

## NOTA BREU

**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 inquilí, *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* Thunb., *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

Zhuanghe Jindao, Dalian (Liaoning province, Fei Wu & Jiace Yu col.), on *Q. mongolica*, (20.vi.2018) vi.2018: 44 ♂ & 142 ♀ (9 ♂ & 19 ♀ in UB); 1-7.vii.2018: 6 ♂ & 5 ♀.

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

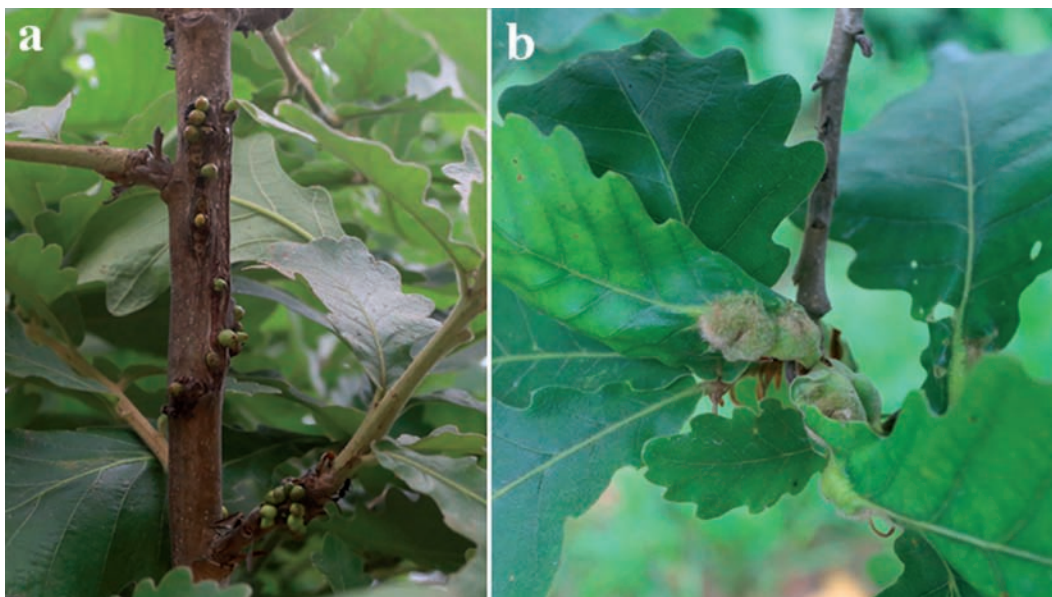


Figure 1. Galls of *Andricus hakonensis*: (a) asexual generation and (b) sexual generation. Pictures' author: Chen Tianlin

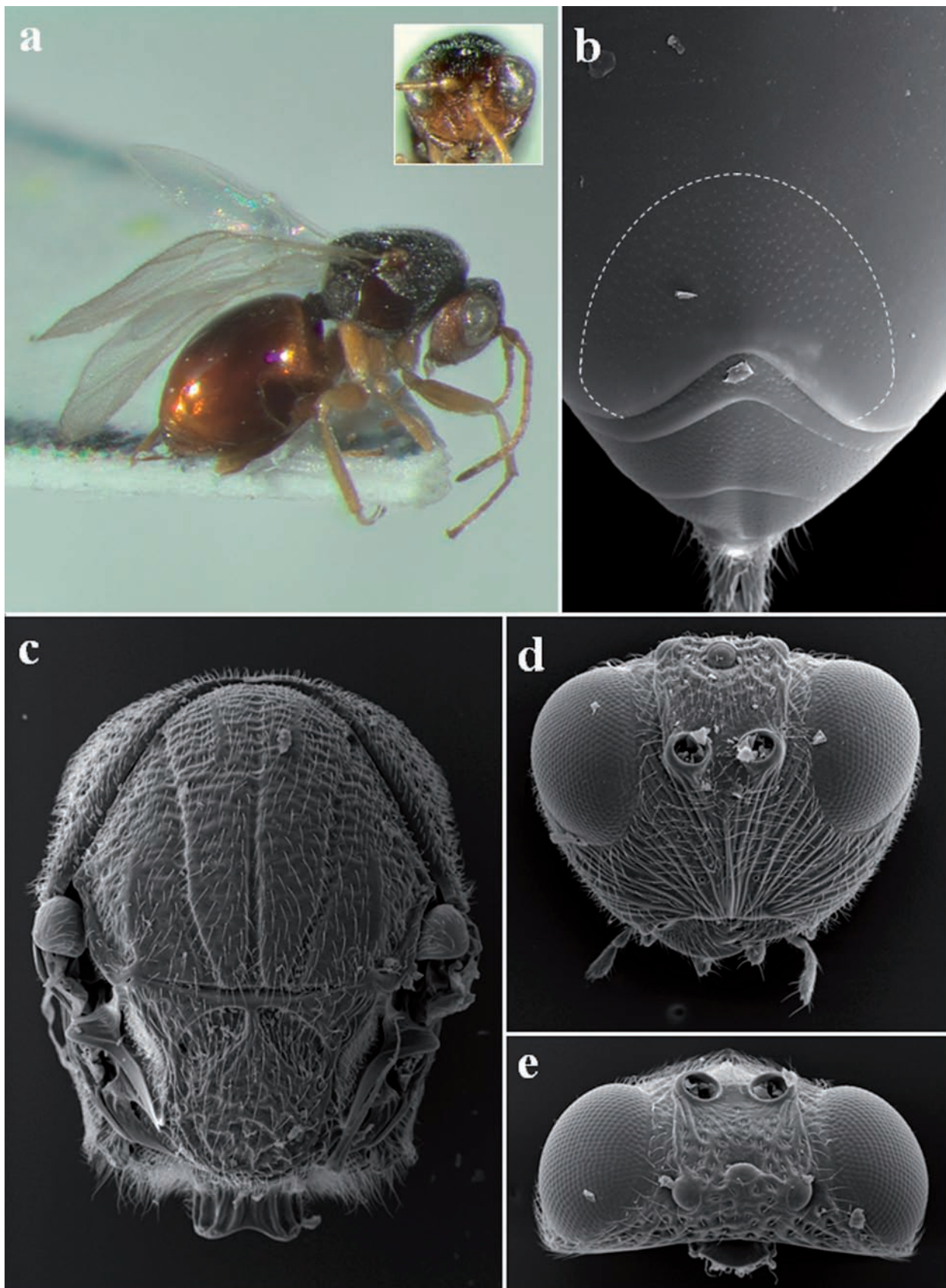


Figure 2. Morphological features of *Synergus chinensis* ♀: (a) lateral habitus and head in frontal view (inset image), (b) metasoma in posterodorsal view, pointing out the punctate area, (c) mesosoma in dorsal view, (d) head in frontal view, (e) head in dorsal view. Pictures' author: Juli Pujade-Villar

South Korea. Kovalev (1965) recorded *S. gallaepomiformis* (Boyer de Fonscolombe) from the Far East of Russia, which was reared from asexual 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. gallaepomiformis* 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

Zhuanghe Haiwangjiudao, Dalian (Liaoning province, Tianlin Chen col.), on *Q. mongolica*, (20.vi.2018) vi.2018: 1 ♂ & 31 ♀ (1 ♂ & 15 ♀ in UB); 1-7.vii.2018: 3 ♀.

Another inquiline species is also related to *Andricus hakonensis* galls: *Synergus symbioticus* Schwéger & Melika, 2015, from Japan and Far East of Russia (Schwéger *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 (posteriorly 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; Schwéger *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 Schwéger *et al.* (2015), *S. hakonensis* is morphologically closely related to *S. ishikariii* Melika & Schwéger, 2015 and *S. belezinellus* Schwéger & 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 coriaceous head, without striae and with deep punctures on frons

(see Fig. 2d of *S. chinensis*), vertex and on the interocellar 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

- ABE, Y., MELIKA, G. & STONE, G. N. 2007. The diversity and phylogeography of cynipid gallwasps (Hymenoptera: Cynipidae) of the Oriental and Eastern Palaearctic Regions, and their associated communities. *Oriental Insects*, 41: 169-212. <http://dx.doi.org/10.1080/00305316.2007.10417504>
- ASHMEAD, W. H. 1904. Description of new Hymenoptera from Japan (I). *Journal of the New York Entomological Society*, 12: 65-84.
- KOVALEV, O. V. 1965. Gall wasps (Hymenoptera, Cynipidae) from the south of the Sovietic Far East. *Entomologicheskije Obozrenije*, 44 (1-2): 46-73. [in Russian, English translation in *Entomological Review*, 44: 25-38].
- MELIKA, G., ÁCS, Z. & BECHTOLD, M. 2004. New species of cynipid inquilines from China (Hymenoptera: Cynipidae: Synergini). *Acta Zoologica Academiae Scientiarum Hungaricae*, 50: 319-336.
- PENZÉS, Z., TANG, C.-T., STONE, G. N., NICHOLLS, J. A., SCHWÉGER, S., BOZSÓ, M. & MELIKA, G. 2018. Current status of the oak gallwasp (Hymenoptera: Cynipidae: Cynipini) fauna of the Eastern Palaearctic and Oriental Regions. *Zootaxa*, 4433 (2): 245-289. <https://doi.org/10.11646/zootaxa.4433.2.2>.
- PUJADE-VILLAR, J., WANG, Y., CHEN, T., SHEN, L. & FERRER-SUAY, M. 2017. Description of a new *Synergus* species from China and comments on other inquiline species (Hymenoptera: Cynipidae: Synergini). *Zootaxa*, 4341 (1): 56-66. <https://doi.org/10.11646/zootaxa.4341.1.4>
- SCHWÉGER, S., MELIKA, G., TANG, C. T., BIHARI, P., BOZSÓ, M., STONE, G. S., NICHOLLS, J. A., & PÉNZES, Z. 2015. New species of cynipid inquilines of the genus *Synergus* (Hymenoptera: Cynipidae: Synergini) from the Eastern Palaearctic. *Zootaxa*, 3999 (4): 451-497. <http://dx.doi.org/10.11646/zootaxa.3999.4.1>
- WACHI, N. & ABE, Y. 2010. Taxonomical status of the oak gall wasp *Callirhytis hakonensis* Ashmead (Hymenoptera: Cynipidae), with description of the sexual generation. *Annals of the Entomological Society of America*, 103: 322-326. <https://doi.org/10.1603/AN09128>