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Abstract

Fourteen new species of oak gallwasps, *Andricus istvani*, *Andricus assarehi*, *Andricus schoenroggei*, *Andricus csokai*, *Andricus chodjaii*, *Andricus megatruncicolus*, *Andricus coriariformis*, *Andricus libani*, *Andricus stellatus*, *Andricus*

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pseudoaries, *Andricus sadeghii*, *Andricus atkinsonae*, *Andricus pujadevillari* and *Dryocosmus caspiensis* (Hymenoptera: Cynipidae: Cynipini) are described from Iran. Data on the diagnosis, distribution and biology of new species are given.

Key words: Cynipidae, oak gallwasp, *Andricus*, *Dryocosmus*, taxonomy, morphology, distribution, biology

Introduction

The Irano-Turanian centre of endemism covers the interior of Turkey, extending eastwards from the beginning of the Central Anatolian Plateau into northwestern Iran. The area is very mountainous, with the high plateaus between the ranges experiencing extreme temperatures and little precipitation. The major vegetation type is treeless steppe, but oaks are a very important component of the sparse deciduous scrub and park-like forest that borders these plateaus, growing to altitudes of over 2000 m (Camus 1936–8, 1938–9; Yaltirik 1982). The oak cynipid gallwasp fauna of Iran remains little-studied (Chodjai 1980; Azizkhani *et al*. 2006). A number of widespread oak gallwasps show their greatest genetic diversity in the eastern mediterranean, suggesting that the Iran-Turanian region may have acted as a major centre of speciation in this group in the past (estimates based on DNA sequence divergence suggest that such a radiation took place at least several million years ago) (Rokas *et al*. 2003a; Stone *et al*. 2001). It remains unclear, however, how much Iranian forests lie within the true centre of this diversity, or whether they represent an eastern limit to the distributions of taxa otherwise found further west. The descriptions provided here represent the continuation of surveys to establish the oak gall fauna of Iran.

Thirty six species of oak associated cynipids were recorded in Iran by Chodjai (1980), but many were erroneously identified and thus incorrectly cited for this region. Iran lies at the eastern limit of the Western Palaearctic, and recent surveys confirm that its cynipid fauna includes widespread Western Palaearctic species (such as *Andricus kollari* (Hartig) and *Cynips quercusfolii* (Linnaeus)), species limited to the eastern part of this region (such as the *insana* form of *Andricus quercustozae* (Bosc), *Andricus megalucidus* Melika, Stone, Sadeghi & Pujade-Villar and *Aphelonyx persica* Melika, Stone, Sadeghi & Pujade-Villar (Melika *et al*. 2004), and taxa currently unknown from Turkey that may represent Iranian endemics: *Andricus stonei* Melika, Tavakoli & Sadeghi, *Dryocosmus tavakolii* Melika, Stone & Azizkhani and *Dryocosmus mikoi* Melika, Tavakoli, Stone & Azizkhani (Azizkhani *et al.* 2006).

This paper reports fourteen new species of oak associated gallwasps, *Andricus istvani* Melika, *Andricus assarehi* Melika & Sadeghi, *Andricus schoenroggei* Melika & Stone, *Andricus csokai* Melika & Tavakoli, *Andricus chodjaii* Melika, *Andricus megatruncicolus* Melika, *Andricus coriariformis* Melika, Challis & Stone, *Andricus libani* Melika, Challis & Stone, *Andricus stellatus* Melika & Tavakoli, *Andricus pseudoaries* Melika, Stone & Sadeghi, *Andricus sadeghii* Melika, Stone, Atkinson & Aligolizade, *Andricus atkinsonae* Melika, Stone, Sadeghi & Zargaran, *Andricus pujadevillari* Melika, Stone, Sadeghi, Atkinson & Zargaran, and *Dryocosmus caspiensis* Melika, Sadeghi, Atkinson, Stone & Barimani, from the Arasbaran, Zagros and Caspian littoral regions of northern Iran, and represents a companion paper to a recent description of new gallwasp species from the Zagros Mountains (Azizkhani *et al.* 2006). Data on the distribution and biology of the new species are given.

The phylogenetic relationships within the western palaearctic *Andricus* species were studied on the basis of gall structures' evolution traits (Stone & Cook 1998) and gene sequences (Rokas 2001; Rokas *et al*. 2003b) and were divided into six clades: a) *mayri-lucidus*, b) *kollari*, c) *coriarius*, d) *quercuscalicis*, e) *hartigi*, and f) *foecundatrix* clade, and a few species (*Andricus inflator, A. hystrix*, *A. gallaeurnaeformis*) appeared to be nested on the tree away from the main *Andricus* clade (Fig. 1). On the basis of morphological peculiarities and obtained DNA sequence data, using nuclear 28S D2, mitochondrial COI and Cyt b gene sequences [molecular results will be published elsewhere], all the herein newly described *Andricus* species were placed into a relevant *Andricus* clade [discussed under „Diagnosis" paragraphs], which showing the position of each species within the phylogenetic relationships in *Andricus*.