



## A review of the genus *Amida* Lewis (Coccinellidae: Ortaliini) from China

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### Abstract

A review of the genus *Amida* Lewis, 1986 from China is presented. Thirteen species are recorded in total, including four new species, *Amida sagittata* Wei et Wang, **sp. nov.**, *Amida longifolia* Wei et Wang, **sp. nov.**, *Amida motuensis* Wei et Wang, **sp. nov.** and *Amida nanlingiensis* Wei et Wang, **sp. nov.**, and two new recorded species from China: *Amida nguyent* Hoàng, 1983 and *Amida mirifica* Hoàng, 1983. Descriptions, re-descriptions and illustrations of all species are provided. A distribution map and an identification key are also given.

**Key words:** Coccinellidea, *Amida*, new species, taxonomy, new record

### Introduction

Ortaliini Mulsant, 1850 is one of the 26 tribes within the Subfamily Coccinellinae Latreille, 1807 (Che *et al.* 2017, 2021). This tribe consists of ten genera and exhibits a wide distribution (Wang *et al.* 2022). However, only two genera of Ortaliini have been documented from China: *Amida* Lewis, 1896, and *Ortalia* Mulsant, 1850.

The genus *Amida* was initially established by Lewis (1896) for a Japanese species *Amida tricolor* (Harold, 1878), which was originally assigned to the genus *Scymnus* Kugelann by Harold (1878). Later, *Amida formosana* Kurisaki, 1920 was recorded from Taiwan Province of China, but it was downgraded as a subspecies as *Amida tricolor formosana* (Kurisaki, 1920) in subsequent studies (Yu and Wang 1999). Hoàng (1982, 1983, 1990) studied Vietnamese *Amida* and described nine new species. Previously, taxonomic studies on Chinese *Amida* were relatively limited. Pang and Mao (1979) described two new species of *Amida*, namely *Amida nigropectoralis* (Pang et Mao, 1979) and *Amida jinghongiensis* (Pang et Mao, 1979), but both of them were originally assigned to the genus *Ortalia*. Yu (2000) presented a brief revision of *Amida* from China and described a new species, namely *Amida decemmaculata* Yu, 2000. So far, seven new species of *Amida* are reported from China.

In this study, a taxonomic review of the genus *Amida* from China is presented, including four new species and two new distributional records. All the species are illustrated and described. Additionally, a diagnosis of the genus, a key to the species and a distribution map are also provided.

### Material and methods

The specimens used in the study were collected from China, and are deposited in the Department of Entomology, South China Agricultural University (SCAU), Guangzhou, China.

Terminology follows Ślipiński (2007). The measurements were made by a micrometer attached to the SteREO Discovery V20 dissecting stereoscope, and defined as follows:

**TL**—total length, from apical margin of clypeus to apex of elytra;

**TW**—total width, across both elytra at widest part;

**TH**—total height, through the highest point of elytra to metaventricle;

**HW**—head width, including eyes;

**PL**—pronotal length, from the middle of anterior margin to the base of pronotum;

**PW**—pronotal width at widest part;

**EL**—elytral length, along the suture, from the apex to the base including the scutellar shield;

**EW**—elytral width, across both elytra at widest part;

**ID**—interocular distance, nearest distance between eyes.

The abdomen was detached and cleared in warm 10% NaOH solution for several minutes. Genitalia of both sexes were dissected, rinsed with distilled water, transferred to glycerol, and examined on slides. Photographs were taken by using digital cameras (ZEISS Imager M2 and Axiocam 506 Color) attached to the dissecting microscope using the ZEN 2.3 software.

External morphological images were taken with a camera (Canon EOS 5D Mark IV) and processed by Helicon Remote (ver. 3.9.7W) and Helicon Focus 7.0.2 software.

## Taxonomy

### Genus *Amida* Lewis, 1896

Chinese common name: 花瓢虫属

(Figs 1a–j, 2e)

Type species: *Scymnus (Nephus) tricolor* Harold, 1878: 87, by original designation.

*Amida* Lewis, 1896: 34.–Sicard 1907: 211; Weise 1923: 185; Korschefsky 1931: 105; Mader 1955: 964; Sasaji 1971: 206; Hoàng 1982: 179–191; Yu 2000: 23–27; Pang *et al.* 2004; Ren *et al.* 2009; Wang *et al.* 2022: 142.

**Description.** Body elongate oval or oval, dorsum slightly to moderately convex, covered with dense pubescence.

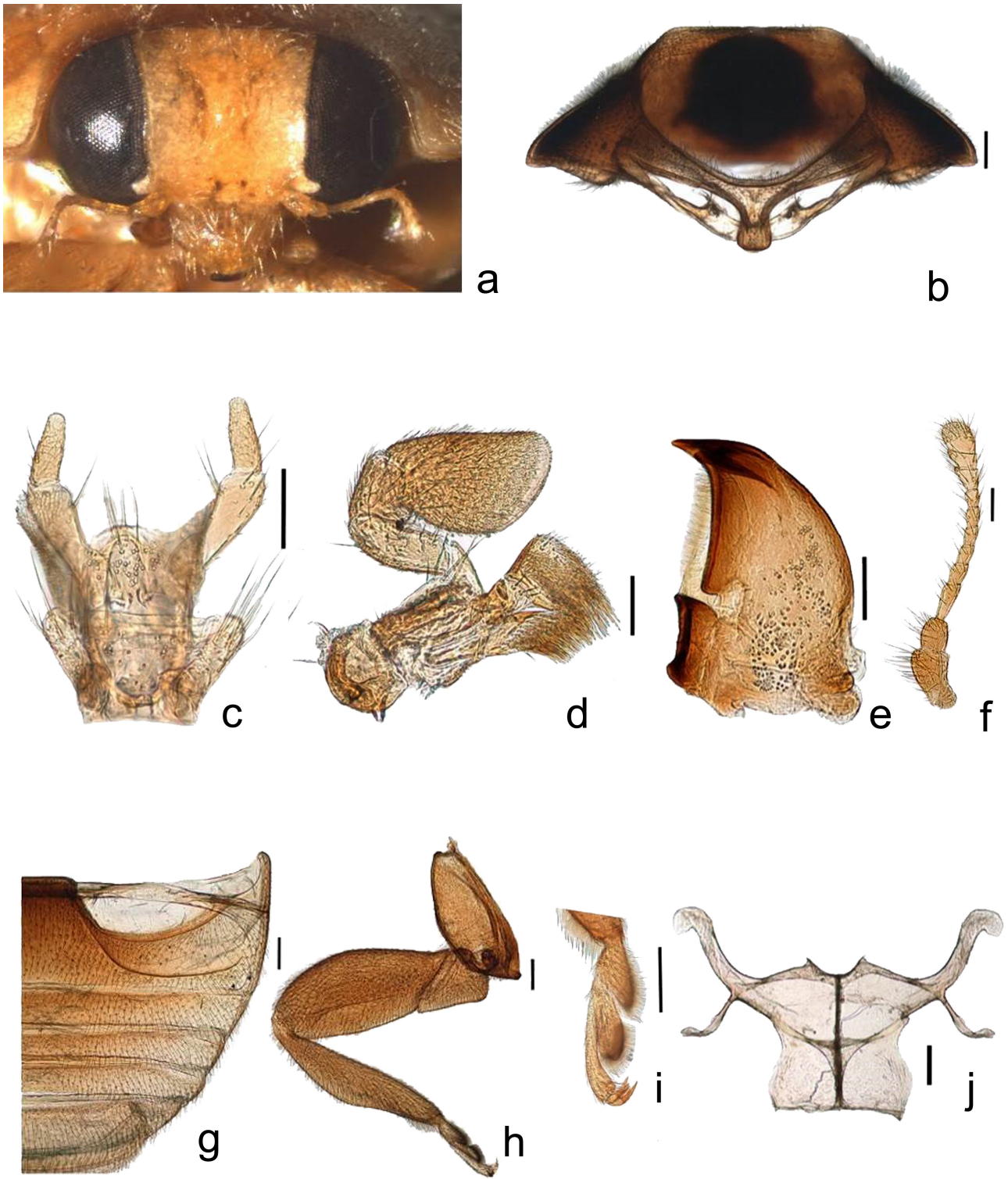
Head with large eyes, interocular margins nearly straight and parallel, interocular canthus at near basal antennae inserts into interocular margin of eyes, to form a post-antennal emargination (Fig. 1a). Antennae composed of 11 antennomeres in total (Fig. 1f): antennomere 1 longest and stoutest, twice as long as its wide; base of antennomere 2 nearly rounded, about 1/2 length of scape; antennomere 3 slender, slightly longer than antennomere 2, about 1/2 width of antennomere 2; antennomere 4–8 similar in length and width; antennomere 9–11 forming a fusiform club, with antennomere 11 being the widest and longest, and its apex nearly semicircular. Mandible with well-developed bifidtooth (Fig. 1e). Maxillary palps comprising 4 palpomeres (Fig. 1d): the base of palpomere 1 trapezoidal, narrowing proximally; palpomere 3 nearly barrel-shaped, elongated, with almost parallel sides. Labial palps with three palpomeres (Fig. 1c), the basal palpomere being the shortest.

Metendosternite stalk slightly shorter than width, with tendons in the middle (Fig. 1j). Abdomen with six ventrites, abdominal postcoxal lines incomplete, reaching about 5/6 length of ventrite 1, and disappearing at 4/5 of abdominal lateral margin (Fig. 1g). Legs stout (Fig. 1h). Femora broadened, sometimes swollen, tibiae slightly broadened; tarsi with three tarsomeres; claws with sharp basal tooth (Fig. 1i).

Male genitalia with penis slender and long, accompanied with an appendage apically (Fig. 2e).

**Distribution.** China, Japan, Vietnam, Thailand, India, Philippines.

**Remarks.** This genus closely resembles genus *Ortalia*, but can be distinguished from the later by the larger body size and antenna which are composed of 11 antennomeres in total. In *Ortalia*, its body size smaller and antenna are composed of 10 antennomeres. However, the boundaries between these two genera remain unclear. To understand this, a detailed molecular phylogenetic study is necessary.



**FIGURE 1.** Main characters of the genus *Amida* Lewis: **a–j.** *Amida tricolor* Harold, 1878: **a.** Head **b.** Pronotum, frontal view **c.** Labium **d.** Maxilla **e.** Mandible **f.** Antenna **g.** Abdomen **h.** Hind leg **i.** Tarsi **j.** Metendosternite. Scale bars: 0.1 mm.

**Key to the species of the genus *Amida* Lewis, 1896 from China**

- 1. Elytra yellow with black and red markings ..... 2
- Elytra yellow or yellow and black ..... 3
- 2. Pronotum with a single mid spot and two lateral spots (Fig. 2a); middle spots on elytra generally U-shaped (Fig. 2a, b). . . . .  
 ..... *A. tricolor* (Harold, 1878)

- Pronotum without distinct spots or only with a small, middle one (Fig. 3a); middle spots on elytra compact, not U-shaped (Fig. 3a, b) ..... *A. tricolor formosana* (Kurisaki, 1920)
- 3. Elytra with more than 8 spots ..... 4
- Elytra without spots or less than 8 spots ..... 5
- 4. Elytra with 9 black spots, central spots form a single sutural macula (Fig. 4a) ..... *A. sagittata* Wei et Wang, sp. nov.
- Elytra with 10 black spots, central spots are separated, independent (Fig. 5a) ..... *A. decemmaculata* Yu, 2000
- 5. Elytra black and without any spots (Fig. 6a) ..... *A. nanlingiensis* Wei et Wang, sp. nov.
- Elytra pale to yellowish brown ..... 6
- 6. Abdominal ventrites 2–4 with a yellowish brown median area (Fig. 7d) ..... *A. longifolia* Wei et Wang, sp. nov.
- Abdominal ventrites 2–4 without darkened area ..... 7
- 7. Tegmen with penis guide symmetrical ..... 8
- Tegmen with penis guide asymmetrical ..... 9
- 8. Appendage of penis longer than penis length ..... *A. vietnamica* Hoàng, 1982
- Appendage of penis shorter than 1/4 of penis length ..... *A. nguyent* Hoàng, 1983
- 9. Apex of penis guide divided into three lobes ..... 10
- Apex of penis guide without processes ..... 11
- 10. Appendage of penis long and slender, longer than half length of penis ..... *A. nigropectoralis* (Pang et Mao, 1979)
- Appendage of penis short and stout, shorter than 1/4 length of penis (Fig. 10e) ..... *A. mirifica* Hoàng, 1983
- 11. Parameres slightly longer than penis guide, with a triangular appendage at distal 1/3 ..... *A. quinquefasciata* (Hoàng, 1982)
- Parameres distinctly longer than penis guide, without triangular appendages ..... 12
- 12. Appendage of penis slightly longer, about 1/2 length of penis (Fig. 12f) ..... *A. jinghongiensis* (Pang et Mao, 1979)
- Appendage of penis short, about 1/4 length of penis (Fig. 13e) ..... *A. motuensis* Wei et Wang, sp. nov.

### *Amida tricolor* (Harold, 1878)

Chinese common name: 三色花瓢虫  
(Fig. 2)

*Scymnus* (*Nephus*) *tricolor* Harold, 1878: 87; Schönfeldt 1887: 195.

*Scymnus* (*Amida*) *tricolor* Schönfeldt, 1897: 143; Matsumura 1907: 61.

*Amida tricolor* Lewis, 1896: 34; Sicard 1907: 211; Weise 1923: 185; Ohta 1929: 13; Korschevsky 1931: 105; Mader 1955: 964; Sasaji 1971: 208; Hoàng 1982: 184; Yu *et al.* 1993: 485; Pang *et al.* 2004: 93; Ren *et al.* 2009: 96; Wang *et al.* 2022: 144.

**Material examined.** **China:** **Anhui:** 3♂2♀, Shitai County, 24. IX. 2010, Wang XM *et al.* leg; 1♂, Huangshan Mountain, 12–13. IX. 2010, Wang XM *et al.* leg. **Hunan:** 1♂, Mangshan National Natural Reserve, Yizhang County, 2. X. 2004, Wang XM leg. **Jiangxi:** 1♂, Jinggangshan National Nature Reserve, Ji'an City, 13. VIII. 2004, Wang XM leg. **Guangdong:** 1♂3♀, Yingde National Forest Park, Qingyuan City, 6–7. X. 2004, Ren SX *et al.* leg; 1♂, Ruyuan County, 22. IX. 2005, Wang XM leg; 2♂, Chebaling National Natural Reserve, Shaoguan City, XI. 1991, Yu GY leg. **Guangxi:** 1♂, Mao'ershan National Natural Reserve, Guilin City, 19. X. 2004, Wang XM leg. **Guizhou:** 1♀, Maolan National Natural Reserve, Libo County, 15. VIII. 2006, ca 800 m, Tang LD leg; 2♂1♀, Maolan National Natural Reserve, Libo County, 15–18. X. 2008, ca 730 m, Liang JB leg.

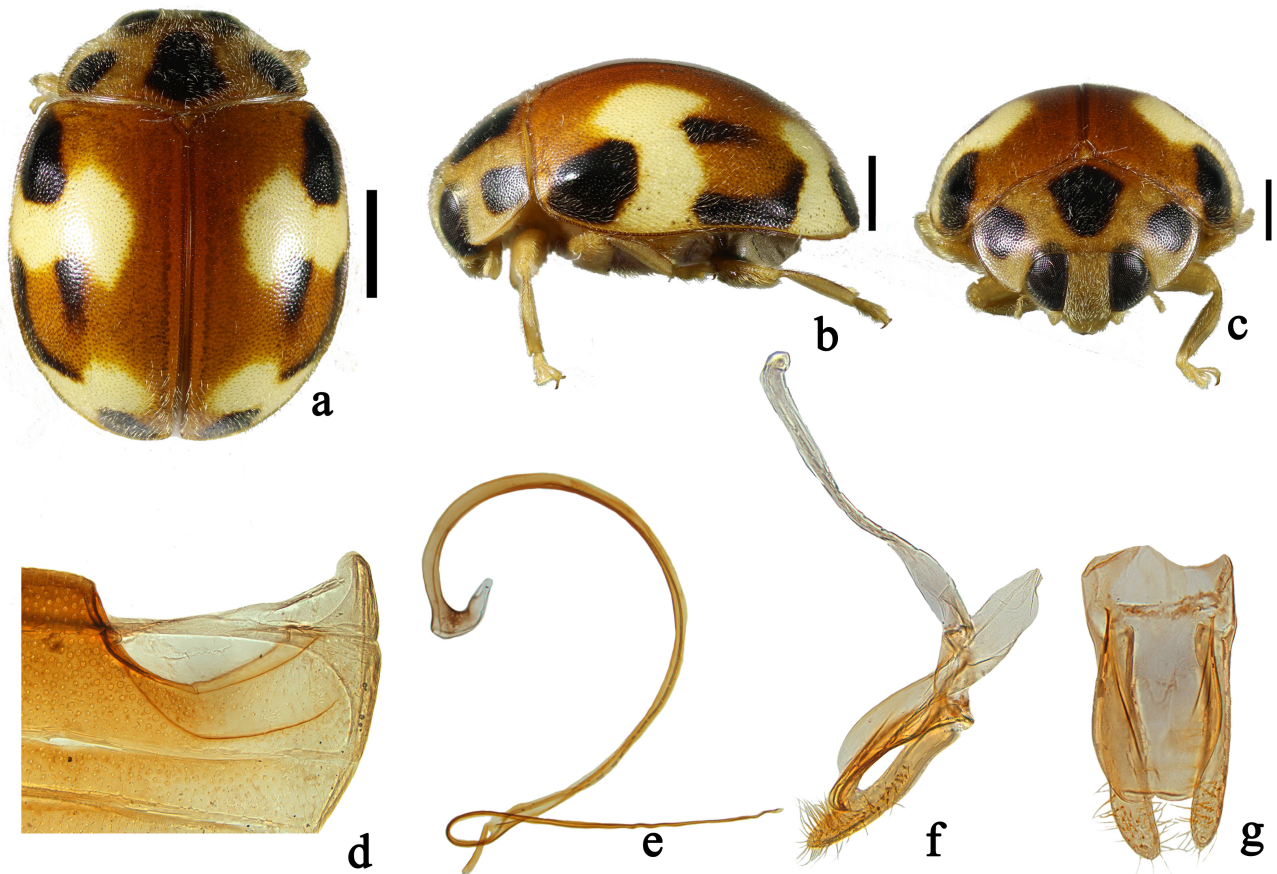
**Diagnosis.** This species can be distinguished from other species of *Amida* by its tricolored elytra, which are yellowish brown with black spots and yellow maculae.

**Description.** TL: 4.13–4.51mm, TW: 3.16–3.57mm, TH: 2.04–2.27mm, TL/TW: 1.26–1.31, EL/EW: 1.00–1.07, PL/PW: 1.77–1.85, HW/PW: 0.94–0.99, PW/EW: 0.40–0.41, EW/HW: 0.38–0.39.

Body oval, dorsum with dense pubescence, moderately convex (Fig. 2a–c). Head, antennae and mouthparts yellow (Fig. 2c). Eyes with interocular margin straight and parallel, interocular distance about 0.38× head width (Fig. 2c). Pronotum light yellow with three black spots, one large and elongated in the middle, not reaching anterior margin of pronotum, and the other two smaller and rounded, located laterally (Fig. 2c). Scutellar shield yellowish brown. Elytra tricolored (Fig. 2a–c), ground color of elytra yellowish brown, each elytron with three black spots, longitudinally aligned along the lateral edge, the middle one generally U-shaped while discontinuous in some individuals; a transverse paler yellow macula present between every two black spots, extending transversely to the lateral edge but not reaching to the elytral suture (Fig. 2a). Abdominal postcoxal lines incomplete and recurved (Fig. 2d).

Male genitalia (Fig. 2e–f) with penis guide in inner view and two sides of penis guide asymmetrical, apically upturned. Parameres (Fig. 2f, g) longer and slender than penis guide, apical 1/3 covered with dense setae. Penis (Fig. 2e) long and slender, apically with threadlike appendage (Fig. 2e). Penis capsule with normally developed inner arm, and reduced outer arm (Fig. 2e).

**Distribution.** China (Anhui, Hunan, Jiangxi, Guangdong, Guangxi, Guizhou, Taiwan); Japan.



**FIGURE 2.** *Amida tricolor* (Harold, 1878): **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 1 mm. (From Wang *et al.* 2022)

***Amida tricolor formosana* (Kurisaki, 1920)**

Chinese common name: 台湾三色花瓢虫

(Fig. 3)

*Amida formosana* Kurisaki, 1920.

*Amida tricolor* var. *formosana* Weise, 1923: 185.

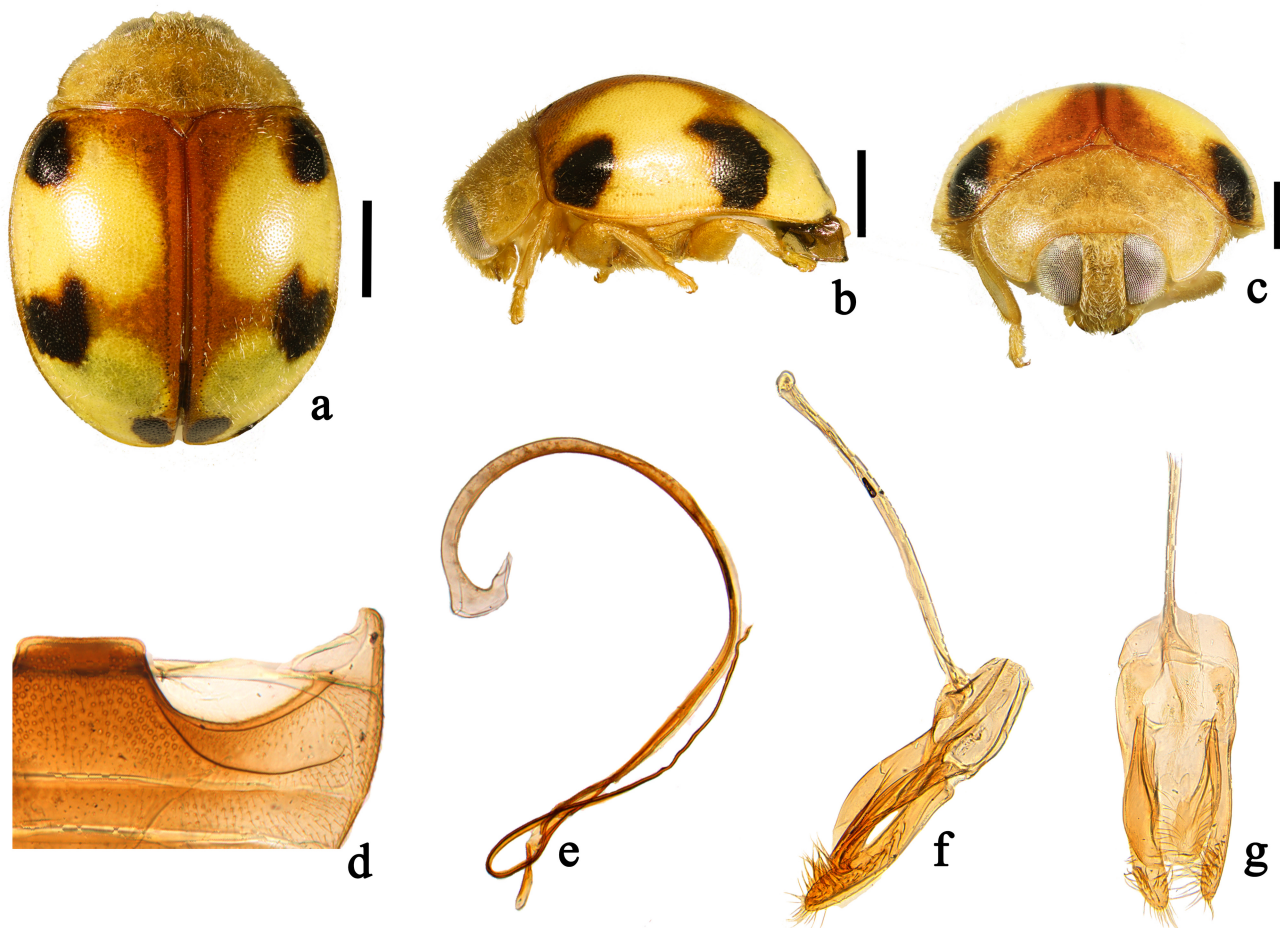
*Amida tricolor formosana* Kurisaki, 1920; Yu 2011: 168; Wang *et al.* 2022: 142.

**Material examined. China: Hainan:** 1♂, Bawangling National Natural Reserve, Changjiang Li Autonomous County, 5. V. 2005, Wang XM leg; 1♂1♀, Wuzhishan Mountain, Wuzhishan City, 24. VII. 2006, Wang XM leg; 1♂2♀, Jianfengling National Natural Reserve, Ledong Li Autonomous County, 18. VII. 2006, Wang XM leg.

**Diagnosis.** This subspecies is similar to *A. tricolor* in coloration and male genitalia, but can be distinguished from the latter by the pattern of pronotum and elytra, in which the middle black spot on pronotum is generally small or absent, and the middle black spot of each elytron is more compact and not present as U-shape (Fig. 3a–c).

**Description.** TL: 4.03–4.61mm, TW: 3.31–3.59mm, TH: 2.03–2.23mm, TL/TW: 1.22–1.28, EL/EW: 1.01–1.05, PL/PW: 1.74–2.04, HW/PW: 0.94–1.15, PW/EW: 0.34–0.42, EW/HW: 0.33–0.34.

Body oval, dorsum moderately convex in lateral view, covered with golden pubescence (Fig. 3a–c). Head, antennae and mouthparts yellow (Fig. 3c). Eyes interocular margin straight and parallel, interocular distance about 0.33× head width (Fig. 3c). Pronotum yellow, scutellar shield reddish brown. Elytra reddish brown (Fig. 3a–c); each elytron with three black spots longitudinally aligned along lateral edge, middle one slightly larger and compact; a large yellow macula present between black spots, reaching the lateral margin and mesally close to the elytral suture (Fig. 3a, b). Abdominal postcoxal lines incomplete and recurved (Fig. 3d).



**FIGURE 3.** *Amida tricolor formosana* (Kurisaki, 1920): **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 1 mm. (From Wang *et al.* 2022)

Male genitalia (Fig. 3e, f) with penis guide stout and both sides of penis guide subparallel, curved apically. Parameres (Fig. 3f, g) longer and slender than penis guide, the apical 1/3 covered with dense pubescence. Penis long and slender (Fig. 3e); penis capsule with stout and thick inner arm and reduced outer arm; apex of penis with threadlike appendage, appendage about 1/2 length of penis (Fig. 3e).

**Distribution.** China (Hainan, Taiwan).

***Amida sagittata* Wei et Wang, sp. nov.**

Chinese common name: 矢叶花瓢虫  
(Fig. 4)

**Material examined. HOLOTYPE:** CHINA: Yunnan: ♂, Nangunhe National Natural Reserve, Banhong Township, Cangyuan Wa Autonomous County, 14–15.V.2008, Wang XM *et al.* leg, No. SCAU(E)16906. **PARATYPES:** CHINA: Yunnan: 1♂, Nangunhe National Natural Reserve, Banhong Township, Cangyuan Wa Autonomous County, 14–15.V.2008, Wang XM *et al.* leg.

**Diagnosis.** This species can be distinguished from other species of *Amida* by the elytra with nine spots, in which the central spot is situated on the elytral suture (Fig. 4a), and the apex of penis guide arrow-shaped (Fig. 4g).

**Description.** TL: 3.34–3.41mm, TW: 2.61–2.70mm, TH: 1.44–2.06mm, TL/TW: 1.28–1.33, EL/EW: 1.04–1.10, PL/PW: 2.33–2.63, HW/PW: 1.41–1.63, PW/EW: 0.31–1.40, EW/HW: 0.44–0.45.

Body nearly oval, dorsum moderately convex with white dense pubescence (Fig. 4a–c). Head, pronotum and scutellar shield pale yellow (Fig. 4c). Eyes large, interocular margin straight and parallel to each other, interocular

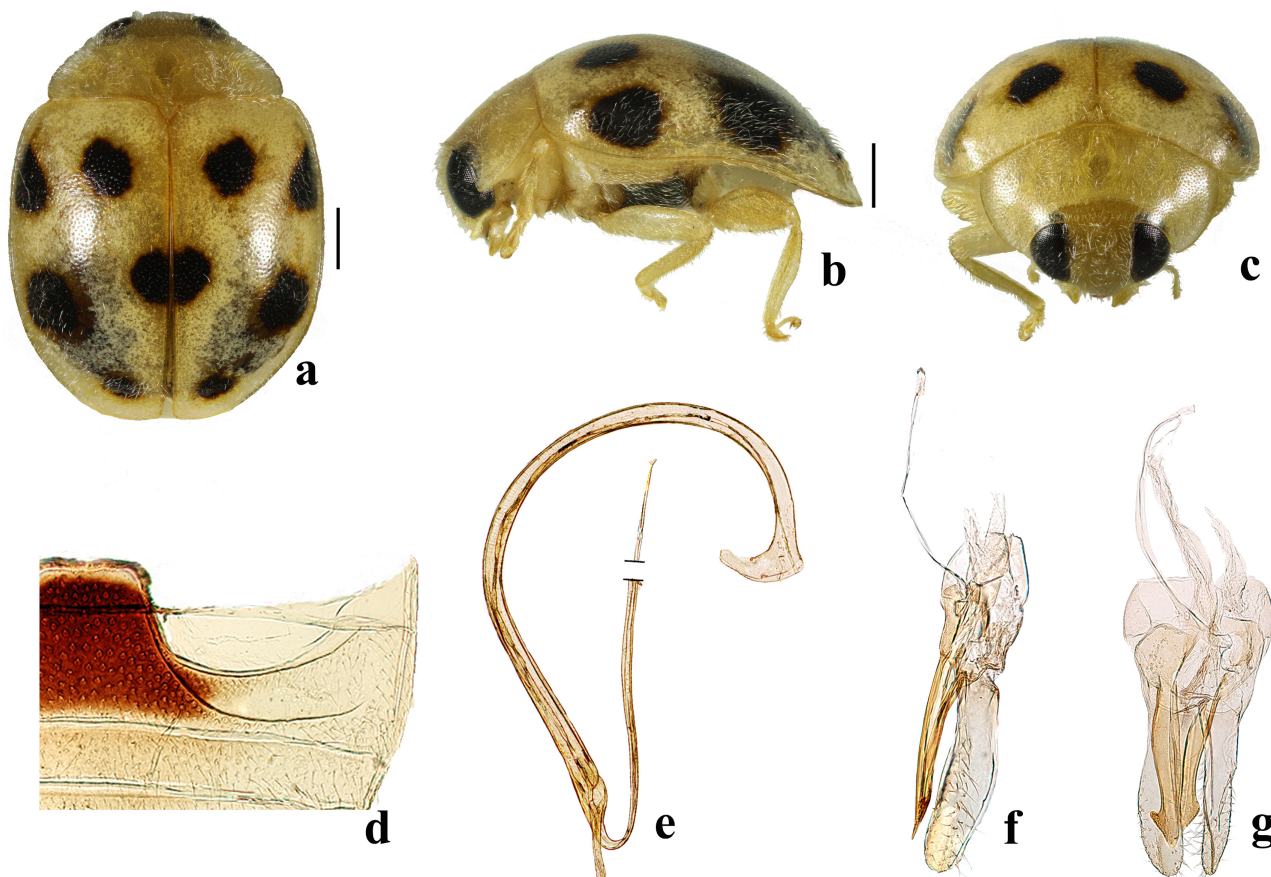
distance about  $0.44 \times$  head width (Fig. 4c). Elytra pale yellow; each elytron with five black spots (Fig. 4a); four rounded, arranged in 2-1-1 form: two transversely aligned near the anterior margin, one at middle close to the lateral edge, one situated posteriorly; the remaining one semicircular, located along the middle of elytral suture, combining with another semicircular spot to form a complete rounded spot when elytra come together.

Abdominal postcoxal lines incomplete and recurved (Fig. 4d).

Male genitalia (Fig. 4e–f) with penis guide stout (Fig. 4f, g), apex pointed and asymmetrical, arrowhead-shaped (Fig. 4g). Parameres thick and elongate, slightly longer than penis guide in lateral view (Fig. 4f). Penis curved, apically with threadlike appendage (Fig. 4e). Penis capsule with slender inner arm, outer arm reduced (Fig. 4e).

**Distribution.** China (Yunnan).

**Etymology.** The specific epithet is derived from the Latin adjective “sagittata”, referring to its arrowhead-shaped penis guide.



**FIGURE 4.** *Amida sagittata* sp. nov.: a. Dorsal view b. Lateral view c. Frontal view d. Abdomen e. Penis f. Tegmen, lateral view g. Tegmen, inner view. Scale bars: a–c: 0.5 mm.

***Amida decemmaculata* Yu, 2000**

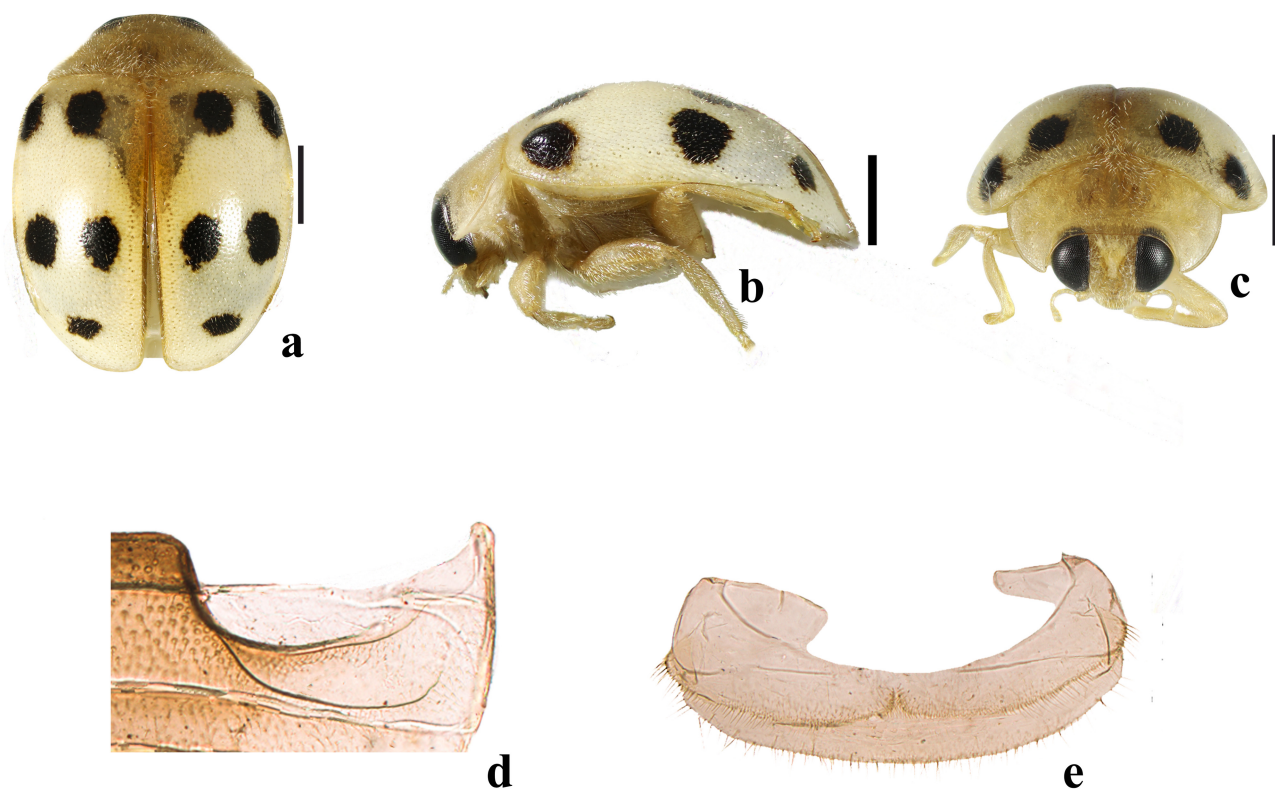
Chinese common name: 十斑花瓢虫  
(Fig. 5)

*Amida decemmaculata* Yu 2000: 25; Pang *et al.* 2004: 92; Ren *et al.* 2009: 94; Wang *et al.* 2022: 142.

**Material examined. China: Yunnan:** 1♀, Mengxing Village, Mengla County, Wang XM leg.

**Diagnosis.** This species can be distinguished from other known species of *Amida* by its yellowish white elytra with ten black spots (Fig. 5a).

**Description.** TL: 3.44mm, TW: 2.72mm, TH: 1.65mm, TL/TW: 1.26, EL/EW: 1.06, PL/PW: 1.74, HW/PW: 1.02, PW/EW: 0.42, EW/HW: 0.37.



**FIGURE 5.** *Amida decemmaculata* Yu, 2000: **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Ovipositor. Scale bars: **a–c:** 0.5 mm. (From Wang *et al.* 2022)

Body elongated oval, dorsum moderately convex in lateral view, with dense white pubescence (Fig. 5a–c). Head, abdomen, scutellar shield and legs yellow (Fig. 5b, c). Eyes with interocular margin straight and parallel, interocular distance about  $0.37\times$  head width (Fig. 5c). Pronotum yellowish brown (Fig. 5c). Elytra yellowish white, anteriorly with a subtriangular, yellowish brown paler area, extending to about  $1/3$  length of elytra; each elytron with five black spots, arranged in a 2-2-1 form: two transversely aligned near the anterior margin, two transversely aligned in the middle, almost directly behind the anterior ones, and one situated in the posterior region (Fig. 5a). Abdominal postcoxal lines incomplete and recurved (Fig. 5d).

**Distribution.** China (Yunnan).

**Remarks.** Male genitalia not studied.

***Amida nanlingiensis* Wei et Wang, sp. nov.**

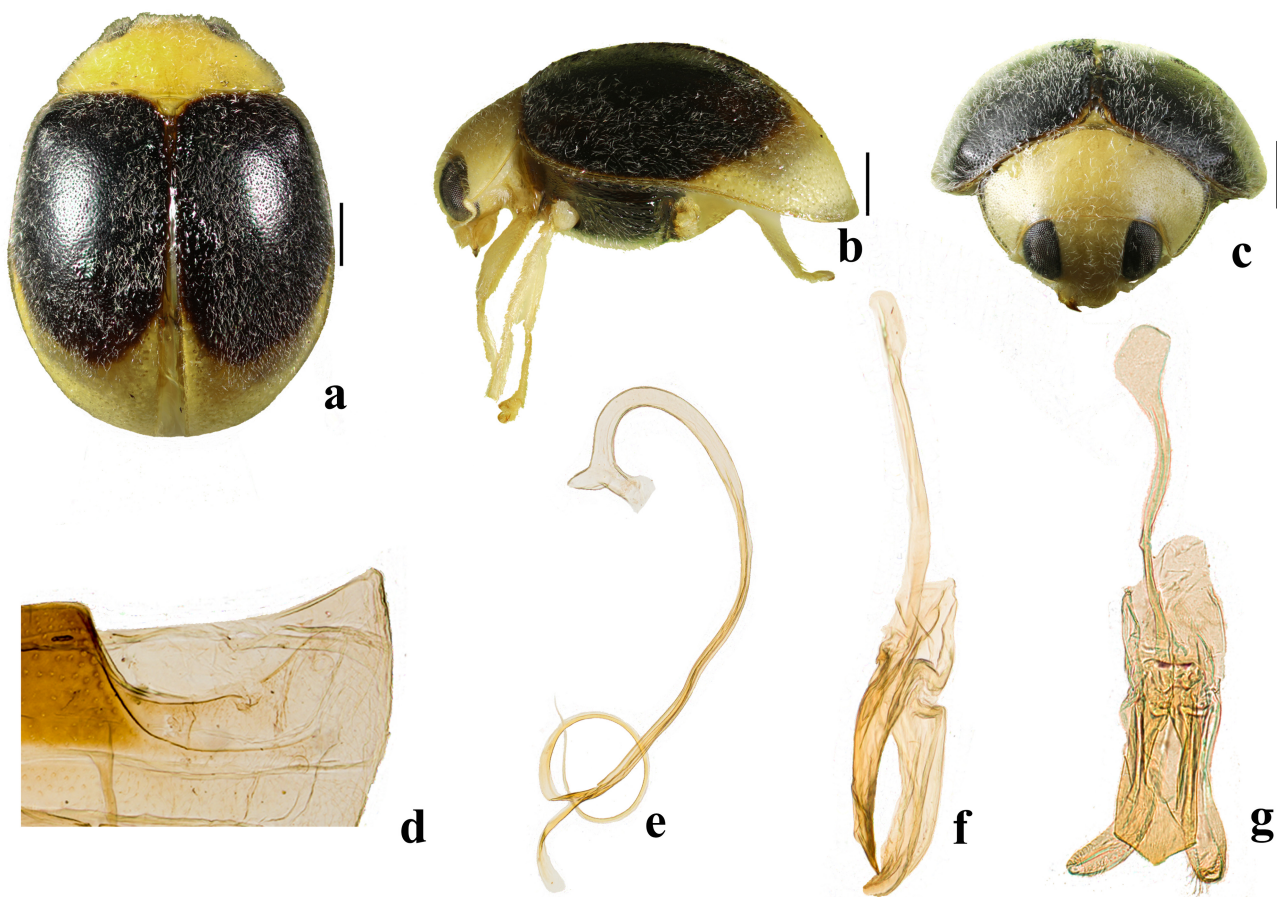
Chinese common name: 南岭花瓢虫  
(Fig. 6)

**Type material. HOLOTYPE: CHINA: Guangdong:** ♂, Qingshuigu, Nanling National Natural Reserve, Ruyuan County, 8. VII. 2005, Wang XM leg, No. SCAU(E)10730. **PARATYPES: CHINA: Guangdong:** 1♀, Qingshuigu, Nanling National Natural Reserve, Ruyuan County, I. 2007, Wang XM leg.; 4♀, Qingshuigu, Nanling National Natural Reserve, Ruyuan County, 8. VII. 2005, Wang XM leg.

**Diagnosis.** This species can be recognized from other species of *Amida* by the the apical  $1/3$  of the elytra yellow, penetrating up to  $1/2$  through the lateral side and suture., black elytra (Fig. 6a–c) with yellowish apices, and the penis apically with threadlike appendage (Fig. 6e).

**Description.** TL: 3.34–3.80 mm, TW: 2.65–3.11 mm, TH: 1.74–1.78 mm, TL/TW: 1.22–1.26, EL/EW: 0.94–0.99, PL/PW: 1.87–2.08, HW/PW: 1.10–1.30, PW/EW: 0.32–0.33, EW/HW: 0.41–0.44.





**FIGURE 6.** *Amida nanlingiensis* sp. nov.: **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 0.5 mm.

Body elongate oval, dorsum moderately convex in lateral view, with white dense pubescence (Fig. 6a–c). Head and pronotum yellow to yellowish white. Eyes large, interocular margin straight and not parallel to each other. Eyes with interocular margin straight and parallel, interocular distance about  $0.41 \times$  head width (Fig. 6c). Elytra black, the apical 1/3 of the elytra yellow, penetrating up to 1/2 through the lateral side and suture. (Fig. 6a–c), apical one-third yellowish.

Abdominal postcoxal lines incomplete and recurved (Fig. 6d).

Male genitalia (Fig. 6e, g) with penis guide stout, slightly shorter than parameres in lateral view (Fig. 6f), parallel in the basal 7/8, then sharply tapering to apex in inner view (Fig. 6g); parameres elongated in lateral view. Penis long and slender, apex with threadlike appendage; penis capsule with robust inner arm and pointed outer arm (Fig. 6e).

**Distribution.** China (Guangdong).

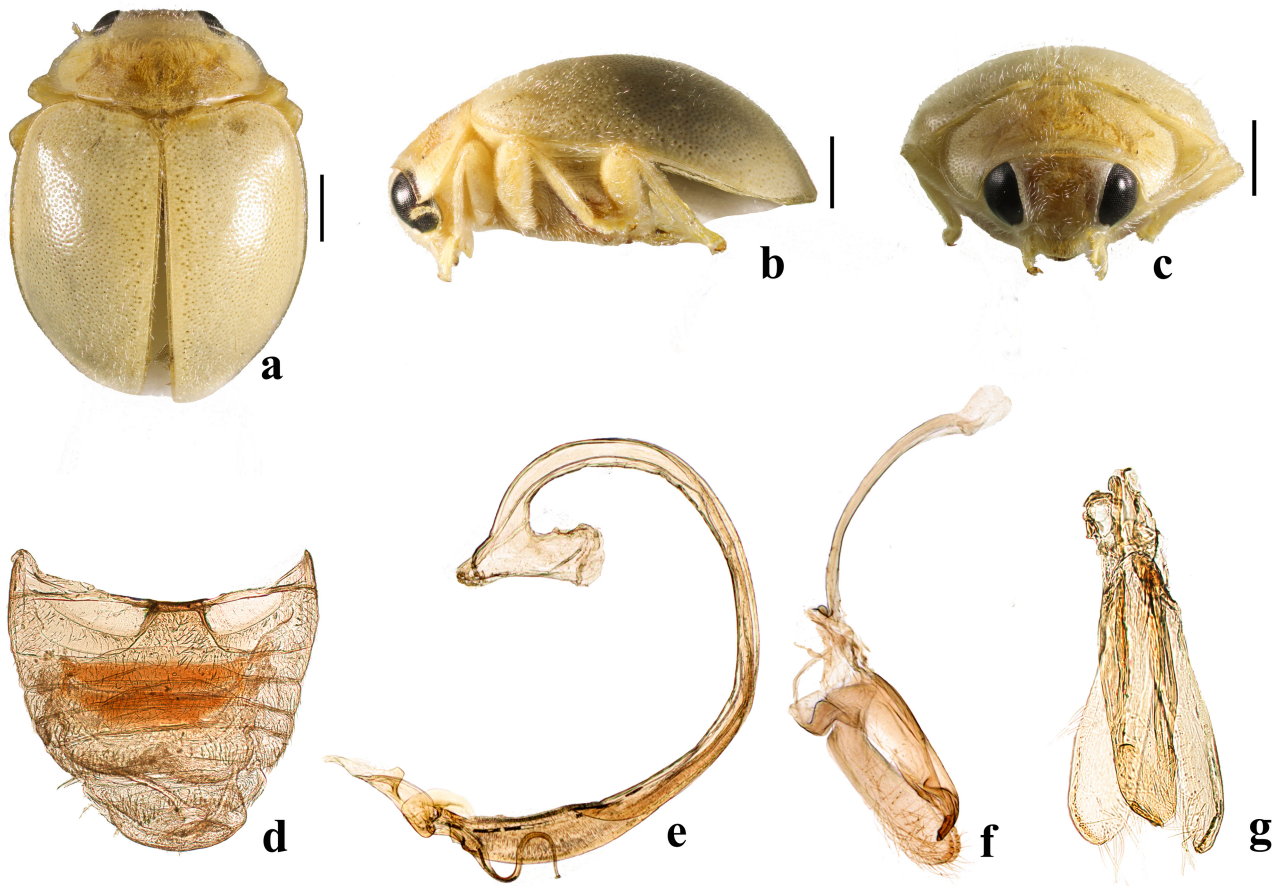
**Etymology.** The specific epithet is given after Nanling Mountains, Guangdong, the type locality.

***Amida longifolia* Wei et Wang, sp. nov.**

Chinese common name: 长叶花瓢虫

(Fig. 7)

**Type material. HOLOTYPE:** CHINA: Yunnan: ♂, Sipsongpanna, 23. VIII. 2005, Wang XM leg, No. SCAU(E)16907. **PARATYPES:** CHINA: Yunnan: 1♂1♀, Jinghong City, 1. V. 2008, Wang XM *et al.* leg; 1♂, Ruili City, 27. VIII. 2005, Qing ZQ leg; 1♂, Sipsongpanna, 5. V. 2009, ca 1050 m, Ren SX *et al.* leg; 1♀, Mengla County, 9. V. 2009, ca 1027 m, Ren SX *et al.* leg.



**FIGURE 7.** *Amida longifolia* sp. nov.: a. Dorsal view b. Lateral view c. Frontal view d. Abdomen e. Penis f. Tegmen, lateral view g. Tegmen, inner view. Scale bars: a–c: 0.5 mm.

**Diagnosis.** This species is close to *A. nguyent* in external appearance, but it can be easily distinguished from the latter by the abdominal ventrites 2–4 with a yellowish brown macula (Fig. 7d), penis moderately stout, broadened at apical 1/3, and apex of penis guide with threadlike appendage, which is shorter than 1/2 length of penis (Fig. 7e). In *A. nguyent*, the abdominal ventrites 2–4 without any maculae (Fig. 9d), penis long and slender, apex of penis with threadlike appendage, shorter than 1/2 length of penis (Fig. 9e).

**Description.** TL: 2.79–2.90mm, TW: 1.99–2.22mm, TH: 1.18–1.35mm, TL/TW: 1.26–1.46, EL/EW: 0.89–1.10, PL/PW: 1.75–2.40, HW/PW: 1.15–1.55, PW/EW: 0.31–0.41, EW/HW: 0.51–0.56.

Body oval, dorsum slightly convex in the lateral view (Fig. 7a–c). Head, pronotum and scutellar shield yellow. Eyes large, interocular margins straight and interocular distance about  $0.51 \times$  head width (Fig. 7c). Elytra pale yellow, unspotted (Fig. 7a–c).

Abdominal postcoxal lines incomplete and recurved (Fig. 7d).

Male genitalia (Fig. 7e–f) with penis guide stout, parameres appear to be about 3/4 length as wide as penis guide only, tapering apically and curved outwards in lateral view, two protrusions extending from the apical 1/3 (Fig. 7f–g); parameres slightly longer than penis guide. Penis moderately stout, broadened at the apical 1/3; apex of penis guide with threadlike appendage, shorter than 1/2 length of penis (Fig. 7e); penis capsule with robust inner arm, and short outer arm, less than 1/2 length of inner arm (Fig. 7e).

**Distribution.** China (Yunnan).

**Etymology.** The specific epithet is derived from the Latin adjective “longifolia”, referring to its tegmen with penis guide slender.

*Amida vietnamica* Hoàng, 1982

Chinese common name: 越南花瓢虫  
(Fig. 8)

*Amida vietnamica* Hoàng, 1982: 189; Yu 2000: 24; Poorani 2002: 53; Pang *et al.* 2004: 93; Ren *et al.* 2009: 96; Wang *et al.* 2022: 144.

*Ortalia pectoralis sensu* Pang *et* Mao, 1979: 38 (not Weise 1901); Cao 1992: 126.

**Material examined.** China: **Guangxi:** 1♂, Aidian Town, 1. VIII. 2005, Wang XM leg; 2♂1♀, Xiaoliancheng, Longchuan, 1. VIII. 1985, Pu TS *et al.* Leg. **Yunnan:** 1♂, Funing County, 16. VIII. 2005, Wang XM leg.

**Diagnosis.** This species is similar to *A. quinquefasciata* in external appearance, but it can be easily distinguished from the latter by the male genitalia with asymmetrical penis guide (Fig. 8g).

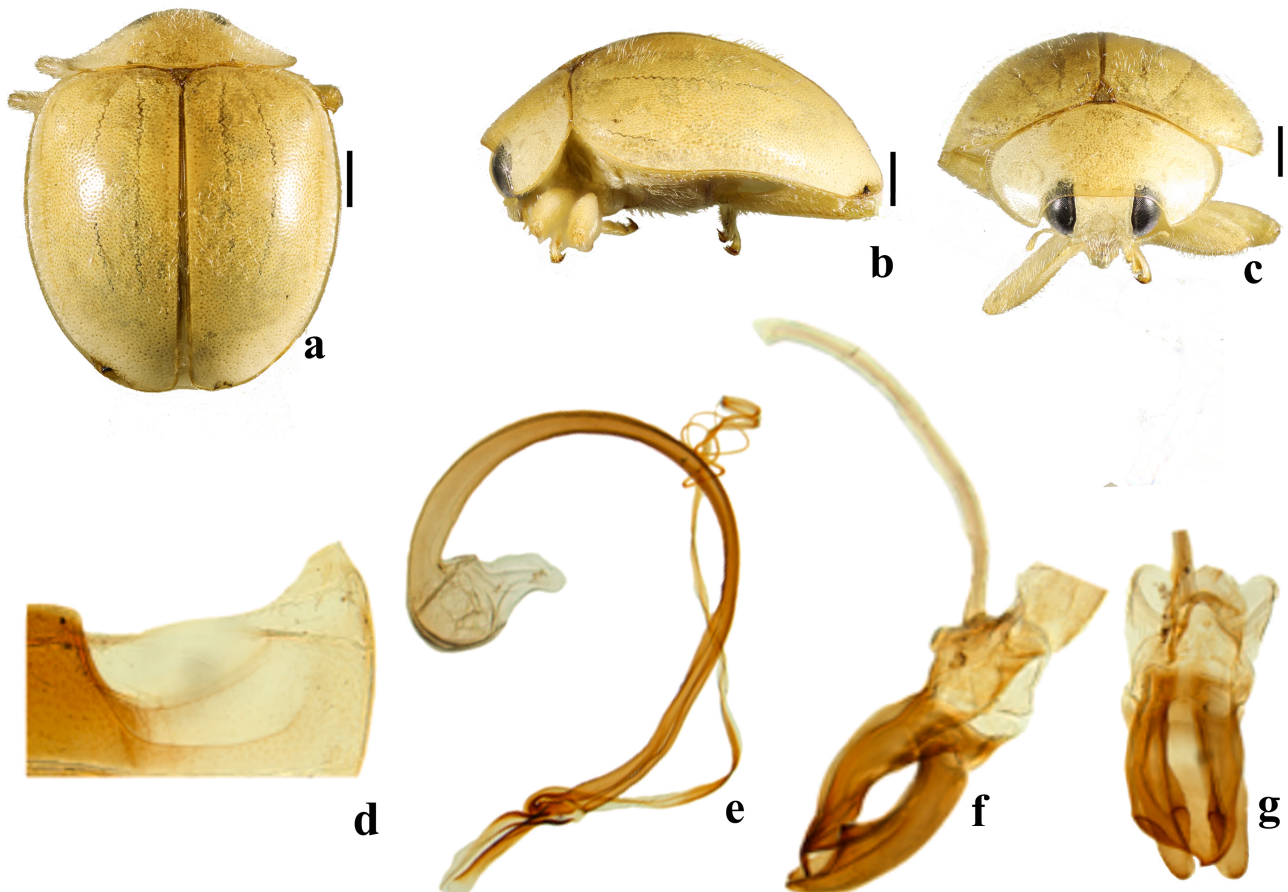
**Description.** TL: 4.94–5.34mm, TW: 4.09–4.49mm, TH: 2.21–2.47mm, TL/TW: 1.19–1.21, EL/EW: 0.98–1.00, PL/PW: 1.91–2.15, HW/PW: 0.94–1.06, PW/EW: 0.35–0.37, EW/HW: 0.46–0.48.

Body oval, dorsum slightly convex, covered with a few long, golden pubescence in lateral view (Fig. 8a–c). Body red of fresh specimen, pronotum yellow. Eyes with interocular distance about 0.46×head width (Fig. 8c). Elytra yellow, without spots.

Abdominal postcoxal lines incomplete and recurved (Fig. 8d).

Male genitalia (Fig. 8e–g) with penis guide stout and asymmetrical, slightly shorter than parameres in lateral view (Fig. 8g); parameres with triangular expansion at the apical 1/3 (Fig. 8f, g). Penis elongate and strongly curved, apically with elongated threadlike appendage, which is more than 2/3 length of penis, apex of appendage spring-like (Fig. 8e); penis capsule with a robust, nearly rounded inner arm and reduced outer arm (Fig. 8e).

**Distribution.** China (Guangxi, Yunnan); Vietnam; India.



**FIGURE 8.** *Amida vietnamica* Hoàng, 1982: a. Dorsal view b. Lateral view c. Frontal view d. Abdomen e. Penis f. Tegmen, lateral view g. Tegmen, inner view. Scale bars: a–c: 1 mm. (From Wang *et al.* 2022)

*Amida nguyent* Hoàng, 1983

Chinese common name: 阮氏花瓢虫  
(Fig. 9)

*Amida nguyent* Hoàng, 1983: 19.

**Material examined. China: Yunnan:** 1♀, Mengla County, 12–13. X. 2006, Wang XM leg; 5♂2♀, Tongbiguan Nature Reserve, Yingjiang County, 22–23. V. 2008, Wang XM *et al.* leg.

**Diagnosis.** This species can be distinguished from other species of *Amida* by the male genitalia with asymmetrical penis guide, and the apex of penis guide with a membranous appendage (Fig. 9f, g).

**Description.** TL: 3.43–3.89mm, TW: 2.77–3.00mm, TH: 1.61–1.82mm, TL/TW: 1.24–1.30, EL/EW: 0.95–1.02, PL/PW: 2.08–2.14, HW/PW: 1.25–1.27, PW/EW: 0.33–0.34, EW/HW: 0.40–0.42.

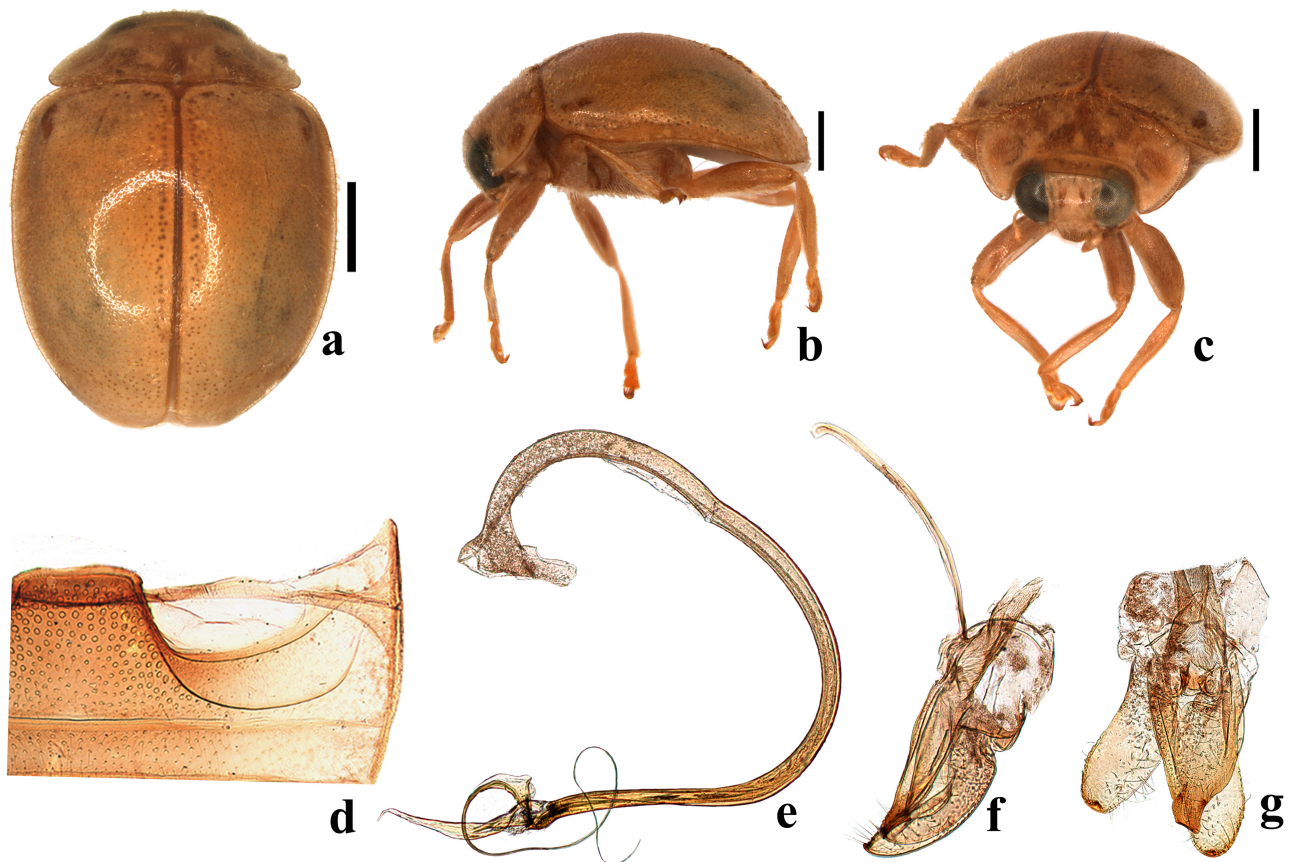
Body nearly oval, dorsum moderately convex, covered with dense yellow pubescence (Fig. 9a–c). Head, pronotum and scutellar shield iridescent yellowish brown (Fig. 9a). Eyes with interocular distance about 0.40× head width (Fig. 9c). Elytra metallic yellowish brown, unspotted, with fine punctures along elytral margin.

Abdomen postcoxal lines incomplete and recurved (Fig. 9d).

Male genitalia (Fig. 9e, f) with penis guide stout and asymmetrical, widest at base, gradually narrowing to apex, apex of penis guide with a membranous appendage (Fig. 9h). Penis long and slender, both sides of penis nearly straight (Fig. 9e), apex of penis with threadlike appendage, shorter than 1/2 length of penis; penis capsule with robust inner arm and reduced outer arm (Fig. 9e).

**Distribution.** China (Yunnan) New distribution; Vietnam.

**Remarks.** This species was initially described by Hoàng (1983) from Vietnam. We examined a series of specimens from Yunnan, and found their male genitalia are consistent and identical with the morphological characters of *A. nguyent*, including the asymmetrical penis guide, and the apex of penis with threadlike appendage which is shorter than 1/2 length of penis. Therefore, we identified these specimens as *A. nguyent*. It is the first record of *A. nguyent* in China.



**FIGURE 9.** *Amida nguyent* Hoàng, 1983: **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 0.5 mm.

### *Amida nigropectoralis* (Pang et Mao, 1979)

Chinese common name: 黑腹花瓢虫

*Ortalia nigropectoralis* Pang et Mao, 1979: 39.

*Amida nigropectoralis* Yu, 2000: 24. Comb. by Yu.

*Amida nigropectoralis* Pang et al. 2004: 92.

**Material examined.** Not examined.

**Diagnosis.** This species can be separated from other *Amida* species by the apex of penis guide divided into three processes, the penis guide nearly as long as parameres (Pang et Mao 1979: Fig. 34); and the base of parameres with a process (Pang et Mao, 1979: Fig. 34).

**Description.** For detailed descriptions and illustrations see Pang et Mao (1979).

**Distribution.** China (Yunnan).

**Remarks.** The species was originally described by Pang and Mao (1979) as *Ortalia nigropectoralis* Pang et Mao, 1979. However, it was subsequently transferred to the genus *Amida* based on the 11-segmented antennae of the type specimens in Yu (2000).

### *Amida mirifica* Hoàng, 1983

Chinese common name: 凸叶花瓢虫

(Fig. 10)

*Amida mirifica* Hoàng, 1983: 19.

**Material examined. China: Hainan:** 5♂, Wuzhishan Mountain, Wuzhishan City, 19. IV. 2000, Peng ZQ leg; 1♂1♀, Wuzhishan Mountain, Wuzhishan City, 3. V. 1996, Peng ZQ leg; 1♀, Wuzhishan Mountain, Wuzhishan City, 24. VII. 2006, Liang JB leg; 2♂, Limushan National Forest Park, 27. IX. 1995, Peng ZQ leg; 1♀, Limushan National Forest Park, 22. VII. 2006, Tang LD leg; 2♂1♀, Bawangling National Nature Reserve, Changjiang Li Autonomous County, 21. III. 1996, Peng ZQ leg; 1♂, Bawangling National Nature Reserve, Changjiang Li Autonomous County, 16. X. 1997, Peng ZQ leg; 1♂, Bawangling National Nature Reserve, Changjiang Li Autonomous County, 3. IX. 1998, Peng ZQ leg; 1♂, Bawangling National Nature Reserve, Changjiang Li Autonomous County, 5. V. 2005, Wang XM leg; **Yunnan:** 1♂, Mengla County, 9. V. 2009, ca 1027 m, Ren SX *et al.* Leg.

**Diagnosis.** This species can be distinguished from the *A. longifolia* by the elytra with four spots (Fig. 10a), the penis short and stout, and the apex of penis guide with three angular processes (Fig. 10g).

**Description.** TL: 2.97–3.28 mm, TW: 2.43–2.54 mm, TH: 1.47–1.50 mm, TL/TW: 1.22–1.29, EL/EW: 0.92–1.01, PL/PW: 2.20–2.23, HW/PW: 1.30–1.40, PW/EW: 0.31–0.32, EW/HW: 0.48–0.54.

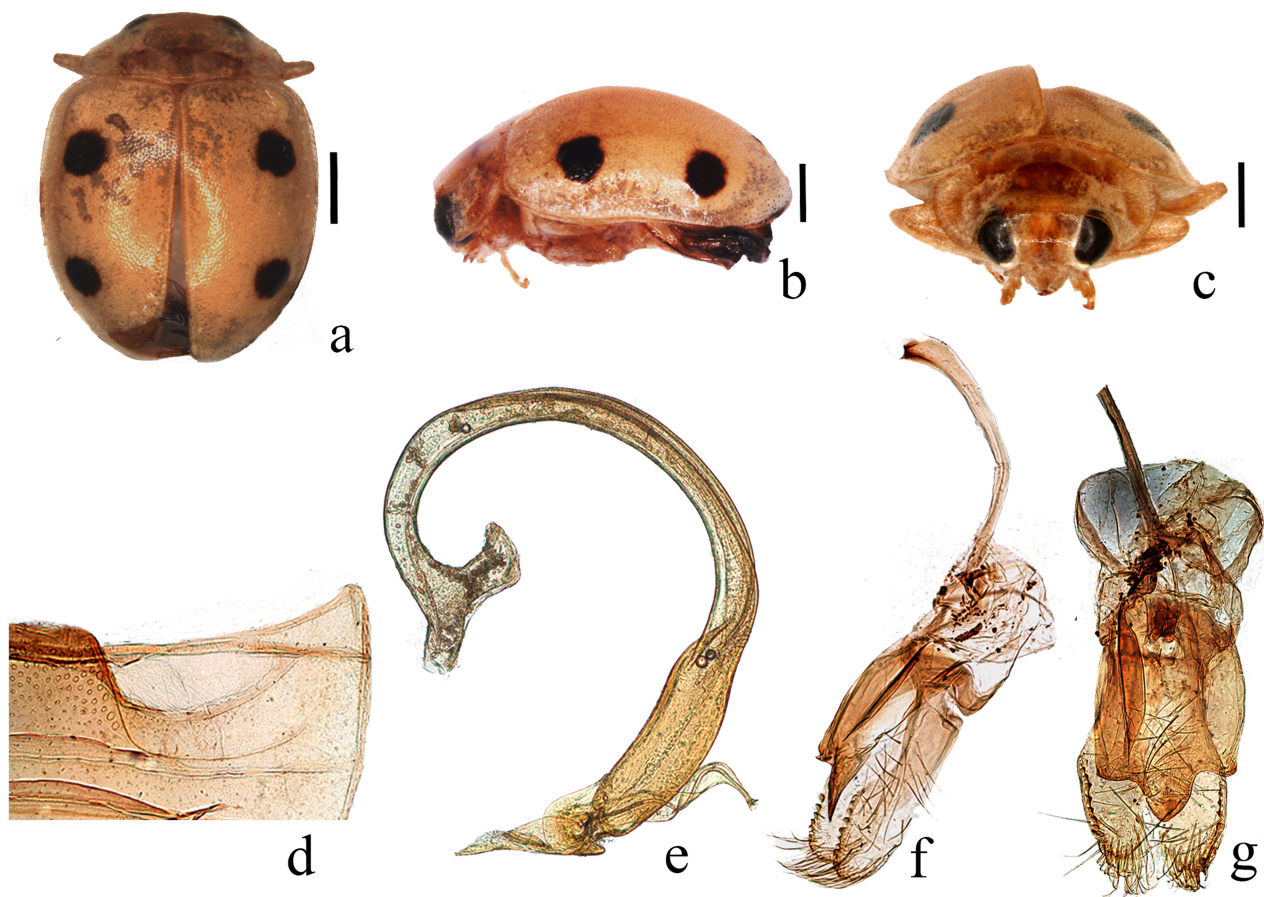
Body short oval, dorsum moderately convex in lateral view, covered with yellow-white pubescence (Fig. 10a–c). Head and pronotum yellow to yellowish brown (Fig. 10c). Eyes with interocular distance about 0.48×head width, inner ocular margins divergent posteriorly (Fig. 10c). Elytra yellowish brown; each elytron with two black spots longitudinally arranged.

Abdominal postcoxal lines incomplete and recurved (Fig. 10d).

Male genitalia (Fig. 10e–g) with penis guide stout and short, shorter than parameres and nearly parallel on both sides, apex of penis guide divided into three lobes, apical part is deeply emarginate on both sides which makes central part to look like a process, the middle one longest in inner view (Fig. 10g); parameres stout, with distinctly serrate margins and dense long apical setae in lateral view (Fig. 10f). Penis stout, broadened at the apical 1/3, with threadlike appendage, shorter than 1/2 length of penis (Fig. 10e); penis capsule with curved inner arm and robust outer arm (Fig. 10e).

**Distribution.** China (Hainan; Yunnan) New distribution; Vietnam.

**Remarks.** This species was initially described by Hoàng (1983) in Vietnam. We examined a series of specimen from Hainan and Yunnan, and found that they are consistent with the identical morphological characters of *A. mirifica*, including the elytra with four spots, and the short and stout penis guide which forms three angular processes. Therefore, we identified these specimens as *A. mirifica*. It is the first record of *A. mirifica* in China.



**FIGURE 10.** *Amida mirifica* Hoàng, 1983: **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 0.5 mm.

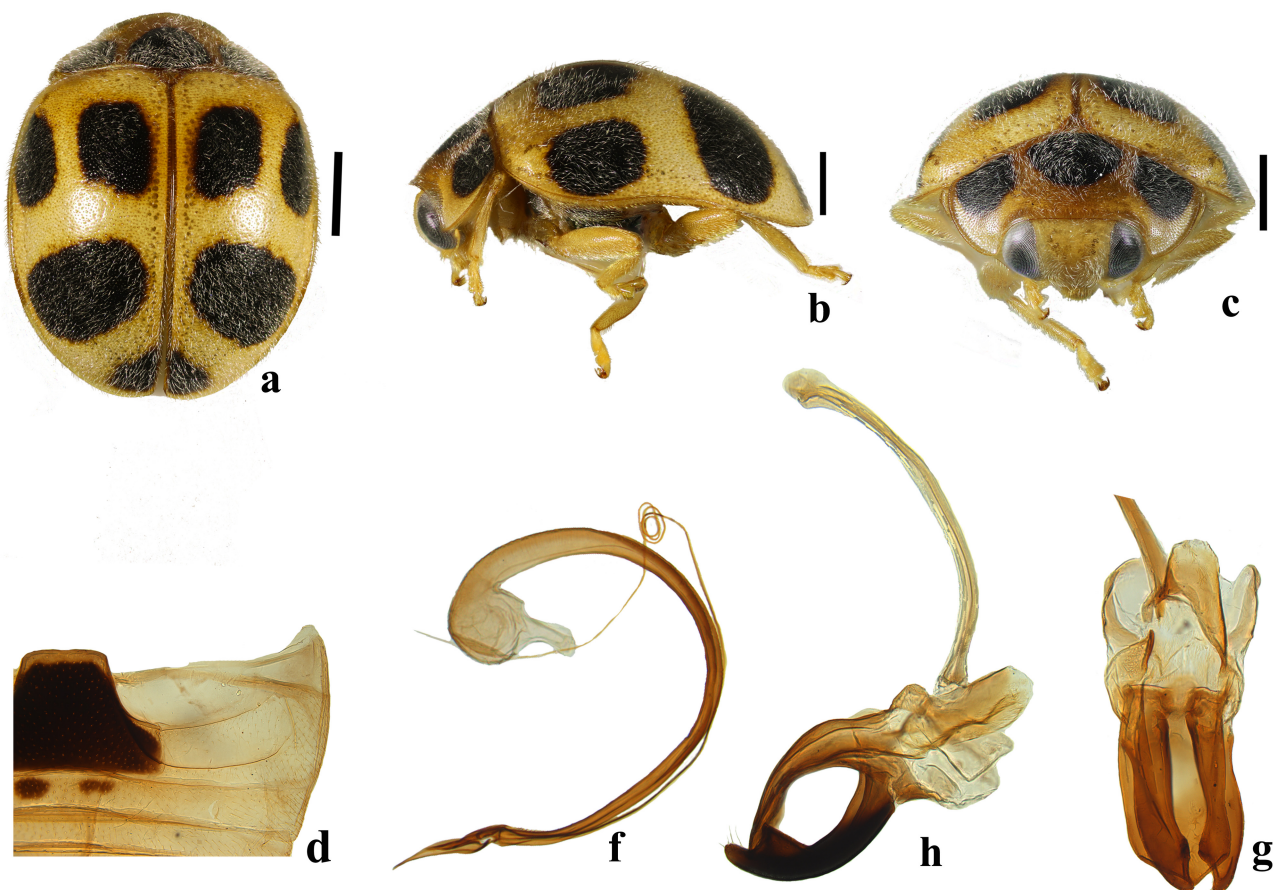
***Amida quinquefasciata* (Hoàng, 1982)**

Chinese common name: 横斑花瓢虫

(Fig. 11)

*Amida quinquefasciata* Hoàng, 1982: 185; Yu 2000: 25; Pang *et al.* 2004: 92; Ren *et al.* 2009: 94; Wang *et al.* 2022: 142.  
*Epilachna filamentacea* Zeng et Pang, 2002: 280. Synonymized by Pang 2004: 92.

**Material examined. China: Hainan:** 1♀, Bawangling National Natural Reserve, Changjiang Li Autonomous County, 21. VIII. 1996, Peng ZQ leg; 2♀, Jianfengling National Natural Reserve, Ledong Li Autonomous County 23. II. 1982, Collector unknown; 1♂1♀, Wuzhishan Mountain, Wuzhishan City, 3. V. 1996, Peng ZQ leg; 1♂1♀, Yinggeling National Natural Reserve, 6. V. 2005, Wang XM leg. **Hunan:** 1♀, Tianpingshan National Nature Reserve, Sangzhi County, 14. VIII. 2001, Peng ZQ leg. **Hubei:** 1♀, Banqiao, Shennong Jia National Natural Reserve, ca 1170 m, 21–24. VII. 2007, Wang XM *et al.* Leg. **Anhui:** 6♂2♀, Tangkou, Huangshan Mountain, ca 460 m, 12–13. IX. 2010, Wang XM *et al.* Leg. **Fujian:** 1♀, Wuyishan National Park, Wuyishan City, 20. VII. 1984, Zhang KC leg; 1♀, Wuyishan National Park, Wuyishan city, 19. VII. 1984, Pang XF leg; 1♂, Meiluowan, 14. XI. 1980, Jiang F leg. **Sichuan:** 1♀, Qingchengshan Mountain, X. 1987, Tong XL leg. **Guizhou:** 4♂7♀, Dongtang, Maolan National Nature Reserve, Libo County, ca 730 m, 15–18. X. 2008, Wang XM *et al.* Leg; 4♂4♀, Sanchahe River, Maolan National Nature Reserve, Libo county, ca 750 m, 19. X. 2008, Wang XM *et al.* Leg; 1♂1♀, Wengang, Maolan National Nature Reserve, Libo County, 15. VI. 2006, Yu WC leg; 1♀, Wengang, Maolan National Nature Reserve, Libo County, 15. VI. 2006, Tang LD leg. **Guangdong:** 8♂11♀, Huangniping, Shimentai National Nature Reserve, Yingde City, 7. X. 2004, Ren SX *et al.* Leg; 1♀, Tianjingshan Forest Park, Ruyuan County, 17. VII. 2005, Wang XM leg.



**FIGURE 11.** *Amida quinquefasciata* Hoàng, 1982: **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 1 mm. (From Wang *et al.* 2022)

**Diagnosis.** This species is similar with *A. Vietnamica* in male genitalia, but can be easily distinguished from the coloration of elytra yellowish white, with five black spots on each elytron, arranged in 2-2-1 form (Fig. 11g, h).

**Description.** TL: 5.07–5.39mm, TW: 3.84–3.96mm, TH: 2.58–2.66mm, TL/TW: 1.32–1.36, EL/EW: 1.03–1.11, PL/PW: 1.78–2.15, HW/PW: 0.97–1.17, PW/EW: 0.36–0.43, EW/HW: 0.46–0.48.

Body oval, dorsum moderately convex in lateral view, covered with dense white pubescent (Fig. 11a–c). Head yellow, eyes with interocular distance about  $0.46\times$  head width (Fig. 11c). Pronotum yellow, generally with three black spots transversely arranged along the posterior margin (Fig. 11c), spots absent in some individuals. Scutellar shield yellow (Fig. 11a–c). Elytra yellowish white, with five black spots on each elytron, arranged in 2-2-1 form: two transversely aligned in anterior half, one much larger in posterior half, and the remaining small one very close to the posterior margin (Fig. 11a). A black macula present from the middle part of metaventrite to abdomen ventrite 1, and two small black spots present in the central part of ventrite 2, transversely arranged (Fig. 11d).

Abdominal postcoxal lines incomplete and recurved (Fig. 11d).

Male genitalia (Fig. 11e–g) with penis guide stout and parallel, approximately twice as wide as parameres, widest at base, parallel on both sides from base to  $4/5$ , gradually narrowing to apex in inner view (Fig. 11f, g); parameres slightly longer than penis guide, with triangular appendage at the apical  $1/3$ , strongly curved in opposite directions to penis guide, forming a large space in lateral view (Fig. 11f). Penis with threadlike appendage, length of appendage longer than penis (Fig. 11e); penis capsule nearly rounded, with long and extended inner arm, outer arm reduced (Fig. 11f).

**Distribution.** China (Anhui, Fujian, Guangdong, Guizhou, Hainan, Hubei, Hunan, Sichuan, Yunnan); Vietnam.

***Amida jinghongiensis* (Pang et Mao, 1979)**

Chinese common name: 景洪花瓢虫

(Fig. 12)

*Ortalia jinghongiensis* Pang et Mao, 1979: 39; Cao 1992: 128.

*Amida jinghongiensis* Yu, 2000: 24; Pang *et al.* 2004: 92; Ren *et al.* 2009: 94; Wang *et al.* 2022: 142.

*Amida platyceps* Hoàng, 1982. Synonymized by Pang *et al.* 2004: 92.

**Material examined. China: Guangxi:** 1♂, Daqingshan Mountain, Pingxiang, 23. XII. 2005, Wang XM leg; 3♂, Aidian Town, Chongming City, 1. VIII. 2005, Wang XM leg. **Yunnan:** 1♂, Longmen, Shanyong, Jinghong, 1. V. 2008, Wang XM *et al.* leg.

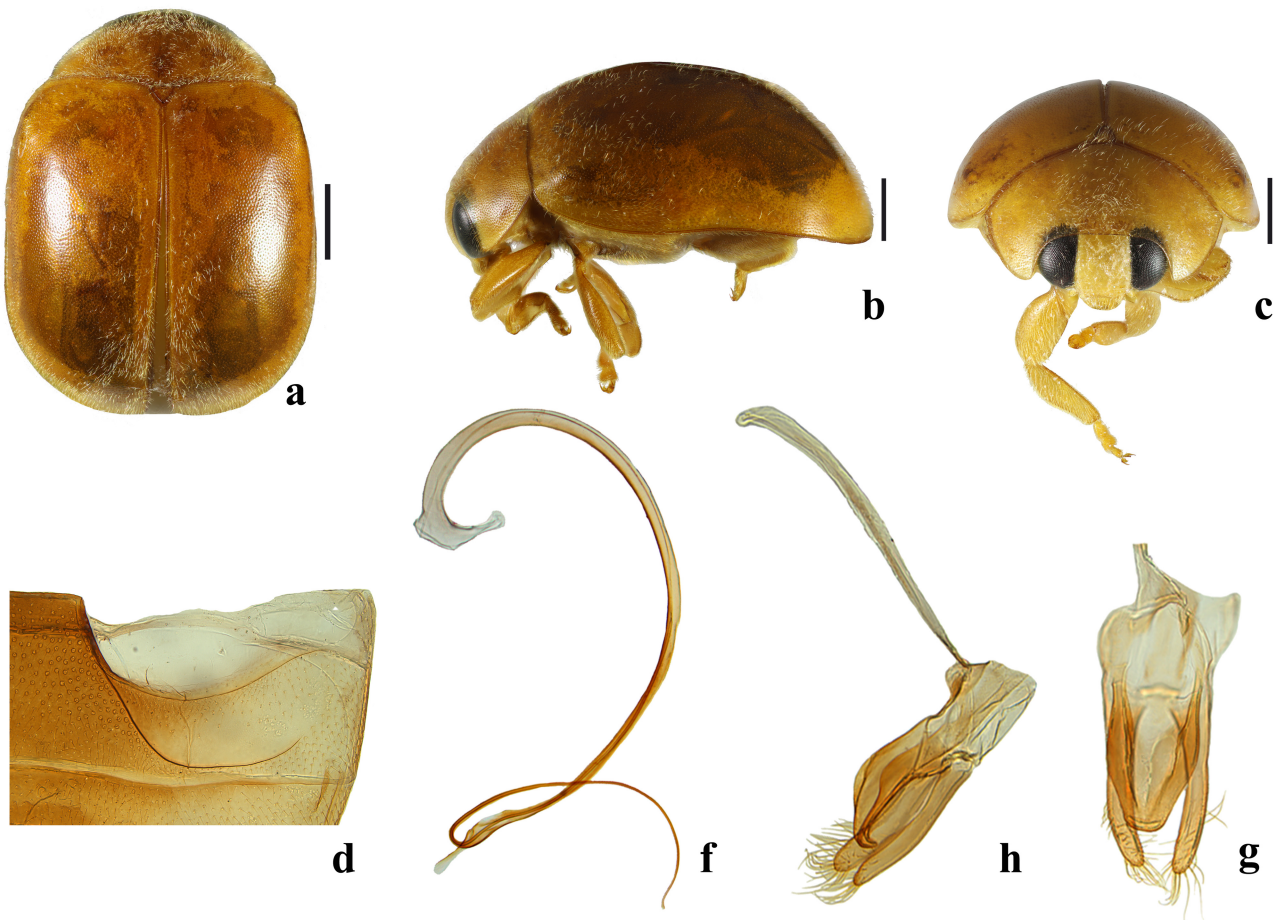
**Diagnosis.** This species can be differentiated from the other *Amida* species by its elytra without spots, and its male genitalia with stout penis guide shorter than parameres, parallel in the basal 2/3 and gradually narrowing near the apical 1/3 (Fig. 12e–g).

**Description.** TL: 3.07–3.59mm, TW: 3.84–3.96mm, TH: 2.58–2.66mm, TL/TW: 1.32–1.36, EL/EW: 1.03–1.11, PL/PW: 1.78–2.15, HW/PW: 0.97–1.17, PW/EW: 0.36–0.43, EW/HW: 0.38–0.39.

Body oval, dorsum moderately convex in lateral view, with dense short pubescent (Fig. 12a–c). Body yellowish brown (Fig. 12a). Head yellow, eyes with interocular distance about 0.38× head width (Fig. 12c). Elytron without spots (Fig. 12a).

Abdominal postcoxal lines incomplete and recurved (Fig. 12d).

Male genitalia (Fig. 12e–g) with penis guide stout, shorter than parameres, parallel in the basal 2/3 and gradually narrowed near the apical 1/3 (Fig. 12f, g); parameres slender and elongate, apically with dense, long setae (Fig. 12f, g). Penis apically with threadlike appendage (Fig. 12e); penis capsule with a long inner arm and reduced outer arm (Fig. 12e).



**FIGURE 12.** *Amida jinghongiensis* (Pang et Mao, 1979): **a.** Dorsal view **b.** Lateral view **c.** Frontal view **d.** Abdomen **e.** Penis **f.** Tegmen, lateral view **g.** Tegmen, inner view. Scale bars: **a–c:** 0.5 mm. (From Wang *et al.* 2022)



**Distribution.** China (Guangxi, Yunnan); Vietnam.

**Remarks.** The species was originally described by Pang and Mao (1979) as *Ortalia jinghongiensis* Pang et Mao, 1979. However, it was subsequently transferred to the genus *Amida* based on the 11-segmented antennae of the type specimens by Yu (2000).

***Amida motuensis* Wei et Wang, sp. nov.**

Chinese common name: 墨脱花瓢虫

(Fig. 13)

**Type material. HOLOTYPE:** CHINA: Xizang: ♂, Motuo, 17. X. 2009, Wang XM *et al.* leg, No. SCAU(E)16903.

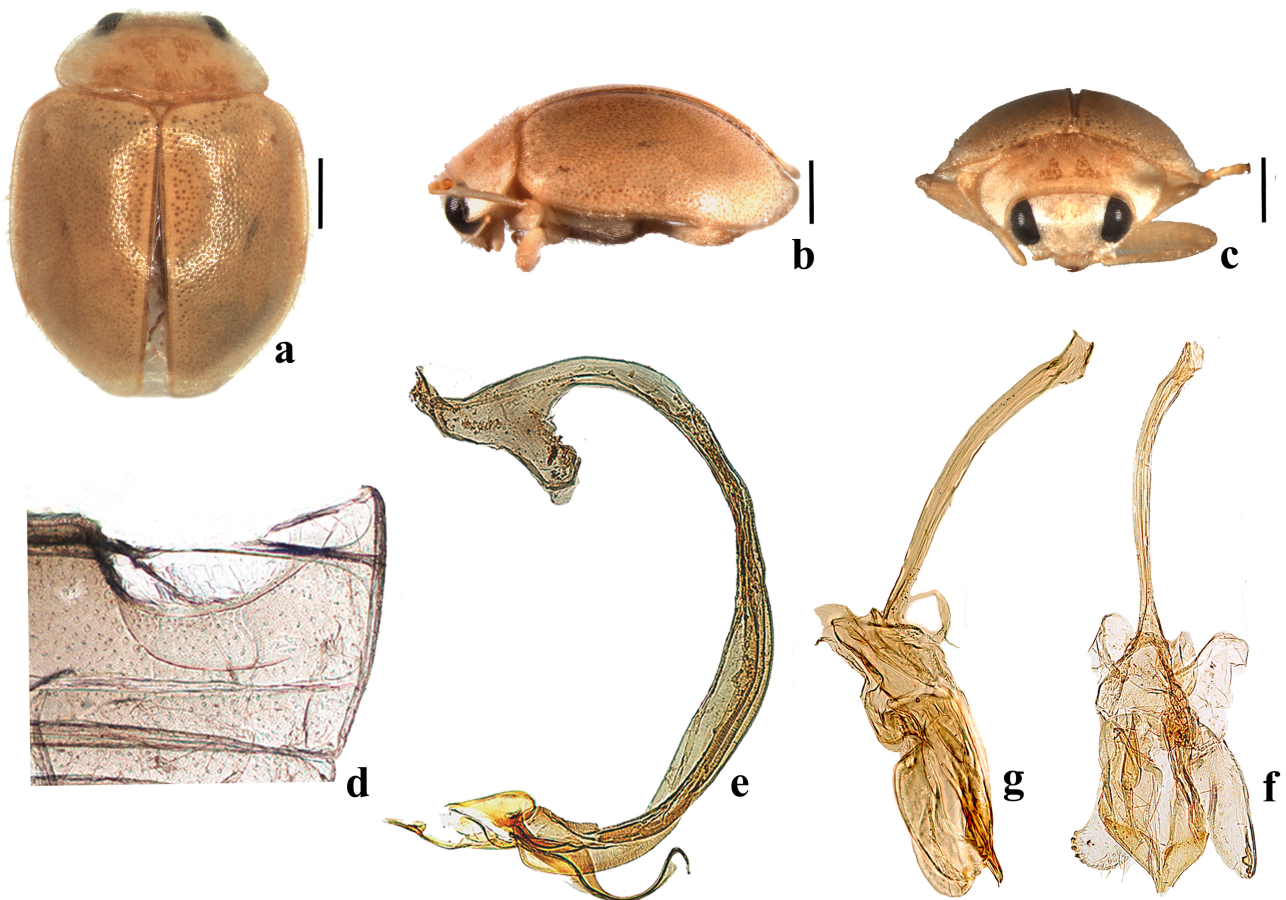
**Diagnosis.** The male genitalia of this species are similar to *A. longifolia* sp. nov. but it can be distinguished from the latter by the robust penis capsule and the penis guide slightly longer than parameres (Fig. 13e–f).

**Description.** TL: 2.74mm, TW: 2.44, TH: 1.33mm, TL/TW: 1.12, EL/EW: 0.86, PL/PW: 1.94, HW/PW: 1, PW/EW: 0.33, EW/HW: 0.50.

Body oval and nearly parallel, dorsum slightly convex in lateral view (Fig. 13a–c). Head yellow, Eyes with interocular margin nearly straight and not parallel to each other, interocular distance about 1/2 width of the head (Fig. 13c). Elytra yellow, margin with fine punctures (Fig. 13a).

Abdominal postcoxal lines incomplete and recurved (Fig. 13d).

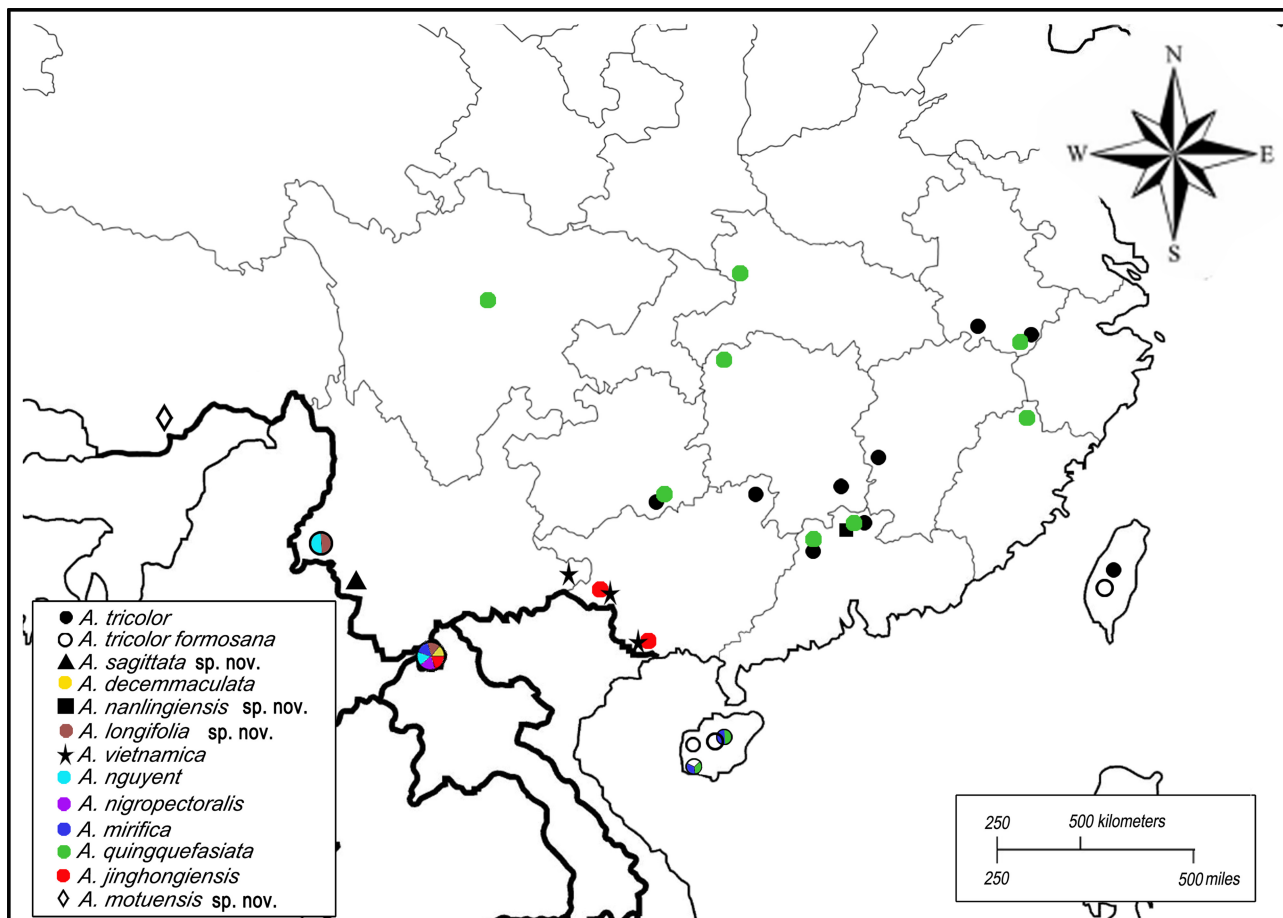
Male genitalia (Fig. 12e, f) with penis guide stout, slightly longer than parameres, parallel in the basal 1/2 on both sides, then gradually tapering to apex in inner view (Fig. 13f); parameres stout, distolaterally serrated (Fig. 13f). Penis stout, broadened at the apical 1/2, with short appendage, almost 1/4 length of penis (Fig. 13e); penis capsule with robust inner arm and robust outer arm (Fig. 13e).



**FIGURE 13.** *Amida motuensis* sp. nov.: a. Dorsal view b. Lateral view c. Frontal view d. Abdomen e. Penis f. Tegmen, lateral view g. Tegmen, inner view. Scale bars: a–c: 0.5 mm.

**Distribution.** China (Xizang).

**Etymology.** The specific epithet is given after Motuo County, Xizang, the type locality.



**FIGURE 14.** Geographic distribution map of the genus of *Amida* from China. **Note:** The distribution records of *A. tricolor* and *A. tricolor formosana* from Taiwan did not permit precise localization, thus the mapped dots for these two species were made by estimation.

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## 中国花瓢虫属*Amida*研究（鞘翅目：瓢甲总科：刻眼瓢虫族）

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**摘要:** 对中国花瓢虫属*Amida*进行了系统分类研究, 共记录13种, 包括4新种, 即矢叶花瓢虫*Amida sagittata* Wei et Wang, **sp. nov.**、长叶花瓢虫*Amida longifolia* Wei et Wang, **sp. nov.**、墨脱花瓢虫*Amida motuensis* Wei et Wang, **sp. nov.**和南岭花瓢虫*Amida nanlingiensis* Wei et Wang, **sp. nov.**及2个中国新记录种, 即阮氏花瓢虫*Amida nguyent*和凸叶花瓢虫*Amida mirifica*。同时对所有种类进行了形态特征描述, 提供了形态特征图以及外生殖器图。

**关键词:** 瓢甲科; 花瓢虫属; 瓢虫科; 新种; 分类研究