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THE GENUS *NESOLOTIS* MIYATAKE, 1966 (COLEOPTERA: COCCINELLIDAE) FROM CHINA, WITH DESCRIPTIONS OF EIGHT NEW SPECIES

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Abstract.— Species of the genus *Nesolotis* Miyatake (Coleoptera: Coccinellidae: Sticholotidinae) endemic to China are reviewed, and the genus is removed from synonymy of *Sticholotis* Crotch. The following eight species are described as new to science: *N. magnipunctata* Wang et Ren, **sp. nov.**, *N. gladiiformis* Wang et Ren, **sp. nov.**, *N. denticulata* Wang et Ren, **sp. nov.**, *N. nigra* Wang et Ren, **sp. nov.**, *N. centralis* Wang et Ren, **sp. nov.**, *N. quadratimaculata* Wang et Ren, **sp. nov.**, *N. cordiformis* Wang, Ren et Chen, **sp. nov.** and *N. dawuishanensis* Wang, Ren et Chen, **sp. nov.** A diagnosis of the genus and a key to known species from China are also provided.



Key words.— Coleoptera, Coccinellidae, Sticholotidinae, *Nesolotis*, new species, China.

INTRODUCTION

The genus *Nesolotis* (Sticholotidinae: Sticholotidini) was erected by Miyatake in 1966, with *Nesolotis impunctata* from Japan as the type species. Seven species of the genus *Nesolotis* have been described throughout the world: Four species, *N. impunctata* Miyatake (1966), *N. punctifrons* Miyatake (1966), *N. amabilis* (Kamiya, 1965) and *N. azumai* Sasaji (1967) from Ryukyu, Japan; one species, *N. tamdaoensis* (Hoàng, 1982) from Vietnam; two species, *N. tsunekii* Sasaji (1967) and *N. shorozui* Sasaji (1967) from Taiwan, China. The male genitalia of the latter two species were described by Yang (1972).

In this paper, *Nesolotis* is reported from mainland China for the first time, with descriptions of eight new species. A key to the known species of this genus from China is also provided.

MATERIALS AND METHODS

The specimens examined were collected from the forests of China. All specimens were preserved in 85% ethanol. External morphology was observed with a Zeiss Stemi 2000-cs dissecting stereo microscope. All the measurements were made by following Ślipiński (2004). Male and female genitalia were dissected, cleared in 10% solution of NaOH by boiling for several minutes, and examined with an Olympus BX51 compound microscope.

Type specimens designated in the present paper are deposited at the Department of Entomology, South China Agriculture University (SCAU), Guangzhou. Images were photographed using a Qimagin 5.0 RTV digital camera, connected to the dissecting microscope, having a Coolsnap-Proef & CRI Micro*Color (0.65X C-mount) digital camera. Image-Pro Plus 5.1 Chinese software was used to capture images from

both cameras, and photos were cleaned up and laid out in plates with Adobe Photoshop CS 8.0.

Abbreviations used in this paper are as follows:

TL – Body length,
 TW – Body width,
 EH – Body height,
 HW – Head width,
 PW – Pronotal width,
 EW – Elytra width.

TAXONOMY

Nesolotis Miyatake, 1966

Nesolotis Miyatake, 1966: 47. Type species: *Nesolotis impunctata* Miyatake, 1966.

Nesolotis: Sasaji, 1967: 16; 1971: 75; Miyatake, 1994: 264.

Paranesolotis Hoàng, 1982: 104. Type species: *Paranesolotis tamdaoensis* Hoàng, 1982.

Nesolotis as synonymy of *Sticholotis* Crotch: Ślipiński, 2004: 390.

Diagnosis. Body size small to moderate, nearly hemispherical, strongly convex, dorsal surface glabrous; antennae 10-segmented; external margin of elytra very narrowly reflexed except a short apical part and narrowly margined in entire length; elytral epipleuron moderately narrow, continuous to apex or disappear before apex, distinctly foveate to receive femoral tips of mid and hind legs; prosternum with the median part comparatively broad, trapezoidal and divergent anteriorly, with anterior corners round; hind wings atrophied or well-developed; abdominal postcoxal lines with an oblique line near hind coxae, sometimes oblique line unclear or absent; legs with femora broad, tibiae of front legs rather strongly expanded externally, moderately so in mid and hind pairs.

Description. Body small to moderately sized, nearly hemispherical, strongly convex, dorsal surface glabrous. Head large, eyes moderately large, rather coarsely faceted; frons very broad, surface convex, punctured; lateral margin with thin process projected upon eyes; clypeus scarcely broadening apically with nearly parallel lateral margins, anterior margin of clypeus slightly concave medially, slightly reflexed, apical angles rounded; antenna 10-segmented (Fig. 3), 1st antennomere stout and elongate, about 1.5 times as long as wide, 2nd nearly as long as and slightly narrower than the basal, 3rd much narrower than and slightly longer than the 2nd, 4th segment two-thirds as long as the 3rd, 5th about half as long as the 4th and slightly longer than wide, 6th distinctly longer than wide, 7th transverse, 8th broadened apical and as long as wide, 9th distinctly broadening apically, nearly as long as wide, 10th (terminal) much narrower and distinctly longer than 9th, parallel-sided at basal half and obliquely truncate at apical half; terminal

maxillary palpomere about 2.5 times as long as wide, weakly narrowing apically at basal $\frac{3}{5}$ and rather strongly narrowing apically at apical $\frac{2}{5}$ (Fig. 4); labial palps 3-segmented, terminal segment slender (Fig. 5).

Pronotum transverse and strongly convex, anterior margin deeply emarginated, anterior corners acutely produced with a rounded tip. Scutellum small and triangular. Elytra strongly convex, each apex of elytron broadly rounded; elytral margin very narrowly expanded externally. Elytra with distinct humeral calli. Hind wings atrophied or well developed.

Prosternum very short, prosternal intercoxal process broad, trapezoidal, divergent anteriorly, with anterior border slightly produced downwards, its anterior corners round, distinctly margined anteriorly and laterally (Fig. 1), deeply excavate on either side; procoxal cavities large. Mesoventrite transverse and trapezoidal between middle coxae; metaventrite comparatively short and transversely developed, with fine but more or less distinct median and subbasal lines, side pieces narrow. Elytral epipleuron moderately narrow, rather strongly convergent posteriorly, reaching to apex; weakly descending below at outer half, distinctly foveate to receive tips of middle and hind femora. Abdomen with five visible sternites in both sexes (Fig. 6); postcoxal lines incomplete, almost but not extending to posterior margin of 1st abdominal ventrite and reaching lateral margin of ventrite, with oblique postcoxal lines, sometimes oblique line unclear or absent. Legs with femora broad, tibiae of front legs rather strongly expanded externally, moderately so in mid and hind pairs (Figs 7–8).

Remark. Ślipiński (2004) in his review of the Australian *Sticholotini* pointed out that all Australian species of *Sticholotis* Crotch have 10-segmented antennae and are winged or wingless, falling in between the extremes represented by *Nesolotis*, *Sticholotis* and *Paranesolotis* Hoàng, and suggested that *Nesolotis* and *Paranesolotis* should be removed into *Sticholotis*.

While working on the Chinese species of *Nesolotis*, we find that their hind wings are well-developed, and the abdominal postcoxal lines are sometimes unclear or absent, which coincide with many common characters of *Paranesolotis*. Therefore, we agree with Ślipiński's opinion that *Paranesolotis* is synonymous with *Nesolotis* (Ślipiński, 2004). However, morphological characters of *Nesolotis* are almost constant and *Nesolotis* can be clearly distinguished from *Sticholotis* as follows: body nearly hemispherical and strongly convex; antennae 10-segmented; prosternal intercoxal process comparatively broader, trapezoidal and divergent anteriorly, with anterior corners round; external margin of elytra very narrow reflexed; elytral epipleuron moderately narrow, distinctly foveate for tips mid and hind femora; and tibiae of front legs rather

strongly expanded externally. *Sticholotis* can be diagnosed by the following combination of characters: body round and moderated convex; antennae 11-segmented; prosternal intercoxal process broad quadrate or subpentagonal, broadening anteriorly and carinate laterally; external margin of elytra distinctly expanded; elytral epipleuron broad and nearly horizontal and indistinctly foveate; tibiae of front legs normal. In conclusion, we consider that *Nesolotis* is still a distinct genus in the tribe Sticholotidini.

Distribution. China (Guangdong, Guangxi, Guizhou, Jiangxi, Taiwan, Yunnan, Hainan); Japan (Ryukyus); Vietnam (Tam Dao).

Nesolotis magnipunctata Wang et Ren, sp. nov.
(Figs 1–12, 41–45)

Diagnosis. Body reddish orange; surface of elytra with six or seven rows of gross punctures on either side of suture extending to $\frac{3}{5}$ elytral length; penis guide in lateral view slightly longer than parameres; penis guide in ventral view long, symmetrical and almost subparallel, with a fingerlike apex.

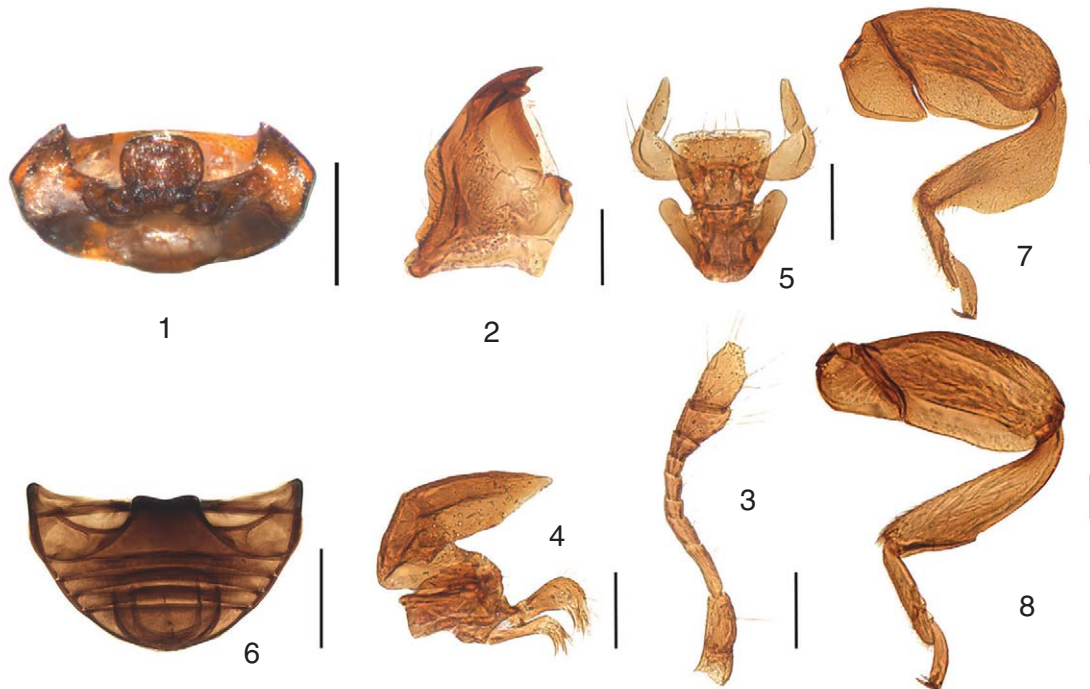
Description. TL: 1.58–2.21 mm, TW: 1.48–1.92 mm, EH: 0.92–1.25 mm.

Body reddish orange. Head yellow brown, antennal and mandible yellow, eyes black. Pronotum orange,

scutellum and elytra reddish orange. Underside yellow brown, except central parts of mesoventrite and metaventrite dark brown. Legs yellow brown.

Body small size, hemispherical, dorsum strongly convex above, dorsal surface glabrous (Figs 9–11). Head faced below, rather wide, about $0.46\times$ of elytral width ($HW/EW=1:2.16$) (Fig. 12); surface of head with fine punctured, separated by about 1.0–1.2 times a diameter; eyes large (Fig. 12), innerocular margins weakly arcuate and strongly convergent apically, widest interocular distance about $1.5\times$ of the narrowest. Pronotum about $0.72\times$ of elytral width ($PW/EW=1:1.38$), punctures on pronotum fine, similar to those on head. Surface of elytra shining, with 6–7 rows of gross punctures forming striae extending to $\frac{3}{5}$ elytral length, other punctures on elytra fine and sparse, similar to those on head. Hind wings well developed. Abdominal postcoxal lines incomplete, with oblique additional lines (Fig. 6).

Male genitalia. Penis moderately short and slender, weakly curved with a very large penis capsule and a small inner process, apex simple, pointed (Fig. 41); penis guide in lateral view slender and almost straight, somewhat thick at base, slightly longer than parameres (Fig. 42); parameres slender, sparsely setose at apex; penis guide in ventral view long, symmetrical, almost subparallel, with a fingerlike apex (Fig. 43).



Figures 1–8. *Nesolotis magnipunctata* Wang and Ren, sp. nov. (1) Prothorax, ventral; (2) mandible; (3) antenna; (4) maxilla, left; (5) labium; (6) abdomen; (7) front leg; (8) hind leg. Scale bars: Figs 1, 6 = 0.5 mm; 2–5, 7–8 = 0.1 mm.

Female genitalia. Coxites elongate, about 4 times as long as wide, outer margin slightly arcuate, median of inner margin feebly notched, each with several short terminal setae (Fig. 44); spermatheca absent.

Types. Holotype: 1♂, **Yunnan:** Longmen, Mengla, 1.V.2008, Wang XM, Leg.; paratypes: **Yunnan:** 3♂♂, 4♀♀, same data as holotype; 1♂, 6♀♀, Menglun, Jinghong, 29.IV.2008, Wang XM, Leg.; 4♂♂, 7♀♀, Menglun, Jinghong, 12.X.2006, Wang XM & Ren SX, Leg.

Distribution. China (Yunnan).

Etymology. The specific epithet refers to the large punctures on elytra.

Remark. This species is similar to *N. amabilis* in the characters of male genitalia, but it is easily distinguishable from the latter as follows: elytra without any spots; with 6–7 rows of gross punctures forming striae extending to $\frac{3}{5}$ elytral length; and penis guide in ventral view with a fingerlike apex. In *N. amabilis*, elytra have eight black spots without gross punctures and the penis guide in ventral view has a round apex.

Nesolotis gladiiformis Wang et Ren, sp. nov.
(Figs 13–16, 46–50)

Diagnosis. Body yellow brown, without any spots; elytra with two rows of gross punctures forming striae in basal half; penis slender and long, weakly curved with distinct outer process and long inner one of penis capsule; penis guide in lateral view slender and almost straight, about 2.0 times as long as parameres; parameres stout and short, without any apical setae; penis guide in ventral view long, symmetrical, almost subparallel at basal $\frac{4}{5}$, then tapering to apex.

Description. TL: 1.63–1.75 mm, TW: 1.46–1.58 mm, EH: 0.92–1.00 mm.

Body yellow brown, without any spots. Antennae and mandible yellow, eyes black. Pronotum, scutellum and elytra yellow brown. Underside yellow brown, except central parts of mesoventrite and metaventrite dark brown. Legs yellow.

Body hemispherical, dorsum strongly convex above, shining and glabrous (Figs 13–15). Head faced below, wide, about $0.47\times$ of elytral width (HW/EW=1: 2.14) (Fig. 16); surface of head with fine punctures, separated by about 1.2–1.8 times a diameter; eyes large, innerocular margins weakly arcuate, strongly convergent apically, widest interocular distance about 1.5 times as the narrowest. Pronotum about $0.74\times$ of elytral width (PW/EW=1: 1.34), punctures on pronotum fine, similar to those on head. Surface of elytra shining, punctures fine and sparse, smaller than those on head, separated by about 1.5–2.5 times a diameter, with two rows of gross punctures forming striae in basal half. Hind wings well developed. Abdominal

postcoxal lines incomplete, with oblique additional lines (Fig. 50).

Male genitalia. Penis slender and long, weakly curved with distinct outer process and long inner one of penis capsule, apex simple and pointed (Fig. 46); penis guide in lateral view slender and almost straight, moderately thick at basal half, about 2.0 times as long as parameres (Fig. 47); parameres stout and short, without any setae at apex; penis guide in ventral view gladiate, almost subparallel at basal $\frac{4}{5}$, then tapering to apex, apex pointed (Fig. 48).

Female genitalia. Coxites elongate, about 5.0 times as long as wide, apex blunt, outer margin arcuate, inner margin nearly straight, each with several short terminal setae (Fig. 49); spermatheca absent.

Types. Holotype: 1♂, **Yunnan:** Longtan, Ximeng, 900 m, 9.V.2008, Wang XM, Leg. Paratypes: **Yunnan:** 1♀, same data as holotype; 1♂, 1♀, Mengdui, Zhenkang, 1400 m, 18.V.2008, Wang XM, Leg.

Distribution. China (Yunnan).

Etymology. The species epithet refers to the gladiate penis guide of tegmen in ventral view.

Remark. This species is similar to *N. azumai* in coloration, morphological characters and male genitalia, but it is easily distinguishable from the latter as follows: body yellow brown; surface of elytra with 2 rows of gross punctures forming striae in basal half; and penis guide of male genitalia in lateral view about 2.0 times as long as parameres. In *N. azumai*, the body is yellow, elytra are without gross punctures and the penis guide in lateral view is slightly longer than parameres.

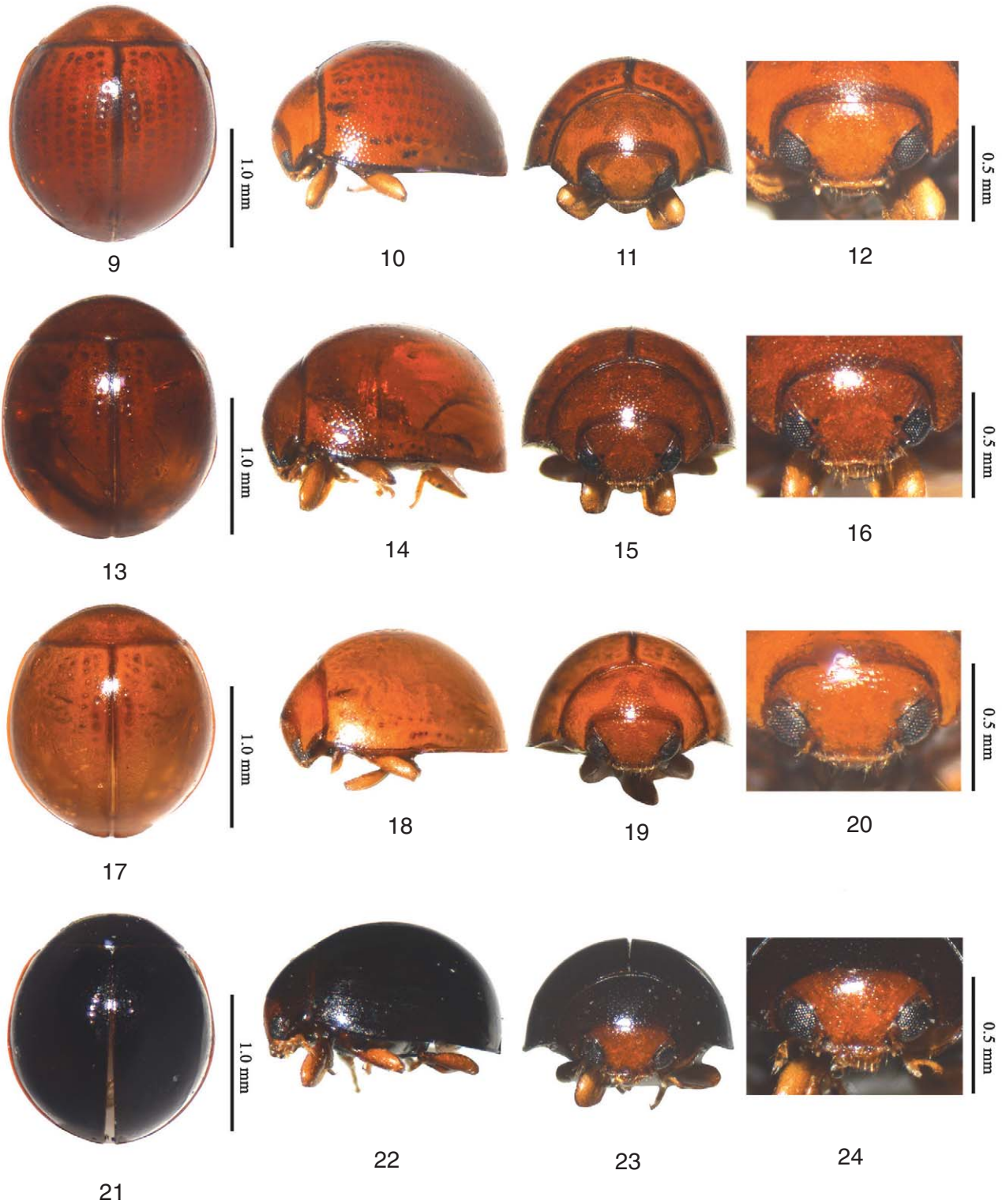
Nesolotis denticulata Wang et Ren, sp. nov.
(Figs 17–20, 51–55)

Diagnosis. Body yellow, without any spots; two rows of gross punctures on elytra forming striae extending to $\frac{3}{5}$ elytral length; apex of lateral margin of penis guide in ventral view with several small teeth.

Description. TL: 1.50–1.88 mm, TW: 1.33–1.67 mm, EH: 0.83–1.08 mm.

Body yellow, without any spots. Head yellow brown, with eyes black. Pronotum and scutellum yellow brown. Elytra yellow brown. Underside yellow, except central parts of mesoventrite and metaventrite dark brown. Legs yellow.

Body small, hemispherical, slightly longer than wide, dorsum very strongly convex above, shining and glabrous (Figs 17–19). Head faced below, wide, about $0.43\times$ of elytral width (HW/EW=1: 2.3) (Fig. 20); surface of head with fine punctures, separated by about 1.2–2.0 times a diameter; eyes large, innerocular margins weakly arcuate and strongly convergent apically, widest interocular distance about 2.0 times as the



Figures 9–24. (9–12) *Nesolotis magnipunctata* Wang et Ren, sp. nov. (13–16) *Nesolotis gladiiformis* Wang et Ren, sp. nov. (17–20) *Nesolotis denticulata* Wang et Ren, sp. nov. (21–24) *Nesolotis nigra* Wang et Ren, sp. nov. (9, 13, 17, 21) Dorsal view; (10, 14, 18, 22) lateral view; (11, 15, 19, 23) frontal view; (12, 16, 20, 24) head.

narrowest. Pronotum about $0.67\times$ of elytral width (PW/EW=1: 1.48), with fine punctures similar to those on head. Surface of elytra shining, with 2 rows of gross punctures forming striae extending to $\frac{3}{5}$ elytral length; punctures fine and sparse, similar to those on head. Hind wings well developed. Abdominal postcoxal lines incomplete, with thin oblique additional lines (Fig. 55).

Male genitalia. Penis moderately short and slender, weakly curved with a large penis capsule, inner process small, apex simple, pointed (Fig. 51); penis guide in lateral view slender, almost straight, somewhat thick and slightly curved at basal $\frac{5}{6}$, slightly longer than parameres (Fig. 52); parameres slender and sparsely setose at apex; penis guide in ventral view long, symmetrical and almost subparallel at basal $\frac{3}{4}$, and lateral margin apically minutely dentate (Fig. 53).

Female genitalia. Coxites elongate, about 4.5 times as long as wide, apex blunt, outer margin slightly arcuate, median of inner margin straight, each with several short terminal setae (Fig. 54); spermatheca absent.

Types. Holotype: 1♂, **Yunnan:** Mengdai, Zhenkang, 1400 m, 18.V.2008, Wang XM, Leg. Paratypes: **Yunnan:** 3♂♂, 1♀, same data as holotype; 3♀♀, Nangun River Natural Reserve, Banhong, Cangyuan, 1790 m, 14.V.2008, Wang XM, Leg.; 2♀♀, Tongbiguan Natural Reserve, Nabang, Yingjiang, 1000 m, 22.V.2008, Wang XM Leg.; 3♂♂, 3♀♀, Tongbiguan Natural Reserve, Yingjiang, 1000m, 22.IX. 2006, Wang XM & Ren SX, Leg.

Distribution. China (Yunnan).

Etymology. The specific epithet refers to the minutely dentate lateral margin of penis guide of tegmen at apex.

Remark. This species is similar to *N. azumai* in coloration, morphological characters and male genitalia, but it is easily distinguishable from the latter as follows: elytral surface with 2 rows of gross punctures forming striae extending to $\frac{3}{5}$ elytral length; lateral margin of penis guide in ventral view apically denticulate; penis capsule large. In *N. azumai*, elytra are without gross punctures and the penis guide is simple at apex, without tooth, and the penis capsule is moderately large.

Nesolotis nigra Wang et Ren, sp. nov.
(Figs 21–24, 56–59)

Diagnosis. Body black, without any spots; surface of elytra with 4–5 rows of gross punctures forming striae in the median part of elytral suture; penis moderately short, stout, with a very large capsule, apex simple and pointed; penis guide longer than parameres, about $1.25\times$ of parameres; penis guide in ventral view short

and wide, symmetrical and almost subparallel at basal $\frac{9}{10}$, then strongly tapering to apex.

Description. TL: 1.42–1.75 mm, TW: 1.29–1.46 mm, EH: 0.83–1.08 mm.

Body black, without any spots. Head yellow brown, with eyes black. Underside dark brown. Legs yellow brown.

Body small size, hemispherical, dorsum strongly convex above, shining and glabrous (Figs 21–23). Head faced below, wide, about $0.44\times$ of elytral width (HW/EW=1: 2.25) (Fig. 24); surface of head with very fine punctures, separated by about 2.0–3.0 times a diameter; eyes large, innerocular margins weakly arcuate and strongly convergent apically, widest interocular distance about 1.5 times as the narrowest. Pronotum about $0.69\times$ of elytral width (PW/EW=1: 1.45), with fine punctures similar to those on head. Surface of elytra shining, with 4–5 rows of gross punctures forming striae; punctures fine and sparse, similar to those on head. Hind wings well developed. Abdominal postcoxal lines incomplete, with thin oblique additional lines (Fig. 59).

Male genitalia. Penis moderately short and stout, curved at base, with a very large penis capsule, apex simple and pointed (Fig. 56); penis guide in lateral view stout and almost straight, apex pointed and slightly curved, moderately thick at basal half, about $1.25\times$ of parameres (Fig. 57); parameres slender, curved at basal $\frac{3}{4}$; penis guide in ventral view short and wide, symmetrical and almost subparallel at basal $\frac{9}{10}$, then strongly tapering to apex (Fig. 58).

Female genitalia. Not known.

Types. Holotype: 1♂, **Hainan:** Zhuzhishan Mountain, Tongzha, 24.VII.2006, Wang XM, Leg. Paratypes: **Hainan:** 1♂, Qixianling, Baoting, 7.V.2005, Wang XM, Leg.; 1♂, Zhuzhishan Mountain, Tongzha, 19.IV.2000, Peng ZQ, Leg.

Distribution. China (Hainan).

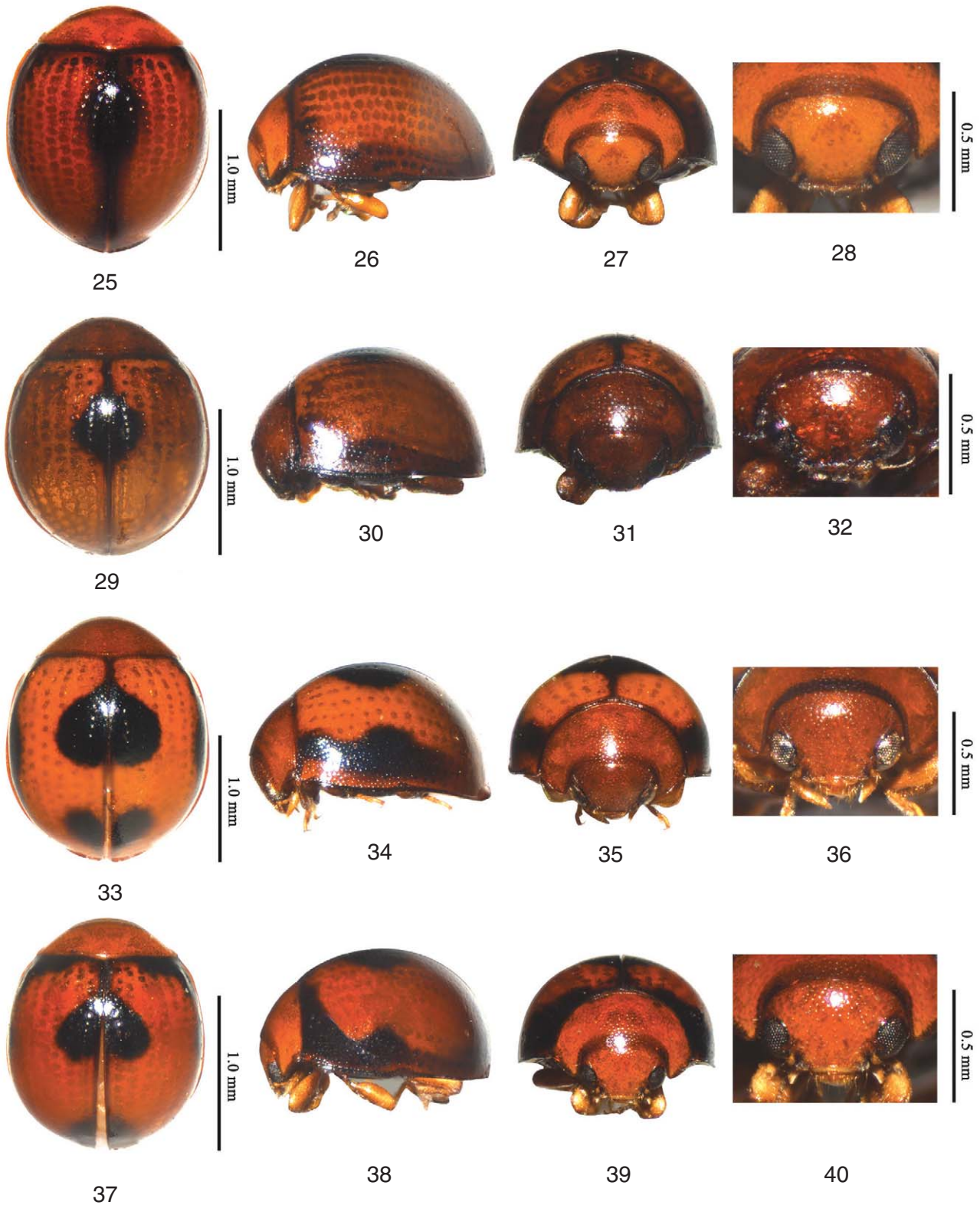
Etymology. The specific epithet refers to the black body.

Remark. This species is easily distinguishable from the other species of *Nesolotis* by the black body without any spots, and the male genitalia.

Nesolotis centralis Wang et Ren, sp. nov.
(Figs 25–28, 60–64)

Diagnosis. Elytra yellow brown, outer margin and basal margin red brown, with a large long oval black spot in middle of elytral suture; elytral surface with 6–7 rows of gross punctures forming striae extending to apex of elytra; outer process of penis capsule very large.

Description. TL: 1.63–1.83 mm, TW: 1.38–1.58 mm, EH: 0.67–1.42 mm.



Figures 25–40. (25–28) *Nesolotis centralis* Wang et Ren, sp. nov. (29–32) *Nesolotis quadratimaculata* Wang et Ren, sp. nov. (33–36) *Nesolotis cordiformis* Wang, Ren et Chen, sp. nov. (37–40) *Nesolotis dawuishanensis* Wang, Ren et Chen, sp. nov. (25, 29, 33, 37) Dorsal view; (26, 30, 34, 38) lateral view; (27, 31, 35, 39) frontal view; (28, 32, 36, 40) head.

Head orange, with eyes black. Pronotum yellow brown and scutellum dark brown. Elytra yellow brown, outer and basal margins red brown, with a large long oval black spot in middle of elytral suture. Underside dark brown. Legs yellow brown.

Body small size, hemispherical, dorsum strongly convex above and glabrous (Figs 25–27). Head faced below, wide, about $0.43\times$ of elytral width ($HW/EW=1: 2.31$) (Fig. 28); surface of head with very fine punctured, separated by about 2.0–3.0 times a diameter; eyes large, innerocular margins weakly arcuate and strongly convergent apically, widest interocular distance about 2 times as the narrowest. Pronotum about $0.70\times$ of elytral width ($PW/EW=1: 1.42$), with punctures slightly larger than those on head, separated by about 1.5–2.0 times a diameter. Surface of elytra glabrous, with 6–7 rows of gross punctures forming striae extending to apex of elytra, other punctures fine and sparse, similar to those on pronotum. Hind wings well developed. Abdominal postcoxal lines incomplete, with thin oblique additional lines (Fig. 64).

Male genitalia. Penis moderately long and slender, strongly curved at basal half part, penis capsule with a very large outer process and a small inner one, apex simple and pointed (Fig. 60); penis guide in lateral view slender and almost straight, somewhat thick at base, tapering to apex, apex pointed, longer than parameres (Fig. 61); parameres slender and sparsely setose at apex; penis guide in ventral view short, symmetrical and almost subparallel at basal $\frac{3}{4}$, then gradually tapering to apex, apex slightly blunt (Fig. 62).

Female genitalia. Coxites elongate, about 4.5 times as long as wide, apex blunt, outer margin slightly arcuate, median of inner margin feebly notched, each with several short terminal setae (Fig. 63); spermatheca absent.

Types. Holotype: 1♂, **Guangxi:** Pinglong, Shiwandashan Mountain, 7.XI.2004. Wang XM, Leg. Paratypes: **Guangxi:** 5♂♂, 5♀♀, same data as holotype; 2♂♂, 7♀♀, Pinglong, Shiwandashan Mountain, 29.VII.2005. Wang XM, Leg.; 1♀, Guilongshan, Napo, 4.VIII.2005, Wang XM Leg; **Guangdong:** 1♂, Big Gorge, Ruyuan, 15.VII.2005, Wang XM, Leg.; 1♂, Tianjingshan, Ruyuan, 17.VII.2005, Wang XM, Leg.; **Yunnan:** 3♀♀, Lianhuatan, Pingbian, 900 m, 22.IV.2008, Wang XM, Leg.

Distribution. China (Guangxi, Guangdong, Yunnan).

Etymology. The specific epithet refers to the elytra having a large long oval spot in the middle of suture.

Remark. The male genitalia of this species are similar to those of *N. azumai*, but *N. centralis* is distinguishable from the latter as follows: Elytra yellow brown with outer and basal margins red brown, with a large, long oval median black spot on suture and 6–7 rows of gross punctures forming striae extending to apex of elytra and the penis of male genitalia with a larger outer process of penis capsule.

This species is also similar to *N. magnipunctata* in coloration, morphological characters and male genitalia, but it is easily distinguishable from the latter by the diagnostic characters detailed earlier.

Nesolotis quadratimaculata Wang et Ren, sp. nov.
(Figs 29–32, 65–69)

Diagnosis. Elytra yellow brown, outer margin red brown, with a large, quadrate, median black spot on suture; elytral surface with 6–7 rows of gross punctures forming striae extending to apex; penis guide slightly short than parameres.

Description. TL: 1.50–1.61 mm, TW: 1.33–1.38 mm, EH: 0.79–0.83 mm.

Head red brown, with eyes black. Pronotum and scutellum red brown. Elytra yellow brown, outer margin red brown, with a large quadrate median black spot on suture. Underside dark brown. Legs yellow brown.

Body small size, hemispherical, dorsum strongly convex above, shining and glabrous (Figs 29–31). Head faced below, wide, about $0.48\times$ of elytral width ($HW/EW=1: 2.09$) (Fig. 32); surface of head with fine punctures, separated by about 1.0–2.0 times a diameter; eyes large, innerocular margins weakly arcuate and strongly convergent apically, widest interocular distance about 1.5 times as the narrowest. Pronotum about $0.72\times$ of elytral width ($PW/EW=1: 1.39$), with fine punctures similar to those on head. Surface of elytra shining, with 6–7 rows of gross punctures forming striae extending to apex of elytra, other punctures fine and sparse, smaller than those on head, separated by about 2.0–4.0 times a diameter;. Hind wings well developed. Abdominal postcoxal lines incomplete, without a thin oblique additional line (Fig. 69).

Male genitalia. Penis moderately short and slender, slightly curved at basal half part, with a big outer capsule and a small inner one of penis capsule, apex simple and pointed (Fig. 65); penis guide in lateral view slender and straight, somewhat thick at base, tapering to apex, apex pointed, slightly shorter than parameres (Fig. 66); parameres slender and sparsely setose at apex; penis guide in ventral view short, symmetrical and almost subparallel at basal $\frac{3}{4}$, then gradually tapering to apex, apex slightly blunt (Fig. 67).

Female genitalia. Coxites (Fig. 68) slightly broken, elongate, about 4 times as long as wide, apex blunt, outer margin slightly arcuate, inner margin nearly straight, each with several short terminal setae; spermatheca absent.

Types. Holotype: 1♂, **Jiangxi:** Longtan, Jinggangshan Mountain, 16.VIII.2004. Wang XM, Leg. Paratypes: 2♀♀, same data as holotype.

Distribution. China (Jiangxi).



Figures 41–55. (41–45) *Nesolotis magnipunctata* Wang et Ren, sp. nov. (46–50) *Nesolotis gladiiformis* Wang et Ren, sp. nov. (51–55) *Nesolotis denticulata* Wang et Ren, sp. nov. (41–43, 46–48, 51–53) Male genitalia: (41, 46, 51) penis; (42, 47, 52) tegmen, lateral view; (43, 48, 53) tegmen, ventral view. (44, 49, 54) Female genitalia: (45, 49, 54) ovipositor; (46, 50, 55) abdomen. Scale bars = 0.3 mm.

Etymology. The species epithet refers to the elytra with a large quadrate spot.

Remark. This species is closely similar to *N. centralis* in coloration, morphological characters and male genitalia, but can be distinguished from the latter by the elytra with a quadrate spot and the male genitalia with outer process of penis capsule small and penis guide slightly shorter than parameres.

This species is also similar to *N. azumai* and can be distinguished from the latter by the elytra with a quadrate spot, 6–7 rows of gross punctures forming striae extending to apex and the male genitalia with penis guide slightly shorter than parameres.

Nesolotis cordiformis Wang, Ren et Chen, sp. nov.
(Figs 33–36, 70–73)

Diagnosis. Elytra yellow brown, outer margin black, with a large inverted cordiform black spot in middle of elytral suture and a small cordiform black spot at basal $\frac{2}{3}$; surface with 6 rows of gross punctures forming striae extending to apex of elytra; penis long and slender, strongly curved at base and middle; penis guide slightly shorter than parameres.

Description. TL: 1.71–1.92 mm, TW: 1.41–1.58 mm, EH: 0.96–1.08 mm.

Head red brown, with eyes silver gray. Pronotum red brown and scutellum dark brown. Elytra yellow brown, outer margin black, with a large inverted cordiform black spot in middle of suture and a small positive cordiform black spot at basal $\frac{2}{3}$. Underside dark brown, except elytral epipleuron yellow brown. Legs yellow brown.

Body small, hemispherical, dorsum strongly convex, shining and glabrous (Figs 33–35). Head faced below, about 0.44× of elytral width (HW/EW=1: 2.34) (Fig. 36); surface of head with fine punctures, separated by about 1.0–2.0 times a diameter; eyes large, innerocular margins arcuate and convergent apically, widest interocular distance about 1.5 times as the narrowest. Pronotum about 0.70× of elytral width (PW/EW=1: 1.42), with fine punctures similar to those on head. Surface of elytra shining, with 6 rows of gross punctures forming striae extending to apex of elytra, other punctures fine and sparse, smaller than those on head, separated by about 2.0–4.0 times a diameter. Hind wings well developed. Abdominal postcoxal lines incomplete, with thin oblique additional lines and sometimes unclear (Fig. 73).

Male genitalia. Penis long and slender, strongly curved at base and middle, with a moderately big penis capsule and a very small inner process, apex simple and pointed (Fig. 70); penis guide in lateral view slender and straight, slightly thick at base, tapering to

apex, apex pointed, slightly short than parameres (Fig. 71); parameres slender, apically sparsely setose; penis guide in ventral view symmetrical and almost subparallel at basal $\frac{6}{7}$, then gradually tapering to apex, apex rounded (Fig. 72).

Female genitalia. Not known.

Types. Holotype: 1♂, **Guizhou:** Lianhuaping, Leigongshan Mountain, 8.X.2008. Wang XM, Leg. Paratypes: **Guizhou:** 2♂♂, Leigongshan Mountain, 14.VIII.2006, Wang XM, Leg.

Distribution. China (Guizhou).

Etymology. The specific epithet refers to the elytra with a large inverted median cordiform spot in suture and a small cordiform black spot at basal $\frac{2}{3}$.

Remark. This species is similar to *N. centralis* in coloration, morphology characters and male genitalia, but it is distinguishable from the latter by the elytral pattern and the male genitalia with penis guide distinctly shorter than parameres.

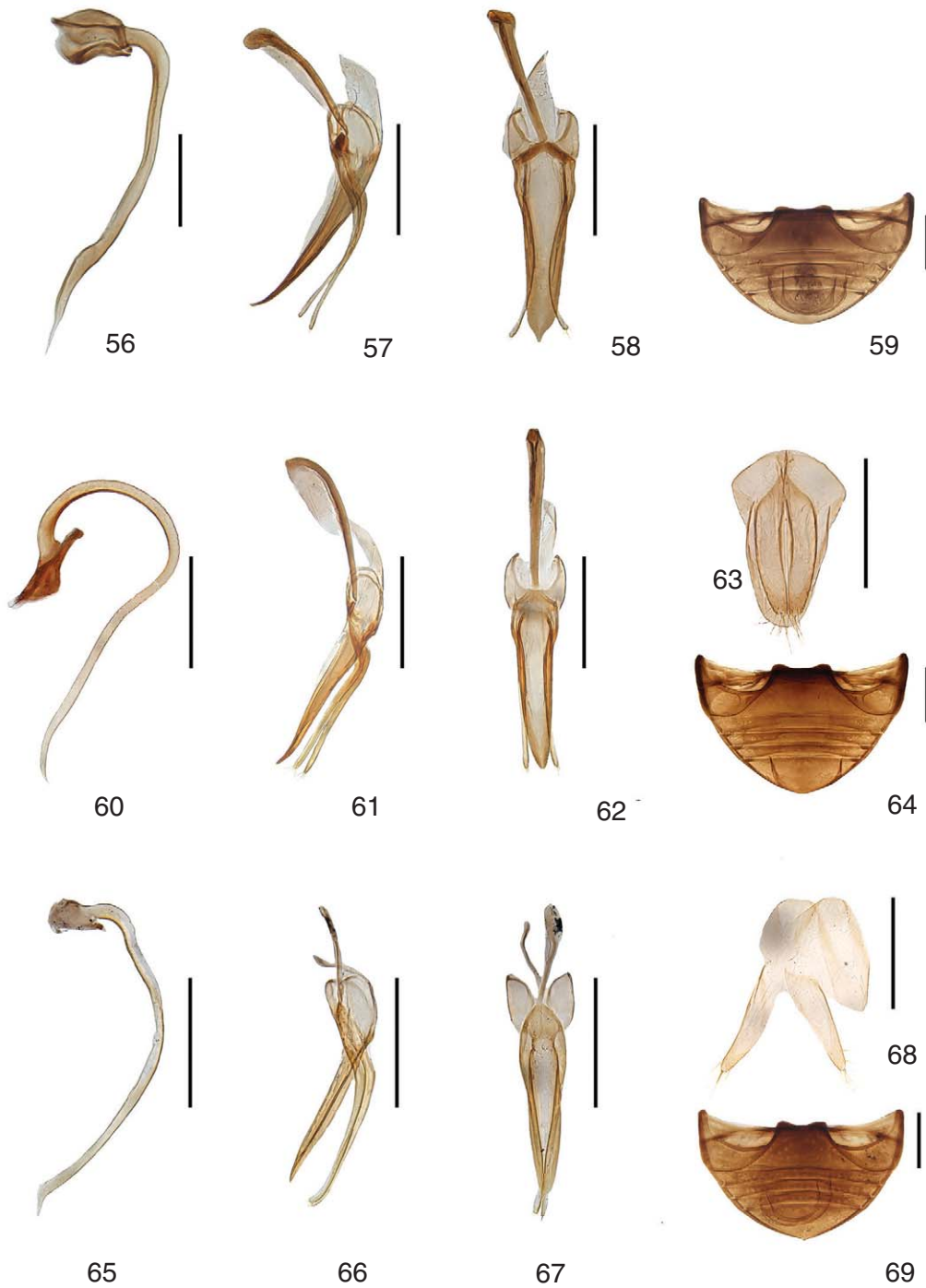
Nesolotis daweishanensis Wang, Ren et Chen, sp. nov.
(Figs 37–40, 74–78)

Diagnosis. Elytra yellow brown, outer and basal margins black, with a big inverted cordiform black spot in middle of elytral suture and a small oval black spot at basal $\frac{2}{3}$; elytral surface with 4–5 rows of gross punctures forming striae extending to apex of elytra; outer process of penis capsule very large; penis guide slightly shorter than parameres; apex of penis guide in ventral view rounded and lateral margin not smooth, with several teeth.

Description. TL: 1.75–1.92 mm, TW: 1.45–1.52 mm, EH: 0.95–1.08 mm.

Head red brown, with eyes black. Pronotum red brown and scutellum dark brown. Elytra yellow brown, outer and basal margins black, with a big inverted cordiform black spot in middle of elytral suture and a small oval black spot at basal $\frac{2}{3}$. Underside dark brown. Legs yellow brown.

Body small size, hemispherical, dorsum strongly convex, shining and glabrous (Figs 37–39). Head faced below, wide, about 0.44X of elytral width (HW/EW=1: 2.25) (Fig. 40); surface with fine punctures, separated by about 0.8–1.2 times a diameter; eyes large, innerocular margins arcuate, widest interocular distance about 1.5 times as the narrowest. Pronotum about 0.71× of elytral width (PW/EW=1: 1.40), punctures sparser than those on head, separated by about 1.0–3.0 times a diameter. Surface of elytra shining, with 4–5 rows of gross punctures forming striae extending to apex of elytra, other punctures fine and sparse, similar as those on pronotum. Hind wings well developed. Abdominal postcoxal lines incomplete, without a thin oblique additional line (Fig. 78).



Figures 56–69. (56–59) *Nesolotis nigra* Wang et Ren, sp. nov. (60–64) *Nesolotis centralis* Wang et Ren, sp. nov. (65–69) *Nesolotis quadrati-maculata* Wang et Ren, sp. nov. (56–58, 60–62, 65–69) Male genitalia: (56, 60, 65) penis; (57, 61, 66) tegmen, lateral view; (58, 62, 67) tegmen, ventral view; (63, 68) female genitalia: ovipositor; (59, 64, 69) abdomen. Scale bars = 0.3 mm.

Male genitalia. Penis long and slender, strongly curved at base and middle, penis capsule with a very large outer process and a very small inner one, apex simple and pointed (Fig. 74); penis guide in lateral view slender and straight, slightly thick at base, tapering to apex, apex pointed, slightly shorter than parameres (Fig. 75); parameres slender, apically sparsely setose; penis guide in ventral view symmetrical and narrowest at base, then gradually broad to apex, apex rounded, lateral margin not smooth, with several teeth (Fig. 76).

Female genitalia. Coxites short and stout, about 3.7 times as long as wide, apex blunt, outer margin arcuate, inner margin nearly straight, each with several short terminal setae (Fig. 77); spermatheca absent.

Types. Holotype: 1♂, **Yunnan:** Daweishan National Natural Reserve, Hekou, Yunnan, 2100 m, 18.IV.2008 Wang XM, Leg. Paratypes: **Yunnan:** 1♀, same data as holotype; 1♂, Daweishan National Natural Reserve, Hekou, 2100 m, 11.X.2006, Wang XM, Leg.; 1♂, 2♀, Daweishan National Natural Reserve, Hekou, 2100 m, 2009.V.22–23. Wang XM, Leg.

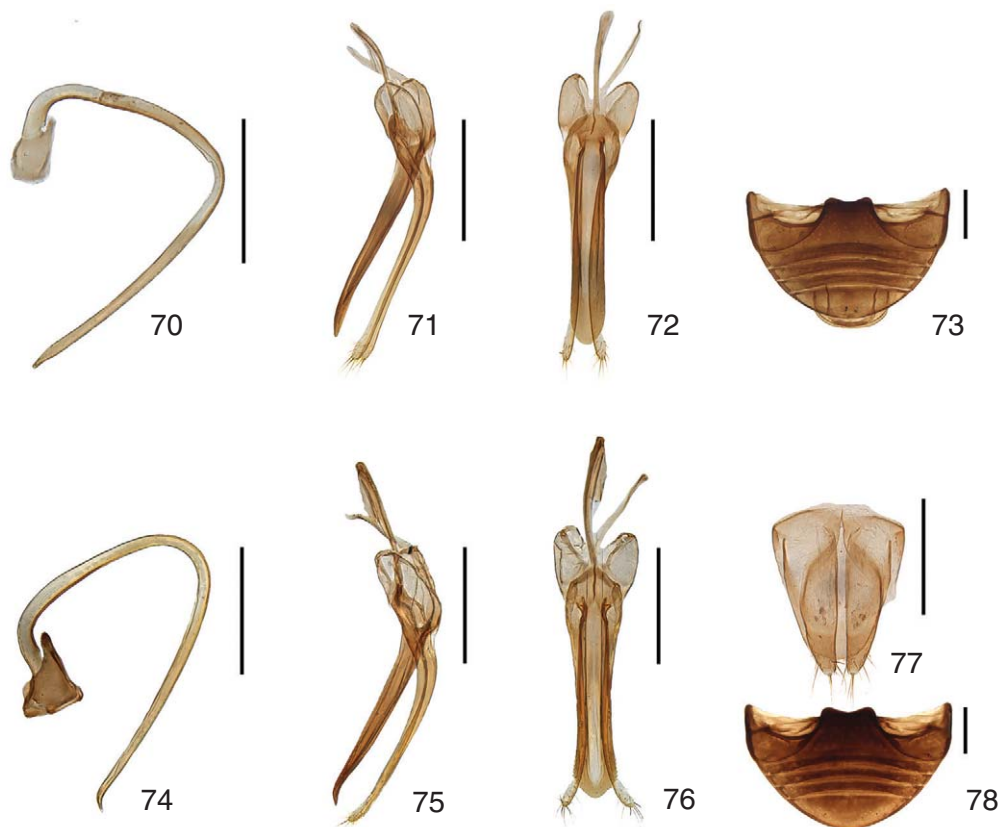
Distribution. China (Yunnan).

Etymology. The specific epithet refers to the type locality, Daweishan National Natural Reserve.

Remark. This species is similar to *N. cordiformis* in coloration, morphological characters and male genitalia, but it can be distinguished from the latter as follows: elytra with very large; apex of penis guide in ventral view rounded and lateral margin with several teeth.

Key to the species of *Nesolotis* from China

1. Elytra without any spots 2
- Elytra with several black spots 5
2. Body all black *nigra* Wang et Ren, sp. nov.
- Body yellow, or yellow brown, or red brown 3
3. Elytral surface with six to seven rows of gross punctures forming striae
- *magnipunctata* Wang et Ren, sp. nov.
- Elytral surface with two rows of gross punctures forming striae 4



Figures 70–78. (70–73) *Nesolotis cordiformis* Wang, Ren et Chen, sp. nov. (74–78) *Nesolotis daweishanensis* Wang, Ren et Chen, sp. nov. (70–72, 74–76) Male genitalia: (70, 74) penis; (71, 75) tegmen, lateral view; (72, 76) tegmen, ventral view; (73) abdomen. (77) Female genitalia: ovipositor. (78) Abdomen. Scale bars = 0.3 mm.

4. Parameres of tegmen short, about half of penis guide. Penis guide in ventral view long, symmetrical and almost subparallel at basal $\frac{4}{5}$, then strongly tapering to apex *gladiiformis* Wang et Ren, sp. nov.
- . Parameres of tegmen long, slightly shorter than penis guide. Penis guide in ventral view long, symmetrical and almost subparallel at basal $\frac{3}{4}$, lateral margin at apex not smooth, minutely dentate *denticulata* Wang et Ren, sp. nov.
5. Elytra with more than 3 black spots 6
- . Elytra with 3 or less than 3 black spots 7
6. Pronotum with a large black spot. Elytra with nine black spots *tsunekii* Sasaji
- . Pronotum without black spots. Elytra with five black spots *shorozui* Sasaji
7. Elytra with a single large median black spot on suture 8
- . Elytra with a small black spot at basal $\frac{2}{3}$ of elytral suture besides one large median black spot 9
8. Elytra with a large long oval black spot. Outer process of penis capsule very large. Penis guide slightly longer than parameres *centralis* Wang et Ren, sp. nov.
- . Elytra with a large quadrate black spot. Outer process of penis capsule small. Penis guide slightly shorter than parameres *quadratimaculata* Wang et Ren, sp. nov.
9. Elytra with a small cordiform black spot at basal $\frac{2}{3}$ of elytral suture. Outer process of penis capsule moderately large. Apex of penis guide in ventral view rounded and lateral margin smooth *cordiformis* Wang, Ren et Chen, sp. nov.
- . Elytra with a small oval black spot at basal $\frac{2}{3}$ of elytral suture. Outer process of penis capsule very large. Apex of penis guide in ventral view rounded and lateral margin with several teeth *daweishanensis* Wang, Ren et Chen, sp. nov.

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