Revision of the genus *Paridea* Baly, 1886 from Taiwan (Coleoptera, Chrysomelidae, Galerucinae)

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**Abstract**

The Taiwanese species of the genus *Paridea* Baly, 1886, are revised. Two new species, *Paridea* (*Semacia*) *houjiyi* sp. n. and *P. (S.) kaoi* sp. n. are described. Both were confused previously with *P. (S.) sexmaculata* (Laboissière, 1930) and *P. (S.) angulicollis* (Motschulsky, 1854) respectively. *Paridea* (*P.*) *sauteri* (Chûjô, 1935) and *P. (P.) taiwana* (Chûjô, 1935) are removed from synonymy with *P. (P.) sinensis* Laboissière, 1930. The synonymy of *Paraulaca flavipennis* Chûjô, 1935 with *Paridea* (*Paridea*) *testacea* Gressitt & Kimoto, 1963 is supported. *Paridea* (*Semacia*) *nigrimarginata* Yang, 1991 is regarded as a junior synonym of *P. (S.) angulicollis* and excluded from the Taiwan fauna. Lectotypes are designated for *Paraulaca costata* Chûjô, 1935, *P. flavipennis* Chûjô, 1935, *P. taiwana* Chûjô, 1935, *Semacia nipponensis* Laboissière, 1930, and *Paridea sinensis* Laboissière, 1930.

**Keywords**

*Paridea, Semacia, Taiwan, taxonomic revision*
Introduction

The genus *Paridea* Baly, 1886, comprising 83 species (Bezděk, unpublished data), is one of the most species-rich genera of Oriental Galerucinae. The genus occurs in Nepal, Bhutan, India, Pakistan, China, Korea, Japan and Southeast Asia. *Paridea apicalis* (Jacoby, 1886), from New Guinea, evidently is not congeneric and is not counted. As in most large Oriental genera of Galerucinae, a comprehensive revision based on the study of primary types has not been performed. Recently, only two larger papers were devoted to *Paridea*: the Chinese species were revised by Yang (1991) and Medvedev and Samoderzhknenov (1997) provided a key to species from the Himalayas and adjacent regions.

*Paridea* Baly, 1886 is similar to other genera of the subtribe Aulacophorina, particularly to *Agetocera* Hope, 1831, *Aulacophora* Chevrolat, 1836, *Pseudocophora* Jacoby, 1884 and *Paraagetricera* Laboissière, 1929. All these genera share unmarginated anterior pronotal margins, the presence of a transverse depression on the pronotum, and all feed on leaves of Cucurbitaceae (cf. Kimoto 1989b, Jolivet and Hawkeswood 1995). *Paridea* is separated easily from other genera by the appendiculate tarsal claws (bifid tarsal claws in others).

Laboissière (1930) described the first *Paridea* species from Taiwan as *Semacia sexmaculata* Laboissière. Chûjô (1935) added five species to the Taiwan fauna as *Paraulaca costata* Chûjô, *Paraulaca cyanipennis* Chûjô, *Paraulaca flavipennis* Chûjô, *Paraulaca sauteri* Chûjô, and *Paraulaca taiwana* Chûjô. Chûjô (1938) later listed a newly recorded species, *Paraulaca angulicollis* (Motschulsky, 1854). Kimoto (1966) synonymized *Paraulaca taiwana* Chûjô, 1935 with *Paraulaca sauteri* Chûjô, 1935; *Paraulaca flavipennis* Chûjô, 1935 with *Paridea testacea* Gressitt & Kimoto, 1963. *Paridea testacea* remains valid because *Paraulaca flavipennis* Chûjô, 1935 is a secondary homonym of *P. flavipennis* (Laboissière, 1930). Kimoto (1974) regarded *Paraulaca sauteri* Chûjô, 1935 as a junior synonym of *Paridea sinensis* Laboissière, 1930. Yang (1991) studied the Chinese species of *Paridea* and described a new species, *Paridea nigrimarginata* from Mt. Takao. Beenen (2010) added this species to Taiwan fauna since he assumed the type locality is in Taiwan. Thus, in total seven species have been described or recorded from Taiwan.

Taxonomic confusion and misidentification often occurs in this genus because some members have variable color patterns and some others have sexually dimorphic characters. Thus, robust sample sizes are required for revising this genus. The Taiwan Chrysomelid Research Team (TCRT) was founded in 2005 and is composed of 10 members. All of them are amateurs interested in making an inventory of all Chrysomelid species in Taiwan. Specimens of the genus have been extensively collected and studied, and host plants recorded. Diagnostic characters were assessed and the status of all species was evaluated based on a large series of specimens.
Materials and methods

More than 1000 specimens have been examined. Most of them (> 90%) were collected either by TCRT or belonged to the historical collection at the Taiwan Agricultural Research Institute (TARI).

To prepare drawings of the adult reproductive systems, the abdomens of adults were separated and boiled in a 10% KOH solution, cleared in distilled water, and then mounted on microscope slides in glycerin for observation. Specimens were examined and drawings were made using a Leica M165 stereomicroscope. Microscope slides were examined and illustrated using a Nikon ECLIPSE 50i microscope. Body parts were then stored in glycerin tubes with the dry mounted specimens.

Host plants are recorded by observing adult feeding behavior in the field. Plants were identified by Chih-Kai Yang.

Specimens examined are deposited at the following institutes and museums.

BMNH The Natural History Museum, London, UK [Michael Geiser];
BPBM Bernice P. Bishop Museum, Hawaii, USA [Shepherd Myers];
CAS California Academy of Sciences, California, USA [David H. Kavanaugh];
FKCC František Kantner collection, České Budějovice, Czech Republic;
HNHM Hungarian Natural History Museum, Budapest, Hungary [Otto Merkl];
ISNB Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium [Pol Limbourg];
IZAS Institute of Zoology, Academia Sinica, Beijing, China [YongYing Ruan];
JBCB Jan Bezděk collection, Brno, Czech Republic;
KMNH Kitakyushu Museum of Natural History, Kitakyushu, Japan [Kyoichiro Ueda];
MNHN Museum National d’Histoire naturelle, Paris, France [Antoine Mantillieri];
NMNS National Museum of Natural Science, Taichung, Taiwan [Ming-Luen Jeng];
SDEI Senckenberg Deutsches Enomologisches Institut, Müncheberg, Germany [Stephan Blank];
TARI Taiwan Agricultural Research Institute, Taichung, Taiwan;
ZMUH Zoologisches Institut und Zoologisches Museum, Universität von Hamburg, Hamburg, Germany [Hossein Rajaei and Kai Schuette];

Exact label data are cited for all type specimens of the described species; a double slash (/) divides the data on different labels and a single slash (/) divides the data in different rows. Other comments and remarks are in square brackets: [p] – preceding data are printed, [h] – preceding data are handwritten, [w] – white label, [y] – yellow label, [o] – orange label, [g] – green label, and [r] – red label.
Taxonomy

Classification of subgenera of Paridea

Five generic or subgeneric names (Paraulaca Baly, 1888, Aeropa Weise, 1889, Semacia Fairmaire, 1889, Semacianella Laboissière, 1930, and Carapaula Chûjô, 1962) were erected based on various sexually dimorphic characters of Paridea. Kimoto (1989b) and Medvedev and Samoderzhenkov (1997) used Paridea (s. str.), Paraulaca and Semacia as valid subgenera, while Yang (1991) considered only Paridea and Semacia as monophyletic after reviewing Chinese species. This arrangement was followed also by Beenen (2010) (with Paraulaca, Carapaula and Semacianella as synonyms of Paridea (s. str.) and Aeropa as synonym of Semacia) and is used also in our study but some characters are modified in the key

Key to species of the genus Paridea from Taiwan

1 Pygidium of both sexes projecting beyond elytral apices; apex of eighth abdominal tergite in male modified into two processes, apical margin without setae .............................................. 2 (subgenus Semacia)
   – Pygidium of both sexes covered by elytra; apex of eighth abdominal tergite not modified, apical margin with setae.................. 4 (subgenus Paridea)
2 Female pygidium deeply emarginated (Fig. 4); elytron of male with one premedian cavity near lateral margin (Fig. 3); without black spot on postscutellar common area in female (Fig. 4) .............................................. P. (S.) houjayi sp. n.
   – Female pygidium entire; elytron of male without a cavity near lateral margin but with postscutellar area depressed (Figs 6, 28, 31); flat and with black spot in female (Figs 9, 32, 33) .............................................. 3
3 Elytron with longitudinal black stripe along lateral margin from base to middle (Fig. 8) .............................................................................. P. (S.) kaoi sp. n.
   – Elytron without black stripe along lateral margin, but with one subbasal black spot near lateral margin (Fig. 30), sometimes extending inwards (Figs 31, 33) .............................................. P. (S.) sexmaculata (Laboissière)
4 Elytron at least partly metallic blue or black .............................................. 5
   – Elytron yellowish brown, sometimes with two pairs of black spots, in some individuals black spots extending to entire elytron except apex .......... 6
5 Vertex black; pronotum with one black spot at middle near basal margin; first tarsomeres of front and middle legs in male strongly swollen (Fig. 34); entire elytra metallic blue (Figs 34, 36) .............................................. P. (P.) costata (Chûjô)
   – Head and prontum yellowish brown; first tarsomeres in male not modified (Fig. 52); lateral margin of elytron from base to apical 1/3 yellowish brown (Fig. 54) .............................................. P. (P.) cyanipennis (Chûjô)
6 Femora and tibia yellowish brown, but outer margins black (Figs 74–79) .... ........................................................................................................ P. (P.) taiwana (Chûjô)
Revision of the genus Paridea Baly, 1886 from Taiwan...

Paridea (Semacia) houjayi sp. n.
http://zoobank.org/6D9F8E80-A589-489A-A9A0-E0129A38E5E8
http://species-id.net/wiki/Paridea_houjayi

Paridea (Paraulaca) sexmaculata: Kimoto & Takizawa, 1997: 180 (misidentification)

Type locality. Taiwan, Ilan, Ssuchi, 24°29’N, 121°25E, 700 m, broad-leaf forest.


Diagnosis. This new species is recognized easily by the elytra of males possessing a lateral cavity near each lateral margin and the pygidium of each female with deeply emarginated apex.

Males. Length 6.2–6.3 mm, width 3.6–3.7 mm. General color (Figs 1–3) yellowish brown; antenna dark brown; scutellum black; elytra pale yellow, with one small, longitudinal black spot at humerus, one large, rounded black spot at postmedian area, apex black; mesepimeron and metathoracic ventrites black; outer margins of femora and tibiae black; tarsi dark brown. Elytron with one premedian cavity near lateral margin; three tufts of long hairs at anterior area and one tubercle at posterior.
Figures 1–9. Paridea species. 1 P. (S.) houjayi sp. n., male, dorsal view 2 ditto, ventral view 3 ditto, lateral view 4 P. (S.) houjayi sp. n., female, dorsal view 5 ditto, lateral view 6 P. (S.) kaoi sp. n., male, dorsal view 7 ditto, ventral view 8 ditto, lateral view 9 P. (S.) kaoi sp. n., female, dorsal view.

of depression; postscullar common area flat and impunctate. Eighth abdominal tergite (Fig. 12) strongly sclerotized, base extremely slender, with one pair of extremely long processes, each process flattened and widened near apex and outer margin of widened
area serrate. Pygidium projecting beyond elytral apices, apex shallowly emarginate. Penis (Figs 10–11) strongly asymmetric, dorsum with longitudinal groove at right side; almost straight from lateral view; apex forming angular process and directed ventrally; endophallic sclerites with two sclerites, one extremely elongate, about 0.75 times as long as penis, other curved and apically pointed.

**Females.** Length 6.2–6.9 mm, width 3.5–3.7 mm. Color (Figs 4–5) similar to male but elytra without excavation. Apical margin of last abdominal ventrite (Fig. 14) with deep notch at middle, between one pair of shallow processes. Pygidium projecting beyond elytral apices, deeply emarginate and forming bilobed process. Gonocoxae (Fig. 13) slender, apex of each gonocoxa with eight to nine setae from apical 1/4 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 15) weakly sclerotized; apex wide, apical margin truncate, surface with extremely dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 16) strongly swollen; pump much longer than receptaculum, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Etymology.** The new species name honors Mr. Hou-Jay Chen, who discovered this interesting new species.

**Distribution.** Taiwan. This new species occurs in northern Taiwan (Fig. 17).

**Host plants.** Cucurbitaceae: *Gynostemma pentaphyllum* (Thunb.) Makino; *Thladiantha nudiflora* Hemsl. ex Forbes & Hemsl.; Compositae: *Aster lasiocladus* Hayata.

**Notes.** Males of this new species were misidentified as *Paridea (S.) sexmaculata* by Kimoto and Takizawa (1997).

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**Paridea (Semacia) kaoi sp. n.**

http://zoobank.org/9FB73A3A-10B1-4603-98D0-D2D8523F37AC
http://species-id.net/wiki/Paridea_kaoi

*Paraulaca angulicollis*: Chûjô 1938: 138 (misidentification)


**Type locality.** Taiwan, Taipei, Wulai, 24°51’N, 121°33’E, 150 m, broad-leaf forest.


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Diagnosis. This new species is similar to P. angulicollis but differs by the separation between basal black lateral margins and subapical spots on the elytra (Fig. 8) (connected in P. angulicollis (Fig. 98)), the wider apical processes of the eighth abdominal tergite in males (Fig. 26) (more slender in P. angulicollis (Fig. 107)), the wider penis in lateral view, and the deep notch on apical margin of the fifth abdominal ventrite in females (Fig. 25) (one pair of rounded processes in P. angulicollis (Fig. 106)).

Males. Length 5.0–5.3 mm, width 2.7–3.1 mm. Head and prothorax yellowish brown (Figs 6–8), labrum black, antenna brown; scutellum pale yellow; elytra pale yellow, postscutellar common area depressed; with one extremely slender black stripe along suture behind excavation, sometimes reduced; with one pair of large black spots subapically, lateral margin and epipleuron black, abbreviated at middle and separated from subapical black spots; meso- and metathoracic ventrites black; legs dark brown, apex of femur and base of tibia paler; abdomen yellow. Eighth abdominal tergite (Fig. 26) strongly sclerotized, transverse and slender, with one pair of slender and curved processes. Pygidium slightly projecting beyong elytral apices. Penis (Figs 21–22) strongly asymmetric, moderately narrowed at apical 1/6; apex narrow, tubular, and small; straight from lateral view; endopalial sclerites with one pointed sclerite, one elongate sclerite, an anterior cluster of small setae, and a posterior cluster of large setae.

Females. Length 5.7–6.1 mm, width 3.3–3.5 mm. Color (Fig. 9) similar to male; elytra without excavation but with black spot instead. Apical margin of last abdominal ventrite (Fig. 25) with shallow emargination at middle, margin of emargination truncate with deep notch at middle. Pygidium slightly projecting beyong elytral apices.
Gonocoxae (Fig. 23) slender, apex of each gonocoxa with eight or nine setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 24) weakly sclerotized; apex narrow, apical margin a little emarginate at middle,
surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 27) swollen; pump much longer than receptaculum, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Etymology.** The name is dedicated to Mr. Shu-Jung Kao who financially supported the Taiwan Chrysomelid Research Team.

**Distribution.** Taiwan. This species occurs in central and northern Taiwan (Fig. 18).

**Host plant.** Cucurbitaceae: *Gynostemma pentaphyllum* (Thunb.) Makino.

**Notes.** This species was misidentified as *Paridea (Semacia) angulicollis* by Chûjô (1938, 1962, 1963).

*Paridea (Semacia) sexmaculata* (Laboissière, 1930)
http://species-id.net/wiki/Paridea_sexmaculata

*Paridea (Paridea) sexmaculata*: Beenen 2010: 468.
*Paraulaca taiwana* Chûjô, 1935: 167 (part).

**Type locality.** Taiwan, Tainan.


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Diagnosis. Paridea (Semacia) sexmaculata is similar to P. (S.) kaoi sp. n. and P. (S.) angulicollis with the depression on postscutellar common area of males but flat and replaced with a black spot in females. It differs by the presence of a black spot near the lateral margin instead of black stripe along lateral margin in P. (S.) kaoi sp. n. and P. (S.) angulicollis, the well sclerotized and extremely slender penis (Fig. 37) and processes on eighth abdominal tergite of males (Fig. 42), and the presence of two acute processes on the fifth abdominal ventrite in females (Fig. 41).

Males. Length 5.1–6.0 mm, width 2.9–3.3 mm. Head and prothorax yellowish brown (Figs 28–30), labrum black, antenna blackish brown; scutellum pale yellow; elytra pale yellow, postscutellar common area depressed; with one pair of black spots near lateral margin at same level with excavation, spots extending inwards in some individuals (Fig. 31; one pair of large black spots subapically, lateral margin and epipleuron yellow; meso- and metathoracic ventrites black; legs yellowish brown, apical half of tibia, and tarsi black; abdomen yellow. Eighth abdominal tergite (Fig. 42) strongly sclerotized, transverse and slender, with one pair of extremely slender and curved processes. Pygidium slightly projecting beyong elytral apices. Penis (Figs 37–38) very slightly asymmetric, weakly narrowed at apical 1/6; apex narrow, tubular, and extremely long; moderately curved from lateral view; endophallic sclerites with one elongate sclerite and one layer of small setae.

Females. Length 5.3–6.2 mm, width 3.1–3.4 mm. Similar to male; elytra without excavation but with transverse black spot instead (Fig. 32), sometimes connected with lateral black spots (Fig. 33). Apical margin of last abdominal ventrite (Fig. 41) with one pair of small, wide, and acute processes at middle, with shallow notch between processes. Pygidium slightly projecting beyong elytral apices. Gonocoxae (Fig. 39) slender, apex of each gonocoxa with eight setae from apical 1/4 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 40) weakly sclerotized; apex wide, apical margin slightly concave at middle, surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 43) slightly swollen; pump much longer than receptaculum, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Distribution. Taiwan, China (Hunan). It is widespread in Taiwan (Fig. 19). Yang (1991) indicated that this species was also found in Hebei, Beijing, Jiangsu, Shanghai, Zheiang, Fujian, and Hainan provinces of China without voucher specimens. These records require confirmation.

Host plant. Cucurbitaceae: Gynostemma pentaphyllum (Thunb.) Makino.

Notes. Two specimens of the type series of Paraulaca taiwana were misidentified. They are P. (S.) sexmaculata and labeled as follow: 1♂; “Shiigo [= Maopu, Wufeng
Figures 28–36. Paridea species. 28 P. (S.) sexmaculata, male, dorsal view 29 ditto, ventral view 30 ditto, lateral view 31 P. (S.) sexmaculata, male, color variation 32 P. (S.) sexmaculata, female, dorsal view 33 P. (S.) sexmaculata, female, color variation 34 P. (P.) costata, male, dorsal view 35 ditto, ventral view 36 ditto, ventral view.
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Paridea (Paridea) costata (Chûjô, 1935)
http://species-id.net/wiki/Paridea_costata

Paraulaca (Carapaula) costata: Chûjô 1962: 198 (redescription); Chûjô 1963: 395.

Type locality. Taiwan, Hualien.


Figures 44–51. Paridea (Paridea) costata. 44 Penis, dorsal view 45 Penis, lateral view 46 Gonocoxae 47 Eighth abdominal sternite 48 Spermatheca 49 Tarsi of front leg, male 50 Tarsi of front leg, female 51 Eighth abdominal tergite.

**Diagnosis.** *Paridea (Paridea) costata* is recognized by the black vertex, presence of one black spot on the pronotum, the metallic blue elytra, and the swollen first tarsomeres of front and middle legs of males.

**Males.** Length 4.5–4.7 mm, width 2.2–2.4 mm. General color (Figs 34–36) yellowish brown; antenna blackish brown but three basal antennomeres paler; vertex with one big black spot; pronotum with a moderate black spot near center; scutellum and elytra bluish black; metathoracic ventrites black; tibia and tarsi dark brown; femora darkened except bases and apices. Elytra with one longitudinal costa arising from humerus, reduced in some individuals. Median lobe at fifth abdominal ventrite deeply depressed. Eighth abdominal tergite (Fig. 51) weakly sclerotized but apex well sclerotized, transverse and wide, apical margin emarginate at middle, with dense long setae along apical margin. First tarsomeres of pro- and mesotarsi swollen (Fig. 49). Penis (Figs 44–45) wide, apically tapering, apex truncate, slightly curved near based from lateral view; with one pair of elongate processes extending from near apex to middle, base curved upwards from lateral view; external process large and wide, lateral margin irregular from middle to apex, with a small process at middle of lateral margin; endophallus without visible sclerites.

**Females.** Length 4.7–4.9 mm, width 2.5 mm. Similar to male; apical margin of last abdominal ventrite smooth, not modified. Gonocoxae (Fig. 46) slender, apex of each gonocoxa with seven or eight setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 47) weakly sclerotized; apex wide, apical margin emarginate at middle, surface with dense long setae on apical margin, spiculum short. Spermatheca (Fig. 48) strongly sclerotized, disk with dense transverse grooves; receptaculum narrower than pump; pump short and wide, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Distribution.** China (Gansu, Jiangxi, Sichuan, Zhejiang), Taiwan. It is uncommon but widespread in Taiwan (Fig. 20).

**Host plants.** Cucurbitaceae: *Thladiantha nudiflora* Hemsl. ex Forbes & Hemsl.

*Paridea (Paridea) cyanipennis* (Chûjô, 1935)
http://species-id.net/wiki/Paridea_cyanipennis

*Paraulaca cyanipennis* Chûjô, 1935: 164
*Paraulaca (Paraulaca) cyanipennis*: Chûjô 1962: 192 (redescription);

**Type locality.** Taiwan, Pingtung, Henchun (= Koshun), 22°00’N, 120°44E, 50 m, broad-leaf forest.

**Type material.** Holotype male (SDEI), mounted on card, labeled: “ Kankau (Koshun) [p] / Formosa [p] / H. Sauter VI. 1912 [p, w] // Holotype [h, red letters]
Figure 52–57. *Paridea* species. 52. *P.* (P.) *cyanipennis*, male, dorsal view 53 ditto, ventral view 54 ditto, ventral view 55 *P.* (P.) *sauteri*, male, dorsal view 56 ditto, ventral view 57 ditto, ventral view.


Additional material examined (n= 16). TAIWAN: Hualien: 2♀♀, Wenlan, 21.X-9.XII.2009, leg. W. T. Yang & K. W Huang (NMNS); Kaoshiung: 1♂, Chi-

asien, 10–13.V.1981, leg. C. C. Chen & C. C. Pan (TARI); 1♂, 1♀, Meinung, 17.VII.2012, leg. J.-C. Chen (TARI); 3♂♂, 2♀♀, Tengchih, 26.IV.2010, leg. J.-C. Chen (TARI); Pingtung: 1♂, Checheng, 1.XII.2012, leg. J.-C. Cheng (TARI); 2♂♀, Kueishan, 3.VIII.2012, leg. J.-C. Chen (TARI); 1♀, Lilungshan, 6.VI.2013, leg. J.-C. Chen (TARI).

**Diagnosis.** This species is similar to *Paridea (Paridea) costata* with the metallic blue elytra but differs in possessing a yellowish brown lateral margin of each elytron, the yellowish brown head and pronotum, and the unmodified first tarsomeres of males.
Males. Length 4.9 mm, width 2.4 mm. General color yellowish brown (Figs 52–54); antennomeres IV-XI darkened; elytra metallic blue, but basal margin, base to apical 1/3 of lateral margin yellowish brown; metathoracic ventrites metallic blue. Elytra with one longitudinal costa arising from humerus, reduced in some individuals. Eighth abdominal tergite (Fig. 62) weakly sclerotized but apex well sclerotized, transverse and wide, apical margin rounded, with dense long seta along apical margin. Penis (Figs 58–59) wide, apically tapering, apex slightly asymmetric and pointed, slightly curved near apex and apex narrowly rounded from lateral view; endophallus with two visible sclerites, apically curved and pointed, one smaller.

Females. Length 5.5–6.1 mm, width 3.0–3.2 mm. Similar to male; apical margin of last abdominal ventrite smooth, not modified. Gonocoxae (Fig. 60) slender, apex of each gonocoxa with seven setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 61) weakly sclerotized; apex wide, apical margin emarginate at middle, surface with longer setae near apical margin and shorter setae on apical margin, spiculum long. Spermatheca (Fig. 63) weakly sclerotized; receptaculum slightly swollen; pump short and wide, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Distribution. The species occurs in eastern and southern Taiwan (Fig. 64).

Host plant. Cucurbitaceae: *Momordica cochinchinensis* (Lour.) Spreng.

*Paridea (Paridea) sauteri* (Chûjô, 1935), stat. r.


Type locality. Taiwan, Chiayi, Talin (= Taihorin), 23°35’N, 120°28E, 50 m, broad-leaf forest.


Additional material examined (n= 51). TAIWAN: Hsinchu: 13♂♂, 3♀♀, Wufeng, 14–16.VII.1982, leg. K. C. Chou & C. C. Pan (TARI); Ilan: 2♂♂, Songluo,
Figures 64–67. Distribution map of Paridea species, solid line: 1000 m, broken line: 2000 m. 64 P. (P.) cyanipennis 65 P. (P.) sauteri 66 P. (P.) taiwana 67 P. (P.) testacea.
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Figures 68–73. Paridea (Paridea) sauteri. 68 Penis, dorsal view 69 Penis, lateral view 70 Gonocoxae 71 Eighth abdominal sternite 72 Eighth abdominal tergite 73 Spermatheca.
Diagnosis. *Paridea (Paridea) sauteri* is similar to some individuals of *P. (P.) taiwana* having yellow apices of the black elytra but differs by possessing yellow femora and black tibiae (black outer margins of femora and tibiae in *P. (P.) taiwana*).

**Males.** Length 4.8–5.5 mm, width 2.9–3.2 mm. General color (Figs 55–57) yellowish brown; antenna dark brown; apex of labrum darkened; elytra black but apex pale yellow; scutellum, meso- and metathoracic ventrites black; tibiae and tarsi blackish brown. Eighth abdominal tergite (Fig 72) weakly sclerotized, transverse and wide, apical margin truncate, with dense long seta along apical margin. Penis (Figs 68–69) wide, apex pointed, ventrally curved; almost straight from lateral view; endophallic sclerites composed of one pair of elongate and longitudinal sclerites, curved inwards near apex, apex projecting from opening.

**Females.** Length 5.5–5.7 mm, width 3.2–3.3 mm. Similar to male; apical margin of last abdominal ventrite smooth, not modified. Gonocoxae (Fig. 70) slender, apex of each gonocoxa with eight setae from apical 1/4 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 71) weakly sclerotized; apex wide, apical margin slightly emarginate at middle, surface with longer setae near apical margin, and shorter and denser setae on apical margin, spiculum long. Spermathecal receptaculum (Fig. 73) slightly swollen; pump extremely long, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Distribution.** Endemic to Taiwan, and with a scattered distribution. The species seems to be allopatric with *P. (P.) taiwana* (Fig. 65). For example, it is common in Wulai, northern Taiwan. But no individuals of *P. (P.) taiwana* have been found in Wulai.

**Host plants.** Cucurbitaceae: *Thladiantha nudiflora* Hemsl. ex Forbes & Hemsl.

*Paridea (Paridea) taiwana* (Chûjô, 1935), stat. r.

*Paraulaca taiwana* Chûjô, 1935: 167; Kimoto 1966: 29 (as synonym of *P. sauteri*).

*Paraulaca (Carapaula) taiwana* Chûjô 1962: 200 (redescription); Chûjô 1965: 98.

**Type locality.** Taiwan, Hualien.


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Diagnosis. This species is similar to Paridea (Paridea) sinensis in general color pattern but differs in possessing extremely variable black spots on the elytra, the smaller external processes on the penis and the abruptly widened apex of the penis in lateral view (the external processes are extremely long and the penis is slender in lateral view in P. (P.) sinensis) and the modified apical margin of the fifth abdominal ventrite of females (Fig. 87).

Males. Length 5.1–5.9 mm, width 2.8–3.2 mm. General color (Figs 74–76) yellowish brown, two pairs of black spots on elytra, anterior one near humerus and other subapical, sizes of spots variable, sometimes spots enlarged and connected with each
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Figures 83–89. *Paridea* (*Paridea*) *taiwana*. 83 Penis, dorsal view 84 Penis, lateral view 85 Eighth abdominal sternite 86 Gonocoxae 87 Fifth abdominal ventrite 88 Eighth abdominal tergite 89 Spermatheca.
other (Fig. 77), even whole elytra black except apices (Fig. 78), sometimes black spots reduced (Fig. 79); outer margins of femora and tibiae black; metathoracic ventrites black. Eighth abdominal tergite (Fig. 88) weakly sclerotized, transverse and wide, apical margin slightly emarginate at middle, with dense long seta along apical margin. Penis (Figs 83–84) wide; apex tubular, curved from lateral view; strongly widened near apex from lateral view; external process small, smaller than medial process; medial process wide apex with several setae.

**Females.** Length 4.8–7.1 mm, width 2.7–3.7 mm. Similar to male; apical margin of last abdominal ventrite emarginate at middle, slightly convex at emargination. Gonocoxae (Fig. 86) slender, apex of each gonocoxa with seven or eight setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 89) weakly sclerotized; apex wide, apical margin concave at middle, surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 15) slightly swollen; pump extremely long, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Distribution.** Endemic to Taiwan. It is the most common and widespread species of the genus in Taiwan (Fig. 66).

**Host plant.** Cucurbitaceae: *Thladiantha nudiflora* Hemsl. ex Forbes & Hemsl.

**Paridea (Paridea) testacea** Gressitt & Kimoto, 1963
http://species-id.net/wiki/Paridea_testacea


**Type locality.** China, Fujian, Shaowu, Tachulan.

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Diagnosis. The species is similar to a few individuals of *Paridea (Paridea) taiwana* having reduced black spots on the elytra but differs by the yellow femora and black tibiae (black outer margins of femora and tibiae in *P. (P.) taiwana)*.

**Figures 90–95.** *Paridea (Paridea) testacea*. 90 Penis, dorsal view 91 Penis, lateral view 92 Gonocoxae 93 Eighth abdominal sternite 94 Eighth abdominal tergite 95 Spermatheca.
**Males.** Length 4.4–4.6 mm, width 2.4–2.5 mm. General color (Figs 80–82) pale yellow; antenna brown; scutellum, tibia, and tarsi blackish brown; mesepimeron and metathoracic ventrites black. Eighth abdominal tergite (Fig. 94) weakly sclerotized, transverse and wide, apical margin slightly emarginate at middle, with dense long seta along apical margin. Penis (Figs 90–91) slender, apically pointed; slightly curved at middle in lateral view; with one pair of elongated sclerites projecting beyond opening; endophallic sclerites composed of one slender sclerite.

**Females.** Length 4.6–5.3 mm, width 2.4–2.8 mm. Similar to male; apical margin of last abdominal ventrite smooth, not modified. Gonocoxae (Fig. 92) slender, apex of each gonocoxa with seven or eight setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base slender. Sternite VIII (Fig. 93) weakly sclerotized; apex wide, apical margin truncate, surface with dense long setae along apical margin, spiculum long. Spermathecal receptaculum (Fig. 95) slightly swollen; pump long, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Host plants.** Cucurbitaceae: *Thladiantha nudiflora* Hemsl. ex Forbes & Hemsl.

**Distribution.** China (Fujian), China. This species is common and widespread in Taiwan (Fig. 67).

**Notes.** Taiwanese populations have a black scutellum which differs from the holotype *Paridea testacea* with a yellowish brown scutellum. Actually, most of types of *Paridea testacea* have the scutellum darkened. In addition, all of the studied types of *P. testacea* (including holotype and allotype) are females. One male was found from Maa’s collection at the BBPM. Examination of the male confirms that both are conspecific.

**Species excluded from Taiwan fauna**

*Paridea (Semacia) angulicollis* (Motschulsky, 1854)  
http://species-id.net/wiki/Paridea_angulicollis

**Rhaphidopalpa angulicollis** Motschulsky, 1854: 50.

**Aulacophora angulicollis** Baly 1874: 186.

**Paraulaca (Aulacophora) angulicollis** Baly 1888: 168.

**Paraulaca (Semacia) angulicollis** Ogloblin 1936: 168.

**Semacia (Semacia) angulicollis** Chûjô and Kimoto 1961: 168.


**Paridea (Paridea) angulicollis** Yang 1991: 269.

**Semacia nipponensis** Laboissière, 1930: 355; Chûjô and Kimoto 1961: 168 (as synonym of *P. angulicollis*).

**Paridea (Semacia) nigrimarginata** Yang, 1991: 279. **syn. n.**

**Type locality.** China, Beijing.

**Type material.** *Rhaphidopalpa angulicollis*: Unavailable for study. The type specimens are not present in the Zoological Museum of Moscow State University (Med-


Diagnosis. See diagnosis of *Paridea (Semacia) kaoi* sp. n.

Males. Length 5.1–5.5 mm, width 3.1–3.3 mm. Head and prothorax yellowish brown (Figs 96–98), labrum black, antenna brown; scutellum pale yellow; elytra pale yellow, with deep excavation behind scutellum at suture; with one extremely slender black stripe along suture behind excavation, sometimes reduced; with one pair of large black spots subapically, lateral margin and epipleuron black, extending posterior and connected with subapical black spots; meso- and metathoracic ventrites black; legs dark brown, apex of femur and base of tibia paler; abdomen yellow. Eighth abdominal tergite (Fig. 107) strongly sclerotized, transverse and slender, with one pair of extremely slender and curved processes. Pygidium slightly projecting beyond elytral apices. Penis slightly asymmetric, slightly narrowed at apical 1/6; apex narrow, tubular, and small; straight from lateral view; endophallic sclerites with one pointed sclerite, one elongate sclerite, and a cluster of large setae.
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Females. Lenth 5.1–5.6 mm, width 3.0–3.4 mm. Similar to male (Fig. 99), elytra without excavation but black spot instead. Apical margin of last abdominal ventrite (Fig. 106) with one pair of small rounded processes at middle, slightly emarginate outside processes. Pygidium slightly projecting beyong elytral apices. Gonocoxae (Fig. 104) slender, apex of each gonocoxa with eight setae from apical 1/7 to apex; connection of gonocoxae extremely slender, base widened. Sternite VIII (Fig. 105) weakly sclerotized; apex narrow, apical margin emarginate at middle, surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 108) slightly swollen; pump much longer than receptaculum, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Distribution. Japan, China (Jiangxi, Hubei, Sichuan). Yang (1991) indicated that this species was also found in Zhejiang, Fujian, Hainan, and Guanxi provinces of
China. These records are dubious since no voucher specimens were examined and Japanese populations were misidentified as Paridea (Semacia) nigrimarginata Yang, 1991 (see below).
**Host plants.** Cucurbitaceae: *Gynostemma pentaphyllum* (Thunb.) Makino, *Trichosanthes cucumeroides* (Ser.) Maxim. ex Fr. & Sav. (Chûjô and Kimoto 1961).

**Notes.** The position of the type locality of *Paridea (Semacia) nigrimarginata* was doubtful since information on the label is insufficient. Only “Mt. Takao” appears on the label and Beenen (2010) supposed that it was located in Taiwan since “Takao” is the Japanese name for Kaoshiung City, but Kaoshiung city is not a mountain. Mt. Takao probably refers to a locality in Japan since a famous mountain (Mt. Takao-Yama, Takao-machi, Hachioji-shi, Tokyo Prof., Japan) exists there with similar names. Moreover, subsequent material (see specimens examined) came from this locality with additional information indicating the Japanese Mt. Takao.

*Paridea (Paridea) sinensis* Laboissière, 1930
http://species-id.net/wiki/Paridea_sinensis

*Paridea sinensis* Laboissière, 1930: 342.


**Type locality.** China, Yunnan, PeYenTsin.


Diagnosis. See diagnosis of *Paridea (Paridea) taiwana*.

**Males.** Length 6.5 mm, width 3.6 mm. General color (Fig. 100) yellowish brown, elytra with two pairs of black spots: one at humerus smaller, other subapical and larger; outer margins of femora and tibiae black; metathoracic ventrites black. Eighth abdominal tergite (Fig. 113) weakly sclerotized, transverse and wide, apical margin slightly emarginate at middle, with dense long seta along apical margin. Penis (Fig. 109–110) slender; external process extending anterior, much longer than medial process; medial process small; straight in lateral view.

**Females.** Length 6.8 mm, width 3.8 mm. Similar to male; apical margin of last abdominal ventrite smooth, not modified. Gonocoxae (Fig. 111) slender, apex of each gonocoxa with eight setae from apical 1/5 to apex; connection of gonocoxae extremely slender, base widened. Sternite VIII (Fig. 112) weakly sclerotized; apex narrow, apical margin slightly concave at middle, surface with longer setae near apical margin and shorter setae on apical margin, spiculum long. Spermathecal receptaculum (Fig. 114) slightly swollen; pump extremely long, strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

**Distribution.** China (Jiangxi, Hubei, Fujian, Sichuan, Yunnan, Guizhou). The distribution of *Paridea (Paridea) sinensis* should be reevaluated since specimens collected from Fujian identified by Gressitt & Kimoto are *Paridea (Paridea) fujiana* Yang, 1991.

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**References**


