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First record of *Andricus hakonensis* (Ashmead) from China and confirmation of its inquiline, *Synergus chinensis* Melika, Ács & Bechtold (Hymenoptera: Cynipidae)

Primer registre d’*Andricus hakonensis* (Ashmead) de Xina i confirmació del seu inquili, *Synergus chinensis* Melika, Ács & Bechtold (Hymenoptera: Cynipidae)

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*Andricus hakonensis* (Ashmead, 1904) has been collected in Japan, Russia and Korea on several species of oaks from *Quercus* section (Penzés et al., 2018): *Q. aliena* Blume, *Q. dentata* Thuill., *Q. mongolica* Fisch. ex Ledeb., and *Q. serrata* Murray. This is the first record of this species from China. The studied material is deposited in the ZAFU (Zhejiang Agricultural and Forestry University) and in the UB (University of Barcelona).

The alternate generations of *A. hakonensis* are known after Wachi & Abe (2010). The asexual generation produces unilocular clustered embedded galls on stems during spring (Fig. 1a); these are round-oblong shaped, smooth, 7-8 mm in high, green or greenish-brown to greenish-red. The sexual generation produces irregular spherical galls in leaf veins or petioles (Fig. 1b), plurilocular, first red in color, then yellowish green from summer to autumn, and lastly green when mature. Adults of the sexual generation emerge in early summer, while adults of the asexual generation emerge in early spring of the following year.

Studied material


Melika et al. (2004) described *Synergus chinensis* Melika, Ács & Bechtold, 2004 from North-Eastern China (Beijing Province), reared from unknown cynipid acorn, leaf and bud galls, and Abe et al. (2007) mentioned this species from

Figure 1. Galls of *Andricus hakonensis*: (a) asexual generation and (b) sexual generation. Pictures’ author: Chen Tianlin

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Figure 2. Morphological features of Synergus chinemis ♀: (a) lateral habitus and head in frontal view (inset image), (b) metastoma in posteriorodorsal view, pointing out the punctate area, (c) mesosoma in dorsal view, (d) head in frontal view, (e) head in dorsal view. Pictures’ author: Juli Pujade-Villar.
South Korea. Kovalev (1965) recorded S. gallaesporiformis (Boyer de Fonscolombe) from the Far East of Russia, which was reared from assexual galls of Andricus symbioticus Kovalev, 1965 and A. attractus Kovalev, 1965, which are currently synonyms of Andricus hakonensis according to Wachi & Abe (2010). Abe et al. (2007) doubt that S. gallaesporiformis occurs in A. hakonensis, and affirms that this material belongs to S. chinensis. Our data confirm this sentence; we have obtained S. chinensis from sexual galls of A. hakonensis. According to these data, S. chinensis occurs in China, South Korea, and Russia.

Studied material


Another inquiline species is also related to Andricus hakonensis galls: Synergus symbioticus Schweger & Melika, 2015, from Japan and Far East of Russia (Schweger et al., 2015) and recently recorded from unknown leaf galls in China (Zhejiang province by Pujade-Villar et al., 2017). Synergus chinensis and S. symbioticus can be differentiated by their color (mesosoma reddish brown in S. chinensis (Fig. 2a), black in S. symbioticus) and the shape of metasoma (poste-rodorsally incised in S. chinensis (Fig. 2b), not incised in S. symbioticus).

Lastly, a species named as Synergus hakonensis Ashmead, 1904 has an uncertain host (Ashmead, 1904; Schweger et al. 2015). This species was described by Ashmead (1904) at the same time that Andricus hakonensis. Adults of both species were sent to Ashmead by Mr. A. Koebele from Hakone (Japan), but nothing makes us suspect that A. hakonensis and S. hakonensis are related; they only share the specific name of the type locality. In fact, according to Schweger et al. (2015), S. hakonensis is morphologically closely related to S. ishikarrii Melika & Schwager, 2015 and S. belezinellus Schwager & Melika, 2015; these three species have both lower face and frons black in contrast to the light brown to yellowish color of S. chinensis and S. symbioticus. Moreover, S. hakonensis differs from all other species mentioned by having a conicrassous head, without striae and with deep punctures on frons (see Fig. 2d of S. chinensis), vertex and on the intercellar area (see Fig. 2e of S. chinensis), and mesoscutum uniformly alutaceous or very delicately coriaceous, without distinct transverse rugae between notauli (see Fig. 2c of S. chinensis).

Bibliography