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Notes on the Genus *Parastasia* Westwood, 1841 from Thailand (Coleoptera: Scarabaeidae, Rutelinae)

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Abstract
This paper presents new records from Thailand for four species of Scarabaeidae Rutelinae: *Parastasia asahi* Wada, 2008, *P. burmeisteri* Ohaus, 1898, *P. dimidiata* Erichson, 1845, and *P. kraatzi* Ohaus, 1900. A list of all *Parastasia* species occurring in Thailand is provided. Additionally, behavioral notes on some species of genus *Parastasia* are included and discussed.

Key words: new record, Rutelini, Parastasiina, circadian rhythms, feeding behavior.

Introduction

The genus *Parastasia* Westwood, 1841 is the largest of the Rutelini tribe (Coleoptera: Scarabaeidae) in Thailand with 10 species documented in the latest research (Hongsuwong et al. 2022). Since then, additional specimens of this genus have been newly discovered by the authors, along with noteworthy behavioral observations. This paper also addresses necessary bionomic discussion.

Material and methods

Acronyms of private and institutional collections examined:

RBMF: Rabbit in the Moon Foundation, Ratchaburi, Thailand;
KUKPS: Kasetsart University Kamphaeng Saen Campus, Nakhon Pathom, Thailand;
THNHM: Thailand Natural History Museum, Pathum Thani, Thailand;
CTH: private collection of Thitipong Hongsuwong, Bangkok, Thailand;
CWP: private collection of Wuttipon Pathomwattananurak, Chiang Rai, Thailand.

The dissections and observations for identification were primarily conducted using a Leica S9i stereomicroscope. Fuji XA5 with 60 mm macro lens was used for photographing the habitus of the specimens, while the aedeagi and mouthparts were photographed by using Leica S9i. All pictures and figure montages were stacked and edited in Adobe Photoshop. All photos are by the authors unless otherwise stated in figure legends.

Acronyms of measurements:

TL: Total length, measured at the clypeal apex to sutural apice of elytrons
HW: head width, measured at maximum of compound eyes;
IOD: interocular distance, measured between the inner outline of compound eyes.

Results

New records
***Parastasia asahi* Wada, 2008** แมลงนูนขาโตสีตาลเรียบี
(Figs 1, 6–8)
Parastasia asahi Wada, 2008: 2, Figs 1–8 (original description; type locality: Borneo).

Material examined: Thailand: Yala Prov., Betong Dist., 5°53’07.5”N, 101°01’17.6”E, S. Sae-Liang leg., 28.III.2022, 1♂ (CTH).

Remarks and distribution. The species was originally reported from Borneo Island (Wada 2008) and has now

been discovered in South Thailand for the first time. It is therefore likely its presence in the Malaysian mainland.

***Parastasia burmeisteri* Ohaus, 1898** แมลงนูนขาโตทรงรี
(Figs 2–3, 9–11, 22–23, 50)
Parastasia burmeisteri Ohaus, 1898: 10 (original description; type locality: Sumatra); Ohaus 1900: 253 (*P. marginata* group); Ohaus 1918: 36 (*P. westwoodii* group); Ohaus 1934: 104 (*P. westwoodii* group); Machatschke 1972: 43 (catalog); Kuijten 1992: 45, figs 37–38 (re-description, key, parameres).

Parastasia nonfriedi Ohaus, 1898: 10 [original description; synonym of *P. burmeisteri* by Arrow (1899: 495)].

Material examined: Thailand: Nakhon Si Thammarat Prov., Phrom Khiri Dist., Phrom Lok Subdist., C. Phothaworn leg., 18.XI.2021, larval instar 3 in rotten log, 16.II.2022, emerged, 1♂ (CTH); Nakhon Si Thammarat Prov., Phrom Khiri Dist., Thon Hong, Wang Lung Waterfall, C. Phothaworn leg., 2.IV.2023, 1♀ (CTH).

Remarks and Distribution. The species has been reported from Malaysia, Indonesia, and the Philippines (Kuijten 1992). The current record represents the northernmost distribution of this species. In addition, the aedeagus of the above reported male specimen slightly differs from Kuijten's description of Sundaic specimens: the concavity of the parameres in lateral view is very shallow, and the apices of the parameres are not curved downward as depicted in Kuijten's figures.

***Parastasia dimidiata* Erichson in Westwood, 1845** แมลงนูนเขาแคระชายเลน
(Figs 4, 12–14, 45)
Parastasia dimidiata Erichson in Westwood, 1845a: 98 (original description; type locality: Batum, Riau Archipelago); Erichson in Westwood 1845b: 101 (description); Ohaus 1900: 258 (*P. heterocera* group); Ohaus 1918: 37 (*P. heterocera* group); Ohaus 1934: 105 (*P. heterocera* group); Machatschke 1972: 95 (catalog); Kuijten 1992: 58 (re-description, key, clypeus and parameres).

Parastasia nitidula Erichson in Westwood, 1845a: 98 (original description; synonym of *P. dimidiata* by Kuijten (1992: 58)).

Urleta ometoides Westwood, 1875: 238 [original description; synonym of *P. dimidiata* by Arrow (1899: 486)].

Parastasia heterocera Ohaus, 1898: 27 [original description; synonym of *P. dimidiata* by Kuijten (1992: 58)].

Material examined: Thailand: Nakhon Si Thammarat Prov., Nopphitum Dist., C. Phothaworn leg., 6.V.2023, 1♂ (CTH).

Remarks and distribution. The species was originally described in two separate publications. The first description appeared in *Transactions of the Royal Entomological Society of London*, Vol. 4, Part 1, authored by Erichson in Westwood (1845a: 98). The second was published in the *Proceedings of the Entomological Society of London*, also by Westwood (1845b: 101). While the *Transactions* and *Proceedings* were usually published together, an exception occurred between 1840 and 1846, during which they were issued separately. This irregular publishing practice led to discrepancies between the two sources, prompting later authors to treat their publication dates independently (Wheeler 1912). The *Proceedings* recorded a date range from 1 January to 4 March 1844, but its actual publication date was 1 October 1845. Meanwhile, *Transactions* Vol. 4, Part 1 was made publicly available on 7 April 1845.

Kuijten (1992) reported that the species was previously known to inhabit small islands or coastal regions in India, Myanmar, Malaysia, Singapore, and Indonesia. Its wide distribution is likely linked to its bionomics, particularly its association with rotting *Rhizophora* L. (Rhizophoraceae) wood during the larval stage. This study officially report a new record of this species from South Thailand. Additionally, a photograph by Kunut Polwichai (2017) from Chumphon Province, Thailand, showed a *P. dimidiata* specimen with primarily yellowish elytra (Fig. 45), whereas the specimen examined in this study was completely dark.

***Parastasia kraatzi* Ohaus, 1900** แมลงนูนคอคอดกระ
(Figs 5, 15–17, 20–21, 28–31, 39–41)
Parastasia kraatzi Ohaus, 1900: 242 (original description; type locality: Tebing-tinggi, Sumatra); Ohaus 1918: 32 (*P. confluens* group); Ohaus 1934: 100 (*P. confluens* group); Machatschke 1972: 39 (catalog); Kuijten 1992: 98, figs 137–139 (re-description, key, parameres).

Material examined: Thailand: Nakhon Nayok Prov., Mueang Dist., Khao Yai National Park, Pha Trom Jai, 10.II.2024, 1♂ (available images on iNaturalist ID natthaphat 2024); Yala Prov., Betong Dist., 5°53'07.5"N, 101°01'17.6"E, S. Sae-Liang leg., 30.III.2022, 1♂ (CTH).

Remarks and distribution. Since its original description by Ohaus (1900), *Parastasia kraatzi* had only been recorded from Sumatra Island. However, this study surprisingly reports its presence on the Asian mainland for the first time, at a location remarkably distant from the type locality. In fact, the species appears to have a much wider distribution across the Indochinese region than previously recognized. Additionally, a fresh male specimen was collected in a white rotting log, while the other one was caught by a light trap.

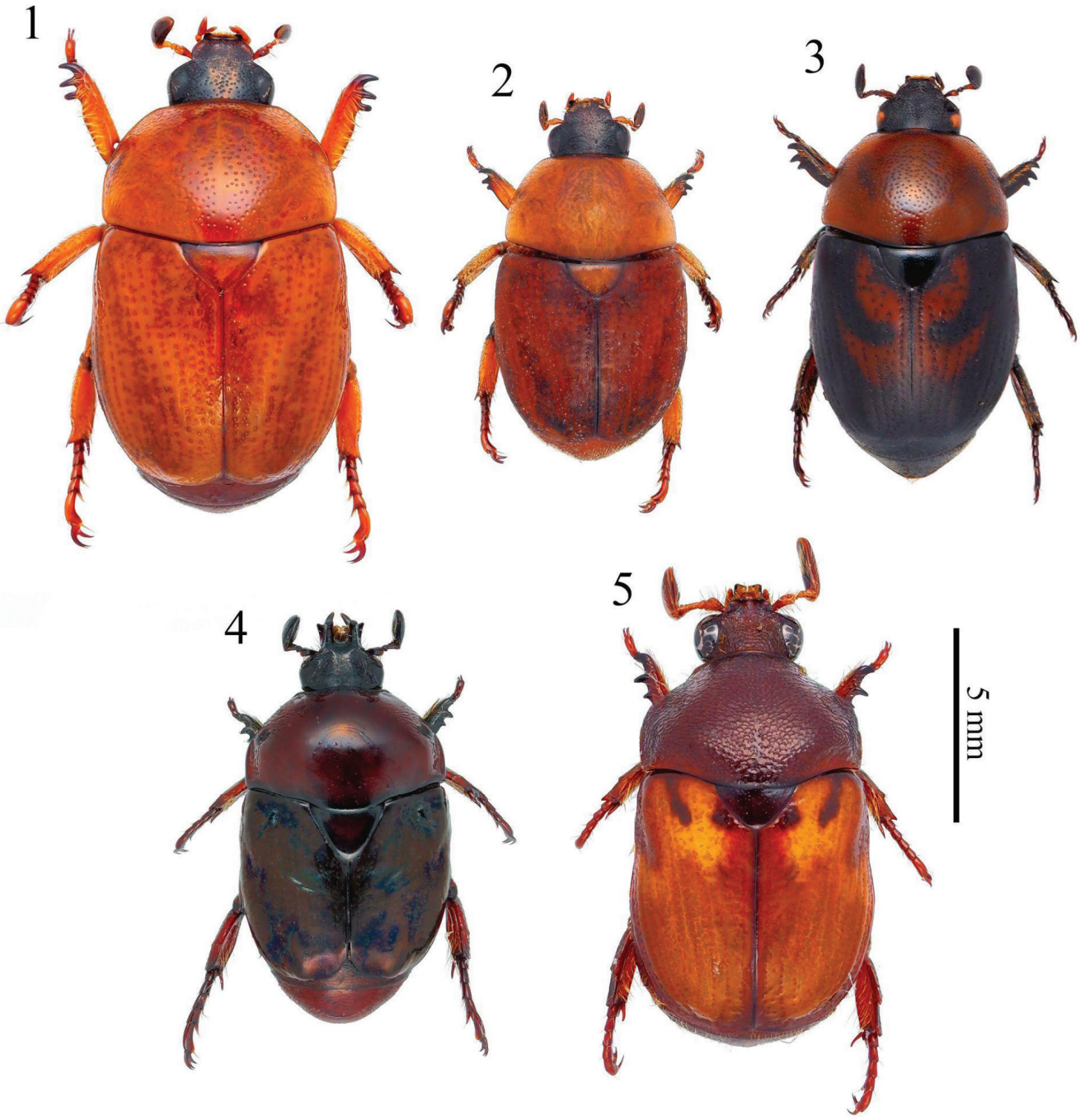
List of *Parastasia* species of Thailand

***Parastasia anomala* Arrow, 1899** แมลงนูนสามเหลี่ยมดำ
Parastasia anomala Arrow, 1899: 495 (original description; type locality: Penang); Ohaus 1900: 252 (*P. anomala* group);

Ohaus 1903: 223 (listing); Ohaus 1918: 35 (*P. anomala* group); Ohaus 1932: 130 (record in Malay Peninsula); Ohaus 1934: 103 (*P. anomala* group); Machatschke 1972: 43 (catalog); Kuijten 1992: 25, figs 5–7 (re-description, key, parameres); Hongsuwong et al. 2020: 10, figs 7–12 (record in Thailand, habitus and male genitalia); Hongsuwong et al. 2022: figs 52, 56, 59, 67 (habitus and male genitalia).

Remarks and distribution. The species has been reported from South Thailand, Malaysia, and Indonesia (Hongsuwong et al. 2020).

***Parastasia bigibbosa* Nonfried, 1891** แมลงนูนดำอกริ้ว
Parastasia bigibbosa Nonfried, 1891: 238 (original description; type locality: Siam); Ohaus 1898: 15 (*P. confluens* group); Ohaus 1918: 32 (*P. confluens* group); Ohaus



Figs 1–5 – Habitus in dorsal view of Thai *Parastasia*, new records. **1**, *P. asahi*; **2–3**, *P. burmeisteri*; **4**, *P. dimidiata*; **5**, *P. kraatzi*; **1–2**, **4–5**, ♂; **3**, ♀.

1934: 100 (*P. confluens* group); Machatschke 1972: 37 (catalog); Kuijten 1992: 33, Figs 21–24 (re-description, key, pronotal sculptures and parameres); Wada 2013: 8, Figs 12–21 (habitus and male genitalia); Hongsuwong et al. 2022: 554, figs 29–39 (record in Thailand, habitus and male genitalia).

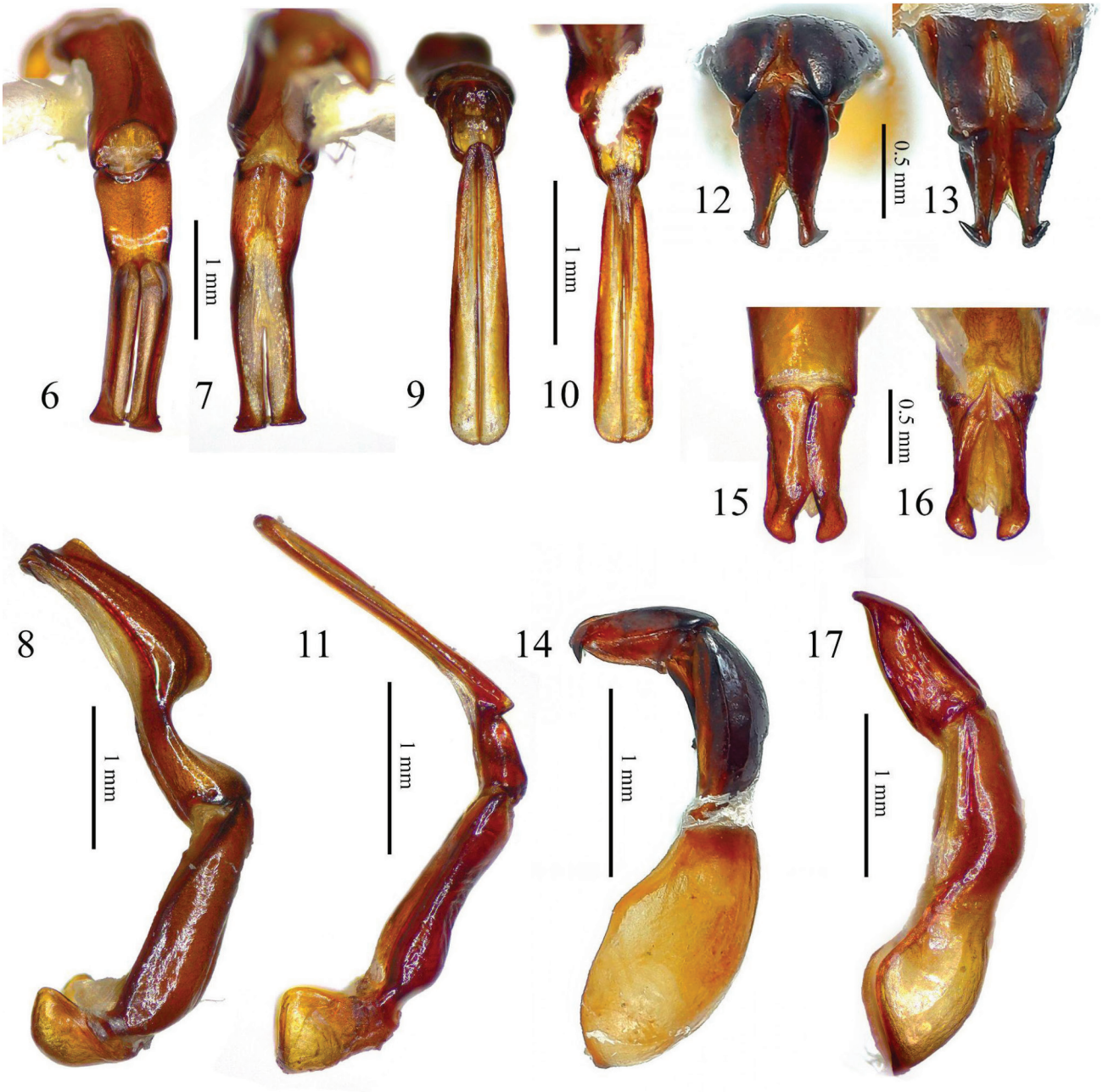
Parastasia sulcicollis Ohaus, 1911: 331 [original description; synonym of *P. bigibbosa* by Kuijten (1992: 33)].

Subpeltonotus andamanae Ghai, Chandra & Ramamurthy, 1988: 21, figs 1–12 [original description; generic synonym of *Parastasia* by Jameson & Wada (2004: 6); synonym of *P. bigibbosa* by Hongsuwong et al. (2022: 554)].

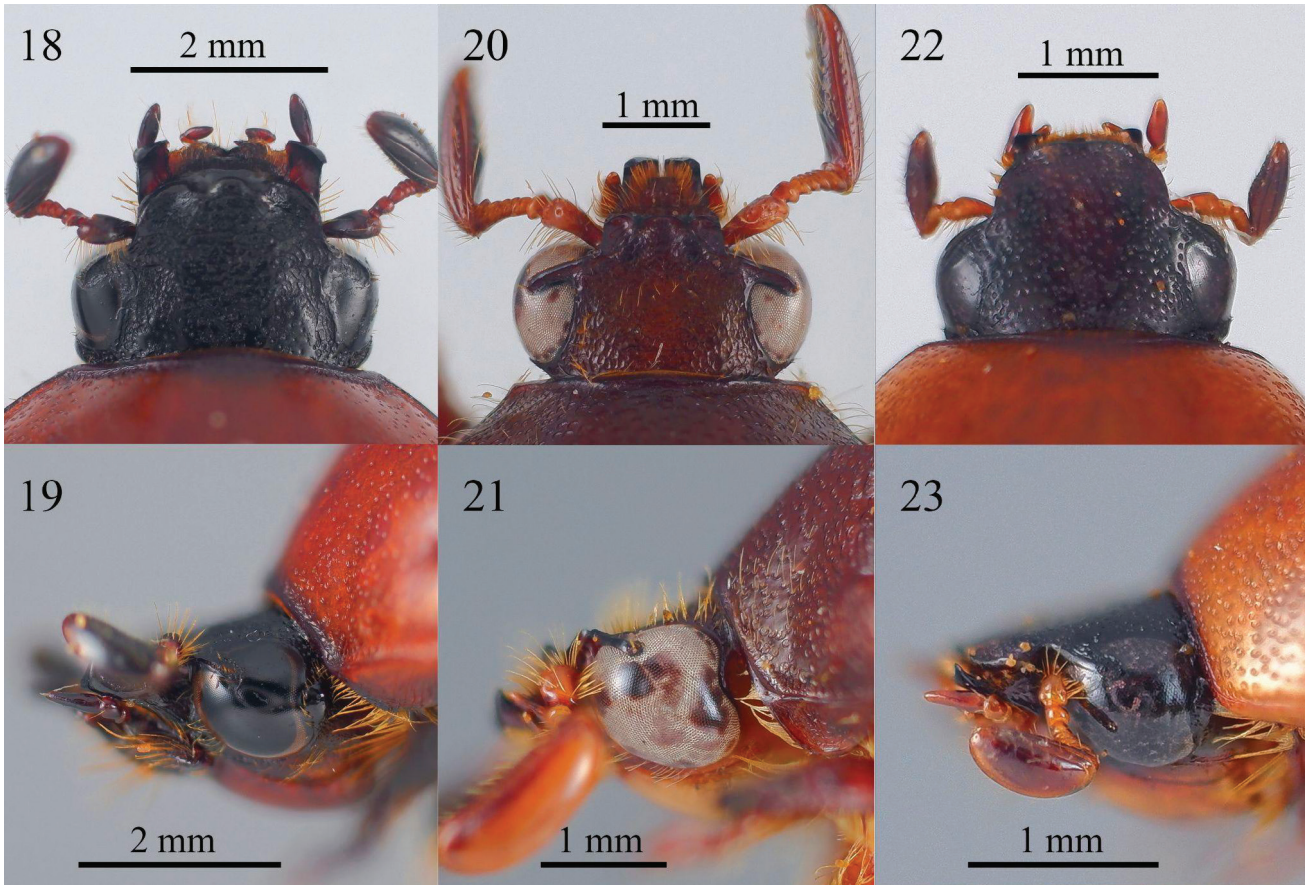
Remarks and distribution. According to Hongsuwong et al. (2022), *P. bigibbosa* was discovered in Malaysia [= Borneo Island], Thailand [= Kanchanaburi and Trat Provinces], and India [= Andamans Island]. Its current distribution appears to span from the Sundaic to the Indochinese Regions.

***Parastasia bimaculata* (Guèrin-Mèneville, 1843)** แมลงนูนลายแต้มคู่
(Fig. 47)

Barymorpha bimaculata Guèrin-Mèneville, 1843: 41, pl. XI, fig. 2 (original description; type locality: Pulo Pinang, Malay Peninsula).



Figs 6–17 – Male genitalia of Thai *Parastasia*, new records. **6–8**, *P. asahi*; **9–11**, *P. burmeisteri*; **12–14**, *P. dimidiata*; **15–17**, *P. kraatzi*; **6**, **9**, **12**, **15**, parameres in dorsal view; **7**, **10**, **13**, **16**, parameres in ventral view; **8**, **11**, **14**, **17**, aedeagus in lateral view.



Figs 18–23 – Head of Thai *Parastasia*. **18–19**, *P. sulcipennis*; **20–21**, *P. kraatzi*; **22–23**, *P. burmeisteri*; **18**, **20**, **22**, dorsal view; **19**, **21**, **23**, lateral view.

Parastasia bimaculata; Burmeister 1844: 376 (synonym *Barymorpha*); Westwood 1845: 99 (subgenus validation); Snellon van Vollenhoven 1864: 150 (listing); Ohaus 1898: 21 (*P. bimaculata* group); Ohaus 1900: 232, fig. 1 (*P. bimaculata* group, male genitalia); Ohaus 1914: 82 (record in Sinabang); Arrow 1917: 42 (re-description); Ohaus 1918: 33 (*P. bimaculata* group); Ohaus 1926: 111 (catalog); Ohaus 1932: 130 (record in Malay Peninsula); Ohaus 1934: 101 (*P. bimaculata* group); Ohaus 1935: 5 (catalog); Machatschke 1972: 40 (catalog); Kuijten 1992: 36, figs 25–29 (re-description, subspecies validation, key, parameres); Hongsuwong et al. 2022: 556, figs 40–50, 58 (record in Thailand, habitus and male genitalia).

Cyclocephala bimaculata Montrouzier, 1855: 23 [original description; synonym of *Barymorpha bimaculata* by Reiche (in Montrouzier 1860: 271)].

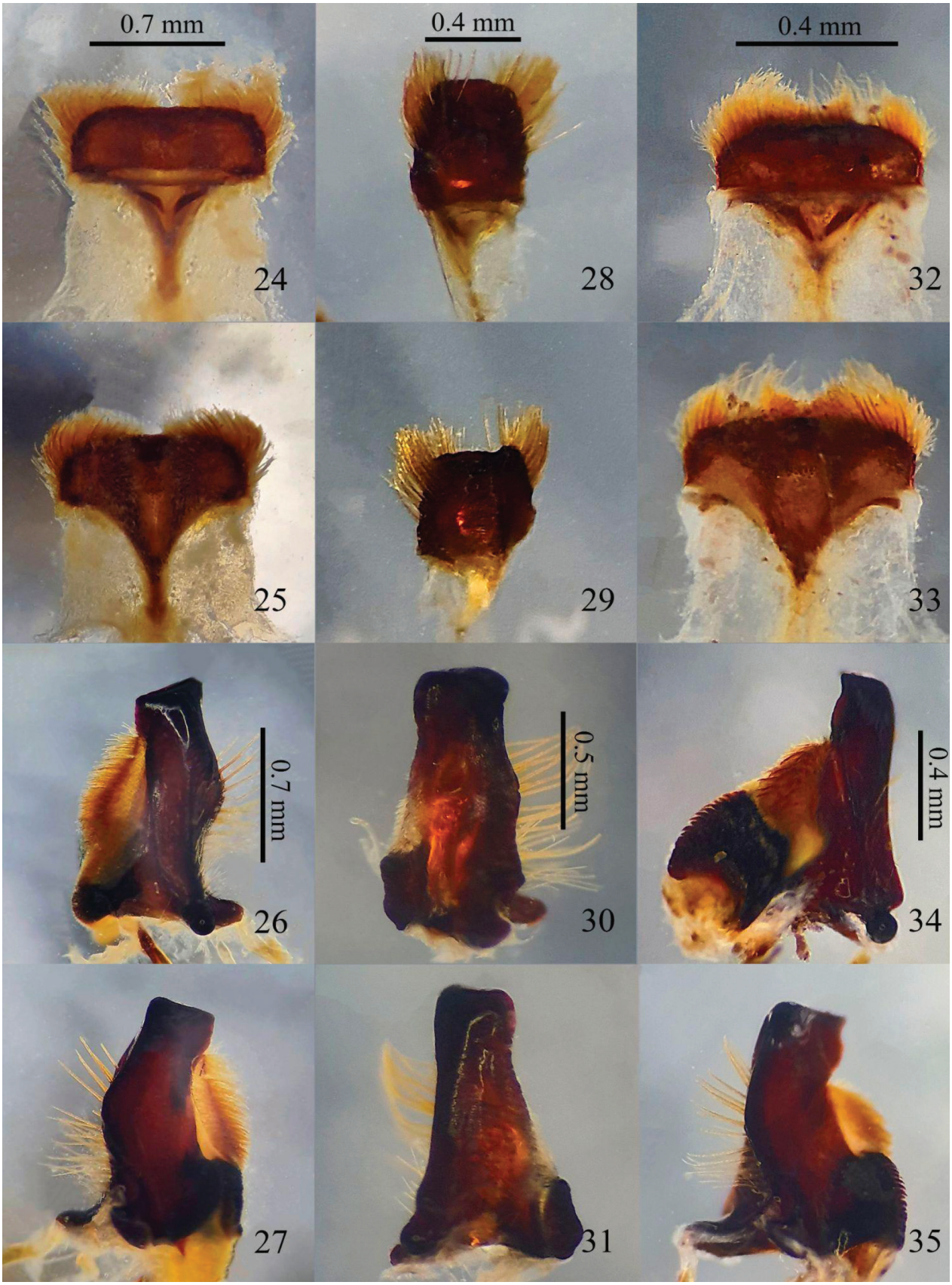
Material examined: Thailand: Trat Prov., Ko Chang Dist., Ko Chang Island, 10.II.2024, 1♀ (available images on iNaturalist ID ggll 2023); Nakhon Si Thammarat Prov., Khao Nan National Park, T. Methisuraphan leg., 10.III.2008, 1♀ (CTH).

Remarks and distribution. New records for this beetle were recently documented from Ko Chang, Trat Province, East Thailand (iNaturalist ID ggll 2023). Consequently, based on its distribution across India, Myanmar, East-South Thailand, Malaysia, Singapore, Indonesia, and the Philippines, its distributional range is one of the widest among *Parastasia* members. In Thailand, the sapro-xylophagous larvae were found in a rotten log from Nakhon Si Thammarat Province (Fig. 47).

***Parastasia birmana* Arrow, 1899** แมลงนูนหยักเหลือง

w*Parastasia birmana* Arrow, 1899: 481, pl. XVII, Figs 3–4 (original description; type locality: Burma); Ohaus 1900: 250, fig. 14 (*P. rufopicta* group, male genitalia); Arrow 1917: 38 (re-description); Ohaus 1918: 35 (*P. canaliculata* group); Ohaus 1934: 103 (*P. canaliculata* group); Paulian 1959: 83, fig. 16 (re-description); Machatschke 1972: 42 (catalog); Kuijten 1992: 42, figs 32–33 (re-description, key, male genitalia); Zorn 2006: 277 (catalog); Ek-Amnuay 2008: 192, fig S54 (habitus); Zorn & Bezděk 2016: 357 (catalog); Zhao 2019: 248 (listing); Hongsuwong et al. 2020: table 1 (listing); Hongsuwong et al. 2022: figs 51, 61–62 (habitus and male genitalia).

Material examined: Thailand: Chiang Mai Prov., Maetang Dist., Mon Ung Kate, V. Supakan leg., 20.IV.1975, 1♂ (THNHM); Nakhon Ratchasima Prov., Sakaerat En-



Figs 24–35 – Mouthparts of Thai *Parastasia***. 24–27**, *P. sulcipennis***; 28–31**, *P. kraatzi*; **32–35**, *P. westwoodii*; **24**, **28**, **32**, labrum in dorsal view; **25**, **29**, **33**, labrum in ventral view; **26**, **30**, **34**, mandible in dorsal view; **27**, **31**, **35**, mandible in ventral view.

vironmental Research Station, S. Pongsa leg., 26.II.1969, 1♂ (THNHM); Nakhon Ratchasima Prov., Pak Chong Dist., Khao Yai National Park, T. Jeenthong leg., 1–2. IV.2009, 4♂♂, 1♀ (THNHM); Chanthaburi Prov., Klung Dist., Khao Sa Bap, K. Thonglongya leg., 25.II.1967, 1♂, 1♀ (THNHM); Trat Prov., Ko Kut Dist., Khlong Yai Ki Waterfall, T. Jeenthong leg., 17.IV.2009, 1♂ (THNHM); Ratchaburi Prov., Suan Phueng Dist., Rabbit in the Moon Foundation, K. Jiaranaisakul leg., 2.VI.2024, 1♀ (RBMF); Ratchaburi Prov., Khao Krachom, 13°34'53.0"N, 99°10'46.5"E, K. Jiaranaisakul leg., 4.V.2024, 1♀ (RBMF); 1♀ (RBMF); Nakhon Si Thammarat Prov., Promkiri Dist., Thon Hong Subdist., 8°55′N, 099°81′E, C. Phothaworn leg., 21.V.2020, 1♂ (CTH); Phang Nga Prov., Takua Pa Dist., 19.V.2023, 1♀ (available images on iNaturalist ID goi-tkp 2023).

Remarks and distribution. Based on its distribution across China, Vietnam, Laos, Myanmar, Thailand, and Cambodia [= Kampuchea] (Kuijten 1992), *P. birmana*, the largest species of *Parastasia* in Thailand, is likely one of the most common Indochinese species.

***Parastasia discolor scutellaris* Erichson in Westwood, 1845** แมลงนูนสีดำแดง

Parastasia scutellaris Erichson in Westwood, 1845a: 98 (original description; type locality: Riau, near Sumatra); Erichson in Westwood 1845b: 101 (description); Ohaus 1900: 244, fig. 10 (*P. discolor* group, male genitalia); Ohaus 1918: 34 (*P. discolor* group); Ohaus 1934: 102 (*P. discolor* group); Machatschke 1972: 41 (catalog).

Parastasia discolor scutellaris; Kuijten 1992: 61, figs 68–69 (re-description, key, synonym of *P. discolor* and subspecies validation, parameres); Hongsuwong et al. 2022: figs 20–22, 26–28 (habitus and male genitalia).

Parastasia mirabilis Arrow, 1899: 488 [original description; synonym of *P. discolor scutellaris* by Kuijten (1992: 61)]).

Remarks and distribution. The taxon was first described from Sumatra, Indonesia (Westwood 1844). Its taxonomic status, along with that of *P. discolor* Westwood, 1841, was the subject of ongoing debate (Arrow 1899; Ohaus 1900). A later comprehensive revision reclassified it as a subspecies of *P. discolor*, determining that *P. mirabilis* and *P. discolor scutellaris* were indistinguishable. As a result, *P. mirabilis* was designated as a junior synonym, extending its known range from Sumatra to the Malay Peninsula (Kuijten 1992). In Wada's dissertation (Wada 2015), the species was recorded in Phang Nga Province, South Thailand, under the name *P. discolor mirabilis*. In addition, the priority of the taxon is the same as in *P. dimidiata*.

***Parastasia indica* Ohaus, 1898** แมลงนูนขาโตอินเดีย (Fig. 46)

Parastasia indica Ohaus, 1898: 9 (original description; type locality: Bengal Kalkutta); Ohaus 1900: 256, fig. 5 (*P. marginata* group, male genitalia), Ohaus 1905: 97 (listing); Arrow 1917: 43 (re-description); Ohaus 1918: 36 (*P. westwooodii* group); Ohaus 1934: 104 (*P. westwooodii* group); Paulian 1959: 84 (re-description); Machatschke 1972: 43 (catalog); Kuijten 1992: 91, figs 124–127 (re-description, key, clypeus and parameres); Zorn 2006: 277 (catalog); Zorn & Bezděk 2016: 357 (catalog); Zhao 2019: 244, figs 19–20, 23–26, 42–46 (habitus and male genitalia); Hongsuwong et al. 2020: table I (listing).

Parastasia fruhstorferi Ohaus, 1902: 57 [original description; synonym of *Parastasia indica* by Ohaus (1905: 97)].

Remarks and distribution. The species exhibits two distinct color morphs: a blackish variant, observed in India, Southwest China, Laos, and North Thailand, and a reddish variant, found from Southeast China to North Vietnam (Kuijten 1992; Zhao 2019). In Thailand, the species has been documented in the provinces of Nan and Chiang Mai (Wada 2015), with an intriguing discovery of additional blackish specimens found in a decaying log in Phetchabun Province, Central Thailand (Fig. 46).

***Parastasia masumotoi* Wada & Muramoto, 1999** แมลงนูนแดงเปลี่ยน

Parastasia masumotoi Wada & Muramoto, 1999: 170, figs 2–3, 7, 12–13 (original description); type locality: Wiang Papao, Chiang Mai); Hongsuwong et al. 2020: table 1 (listing); Hongsuwong et al. 2022: figs 54, 63–64, 69 (habitus and male genitalia).

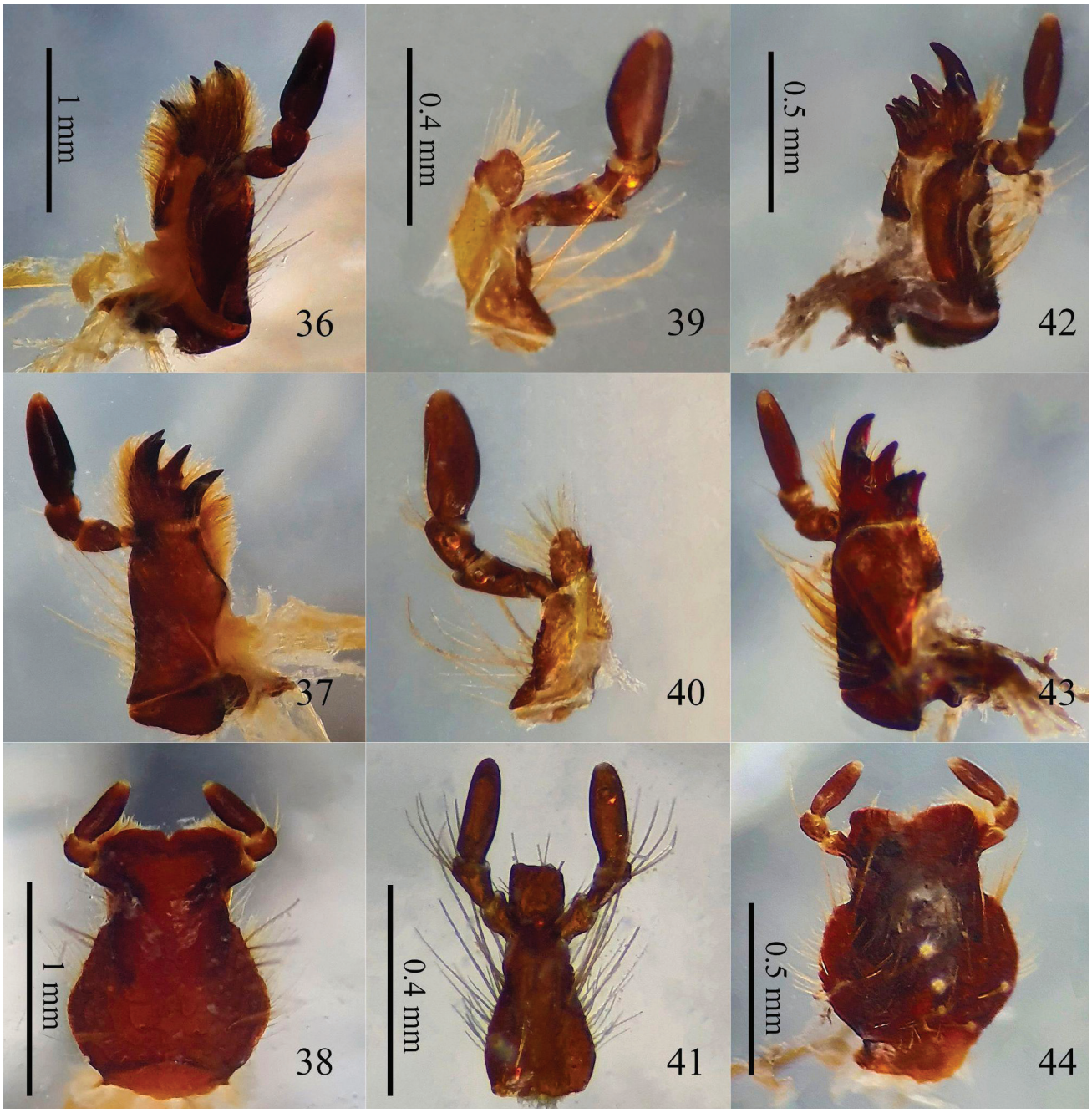
Parastasia alternata Arrow, 1899; Ek-Amnuay, 2008: 192 (misidentification).

Material examined: Thailand: Chiang Rai Prov., Wiang Pa Pao Dist., Khun Lao, R. Pornvannapet leg., 28.V.2019, 2♂♂ (CTH).

Remarks and distribution. *Parastasia alternata* Arrow, 1899 was locally recorded from Wiang Pa Pao by Ek-Amnuay (2008). However, it has been noted that this species is restricted to the Himalayan Region (Kuijten 1992; Zorn & Bezděk 2016; Zhao 2019). The diagnosis and recorded locality of *P. alternata* in Thailand differ from the specimens in those of earlier studies. Based on the locality, the recorded species may actually be *P. masumotoi*, which is endemic to Thailand. Additionally, the specimens used in this study were collected during the day.

***Parastasia spinosa* Hongsuwong, Jaitrong & Sanguansub, 2022** แมลงนูนสีชาดจันทบูร

Parastasia spinosa Hongsuwong, Jaitrong & Sanguansub, 2022: 548, figs 1–16 (original description; type locality: Soi Dao, Chanthaburi).



Figs 36–44 – Mouthparts of Thai *Parastasia*. **36–38**, *P. sulcipennis*; **39–41**, *P. kraatzi*; **42–44**, *P. westwoodii*; **36**, **39**, **42**, maxilla in dorsal view; **37**, **40**, **43**, maxilla in ventral view; **38**, **41**, **44**, mentum.

Parastasia selangorica Kuijten, 1992; Hongsuwong et al., 2020: table 1 (misidentification).

Remarks and distribution. *P. selangorica* Kuijten, 1992 was originally described from Malaysia and later reported in North and East Thailand (Wada 2015; Hongsuwong et al. 2020). However, a specimen from East Thailand was subsequently reidentified as *P. spinosa* (Hongsuwong et al. 2022). The occurrence of *P. selangorica* in North Thailand seems improbable, as there are no records of it being found in the regions between Malaysia and North Thailand. Consequently, we have decided not to include *P. selangorica* in this list of Thai species.

***Parastasia sulcipennis* Gestro, 1888** แมลงนูนนวลแดง
(Figs 18–19, 24–27, 36–38)
Parastasia sulcipennis Gestro, 1888: 113 (original description; type Locality: Teinzo, Burma); Ohaus 1900: 251 (*P. rufopicta* group); Arrow 1917: 43, figs 11–12 (re-description, habitus); Ohaus 1918: 35 (*P. canaliculata* group); Ohaus 1934: 103 (*P. canaliculata* group); Machatschke 1972: 43 (catalog); Kuijten 1992: 152, figs 247–249 (re-description,

key, parameres); Ek-Amnuay 2008: 194, fig. S56 (habitus); Hongsuwong et al. 2020: table 1 (listing); Hongsuwong et al. 2022: Figs 55, 65–66, 70 (habitus and male genitalia).

Material examined: Thailand: Chiang Rai Prov., Wiang Pa Pao Dist., W. Pathomwattananurak leg., 7.VI.2019, 3♂♂ (CTH and THNHM); Chiang Rai Prov., Wiang Pa Pao Dist., local collector leg., 11.V.2023, 9♂♂ (CTH and THNHM); Chiang Mai Prov., Mueang Dist., Chang Pueak Subdist., near Doi Suthep, 18°81′43.7″N, 98°95′66.4″E, S. Sribundit leg., 25.V.2024, 1♀ (CTH); Phetchabun Prov., Lom Kao Dist., local collector leg., 25.V.2024, 1♂ (CWP).

Remarks and distribution. Kuijten (1992) provided specimens with localities in India, Bangladesh, Myanmar, Laos, and North–Northeast Thailand. The male specimens in this study were all collected at elevations above 800 m during the day, while a female specimen was discovered in a lowland area (below 100 m).

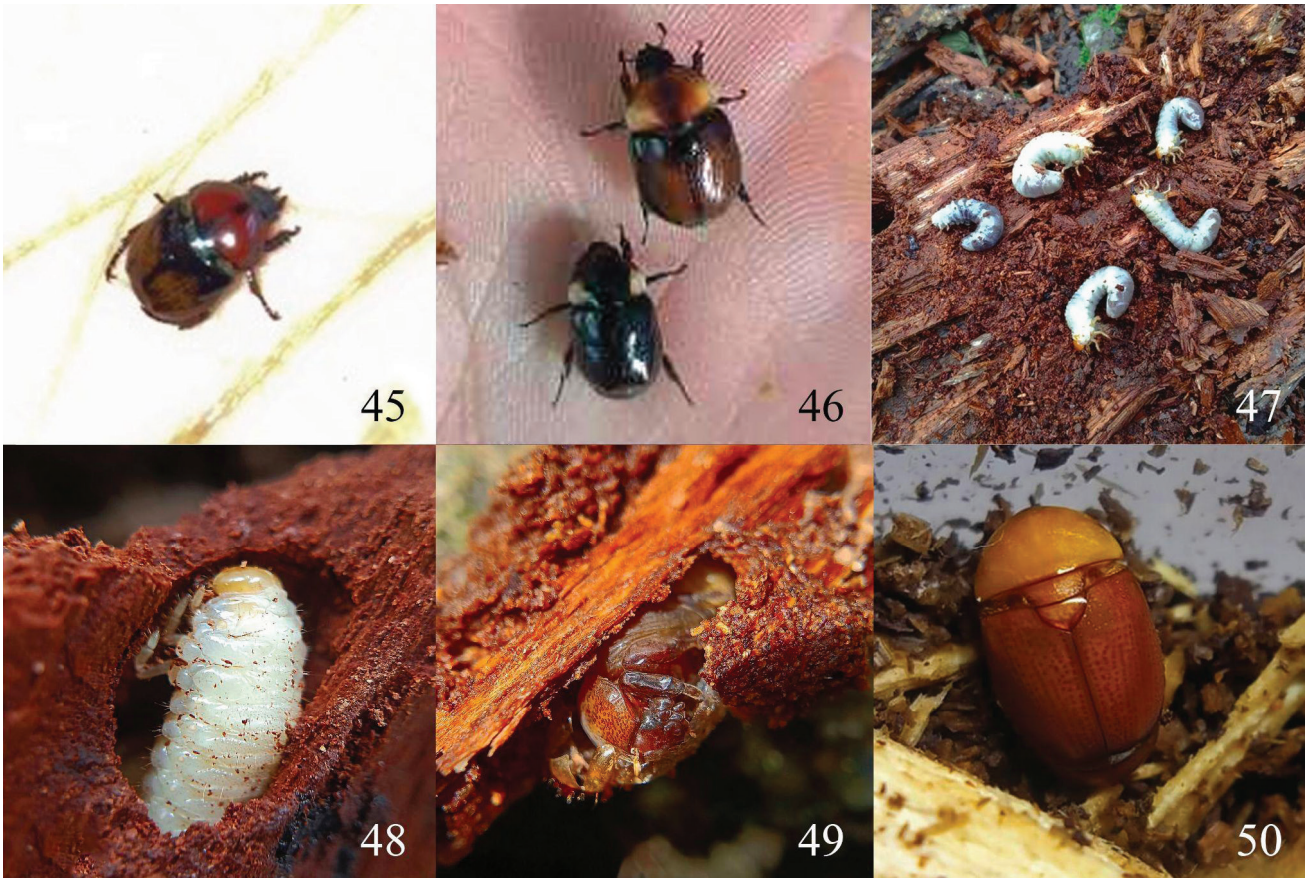
***Parastasia westwoodii* Westwood, 1841** แมลงนูนขาโตสีตาลไหม้
(Figs 32–35, 42–44, 48–49)

Parastasia westwoodii Westwood, 1841: 35 (original description; type Locality: Sumatra); Westwood 1842: 304 (description); Burmeister 1844: 374 (re-description); Westwood 1845: 96, Plate VI, fig. 1 (re-description); Kuijten 1992: 164, figs 261–265 (re-description, key, parameres); Hongsuwong et al. 2020: table 1 (listing); Hongsuwong et al. 2022: fig. 53 (female habitus).

Parastasia westwoodi; Ohaus 1898: 10 (misspelling, *P. bicolor* group); Arrow 1899: 495 (misspelling, re-description); Ohaus 1900: 252 (misspelling, *P. marginata* group); Ohaus 1918: 36 (misspelling, *P. westwoodii* group); Ohaus 1934: 104 (misspelling, *P. westwoodii* group); Machatschke 1972: 44 (misspelling, catalog).

Parastasia obscura Guerin-Méneville, 1843: 39 [original description; synonym of *Parastasia westwoodii* by (Kuijten 1992: 164)].
Parastasia sordida Sharp, 1881: 241 [original description; synonym of *Parastasia westwoodii* by Ohaus (1898: 10)].

Material examined: Thailand: Nakhon Si Thammarat Prov., Phrom Khiri Dist., Phrom Lok Subdist., C. Phothaworn leg., 12.XI.2021, larval instar 3 in rotten log, 21.XI.2021, emerged, 1♀ (CTH).



Figs 45–50 – Habitus of Thai *Parastasia*. **45**, *P. dimidiata*, Chumphon Prov. Photo by Kunut Polwichai (2017); **46**, *P. indica*, Phetchabun Prov. Photo by Jittathep Songsatparinyawong (2024); **47**, larval stage of *P. bimaculata*; **48–49**, prepupal and pupal stages of *P. westwoodii*; **50**, fresh emergence of adult *P. burmeisteri*.

Remarks and distribution. Apart from Malaysia, Indonesia, and the Philippines, Kuijten (1992) recorded this species once in Thailand, although he did not specify the precise locality. A specimen used in this study was collected from a red rotting log from South Thailand while in the larval stage and emerged as an adult in November (Figs 48–49).

Discussion

Despite the ongoing discovery of new taxa and distributional records of *Parastasia*, little else is known about this genus. Based on the collecting methods, which often involve capturing adults with light traps during Summer, members of *Parastasia* would appear as nocturnal phytophagous rutelines. However, relying solely on light trapping may not accurately reflect their behavior, as some specimens used in this study were collected during the day, and often diurnal insects are also attracted to artificial light at night (Shimoda & Honda 2013). Previous studies on some scarabs have used specific morphological traits to differentiate their circadian rhythms. Tocco et al. (2019; 2021) confirmed that body size, size of compound eyes, and shape of facets can indicate behavioral traits. Crepuscular and nocturnal species generally have larger body sizes and larger compound eyes compared to diurnal species, while large facets are characteristic of diurnal species. In this study, most *Parastasia* species exhibit relatively small compound eyes (0.70 > IOD: HW > 0.65) (Fig. 18). Notably, members of Ohaus's *P. westwoodii* group (*P. asahi*, *P. burmeisteri*, *P. indica*, *P. westwoodii*), along with *P. anomala* and *P. dimidiata*, possess distinctly narrow eyes (IOD: HW > 0.70) (Fig. 22). Conversely, members of the *P. confluens* group (*P. bigibbosa* and *P. kraatzi*) are characterized by larger eyes (IOD: HW < 0.60) (Fig. 20). These characteristics suggest that the majority of *Parastasia* species are diurnal, with the exception of the large-eyed species, which were mostly collected at night using light traps. However, further intensive studies of their actual behavior are necessary for confirmation

The structures of mouthparts are adapted to the feeding behavior and food sources (Karolyi et al. 2016). In the case of *Parastasia*, their mouthparts suggest that they consume a variety of plant materials with specific characteristics: 1) a broad labrum (Figs 24–25); 2) well-developed mandibles with a cutting edge incisor, a densely setose-spinose *lacinia mobilis*, and a well-developed serrated mola (Figs 26–27); 3) prominent galeal teeth, often covered with dense setae (Figs 36–37); and 4) a relatively broad labium (Fig. 38). However, the chewing behavior of the *P. confluens* group seems lacking, with features such as: 1) a tiny labrum (Figs 28–29); 2) narrow mandibles without a clear cutting edge incisor, a small lacinia mobilis with sparse setae, and a small edentate mola (Figs 30–31); 3) reduced maxillae, maxillary galea without large teeth, covered with long setae (Figs 39–40); and 4) a slender labium with large labial palps (Fig. 41). These characteristics suggest that this group may primarily feed on liquid food sources such as nectar or sap. In contrast, some species in the *P. westwoodii* group, such as *P. nigripennis* Sharp, 1888, and *P. gestroi* Ohaus, 1900, have been observed interacting with Araceae flowers. These species are attracted by heat and floral odors in the morning (Hoe et al. 2016; Kumano & Yamaoka 2006). The mouthparts of this group are specialized in chewing plant tissues, featuring: 1) mandibles with a notably cutting edge incisor, a large lacinia mobilis with prominent teeth, and a large serrated mola (Figs 34–35); and 2) well-developed galeal teeth without long setae (Figs 42–43). Members of this group may be specifically associated with flowers as visitors or pollinators

Sun et al. (2024) provided an in-depth description of the larval stage of *P. ferrieri* Nonfried, 1895, highlighting that the larvae are sapro-xylophagous, inhabiting decaying logs without causing agricultural damage. Our findings align with this observation, as we collected all larval, prepupal, pupal, and fresh adult specimens exclusively from white or red rotting logs (Figs 47–50). This supports the notion that *Parastasia* larvae do not behave as occasional pests. Instead, they play an important ecological role by decomposing dead wood, reinforcing their status as beneficial organisms rather than threats to vegetation.

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