

NEW SPECIES OF CYNIPID INQUILINES FROM CHINA
(HYMENOPTERA: CYNIPIDAE: SYNERGINI)

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Four new species of cynipid inquilines, *Synergus chinensis* and *S. xiaolongmeni*, *Saphonecrus chaodongzhui* and *S. naiquanlini* (Hymenoptera: Cynipidae: Synergini) from China are described. Description and diagnosis of adult insects, their host associations and some notes on their biology are given.

Key words: cynipid inquilines, *Synergus*, *Saphonecrus*, taxonomy, morphology, distribution

INTRODUCTION

Inquiline cynipids have lost the ability to induce their own galls, nevertheless they are also phytophagous insects, like the gall wasps. Cynipid inquiline larvae can develop inside the gall-inducer chamber and then usually cause the death of the gall-inducer cynipid larvae, or locate and feed in the peripheral tissue of the gall and also can provoke or not the death of the gall inducer larvae, especially when the number of inquilines is high. They are placed in a separate tribe Synergini, between other 5 tribes of gall inducers within Cynipinae subfamily of Cynipidae (RONQUIST 1999). Inquiline cynipids have a worldwide distribution, but the majority are found in the Holarctic region and are represented by 5 genera: *Ceroptres* HARTIG, 1840, *Saphonecrus* DALLA TORRE et KIEFFER, 1910, and *Synophrus* HARTIG, 1843 – all are inquilines in oak cynipid galls; *Periclistus* FOERSTER, 1869 – inquilines in rose galls, and *Synophromorpha* ASHMEAD, 1903 – inquilines in *Diastrophus* galls on *Rubus*.

Little is known about the cynipid inquiline fauna of the Eastern Palaearctic. MONZEN (1953) listed six species of *Synergus* from Japan: *S. atamiensis* ASHMEAD, 1904, *S. gifuensis* ASHMEAD, 1904, *S. hakonensis* ASHMEAD, 1904, *S. japonicus* WALKER, 1874, *S. jezoensis* UCHIDA et SAKAGAMI, 1948, and *S. mizunarae* SHINJI, 1940. Two species only were recorded after their descriptions: *Synergus japonicus* and *S. gifuensis*. MASUDA (1959) recognised two forms of *S. japonicus*: type “A” and type “B”, on the basis of differences in life cycles and impact of the gall structure. Later, ABE (1990, 1992) extended the biological studies on “*S. japonicus*” species complex. The biological differences found by previous

authors are supported by morphological characters separating two species in the “*Synergus japonicus*” complex: *Synergus japonicus* and *S. gifuensis* ASHMEAD, 1904 (PUJADES-VILLARS *et al.* 2002). Descriptions of other *Synergus* species, known from Japan: *S. atamiensis*, *S. hakonensis*, *S. jezoensis*, and *S. mizunarae*, do not agree with the morphology of species here in described (ASHMEAD 1904, UCHIDA & SAKAGAMI 1948, SHINJI 1940).

KOVALEV (1965) reared *Synergus gallaepomiformis* (BOYER DE FONSCOMBE, 1832) from galls of *Andricus symbioticus* KOVALEV, 1965 and *A. attractus* KOVALEV, 1965 collected from *Q. mongolicus*, near Lake Khasan (Primorskij Kraj), on the border with China. The two newly described species differ from it (see diagnosis below for both species).

Nine species of *Saphonecrus* were described from Holarctic: 4 species from North America: *S. brevicornis* (ASHMEAD, 1896), *S. brevis* WELD, 1926, *S. favanus* WELD, 1944, and *S. gemmariae* (ASHMEAD, 1885); 5 species from the Western Palearctic, particularly from Europe: *S. barbotini* PUJADE-VILLAR *et* NIEVES-ALDREY, 1985, *S. connatus* (HARTIG, 1840), *S. haimi* (MAYR, 1872), *S. lusitanicus* (TAVARES, 1902), and *S. undulatus* (MAYR, 1872).

Earlier 5 species of *Saphonecrus* were described from Eastern Palearctic: *S. excisus* (KIEFFER, 1904) from Bengali (Kursegong), reared from *Neuroterus haasi* KIEFFER, 1904 (KIEFFER 1904); 2 species, *S. serratus* WELD, 1926 and *S. areolatus* WELD, 1926 were described from Philippines (Luzon Island) (WELD 1926); *S. sinicus* BELIZIN, 1968 from China, Sechuan and *S. diversus* BELIZIN, 1968 from Russia, Primorskij Kraj (BELIZIN 1968).

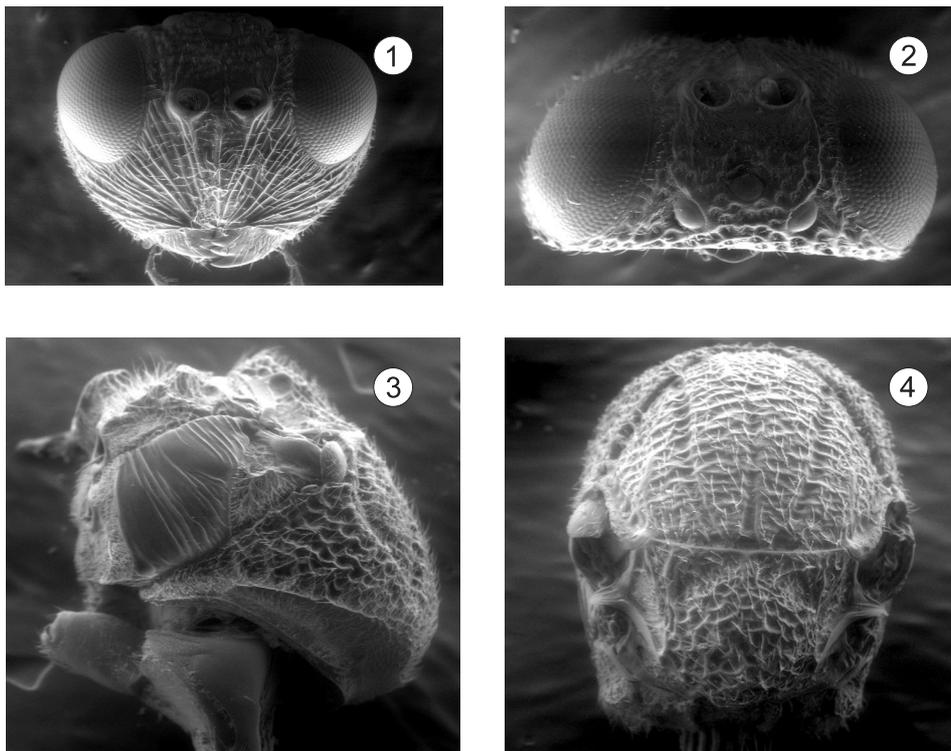
We follow the current terminology of morphological structures for the wasps (EADY & QUINLAN 1963, GIBSON 1985, RONQUIST & NORDLANDER 1989). Abbreviations for fore wing venation follow RONQUIST and NORDLANDER (1989). Additional abbreviations used here include: F1–F12, 1st and subsequent flagellomeres; POL (post-ocellar distance), the distance between the inner margins of the posterior ocelli; OOL (ocellar–ocular distance), the distance from the outer edge of a posterior ocellus to the inner margin of the compound eye.

Scanning electron microscope photographs were taken by Philips XL30ESEM, without coating, under low voltage (under 10 kV).

Below two new species of *Synergus*: *S. chinensis* MELIKA, ÁCS *et* BECHTOLD and *S. xiaolongmeni* MELIKA, ÁCS *et* BECHTOLD and two new species of *Saphonecrus*: *S. chaodongzhui* MELIKA, ÁCS *et* BECHTOLD and *S. naiquanlini* MELIKA, ÁCS *et* BECHTOLD are described from China.

***Synergus chinensis* sp. n.**
(Figs 1–9)

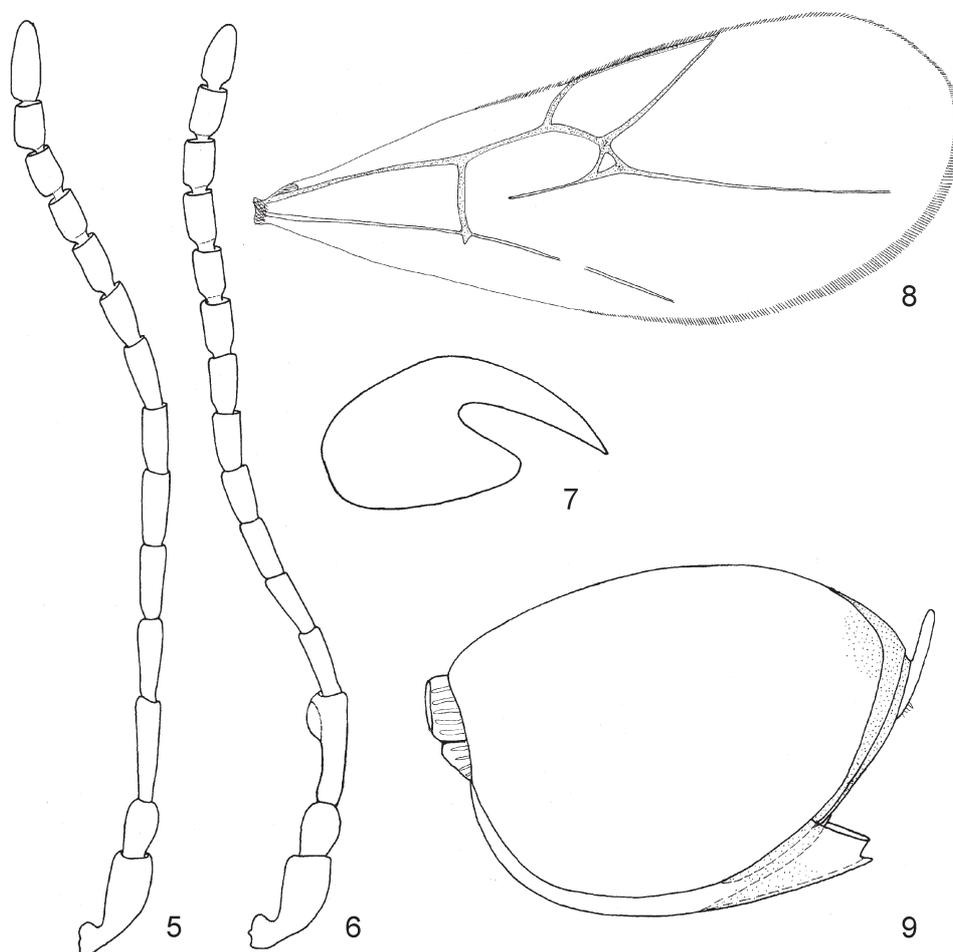
Description – Female. Head dark brown to reddish, except interocellar area and occiput; antenna light brown to yellow, with darker distal flagellomeres; scutum and scutellum always black, pronotum laterally, mesopleuron, metascutellum and propodeum dark, red brown, tegula light brown; wing veins light yellow; legs light brown to yellow, with darker coxae; metasoma uniformly red brown. Head from above 2.6 times as wide as long, 1.3 times as broad as high and subquadrate in front view, broader than thorax; gena slightly broadened behind eye (Figs 1–2); POL 2.0 times as long as OOL, OOL equal or only very slightly longer than diameter of lateral ocellus; vertex, interocellar area and occiput dull rugose, frons rugous with deep punctures, frontal carinae strong reaching lateral ocelli; lower face and gena with strong striae irradiating from clypeus to compound eye and antennal socket; malar space 0.6 times as long as height of eye (Figs 1–2). Antenna 14-segmented, F1 2.0 times as long as pedicel and 1.3 times as long as F2 (Fig. 5). Mesosoma 1.2–1.4 times as long as high in lateral view (Fig. 3), pronotum dull rugose, with strong lateral pronotal carina; scutum subquadrate from above, nearly as long as broad, with strong transverse rugae, complete in anterior 1/3 and interrupted posteriorly, interspaces between rugae coriaceous; notauli deep, com-



Figs 1–4. *Synergus chinensis* sp. n., female: 1 = head, front view, 2 = head, dorsal view, 3 = mesosoma, lateral view, 4 = mesosoma, dorsal view

plete; median scutellar line deep reaching to $\frac{3}{4}$ or more of scutum (Fig. 4). Mesopleuron with strong transverse striae (Fig. 3). Scutellum slightly longer than broad, dull rugose, scutellar foveae with coriaceous bottom, separated by a distinct carina (Fig. 4). Propodeum delicately coriaceous, lateral propodeal carinae straight, parallel, central area delicately coriaceous to smooth. Fore wing with pale yellow veins, margin ciliate; radial cell closed, 3.1 times as long as broad, areolet distinct, closed, second abscissa of Rs only slightly curved or nearly straight (Fig. 7). Tarsal claws with basal lobe (Fig. 8). Metasomal terga 2+3 with posterior minute punctures, limited to small apical dorsal patch (Fig. 9). Length 2.1–3.5 mm.

Male. Similar, but with light yellow lower face; antenna 15-segmented, F1 curved, expanded apically, F1 1.6 times as long as F2 (Fig. 6).



Figs 5–9. *Synergus chinensis* sp. n.: 5 = antenna, female, 6 = antenna, male, 7 = fore wing, female, 8 = tarsal claw, female, 9 = gaster, lateral view, female

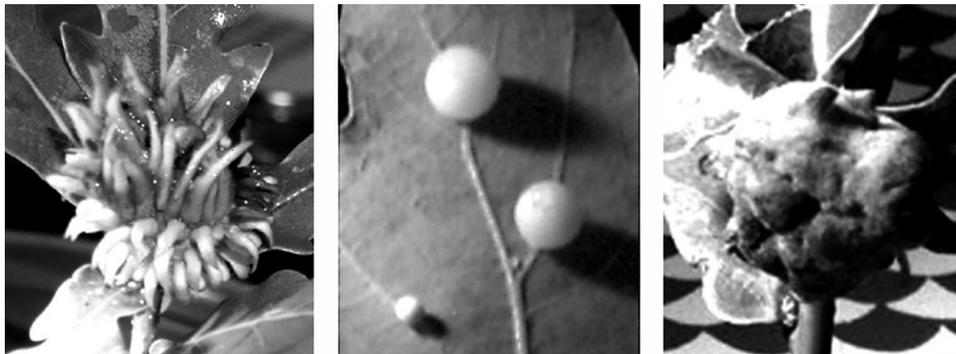
Type material – Holotype female: “CHINA, Beijing Province, Mentougou District, 150 km NW of Beijing, 28.VII.2002; leg. G. Melika”, “Xiaolongmen Station, 1095 m a.s.l.; 39°59'22”N; 115°31.479, from *Quercus* sp.”, “ex acorn gall, *Andricus* sp.1., em. 21.VIII.2002”, and “HOLOTYPE female. *Synergus chinensis* Melika, Ács & Bechtold, desig. G. Melika 2003”. 33 female and 16 male paratypes from the same collecting site: 27 female and 12 male paratypes with the third label “ex acorn gall, *Andricus* sp. 1, em. 21.VIII.2002”, 1 female and 3 male paratypes with the third label “ex leaf gall, *Andricus* sp. 2, em. 03.IX.2002”; 5 female and 1 male paratypes with the third label “ex bud gall, *Andricus* sp. 3, em. 15.VIII.2002”.

Holotype, 2 female and 2 male paratypes in the HHNM, Budapest, Hungary; 4 female and 4 male paratypes in the Institute of Zoology of Chinese Academy of Sciences, Beijing, China; 21 female and 6 male paratypes in the collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary.

Etymology – The species is named after the country, China, where it was collected.

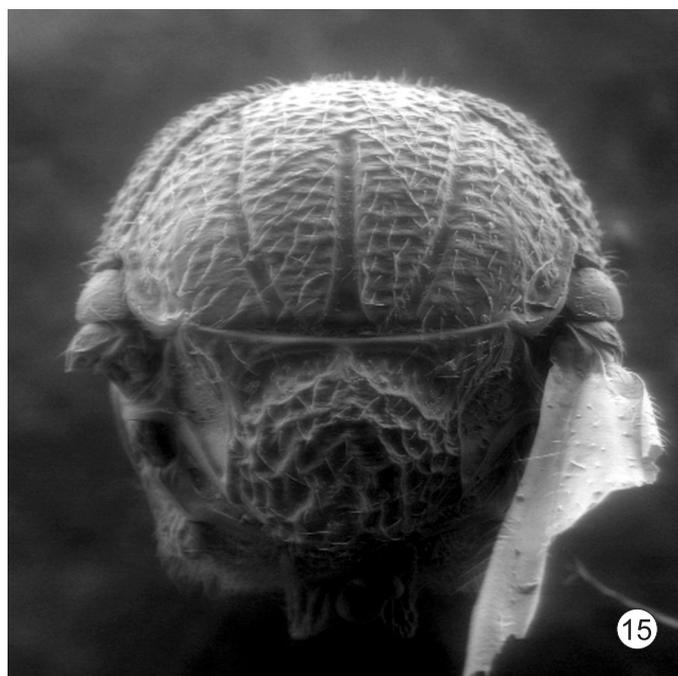
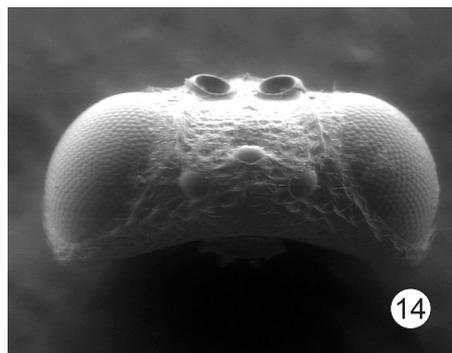
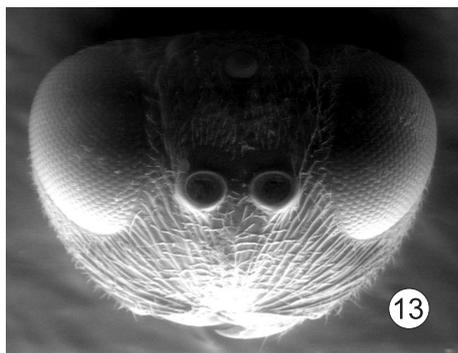
Host cynipid galls – This species was reared from galls of three different unidentified, probably unknown, new species: “*Andricus* sp. 1” – monolocular galls on acorns, on *Quercus* sp. (Fig. 10). In the galls, attacked by inquilines, a large number of inquiline larval chambers can be found in the gall parenchyma. “*Andricus* sp. 2” – small rounded leaf galls, underside of leaves, collected from unknown species of oaks (Fig. 11). The shape, size and inner structure of the gall is quite like *Cynips quercus* (FOURCROY, 1785), asexual galls. No doubts, that it is an *Andricus* species – we reared also adult gall wasps from these galls. “*Andricus* sp. 3” – unknown bud gall, collected from *Quercus* sp. (Fig. 12), its shape and size like that of European well-known and common *Andricus coriarius* (HARTIG, 1843) galls.

Diagnosis – Closely related to a very common, widely distributed Western Palaearctic species, *Synergus gallaepomiformis* (BOYER DES FONSCOLOMBES, 1832), especially the first spring generation, which usually emerges from the sexual galls of *Biorhiza pallida* (OLIVIER, 1791). In *S. chinensis* the head from above is 2.6 times as broad as long; the sculpture of the vertex and frons is dull rugose, frontal carinae are not clearly defined, sometimes branching and do not reach lat-



Figs 10–12. *Andricus* galls. 10 = *A.* sp. 1, 11 = *A.* sp. 2, 12 = *A.* sp. 3

eral ocelli (Fig. 2); OOL equal or only very slightly longer than diameter of lateral ocellus; F1 of female not more than 1.3 times as long as F2 (Fig. 5), F1 of male is strongly expanded apically (Fig. 6); the sculpture of the scutum is more dull, with strong transverse rugae (Fig. 4); the apical patch with distinct punctures on the female terga 2+3 is larger, punctures are distinct (Fig. 9). In *S. gallaepomiformis* the head from above is 2.3 as wide as long; the sculpture of the vertex and frons is deli-



Figs 13–15. *Synergus gallaepomiformis* sp. n.: 13 = head, front view, female, 14 = head, dorsal view, female, 15 = mesosoma, dorsal view, female

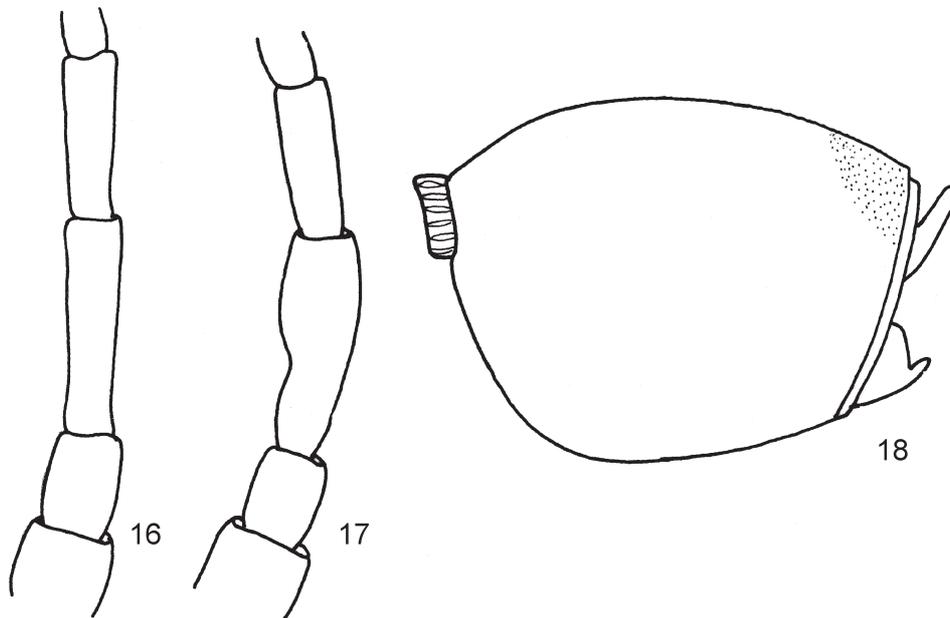
cate, frontal carinae are distinct, not branching; OOL nearly twice as long as the diameter of the lateral ocellus (Figs 13–14); F1 of the female not more than 1.5 times as long as F2 (Fig. 16), F1 of the male is weakly expanded apically (Fig. 17); the sculpture of the scutum much more delicate (Fig. 15); the apical patch with very minute punctures on the female terga 2+3 is small, sometimes punctures are indistinct (Fig. 18).

Distribution – China, Beijing Province, Mentougou District, 150 km NW of Beijing, Xiaolongmen Station, 1095 m a.s.l.

***Synergus xiaolongmeni* sp. n.**

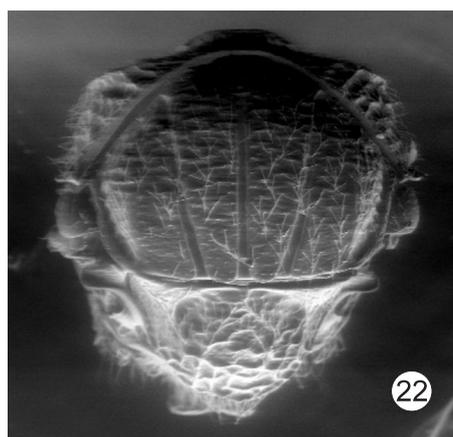
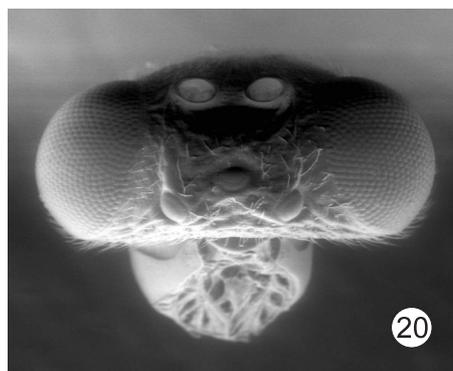
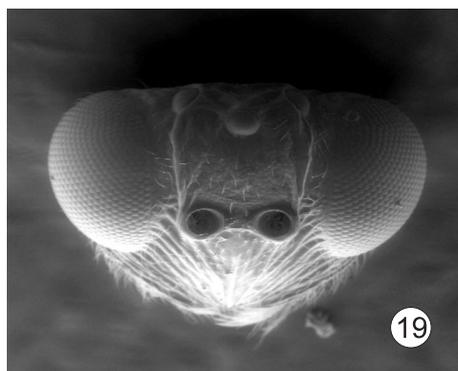
(Figs 19–27)

Description – Female. Head and mesosoma black, mesopleuron and propodeum dark brown; antenna light brown to yellow, with darker distal flagellomeres; tegula brown; wing veins light yellow; legs brown, with darker coxae; metasoma uniformly dark reddish brown. Head from above 2.1 times as wide as long, 1.3 times as broad as high and trapezoid in front view, broader than thorax, gena not broadened behind eye (Figs 19–20); POL 2.0 times as long as OOL, OOL equal or only very slightly longer than diameter of lateral ocellus; vertex, interocellar area and occiput dull rugose, frons



Figs 16–18. *Synergus gallaepomiformis* sp. n.: 16 = antenna, F1–F2, female, 17 = antenna, F1–F2, male, 18 = gaster, lateral view, female

rugose with deep punctures, frontal carinae strong, reaching lateral ocelli, without distinct branching before ocelli; lower face (from antennal sockets to tip of clypeus) 0.8 times as high as distance between compound eyes, measured prolong transfacial line; lower face and gena with strong striae irradiating from clypeus to compound eye and antennal socket; malar space 0.8 times as long as height of eye (Figs 19–20). Antenna 14-segmented, F1 2.1 times as long as pedicel and 1.4 times as long as F2 (Fig. 23). Mesosoma 1.2 times as long as high in lateral view, pronotum dull rugose, with strong lateral pronotal carina; laterally with strong non-branched transverse rugae (Fig. 21); scutum quadrate from above, nearly as long as broad, coriaceous, with weak interrupted transverse rugae, interspaces between rugae coriaceous; notauli and median scutellar line deep, complete, reach pronotum (Fig. 22). Mesopleuron with strong uniform transverse striae (Fig. 21). Scutellum only slightly longer than broad, dull rugose, scutellar foveae with coriaceous bottom, separated by narrow distinct carina (Fig. 22). Propodeum finely coriaceous, lateral propodeal carinae straight, parallel, central area finely coriaceous to smooth; lateral parts of propodeum with dense white pubescence. Fore wing with pale yellow veins, margin ciliate; radial cell closed, 3.2 times as long as broad, areolet distinct, closed, sec-



Figs 19–22. *Synergus xiaolongmeni* sp. n.: 19 = head, front view, female, 20 = head, dorsal view, female, 21 = mesosoma, lateral view, female, 22 = mesosoma, dorsal view, female

ond abscissa of Rs nearly straight (Fig. 25). Tarsal claws with basal lobe (Fig. 26). Metasomal terga 2+3 with posterior minute punctures, limited to small apical dorsal patch (Fig. 27). Length 2.0–3.2 mm.

Male. Similar, but with brown lower face; antenna 15-segmented, F1 strongly expanded apically, F1 2.4 times as long as F2 (Fig. 24).

Type material – Holotype female: “CHINA, Beijing Province, Mentougou District, 150 km NW of Beijing, 28.VII.2002; leg. G. Melika”, “Xiaolongmen Station, 1095 m a.s.l.; 39°59'220; 115°31.479, from *Quercus* sp”, “ex leaf gall, *Andricus* sp. 2., em. 12–18.VIII.2002”, and “Holotype. Female. *Synergus xiaolongmeni* Melika, Ács & Bechtold, desig. G. Melika 2003”; 12 female and 3 male paratypes with the same labels as the holotype.

Holotype, 2 female and 1 male paratypes in the HNHM, Budapest, Hungary; 2 female and 1 male paratypes in the Institute of Zoology of Chinese Academy of Sciences, Beijing, China; 8 female paratypes and 1 male paratypes in the collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary.

Etymology – The species is named after the collecting locality, Xiaolongmen Biological Station.

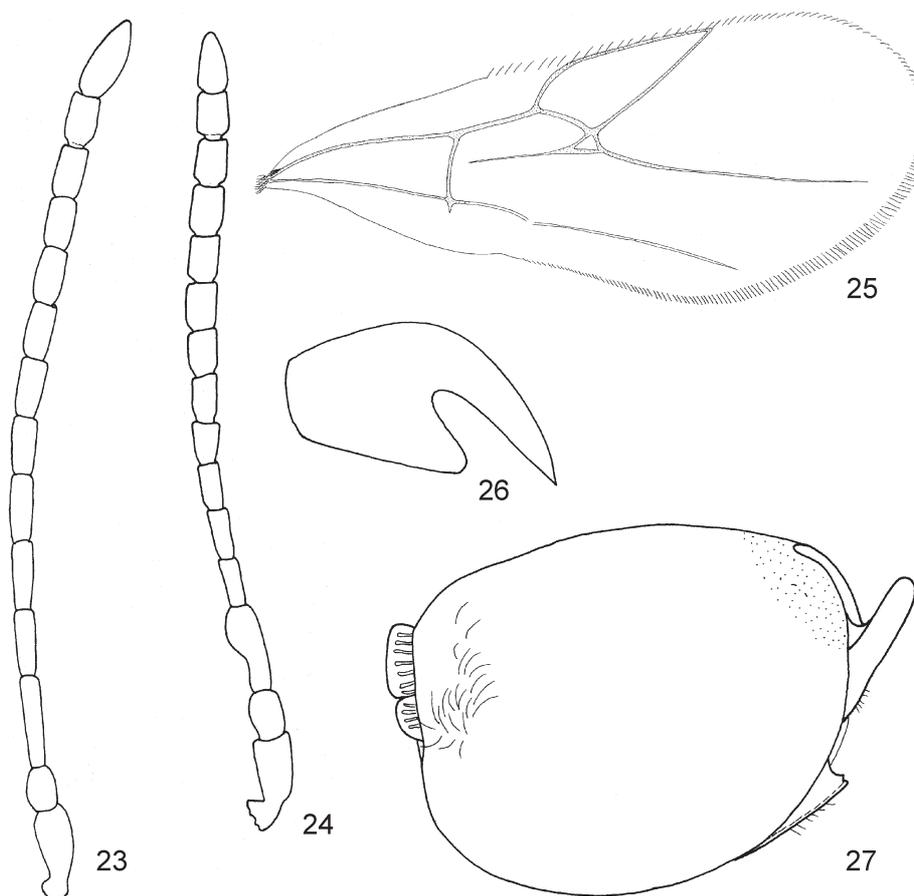
Host cynipid galls – This species was reared from galls of “*Andricus* sp. 2” – small rounded leaf galls, underside of leaves, collected from unknown species of oaks (Fig. 11).

Diagnosis – Closely related to a well-known and common, widely distributed Western Palaearctic species, *Synergus pallicornis* HARTIG, 1841. In *S. xiaolongmeni* the head from above 2.1 times as wide as long; POL 2.0 times as long as OOL; the vertex, interocellar area, occiput and frons dull rugose, the frons rugose with deep punctures, frontal carinae without distinct branching before ocelli (Figs 19–20); F1 of the female antenna 2.1 times as long as pedicel and 1.4 times as long as F2 (Fig. 23), F1 of the male antenna strongly expanded apically, F1 2.4 times as long as F2 (Fig. 24); the sculpture of the scutum is dull, with strong transverse rugae, notauli and median scutellar line are deep, complete and reaching the pronotum (Fig. 22); female’s metasoma uniformly dark reddish brown, the apical patch of minute punctures smaller (Fig. 27). In *S. pallicornis* the head from above 2.4–2.5 times as wide as long; POL 2.75 times as long as OOL; the frons coriaceous, without punctures, lateral frontal carinae strong and often branched near ocelli; subparallel carinae are running transversely between lateral ocelli, and obliquely from each posterior ocellus to the margin of the occiput (Figs 28–29); F1 of the female antenna only 1.7–1.8 times as long as pedicel and 2.1 times as long as F2 (Fig. 31); F1 of the male antenna is less expanded apically and 1.5–1.7 times as long as F2 (Fig. 32); the scutum is coriaceous, notauli are complete but shallow, superficial, the median scutellar line reaching to the half way or less of the scutum (Fig. 30); female’s metasoma is black, the apical patch of minute punctures larger (Fig. 33).

Distribution – China, Beijing Province, Mentougou District, 150 km NW of Beijing, Xiaolongmen Station, 1095 m a.s.l.

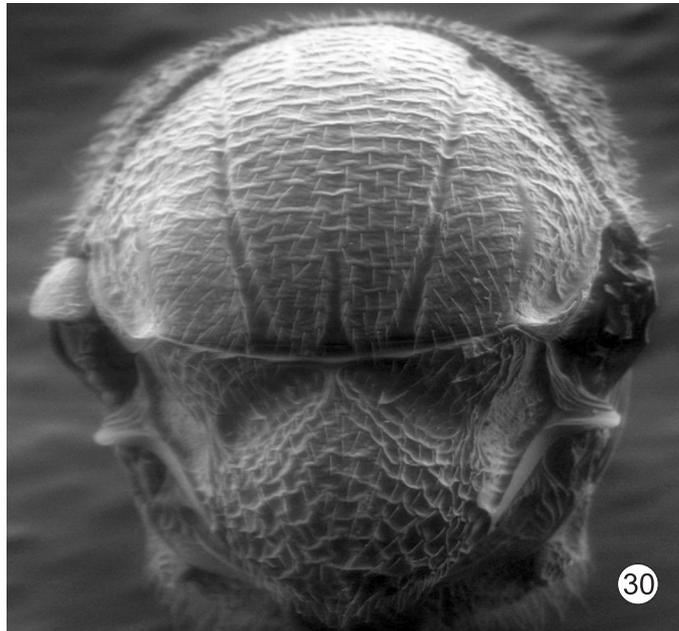
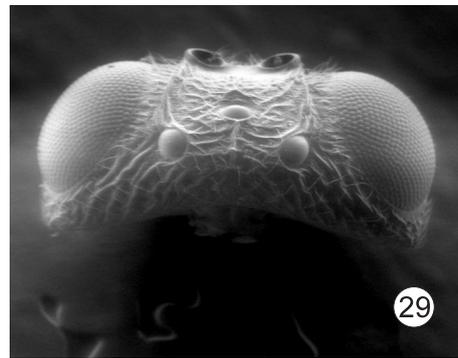
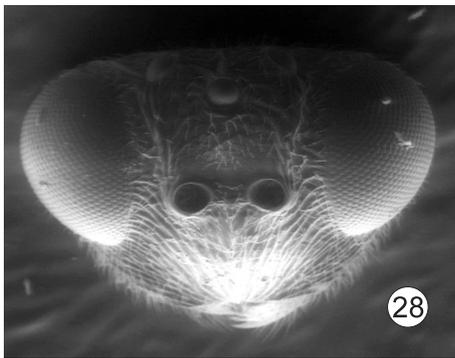
Synergus japonicus WALKER, 1874

The most abundant *Synergus* species, reared from cynipid oak galls, collected by us at the Xiaolongmen Biological Station (China, Beijing Province, Mentougou District, 150 km NW of Beijing) during July 2002, from three unidentified *Quercus* species was *Synergus japonicus*. We reared this species from all three mentioned oak galls: “*Andricus* sp. 1”, “*Andricus* sp. 2”, “*Andricus* sp. 3”,



Figs 23–27. *Synergus xiaolongmeni* sp. n.: 23 = antenna, female, 24 = antenna, male, 25 = forewing, female, 26 = tarsal claw, female, 27 = gaster, lateral view, female

and from asexual galls of *Andricus mukaigawae* (MUKAIGAWA, 1913). Both species, *Andricus mukaigawae* and *Synergus japonicus* are listed for the Chinese fauna for the first time. *Synergus japonicus* belongs to Section I (MAYR 1872) of *Synergus*, which is characterized by a band of punctures on the posterior end of metasomal terga 2+3, reaching the ventral edge of the tergum, while the two newly described species belong to Section II (MAYR 1872).

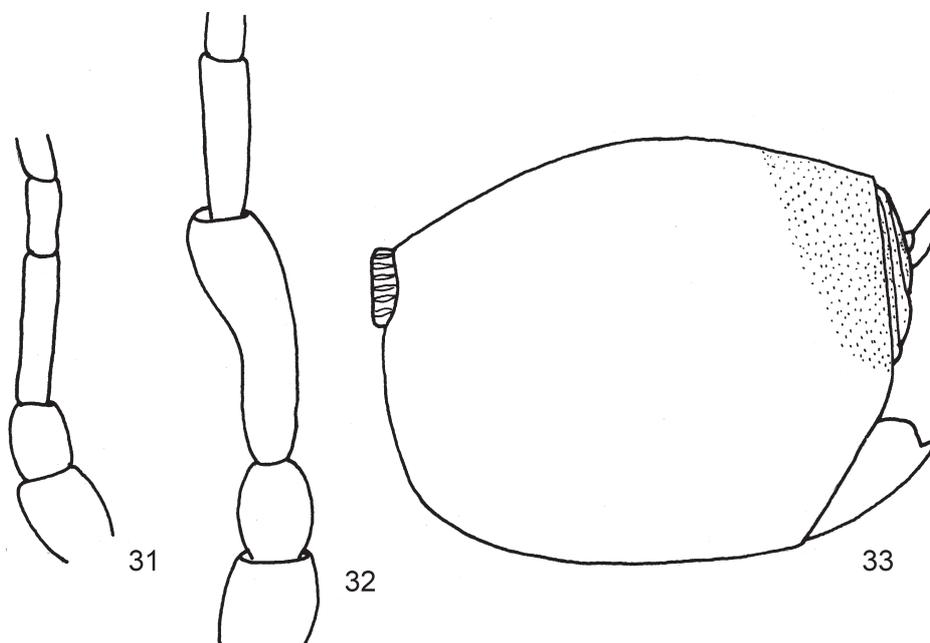


Figs 28–30. *Synergus pallicornis* sp. n.: 28 = head, front view, female, 29 = head, dorsal view, female, 30 = mesosoma, dorsal view, female

Saphonecrus chaodongzhui sp. n.

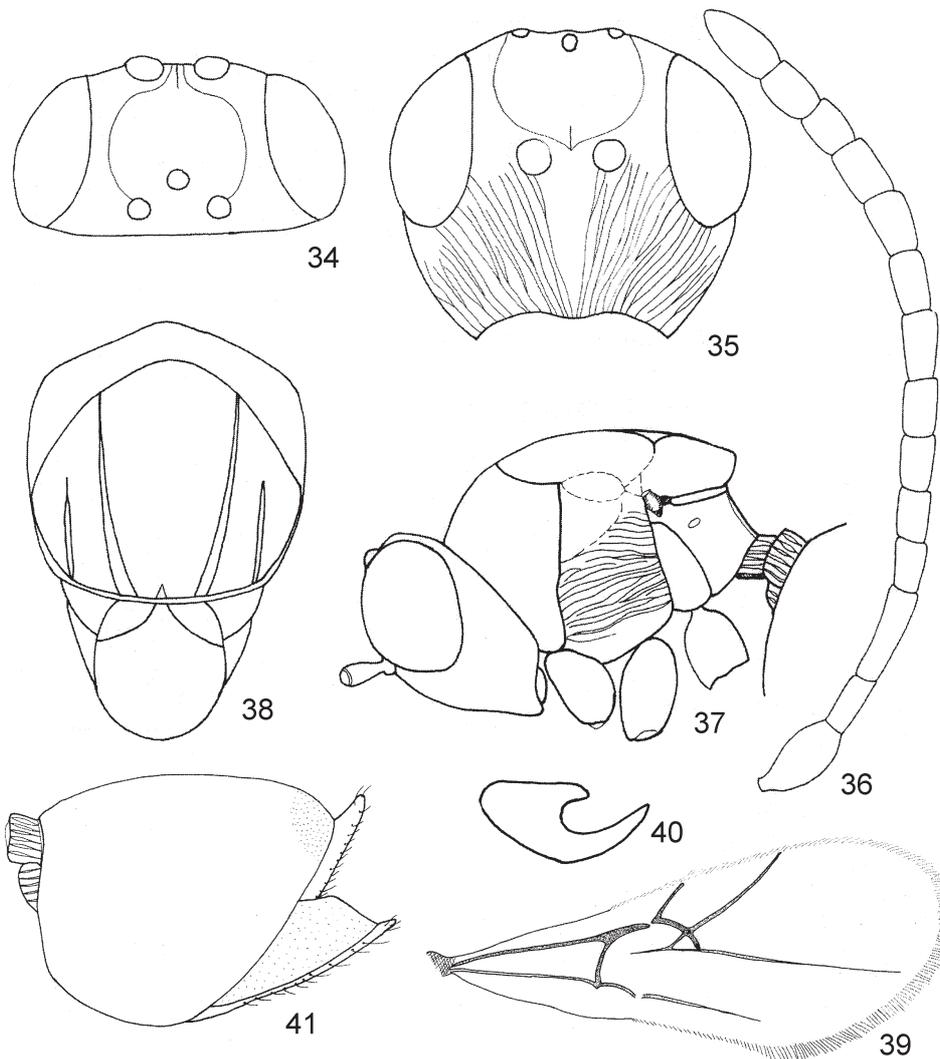
(Figs 34–41)

Description – Female. Vertex, interocellar area, occiput and central rounded area on frons black; genae, narrow stripes around compound eyes, lower face and clypeus brown, except two blackish brown lateral spots on lower face; mandibles yellow with dark brown tips, labial and maxillar palpi yellow; antennae and legs uniformly light brown, except darker hind coxae; wing veins distinct, brown; mesosoma black, except light brown to yellow tegula; petiole black, metasoma reddish brown, to dark brown dorsally, uniformly lighter till ventral part. Head from above 1.9–2.0 times as broad as long (Fig. 34), 1.2 times as broad as high and subquadrate in front view, as broad as thorax, gena not broadened behind eye (Fig. 35); POL nearly equal OOL, OOL 1.8–2.0 times as long as diameter of lateral ocellus. Vertex, interocellar area, occiput, frons and gena delicately coriaceous; two very weak frontal carinae delimited a dark very slightly impressed central area between antennal sockets and ocelli, with very weak incomplete central vertical carinae (Figs 34–35); lower face and gena with delicate striae irradiating from clypeus to compound eye and antennal socket (Fig. 35); malar space 0.65–0.7 times as long as height of eye (Fig. 35). Antenna 14-segmented, flagellomeres slightly broadened to F12, F1 1.6 times as long as pedicel and 1.8 times as long as F2, F12 1.7 times as long as F11, F2–F5 shortest flagellomeres (Fig. 36). Mesosoma 1.25–1.3 times as long as high from lateral view (Fig. 37). Pronotum with uniform dense pubescence, delicately coriaceous dorsally, with stronger sculpturing laterally, with weak lateral striae, laterally rounded, without lateral pronotal carina. Scutum subquadrate from above, nearly as long as broad, with weak, interrupted transverse

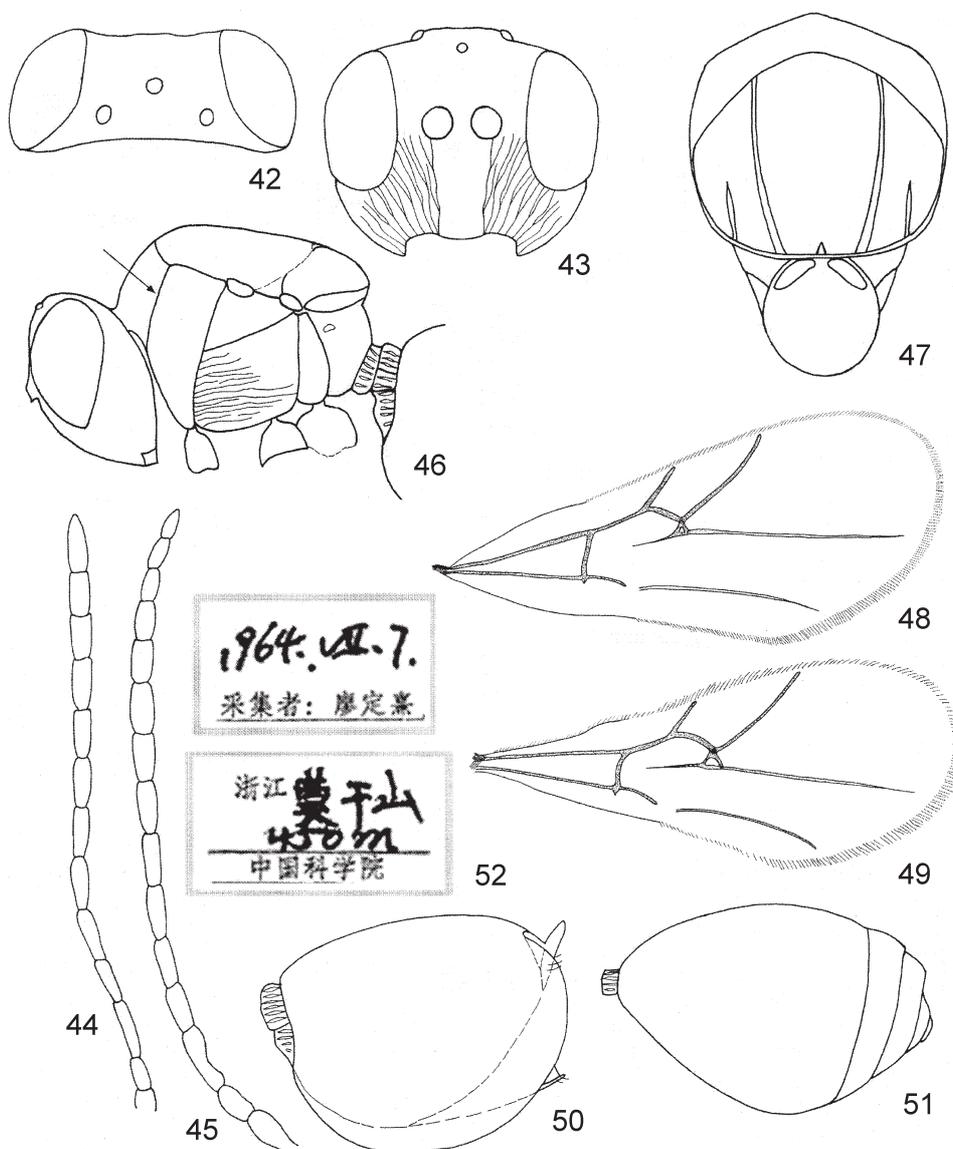


Figs 31–33. *Synergus pallicornis* sp. n.: 31 = antenna, F1–F2, female, 32 = antenna, F1–F2, male, 33 = gaster, lateral view, female

rugae, interspaces between rugae delicately coriaceous; notauli complete, narrow and distinct, slightly broader posteriorly and narrowed down anteriorly; median scutellar line absent or in two paratype females only very indistinctly indicated at main base; parapsidal lines present reaching to $\frac{3}{4}$ of scutum (Fig. 38). Mesopleuron with delicate transverse striae (Fig. 37). Scutellum slightly longer than broad, dull rugose, scutellar foveae indistinctly delimited from disk of scutellum, in a form of



Figs 34–41. *Saphonecrus chaodongzhui* sp. n., female: 34 = head from above, 35 = head, front view, 36 = antenna, 37 = head and mesosoma, lateral view, 38 = scutum and scutellum, dorsal view, 39 = fore wing, 40 = hind leg, tarsal claw, 41 = metasoma, lateral view



Figs 42–52. *Saphonecrus naiquanlini* sp. n.: 42 = head from above, female, 43 = head, front view, female, 44 = antenna, female, 45 = antenna, male, 46 = head and mesosoma, lateral view, female, 47 = scutum and scutellum, dorsal view, female, 48 = fore wing, female, 49 = fore wing, male, 50 = metasoma, lateral view, female, 51 = metasoma, lateral view, male, 52 = Chinese labels of holotype female

depressions with same sculpture as the disk, separated by elevated central portion (Fig. 38). Propodeum uniformly delicately coriaceous, with uniform short dense white setae, lateral propodeal carinae straight, parallel, central area delicately coriaceous; metascutellum smooth, shining. Fore wing margin ciliate; radial cell opened, 3.0 times as long as broad, areolet distinct, closed, second abscissa of Rs only slightly curved, not reaching wing margin, as well as R_1 ; R_1+Sc interrupted before reaching R_1 (Fig. 39). Tarsal claws with basal lobe (Fig. 40). Petiole sulcate; metasomal terga 2+3 with posterior very minute punctures, limited to small apical dorsal patch; hypopygium with very minute dense punctures, ventral ridge with short white setae, prominent part of ventral spine of hypopygium short, 2.0 times as long as broad (Fig. 41). Length 1.9–2.1 mm.

Male unknown.

Type material – Holotype female: both labels in Chinese language “Yunnan, Diqing, Xiaozhongdian, 3200M, 1984.07.31”, “84.7.31, coll. Changfang Li”, and a red label in English language “HOLOTYPE. Female. *Saphonecrus chaodongzhui* Melika, Ács & Bechtold, desig. G. Melika 2003”. Two paratype females with the same labels as the holotype. Holotype female in the Institute of Zoology of Chinese Academy of Sciences, Beijing, China and 2 female paratypes in the collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary.

Etymology – The species is named in honour of Dr. Chaodong Zhu, Associate Professor of the Institute of Zoology, Chinese Academy of Sciences (Beijing, China).

Host cynipid galls are unknown.

Diagnosis – Closely resembles the Western Palaearctic *Saphonecrus connatus* (HARTIG, 1840): the lateral pronotal carina is absent, the pronotum is rounded in dorsal view; F1 of the antenna less than 2.0 times as long as the pedicel, and the radial cell is 2.5–3.0 times as long as broad. However, in *S. chaodongzhui* the head and metasoma are brown or reddish brown, the frons with two weak frontal carinae, delimited an impressed central area, notauli are distinct, deep and complete, the disk of the scutellum is dull rugose; the propodeum with dense white setae; the metasoma with an apical patch of minute punctures, while in *S. connatus* the entire body is black, the frons without central impression and frontal carinae; notauli are absent or very indistinctly traceable at the main posterior part of the scutum; the disk of the scutellum is delicately coriaceous; the propodeum is smooth, shiny, without setae; the metasoma without apical patch of minute punctures. *Saphonecrus chaodongzhui* also closely related to *S. sinicus* BELIZIN, 1968, described from China, Sechuan, but differs in the presence of a central impressed area on the frons, notauli are distinct, deep, parapsidal lines present, anterior parallel lines are absent, the scutellum is narrower than the scutum; tergite 3 without a line of short white setae at the base, while in *S. sinicus* the frons is uniformly delicately coriaceous, without traces of frontal carinae and impressed central area, notauli are very narrow, parapsidal lines are absent, anterior parallel lines are pres-

ent, and the base of scutellum as broad as the scutum; tergite 3 with a line of short white setae.

Distribution – China, Yunnan, Diqing, Xiaozhongdian.

Saphonecrus naiquanlini sp. n.

(Figs 42–52)

Description – Female. Head uniformly dark brown to black; pronotum, scutum and scutellum black; mesopleuron, propodeum dark brown, antennae and legs uniformly light brown; wing veins light brown; metasoma reddish brown. Head from above 2.2 times as wide as long (Fig. 42), 1.3 times as broad as high and subquadrate in front view, as broad as thorax, gena not broadened behind eye (Fig. 43); POL 3.5 times as long as OOL, OOL slightly longer than diameter of lateral ocellus; vertex, frons and gena delicately coriaceous; interocellar area and occiput with very weak, delicate dense transverse striae; lower face and gena with delicate striae irradiating from clypeus to eye and antennal socket (Fig. 43); malar space 0.5 times as long as height of eye (Fig. 43); lower face, clypeus and malar space with dense uniform white setae, frons with very sparse few white setae. Antenna 13-segmented, flagellomeres slightly broadened to F11, F1 1.6 times as long as pedicel and 1.3 times as long as F2 and nearly equal F3; F11 1.3 times as long as F10 (Fig. 44). Mesosoma 1.25–1.3 times as long as high from lateral view (Fig. 46). Pronotum with uniform dense pubescence, dorsally delicately coriaceous, with stronger sculpturing laterally, with strong lateral pronotal carina (Fig. 46). Scutum from above 1.25 times as broad as long, with weak, interrupted transverse rugae, interspaces between rugae delicately coriaceous; notauli complete, narrow and distinct, slightly broader posteriorly and narrowed down anteriorly; median scutellar line present in form of impression at the main base of scutum; parapsidal lines present, reach to 1/2 of scutum (Fig. 47). Mesopleuron with delicate transverse striae reach to the end of mesopleuron in ventral half, while upper half posteriorly smooth and shiny (Fig. 46). Scutellum slightly longer than broad, with sparse white setae, dull rugose, scutellar foveae narrow, distinctly delimited from disk of scutellum, separated by a central narrow carina, bottom of foveae smooth (Fig. 47). Propodeum finely coriaceous, with uniform short dense white setae laterally, lateral propodeal carinae straight, slightly diverging towards metascutellum, central area smooth, without setae; metascutellum smooth, shining. Fore wing margin ciliate; radial cell open, 3.0 times as long as broad, areolet distinct, small, closed, second abscissa of Rs only slightly curved not reaching wing margin, as well as R₁ (Fig. 48). Tarsal claws with basal lobe. Petiole sulcate; metasomal terga 2+3 without minute punctures posteriorly, prominent part of ventral spine of hypopygium short, nearly as long as broad (Fig. 50). Length 1.9–2.3 mm.

Male. Similar to female, except frons, lower face, pronotum, scutum and scutellum with very dense white pubescence; antennae and legs yellow; antenna 15-segmented, F1 curved and slightly expanded apically, F7–F9 broadest flagellomeres, F10 to F13 narrower (Fig. 45); fore wing narrower, with longer margin cilia, areolet slightly larger (Fig. 49); metasoma in Fig. 51.

Type material – Holotype female: both labels in Chinese language (Fig. 52) “Zhejiang, Mt. Mogan, 450 m”, “1964.VII.7., coll. Dingxi Liao”, and a red label in English language “HOLOTYPE. Female. *Saphonecrus naiquanlini* Melika, Ács & Bechtold, desig. G. Melika 2003”. One female and 2 male paratypes with the same collecting labels as the holotype. Holotype female and one paratype male in the Institute of Zoology of Chinese Academy of Sciences, Beijing, China and 1 female and 1 male paratypes in the collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary.

Etymology – The species is named in honour of Dr. Nai-quan Lin, Professor of the Biological Control Research Institute, Fujian Agriculture and Forestry University (Fuzhou, Fujian, China).

Host cynipid galls are unknown.

Diagnosis – Closely related to *S. diversus* BELIZIN, 1968, however, *S. naiquanlini* differs in the F1 of female antenna only 1.3 times as long as F2, F11 1.3 times as long as F10, subsequent flagellomeres nearly of the same length; the mesopleuron striate, the median scutellar line is very short, in a form of a depression at the main base of the scutum; the central propodeal area is smooth and shiny, without pubescence; the base of terga 2+3 without a line of sparse white setae. In *S. diversus* F1 almost nearly 2.0 times as long as F2, F11 2.0 times as long as F10, subsequent flagellomeres shortening to the end of the antenna; the mesopleuron is shiny and smooth; the scutum with a distinct median scutellar line; the propodeum is uniformly pubescent; the base of terga 2+3 with a line of sparse white setae.

Distribution – China, Zhejiang.

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REFERENCES

- ABE, Y. (1990) Life cycles of two species of the *Synergus japonicus* complex (Hymenoptera: Cynipidae). *Akitu* **120**: 1–7.
- ABE, Y. (1992) Ethological isolation between inquiline gall wasps, the *Synergus japonicus* complex (Hymenoptera: Cynipidae), which sometimes coexist in host galls. *Applied Entom. Zool.* **27**(4): 527–531.
- ASHMEAD, W. H. (1904) Description of new Hymenoptera from Japan. I. *J. N. Y. Ent. Soc.* **12**: 65–84.
- BELIZIN, V. I. (1968) New genera and species of gall wasps (Hymenoptera, Cynipoidea) of the Soviet Far East and adjacent territories. *Zool. Zhurn.* **47**(5): 701–719. [In Russian]
- EADY, R. D. & QUINLAN, J. (1963) *Handbooks for the identification of British insects. Hymenoptera. Cynipoidea*. London. VIII (Ia). 81 pp.
- GIBSONS, G. A. P. (1985) Some pro- and mesothoracic structures important for phylogenetic analysis of Hymenoptera, with a review of terms used for the structures. *Can. Entomol.* **117**: 1395–1443.
- KIEFFER, J. J. (1904) Description de quelques Cynipides exotiques dont l'un forme un genre nouveau. *Bull. Soc. Hist. nat. Metz* **2**(11): 59–66.
- KOVALEV, O. V. (1965) Gall wasps (Hymenoptera, Cynipidae) from the south of the Soviet Far East. *Rev. d'Ent. l'URSS* **44**(1–2): 46–73. [In Russian]

- MASUDA, H. (1959) Life of gall wasps. Pp. 103–138. In IWATA, K., FURUKAWA, H. & YASUMATSU, K. (eds): *Nihon-Konchu-ki* **3**. Kodan-sha, Tokyo. [In Japanese]
- MONZEN, K. (1953) Revision of the Japanese gall wasps with the descriptions of new genus, subgenus, species and subspecies (I) Cynipidae (Cynipinae), Hymenoptera. *Annual Reports of the Gakugei Faculty, Iwate University* **5**(2): 15–21.
- PUJADE-VILLAR, J., ROS-FARRÉ, P. & ABE, Y. (2002) Biological and morphological differences of two closely related species of *Synergus* from Japan (Hymenoptera: Cynipidae). Pp. 278–281. In MELIKA, G. & THUROCZY, CS. (eds): *Parasitic wasps: Evolution, systematics, biodiversity and biological control*. Agroinform, Budapest.
- RONQUIST, F. (1999) Phylogeny, classification and evolution of the Cynipoidea. *Zool. Scr.* **28**(1–2): 139–164.
- RONQUIST, F. & NORDLANDER, G. (1989) Skeletal morphology of an archaic cynipoid, *Ibalia rufipes* (Hymenoptera: Ibalidae). *Ent. Scand., Suppl.* **33**: 1–60.
- SHINJI, O. (1940) [On two new species of Cynipidae (Hymenoptera)]. *Insect World* **44**: 258–260. [In Japanese]
- UCHIDA, T., SAKAGAMI, S. F. & MIMURA, H. (1948) [On one oak gall wasp, *Cynips mukaigawae* (Mukaigawa), with a description of a new inquiline gall wasp]. *Matsumushi* **3**(1): 11–17. [In Japanese]
- WELD, L. H. (1926) Field notes on gall-inhabiting cynipid wasps with descriptions of new species. *Proc. U. S. Nat. Mus.* **68**(10): 1–131.

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