

A new species of *Gilpinia* Benson (Hymenoptera: Diprionidae) from China and three new combinations

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Abstract: *Gilpinia yangi* Wang & Wei **sp. nov.** (Hymenoptera: Diprionidae) from China is described. It shares common coloration with most Chinese *Gilpinia* species, but differs in its unique lancet. *G. infuscalae* Wang & Wei, 2019 is transferred to genus *Diprion* as a new combination *Diprion infuscalae* (Wang & Wei, 2019), **comb. nov.**, *G. massoniana* G. Xiao, 1992 and *G. lishui* Li, Wang & Wei, 2022 transferred to genus *Macrodiiprion* as new combinations *Macrodiiprion massoniana* (G. Xiao, 1992) **comb. nov.** and *Macrodiiprion lishui* (Li, Wang & Wei, 2022), **comb. nov.** A revised key to known species of *Gilpinia* from China is provided.

Key words: Tenthredinoidea; taxonomy; key

中国吉松叶蜂属一新种和三个新组合（膜翅目：松叶蜂科）

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摘要：记述中国吉松叶蜂属 *Gilpinia* Benson, 1939（膜翅目：松叶蜂科）1 新种：杨氏吉松叶蜂 *Gilpinia yangi* Wang & Wei **sp. nov.** 该种色斑虽与其他中国吉松叶蜂相近，但锯腹片构造不同。文中还把 *G. infuscalae* Wang & Wei, 2019 移至松叶蜂属建立新组合 *Diprion infuscalae* (Wang & Wei, 2019), **comb. nov.**；把 *G. massoniana* G. Xiao, 1992 和 *G. lishui* Li, Wang & Wei, 2022 移至大松叶蜂属建立新组合 *Macrodiiprion massoniana* (G. Xiao, 1992) **comb. nov.** 和 *Macrodiiprion lishui* (Li, Wang & Wei, 2022), **comb. nov.**。本文还修订了中国吉松叶蜂已知种检索表。

关键词：叶蜂总科；分类；检索表

Introduction

Diprionidae is a small sawfly family of Tenthredinoidea with about 152 known species belonging to 11 extent genera till the end of 2022. The known genera of the family were defined and keyed out by Benson (1939, 1954). In the latter paper, Benson classified this family into two subfamilies, Monocteninae and Diprioninae based on the structure of the anal cell in fore wing. Benson mainly recognized the genera based on the characters of the shape

Accepted 11 September 2023. Published online 8 March 2024.

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of the mesoscutellum, the length of the anal petiole of the hind wing, the distance between cenchri, the antennal structure and the sculptures on the abdominal terga. However, the boundaries among *Gilpinia*, *Macrodiprion* and *Diprion* are not so clear. *Gilpinia* Benson, 1939 is the second largest genus in Diprionidae and contains 39 species worldwide (Wang *et al.* 2019; Li *et al.* 2022). Sixteen have been recorded from China (Wang *et al.* 2019; Li *et al.* 2022). The ongoing study on the molecular phylogeny of Diprionidae based on genomes reveals that some recently described species under *Gilpinia* are not correctly placed (Li *et al.* 2023). A new genus with seven new combinations were proposed last year (Wei & Niu 2023). Wei (2024) transferred 3 southeastern Asian *Gilpinia* species into *Diprion* and a Chinese species *Gilpinia wui* into *Macrodiprion*. Some of additional questionable species of *Gilpinia* are discussed in this paper.

In addition, a new species, *G. yangi* Wang & Wei **sp. nov.**, from Shenyang, Liaoning Province, China is described and a revised key to the valid Chinese species of *Gilpinia* *s. str.* is provided.

Material and methods

The specimens were examined with a stereomicroscope model Motic-SMZ-168. Adult images were taken with a Nikon D700 digital camera and a series of images montaged using Helicon Focus (©HeliconSoft). All images were further processed with Adobe Photoshop CS 11.0®.

The morphological terminology follows Viitasaari (2002), except for the genitalia which follows Ross (1945). The annuli, ctenidia and serrulae are counted from the base of the lancet to the tip.

The following key to females is compiled by HNW. It is based on the original descriptions and material examined from the following collections: Asian Sawfly Museum, Nanchang, China (ASMN); Scientific Research and Management Center of East China Pharmaceutical Botanical Garden, Lishui, Zhejiang, China (formerly Lishui Academy of Forestry, LSAF), National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM) and the National Museum of Nature and Science, Ibaraki, Japan (NSMT).

The holotype and paratypes of the new species are deposited in ASMN.

Taxonomy

Key to the Chinese species of *Gilpinia* Benson (♀, examined species are marked with *)

1. Inner spur of hind tibia scale-like; first ctenidium short and straight (Figs 2A–C) 2
- . Inner spur of hind tibia spine-like; first ctenidium quite long or distinctly curved (Figs 2D–H) 4
2. Annuli 2 and 3 divergent downwards (Fig. 2B); pronotum entirely yellow; only posterior margin of mesoscutellum black. China (Heilongjiang); Finland **G. fennica* (Forsius)
- . Annuli 2 and 3 parallel (Figs 2A, C); pronotum yellow with black marks; both anterior and posterior margins of mesoscutellum black 3
3. Serrulae 3–5 broader than the ctenidium bearing them (Fig. 2A); head with a dark band on ocellar area, not reaching inner margins of eyes; apical margin of clypeus straight; ocellar area with 3 small brownish marks; pronotum pale with anterior margin black. China (Inner Mongolia)
..... *G. baiyinaobaoa* G. Xiao & X. Huang

- Serrulae 3–5 equal to the ctenidium bearing them (Fig. 2C); head with a dark band on ocellar area, reaching inner margins of eyes; apical margin of clypeus slightly incised; ocellar area without brownish marks; pronotum black with lateral corners pale. China (Heilongjiang, Jilin); Siberia; Europe **G. virens* (Klug)
- 4. Head pale with black at most on ocellar area above toruli. China (Hebei)·· *G. funingensis* Wen, Sun & Li
- Head black at least between ocellar area and toruli 5
- 5. Scape, pedicel black with each basally pale; lancet as in Fig. 2E. China (Sichuan, Yunnan)·..... *G. yongrenica* G. Xiao & X. Huang
- Scape and pedicel pale 6
- 6. Head pale with a horizontal dark area between ocelli and eyes; lancet as in Fig. 2G. China (Heilongjiang); Japan (Hokkaido) *G. tohi* Takeuchi
- Head mostly black at most of head margin, labrum, clypeus, supraclypeal area pale 7
- 7. Lancet with 10 annuli, the first ctenidium distinctly bent with middle part convex outwards 8
- Lancet with 11 annuli, the first ctenidium weakly concave inwards. China (Fujian); Thailand **G. marshalli* (Forsius)
- 8. Serrulae 2 long and flat with its length about 1.7 times serrulae 3, second ctenidium distinctly curved and subparallel with first ctenidium (Figs. 2H). China (Liaoning)·..... **G. yangi* Wang & Wei **sp. nov.**
- Serrulae 2 shortly protruding with length hardly longer than serrulae 3, second ctenidium straight and distinctly divergent downward with first ctenidium. (Fig. 2F). China (Heilongjiang) *G. pinicola* G. Xiao & X. Huang

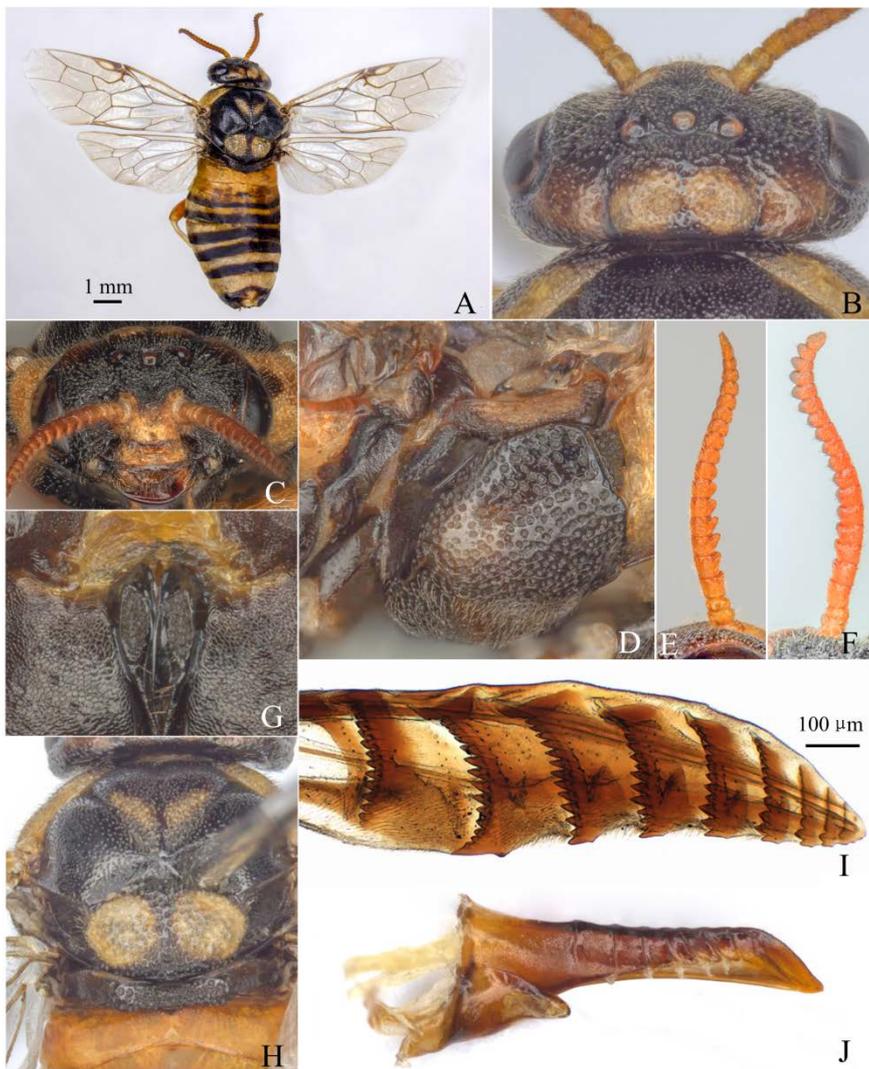
1. *Gilpinia yangi* Wang & Wei **sp. nov.** (Fig. 1)

Female (Fig. 1). Body length 10.0 mm, wing expanse 17.3 mm. Black with yellow marks, posterior half of postocellar area and of temple, supraclypeal area, antennal sockets, clypeus, labrum, lateral of pronotum, tegula, lateral of prescutum and of mesoscutellum, abdominal tergum 1, abdominal tergum 2–8 except posterior margins, terminal tergum, posterior center of mesepisternum, upper margin of anepimeron, abdominal sterna 2–8 except posterior margins, antenna, maxillary and labial palpi, coxa apex, trochanter 1 apex and femur, tibial base and each tarsomere yellow; apex of mandible reddish. Wings transparent with brownish veins and dark-brownish stigma.

Head and thorax densely punctured; katepimeron (Fig. 1D), metepimeron and terga densely wrinkled without punctures.

Head and mesonotum covered with short dense hairs, hair length 0.9 times diameter of front ocellus. Head apex blunt, clypeus concave apically with depth about 0.1 times height of clypeus, eyes total area 0.1 times of head in dorsal view; lateral ocelli and front ocellus forming a blunt angle about 150°, lateral ocellus major axis as long as diameter of front ocellus, OOL : POL : OCL = 73 : 62 : 85 (Fig. 1B); postocellar furrow, lateral furrow and central furrow of postocellar area distinct, length of postocellar area 1.4 times width; eye width about 17 times diameter of front ocellus (Fig. 1C), 1.0 times distance between eyes posterior edges, distance between posterior edges of eyes 2.1 times minor axis of head, distance between front ocellus and head front edge 0.5 times distance between front ocellus and head posterior edge, gena convergent backwards in dorsal view; malar space 1.2 times diameter of front ocellus; distance between eye and torulus 1.3 times distance between toruli; antenna (Figs 1E, 1F) with 19 antennomeres, scape 1.6 times length of pedicel, middle antennomeres with both lateral margins subparallel and a single short rounded ramus without

degraded inner ramus, flagellum ramus 1 shorter than 2, flagellum 1 as long as length of 2. Mesoscutellum (Fig. 1H) length 1.6 times width with anterior margin blunt, forming an angle about 135° , tip of mesoscutellar appendage exposed; cenchri narrow with distance as long as its major axis, major axis 8.1 times minor axis; metascutellum width 5.0 times length. Fore wing with degraded vein Sc1, vein R 1.1 times vein R+M; anal cell petiole 1.6 times width of anal cell in hind wing. Hind inner tibial spur spine-like, 1.1 times length of outer hind spur, 0.7 times length of hind basitarsomere; hind basitarsomere length 1.7 times width, 1.1 times maximum width of hind tibia, hind basal tarsal pulvillus length as long as width of hind basitarsomere apex, total length of hind tarsomeres 2–5 3.3 times of basitarsomere; claw with a single inner tooth.



Figures 1. *Gilpinia yangi* Wang & Wei **sp. nov.**, ♀. A. Adult, dorsal view; B. Head, dorsal view; C. Head, frontal view; D. Mesopleuron, lateral view; E. Antenna, dorsal view; F. Antenna, lateral view; G. Scopa; H. Thorax and base of abdomen, dorsal view; I. Lancet; J. Lance. A–H. Holotype. photo by Hannan WANG.

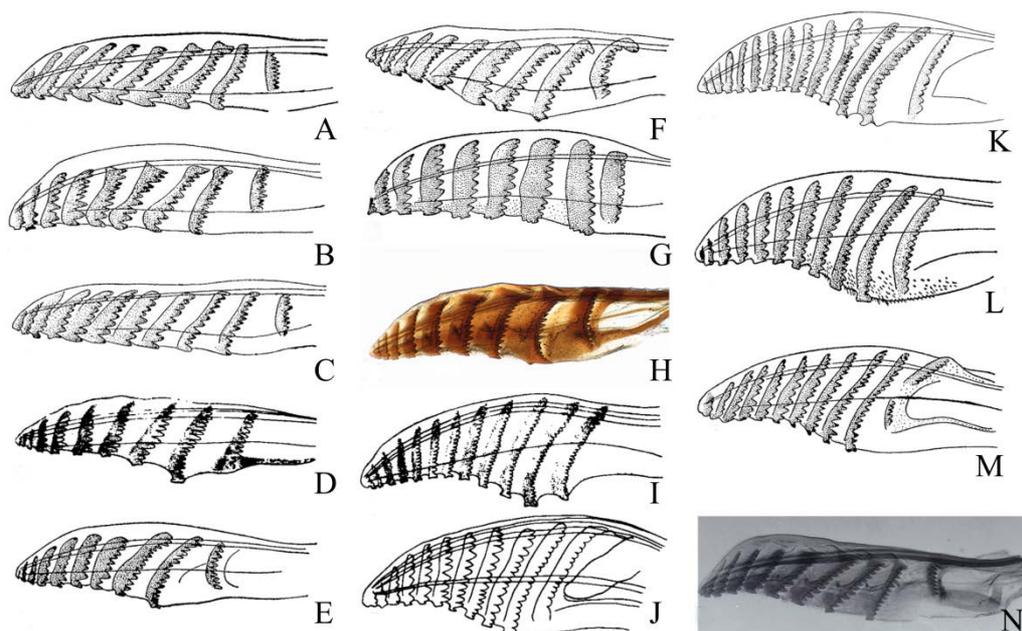


Figure 2. Lancets. A. *Gilpinia baiyinaobaoa* Xiao & Huang, 1985 ; B. *G. fennica* (Forsius, 1911); C. *G. virens* (Klug, 1812); D. *Macrodirion massoniana* (G. Xiao, 1992); E. *G. yongrenica* Xiao & Huang, 1984; F. *G. pinicola* Xiao & Huang, 1985; G. *G. tohi* Takeuchi, 1940; H. *G. yangi* sp. nov.; I. *Hugilpinia tabulaeformis* (Xiao, 1992); J. *H. hebedentata* (Xu, 1997); K. *H. jinghongensis* (Xiao & Huang, 1984); L. *H. jingxii* (Xiao & Huang, 1984); M. *H. lipuensis* (Xiao & Huang, 1985); N. *G. nigra*. A–G, I–M. Drawings of lancet by Xiao (1992), Xiao *et al.* (1992) and Xu (1997); N. Photo by David R. Smith.

Scopa width about 1.8 times width of cercus (Fig. 1G), length 5.3 times width of cercus, apically blunt, slightly protruding out of tergum 9; lancet (Fig. 1I) with 10 distinct annuli, narrowing toward apex from annulus 2, annulus 1 curved and degraded without serrula with height 0.8 times annulus 2, annulus 1 remote and feebly divergent downwards with annulus 2, annuli 2–6 subparallel.

Male. Unknown.

Host plant. Unknown.

Holotype. ♀, **China**, Liaoning, Shenyang, VI-2013, Zhongzhou YANG. **Paratypes.** 15♀, data same as the holotype.

Variation. Body length 9.8–10.9 mm; wing expanse 16.8–18.8 mm; other characteristics without distinct variation.

Etymology. The specific epithet “*yangi*” refers to the collector of the types.

Remarks. *Gilpinia yangi* Wang & Wei sp. nov. is similar to *G. virens* (Klug, 1812), but the latter differs from *G. yangi* in having para-antennal field, malar space, lateral scutum yellow, terga 2–10 with shallow punctures, lateral ocelli and front ocellus forming a straight line, OOL : POL : OCL = 3 : 3 : 2, postocellar area length about 3.0 times width, distance between eyes about 15.1 times diameter of front ocellus, distance between front ocellus and frontal head margin about 1.2 times distance between front ocellus and posterior head margin, malar space about 1.6 times diameter of front ocellus, distance between eye and antennal

socket about 1.3 times distance between antennal sockets, antenna with 18 distinct antennomeres, scape length about 1.9 times pedicel, both lateral margins of medial antennomeres outward expanded, each with a short rounded outer ramus and an inner degenerated ramus, mesoscutellum length about 1.3 times width with anterior margin blunt forming an angle about 125° , major axis of cenchri about 4.1 times minor axis, metascutellum width about 2.9 times length, hind inner tibial spur scale-like, hind basitarsomere length about 1.9 times width and 1.6 times maximum width of hind tibia, hind basal tarsal pulvillus length about 0.7 times width of hind basitarsomere apex, hind tarsomere 2–5 total length about 2.1 times length of basitarsomere.

2. *Diprion infuscalae* (Wang & Wei, 2019) comb. nov.

Gilpinia infuscalae Wang & Wei in Wang, Smith, Xiao, Niu & Wei, 2019: 589.

The phylogenetic analysis of Diprionidae based on genomes reveals that *Gilpinia infuscalae* Wang & Wei, 2019 is a member of *Diprion* (Li *et al.* 2023). Three morphological characters also support it to be a species of *Diprion*: cenchri small with distance between them longer than the longest axis of a cenchrus; lancet strongly broadened at middle with annulus 2 much longer than annulus 1 and clearly longer than annulus 3 with the second serrula long and broadly incised ventrally; penis valve triangular with a row of minute teeth. So this new combination should be proposed for this species.

Distribution. China (Jiangxi).

3. *Macrodiprion lishui* (Li, Wang & Wei) comb. nov.

Gilpinia lishui Li, Wang & Wei, 2022: 61.

The phylogenetic analysis of Diprionidae based on genomes reveals that *Gilpinia lishui* Li, Wang & Wei, 2022 is a member of *Macrodiprion* (Li *et al.* 2023). The strongly compressed antenna with a truncate apex also supports it to be a member of *Macrodiprion*. The short and stout lancet is somewhat different from the longer lancet of the type species of this genus. Several undescribed species of *Macrodiprion* also have a similar lancet with *Gilpinia lishui*. So this new combination is proposed for the species.

Distribution. China (Zhejiang).

4. *Macrodiprion massoniana* (G. Xiao, 1992) comb. nov.

Gilpinia massoniana G. Xiao, 1992: 193.

Although there is no genome data of *Gilpinia massoniana* for phylogenetic analysis, the typical *Macrodiprion* antenna (antenna strongly compressed with a truncate apex), lancet similar to *M. lishui*, and the penis valve broad with apical margin strongly incised support *Gilpinia massoniana* to be a member of *Macrodiprion*. So this new combination is proposed here.

Distribution. China (Anhui).

Acknowledgements

This research was supported by Hunan Provincial Innovation Foundation for Postgraduates (CX2017B398), the Scientific Innovation Fund for Graduates of Central South University of Forestry and Technology (CX2017A03), and the National Natural Science Foundation of China (31970447; 3167234).

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