessary to establish novel genera and to reappraise the limits of existing genera.

Herein we use morphological and molecular data to support the description of a new genus of oak gallwasp—*Cyclocynips* Melika, Tang, & Sinclair—consisting of two new species associated with trees of the *Quercus* subgenus *Cyclobalanopsis* in Taiwan.