

## Two new species of *Janus* Stephens (Hymenoptera: Cephidae) from China with a key to Chinese species

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**Abstract:** The diagnosis of *Janus* Stephens 1829 and a key to the Chinese species of the genus is provided. *Janus megamaculatus* Liu & Wei sp. nov. and *J. rufus* Liu & Wei sp. nov. are described from China. *Janus megamaculatus* sp. nov. differs from its known congeners by the body very large, head and thorax yellow brown with few black macula, the abdomen yellow brown with transverse black bands, the mesoscutal middle lobe with a deep middle furrow and the apical sheath as long as the basal sheath. *Janus rufus* sp. nov. is similar to *Janus xanthus* Naito & Smith, 1998 in structure but differs from the latter by the head and thorax almost entirely yellow brown, the antenna brown and about 2 times as long as head and thorax together, the hind femur yellow brown, the cell Rs in hindwing closed and cercus 0.14 times as long as the apical sheath.

**Key words:** Symphyta; Hartigiinae; taxonomy

### 中国简脉茎蜂属二新种暨中国已知种检索表（膜翅目：茎蜂科）

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**摘要:** 简要记述了简脉茎蜂属的特征, 编制了中国种类检索表。记述中国茎蜂科 2 新种: 大斑简脉茎蜂 *Janus megamaculatus* Liu & Wei sp. nov. 和黄褐简脉茎蜂 *J. rufus* Liu & Wei sp. nov.。大斑简脉茎蜂体型大, 亮黄色, 头胸部具很少量的黑色斑纹, 腹部各节背板具暗褐色或黑褐色横带斑, 中胸背板前叶中纵沟很深, 锯鞘端等长于锯鞘基等, 与同属已知种类均不相同。黄褐简脉茎蜂与西藏易贡分布的黄腹简脉茎蜂 *Janus xanthus* Naito & Smith, 1998 比较近似, 但头胸部几乎全部黄褐色, 触角褐色, 较短, 长约 2 倍于头胸部之和, 后足股节黄褐色, 后翅 Rs 室封闭, 尾须短小, 背面观长仅 0.14 倍于锯鞘端长等, 与后者不同。

**关键词:** 广腰亚目; 等节茎蜂亚科; 分类

### Introduction

*Janus* Stephens, 1829 is currently the third largest genus among the Cephidae but it is probably the largest genus in Cephidae based on the material in our collection. Until the end of

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2016, 26 species had been described worldwide and 12 of them have been recorded from China (Taeger *et al.* 2010, 2016; Wei *et al.* 2006).

Muche (1981) revised the world species of Cephidae, although we find there are mistakes in the paper. Muche keyed out and simply described 11 Palaearctic species and 4 American species of *Janus*. Wei & Nie (1996) revised 6 Chinese *Janus* species and provided a key to 11 Asian species. In the next year, Wei & Nie (1997) described 4 additional species and provided a list of *Janus* species from China. Naito *et al.* (1998) described 2 new *Janus* species, from Sichuan and Tibet respectively.

## Material and methods

Specimens were examined with a Leica S8APO dissection microscope. Adult images were taken with a Nikon D700 digital camera and the series of images montaged using Helicon Focus (©HeliconSoft), while detail images were taken with a Leica Z16 APO/DFC550. All images were further processed using Adobe Photoshop CS 6.0.

The terminology of sawfly genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002).

All types of these new species are deposited in the Insect Collection of the Central South University of Forestry and Technology, Changsha, Hunan, China (CSCS).

## Taxonomy

### 1. *Janus* Stephens, 1829

*Janus* Stephens 1829: 341. Type species: *Janus connectens* Stephens, 1829, by monotypy.

*Phylloecus* Newman 1838: 485. Type species: *Phylloecus faunus* Newman, 1838, by monotypy.

*Ephippionotus* A. Costa 1860: 10. Type species: *Ephippionotus luteiventris* A. Costa, 1860, by subsequent designation of Rohwer 1911.

Diagnosis. Head not distinctly elongated behind eyes in dorsal view (Figs. 5, 7, 19) and lateral view (Figs. 1–3, 20); left mandible bidentate, inner tooth about as long as or slightly longer than outer tooth and distinctly shouldered (Figs. 8, 22); distance between antennal toruli much shorter than distance between torulus and anterior tentorial pit, supraclypeal area roundly elevated without middle keel (Figs. 4, 18); occipital carina distinct; antenna not distinctly incrassate toward apex, third antennomere usually longer than fourth (Figs. 9, 21); pronotum much broader than long; upper part of mesepisternum without transverse furrow (Fig. 23); middle tibia with 1 preapical spur, hind tibia with 2 preapical spurs (Figs. 12, 25); metabasitarsus slender, much shorter than following 4 tarsomeres together and not shorter than following 3 tarsomeres together; claw short with a large and acute basal lobe, inner tooth much broader and longer than apical tooth (Figs. 13, 26); forewing: vein 1r1 meeting pterostigma at extreme base or base of vein 1r1 atrophied, vein 2r1 meeting pterostigma beyond middle (Fig. 10); cell Rs in hindwing sometimes absent; second abdominal segment much higher than long in lateral view; ovipositor sheath bent ventrally and about as long as hind tibia, apical sheath about 0.7–1.0 times as long as basal sheath (Figs. 1, 3, 14, 27); cercus shorter than 1/3 length of apical sheath in dorsal view; lancet strongly sclerotized, annular suture usually absent,

serrulae sclerotized and protruding, apical margin usually shallowly incised (Figs. 16, 17, 28, 29), seldom pointed.

Distribution. Holarctic.

Two new species in this genus are described below from China.



Figures 1–3. 1. *Janus megamaculatus* Liu & Wei sp. nov., female; 2. *Janus megamaculatus* Liu & Wei sp. nov., male; 3. *Janus rufus* Liu & Wei sp. nov., female. Adult, lateral view. Scale bar = 1 mm.

## 2. *Janus megamaculatus* Liu & Wei sp. nov. (Figs. 1, 2, 4–17)

Description. Female (Fig. 1). Body length 17–21 mm (including sheath). Body shiny yellow brown; antenna brown, gradually darkened toward apex with several apical antennomeres black brown; postocellar area and connected oblique macula on temple, anterior margin of pronotum, anterior part of mesoscutal middle lobe and most of lateral lobe, anterior and posterior corners of mesoscutellum, ventral third of mesepisternum, anterior stripe on mesepimeron, ventral side of metepisternum, upper half of abdominal tergite 9 dark orange; frontal ridge, ocellar area and connected lateral fovea, transversal band close to anterior margin of pronotum, middle transversal band on mesoscutal middle lobe, lateral cliff of lateral lobe, lateral margin of mesoscutellum, epicnemium, anterior-lower corner of mesepisternum, posterior band of katepimeron, lower posterior corner of metepisternum and ventral part of metepimeron black; anterior third (lateral part) to two thirds (middle part) of abdominal tergites 2–10, a triangular macula on anterior half of sternites 3–6 dark brown to black brown, apical sheath dark brown. Wing

subhyaline with faint yellowish tinge, pterostigma largely, cell C and vein C pale brown, other veins black brown. Legs yellow brown, extreme base of fore and middle femora, hind femur entirely, apical 3/5 of hind tibia and hind tarsus entirely dark brown. Body hairs yellow brown.

Body smooth and shiny, mandibles with some large punctures; supraclypeal area, mesoscutal middle lobe and lateral lobes, anterior of mesoscutellum and mesopleuron sparsely and minutely punctured, frontal ridge densely microsculptured, abdominal tergites with faint microsculptures and shallow punctures, apical sheath finely and densely microsculptured.

Inner tooth of left mandible slightly longer than outer tooth and with an obscure shoulder (Figs. 6, 8); malar space as long as pedicellum and 1.2 times as long as diameter of lateral ocellus; inner margins of eyes distinctly divergent downwards in anterior view, distance between eyes at level of toruli 1.2 times as long as longest axis of eye; distance between toruli 0.8 times as long as distance between torulus and anterior tentorial pit and 1.1 times as long as breadth of inner orbit, area between toruli with a short and low middle ridge (Fig. 4); in dorsal view head clearly narrowed behind eyes, middle of posterior margin faintly incised; postocellar furrow fine and shallow, interocellar furrow broad and shallow; middle fovea absent, frons flat; postocellar area about as long as broad, slightly elevated, lateral furrows absent; POL : OOL : OCL = 14 : 22 : 37 (Fig. 5). Antenna with 32–33 antennomeres, antennomere 2 broader than long, antennomere 3 about 1.6 times as long as antennomere 4, antennomeres 22–31 broader than long (Fig. 9). Posterior margin of pronotum deep triangularly incised at middle; middle furrow of mesoscutal middle lobe and notaulices quite deep, mesoscutellum broader than long (Fig. 11). Apical spurs of hind tibia subequal in length, metabasitarsus as long as following 3 tarsomeres together (Fig. 12); inner tooth of claw at middle, distinctly longer and much broader than apical tooth (Fig. 13). Vein 1r1 complete and 1.6 times as long as 2r1 and meeting pterostigma, cell 1Rs slightly shorter than 2Rs, vein 2m-u slightly beyond vein 1r-m, cu-a meeting cell 1M at basal 0.23, anal cross-vein distinctly convex outwards; cell Rs in hindwing closed and slightly shorter than cell M (Fig. 10). Abdomen strongly compressed laterally from second segment, dorsum of tergite 9 with broad and deep furrow, basal third of tergite 10 with shallow furrow; ovipositor sheath as long as hind tibia, apical sheath as long as basal sheath and with distinct longitudinal ridge on outside (Fig. 14); in dorsal view cerci 3 times as long as broad and enlarged at middle, about 0.2 times as long as apical sheath (Fig. 15); lancet as in Fig. 16, middle serrulae as in Fig. 17.

Male. Body length 15mm (Fig. 2). Color and structure similar to female except for: black maculae on head larger than those on female (Fig. 7), antenna with 28 antennomeres, vein 2r1 almost meeting pterostigma at middle; apical margin of subgenital plate roundish with a small middle incision; posterior margin of sternite 8 deeply emarginated; cerci slender and about 5 times as long as broad; harpe narrow, 2.5 times as long as broad, apical margin round.

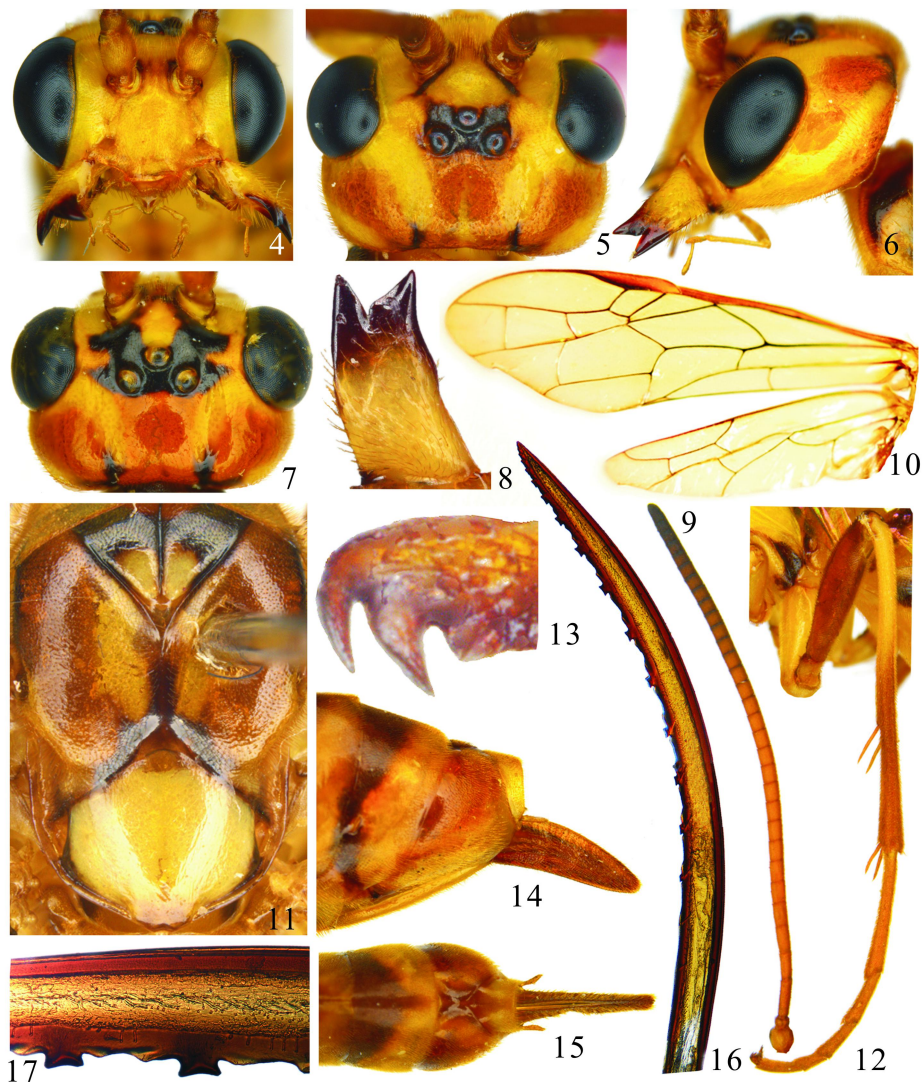
**Etymology.** The specific epithet of the new species refers to its large body and color pattern.

**Holotype.** ♀, **China**, Hunan, Yizhang, Mt. Mangshan, alt. 1000 m, 15-IV-2003, Wei XIAO leg. **Paratypes.** 1♀, **China**, Guangxi, Xing'an, Tongrencun, 110°39.093'E,

25°37.207'N, alt. 337 m, 19-IV-2006, Fangjun LIAO leg.; 1♀1♂, **China**, Yongzhou, Mt. Shunhuangshan, alt. 900–1200 m, 28-IV-2004, Meicai WEI leg.; 2♀, **China**, Hunan, Guidong, Qiyunshan Hydropower Station Gully, 113°55.598'E, 25°45.361'N, alt. 752 m, 05-IV-2015, Meicai WEI & Gengyun NIU leg.

Distribution. China (Hunan, Guangxi).

Remarks. This new species is much bigger than any other known species in this genus. The body color pattern is also unique for members of this genus. Besides the size and color, this new species differs from its known congeners by the mesoscutal middle lobe with a deep middle furrow and the apical sheath as long as the basal sheath.



Figures 4–17. *Janus megamaculatus* Liu & Wei sp. nov. (4–6, 8–17. Female; 7. Male). 4. Head, frontal view; 5. Head, dorsal view; 6. Head, lateral view; 7. Head, dorsal view; 8. Left mandible; 9. Antenna; 10. Wings; 11. Mesoscutellum; 12. Hind leg; 13. Claw; 14. Ovipositor sheath, lateral view; 15. Ovipositor sheath, dorsal view; 16. Lancet; 17. Serrulae.

### 3. *Janus rufus* Liu & Wei sp. nov. (Figs. 3, 18–29)

Female (Fig. 3). Body length 13 mm (including sheath). Body and leg yellow brown, face, mandibles largely, tegula, mesoscutellum, area of “cenchri”, upper corner of mesepisternum and hind coxa shiny yellow, antenna brown, slightly darkened toward apex; interocellar area, mesopleuron suture, basal outer corner of middle coxa black; apical sheath black brown. Wings subhyaline with feeble yellowish tinge and slightly infusate toward apex, pterostigma and most of vein C pale brown, other veins brown. Body hairs yellow brown, setae on sheath black brown.

Body smooth, shiny, mandibles with large punctures; mesoscutal middle lobe and lateral lobes, most of mesoscutellum (Fig. 24), ventral parts of mesopleuron and metapleuron finely punctured, upper parts of mesopleuron and metapleuron faintly punctured (Fig. 23), abdominal tergites and middle of sternites shallowly but distinctly punctured; apical sheath distinctly microsculptured, almost mat (Fig. 27).

Inner tooth of left mandible distinctly shouldered (Fig. 22); malar space as long as diameter of lateral ocellus and 0.8 times as long as pedicellum; inner margins of eyes weakly divergent downwards, distance between eyes at level of toruli 1.25 times as long as longest axis of eye; distance between toruli as long as inner orbit and 0.8 times distance between torulus and anterior tentorial pit; area between toruli roundish without keel (Figs. 18, 19); in dorsal view head clearly narrowed behind eyes, middle of posterior margin of head weakly concave (Fig. 19); postocellar furrow fine and shallow, interocellar furrow absent; frons with a distinct middle longitudinal furrow; postocellar area 1.3 times as long as broad, lateral furrow absent; POL : OOL : OCL = 10 : 15 : 31 (Fig. 19); antenna with 31 antennomeres, antennomere 2 broader than long, antennomere 3 1.2 times as long as antennomere 4 (Fig. 21). Posterior margin of pronotum shallowly incised; middle furrow on mesoscutal middle lobe shallow, notaulices deep; mesoscutellum about as long as broad (Fig. 24). Hind tibia with 2 preapical spurs, inner apical spur of hind tibia 0.6 times as long as outer spur; metabasitarsus 1.1 times as long as following 3 tarsomeres together and much shorter than following 4 tarsomeres together (Fig. 25); inner tooth of claw close to basal lobe, much longer and broader than apical tooth (Fig. 26). Forewing with vein 1r1 complete and 1.3 times as long as 2r1, cell 1Rs about as long as 2Rs, inner lower corner of 2Rs strongly extending backwards, vein 2m-cu beyond and remote from 1r-m, cu-a meeting cell 1M at basal 0.2, anal cross vein weakly convex outwards (Fig. 3); cell Rs in hindwing closed, 0.8 times as long as cell M. Abdomen weakly compressed from second segment, dorsum of tergite 9 with a broad and shallow middle furrow, tergite 10 without middle furrow; ovipositor sheath 0.95 times as long as hind tibia, apical sheath 0.9 times as long as basal sheath, with an obscure longitudinal ridge (Fig. 27); in dorsal view cerci slender, 4.5 times as long as broad and about 0.14 times as long as apical sheath; lancet as in Fig. 28, middle serrulae as in Fig. 29.

Male. Unknown.

**Holotype.** ♀, **China**, Guizhou, Mt. Fanjingshan, alt. 900 m, 03-VIII-2001, Mingli CHEN & Ningting HUANG leg.

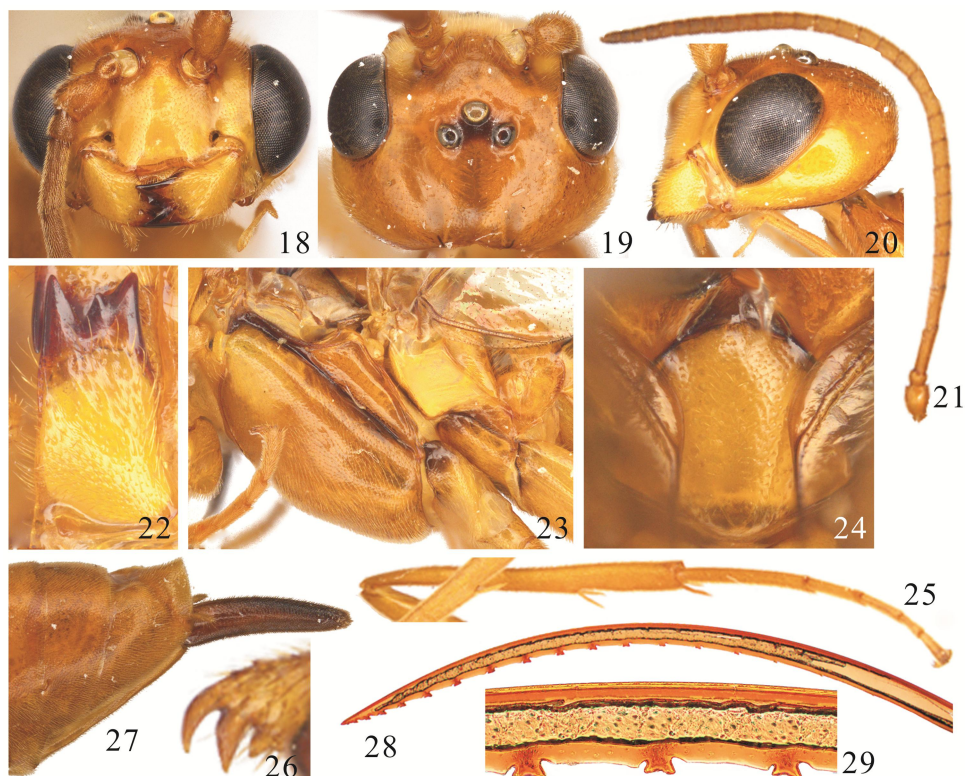
Etymology. The species is named after its body color.

Distribution. China (Guizhou).

Remarks. This is the first *Janus* species with the body almost entirely yellow brown.



This new species is similar to *Janus xanthus* Naito & Smith, 1998 in structure but differs from the latter species by the head and thorax almost entirely yellow brown, antenna brown and about 2 times as long as head and thorax together, the hind femur yellow brown, the cell Rs in hindwing closed and cerci 0.14 times as long as apical sheath. In *J. xanthus* the head and thorax largely black, antenna black brown and about 2.5 times as long as head and thorax together, the hind femur black brown, the cell Rs in hindwing open and cerci 0.25 times as long as the apical sheath.



Figures 18–29. *Janus rufus* Liu & Wei sp. nov. 18. Head, frontal view; 19. Head, dorsal view; 20. Head, lateral view; 21. Antenna; 22. Left mandible; 23. Mesopleuron; 24. Mesoscutellum; 25. Hind leg; 26. Claw; 27. Ovipositor sheath, lateral view; 28. Lancet; 29. Serrulae.

#### Key to known species of *Janus* from China

1. Pronotum yellow white or with distinct pale macula.....2
- Pronotum black.....11
2. Body largely yellow brown or reddish brown with black maculae.....3
- Head and thorax largely black with a few pale maculae.....5
3. Body yellow brown, apical sheath dark brown.....*J. rufus* Liu & Wei sp. nov.
- Head and thorax with distinct black macula.....4
4. Body length 17–20 mm and yellow brown; head without X-shaped black macula; vein 1r1 entire; hind femur dark orange.....*J. megamaculatus* Liu & Wei sp. nov.
- Body length 10 mm and shining yellow; head with X-shaped black macula; vein 1r1 absent; hind femur black.....*J. bellus* Wei & Nie

5. Abdominal segments 2–10 yellow brown; antenna slender and about 2 times as long as head and thorax together; cell Rs in hind wing open..... *J. xanthus* Naito & Huang
- Abdominal tergites usually entirely black, seldom tergites 2–4 largely reddish brown; antenna shorter than 2 times head and thorax together..... 6
6. Hind wing with cell Rs open; pronotum with broad yellow white macula..... 7
- Hind wing with cell Rs closed; pronotum with narrow yellow white margin..... 10
7. Abdominal sternites 3–8 and all folds of tergites yellow brown; mesoscutellum densely punctured.....  
..... *J. punctatenuis* Wei & Nie
- At least abdominal sternites 3–5 and all folds of tergites black; mesoscutellum hardly punctured..... 8
8. Abdominal segments 2–4 in female reddish brown, apical 3 sternites in male yellow brown; subgenital plate in male without apical node; hind knee without black macula..... 9
- Abdomen in female entirely black; only subgenital plate yellow brown in male; subgenital plate with an apical node; hind knee with black macula..... *J. piri* Okam & Muram
9. Clypeus with yellow macula..... *J. sheni* Wei & Nie
- Clypeus entirely black..... *J. gussakovskii* Maa
10. Third antennomere shorter than fourth antennomere in both sexes; hind tarsus yellow brown.....  
..... *J. cephoideus* Wei
- Third antennomere longer than fourth antennomere in both sexes..... 11
11. Hind tarsus entirely black; hind tibia yellow white at basal third and black at apical two thirds; third antennomere longer than fourth antennomere; cell Rs in hind wing closed..... *J. conicercus* Maa
- Hind tibia and hind tarsus yellow brown; third antennomere as long as fourth antennomere; cell Rs in hindwing open..... *J. longicaudus* Naito & Smith

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