

SHORT COMMUNICATION

***Minpolyphaga inexpectata*, a new genus and species of Polyphagini (Blattodea: Corydiidae: Corydiinae) from southeast China**

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Abstract. A new genus and species, *Minpolyphaga inexpectata* gen. & sp. nov. is described based on material collected from Zhangzhou City, Fujian Province, southeast China. *Minpolyphaga inexpectata* gen. & sp. nov. exhibits uniform colouration in the male, and a small-sized body in both sexes (13.7–15.8 mm in males, 12.8–13.5 mm in females), making it the smallest species of Polyphagini found in China.

Key words. Blattodea, Corydiidae, Corydiinae, *Minpolyphaga*, new genus, new species, Fujian, China

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Introduction

The subfamily Corydiinae, the nominotypical subfamily of Corydiidae, is currently classified into two tribes, Polyphagini and Corydiini. Polyphagini can be distinguished from Corydiini by the females being apterous (REHN 1951). As a typical group of Corydiidae, Polyphagini is mainly distributed in the Palearctic, Oriental and Nearctic Regions. Three genera and 23 species are known from China (QIU et al. 2019). *Eupolyphaga* Chopard, 1929 is the most abundant genus of Polyphagini in China, which includes 20 named species; while the genera *Polyphaga* Bolívar, 1882 and *Epipolyphaga* Qiu, Che & Wang, 2019 are represented in China by two and one species, respectively (QIU et al. 2018a, b, 2019).

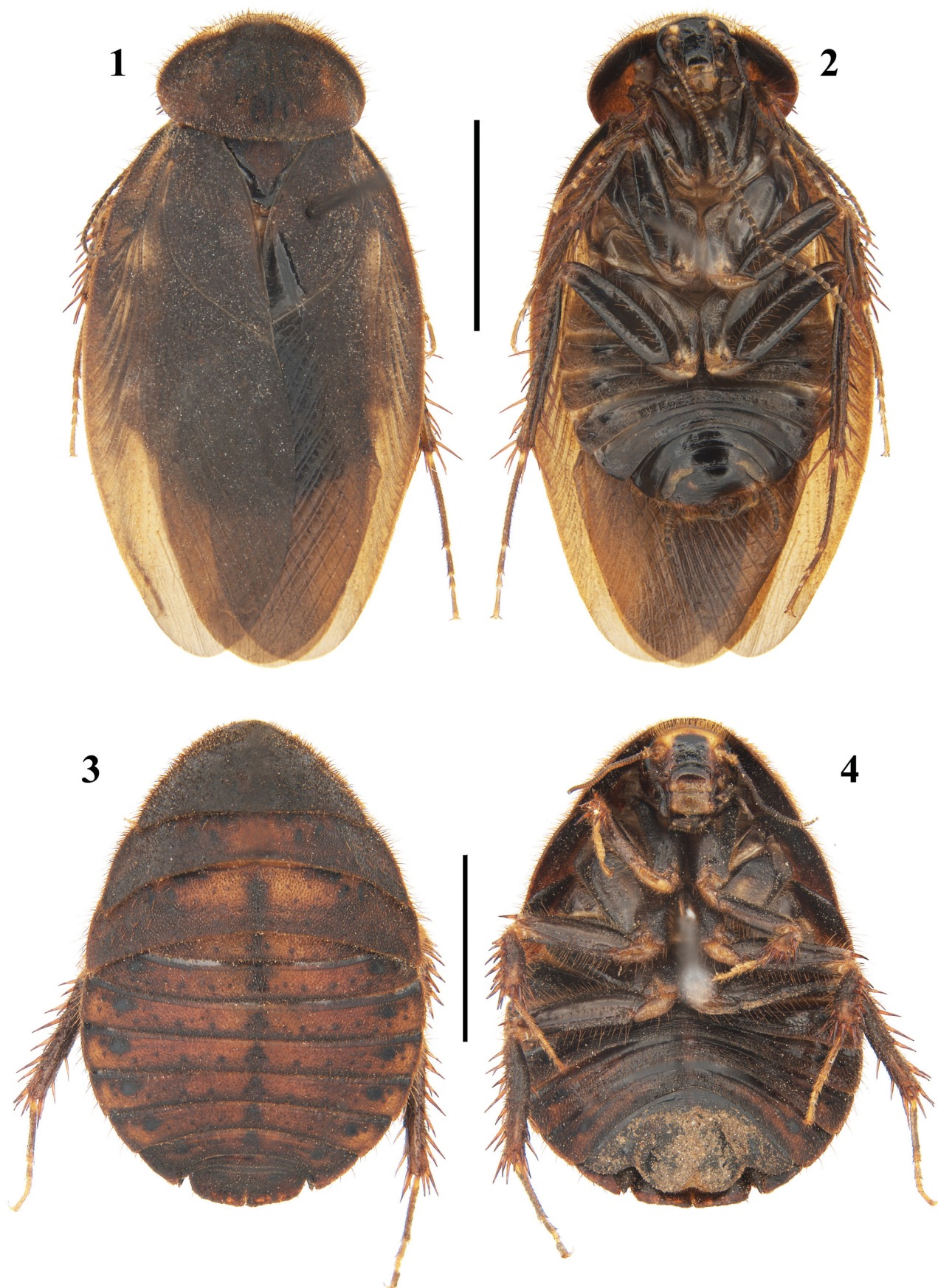
The hilly province of Fujian is located in southeast China. Reports on Corydiidae species from this province are scarce, among which, *Eucorydia dasytoides* (Walker, 1868) is the most frequently recorded species (WALKER 1868; KIRBY 1903, 1904; WU 1935; BEY-BIENKO 1954; PRINCIS 1963; ZHAO 1982; WOO et al. 1986; FENG & WOO 1999; QIU et al. 2017; LIU et al. 2017). One species of *Tivia* Walker, 1869 was also recently reported (LIU et al. 2017, QIU et al. 2019). *Eupolyphaga yunnanensis* (Chopard, 1922) was also mentioned from Fujian in FENG & WOO (1999), although this record requires confirmation, since this species is mainly recorded from the highlands of west China (QIU et al. 2018b).

During October 2017, the first author made a trip to Fujian, and obtained a Polyphagini species from Mt. Yundongyan, in Zhangzhou City. With abundant individuals being studied, the species is confirmed to be a new species belonging to a new genus. This discovery enriches the knowledge of Corydiidae in Southeast China, which is a poorly investigated area for Corydiidae, and raises the number of Chinese Polyphagini genera to four.

Material and methods

The type specimens and the additional materials of the new taxa are all deposited in the Institute of Entomology, Southwest University, Chongqing, China (SWU). Morphological terminology used in this paper mainly follows KLASS (1997) for the genitalia, LI et al. (2018) for wing venation, and ROTH (2003) for the remaining characters. The genital segments of the examined specimens were macerated in 10% NaOH and observed in glycerin jelly using a Motic K400 stereomicroscope and a Leica® M205A stereomicroscope. Drawings of venation were made with the aid of Adobe Photoshop® CS6. Photos of habitus, body characters, wing venation and genital segments were taken using a Leica® M205A stereomicroscope. All photographs mentioned above were modified in Adobe Photoshop® CS6 (for the white background, and increasing the brightness and desaturation).





Figs 1–4. *Minpolyphaga inexpectata* gen. & sp. nov., habitus. 1–2 – male holotype from Zhangzhou, Fujian (1 – dorsal view; 2 – ventral view). 3–4 – female paratype from Zhangzhou, Fujian (3 – dorsal view; 4 – ventral view). Scale bars: 5 mm.

Taxonomy

Minpolyphaga gen. nov.

Type species. *Minpolyphaga inexpectata* sp. nov., here designated.

Diagnosis. This new genus resembles *Eupolyphaga* in general appearance, but it can be readily distinguished from the latter by the following characters: 1) the body of both sexes is distinctly smaller from any species in *Eupolyphaga* (male: 13.7–15.8 mm in this new genus, 22.3–36.8 mm in *Eupolyphaga*; female: 12.8–13.5 mm in this new genus, 15.2–30.2 mm in *Eupolyphaga*); 2) in the male of *Minpolyphaga*, the eyes are small, wide apart, the interocular space is greater than the distance between ocelli, and sub-equal to the distance between antennal sockets, whereas in *Eupolyphaga*, the eyes are large, the interocular space is narrower than the distance between ocelli and the antennal sockets, sometimes sub-equal to the distance between ocelli; 3) in the female, the ocelli are absent in *Minpolyphaga*, but are present in *Eupolyphaga* (although they are reduced, in the form of two white spots); 4) the male tegmen is characterized by a narrowed anal area, while the corresponding area is not narrowed in *Eupolyphaga*; 5) the posterior margin of the male subgenital plate protrudes slightly, while in *Eupolyphaga* it is curved and somewhat concave; 6) phallomere L8 is provided with two sclerites, one of them distinctly stick-like, whereas *Eupolyphaga* possesses an L8 phallomere composed of a single lamelliform sclerite; 7) the R2 phallomere of *Minpolyphaga* is provided with two appendages, while the R2 of *Eupolyphaga* lacks them.

Description. Male. Body small. Head triangularly rounded; eyes wide apart, ocelli present, with ocellar ridge; frons flat, with two shallow pits between ocelli; antennae slender; clypeus divided into ante- and post-clypeus; labrum wide, distal margins round. Pronotum transversely oval, entirely covered with setae. Tegmina and wings fully developed, exceeding the end of abdomen (flyable); tegmina with Sc swelling present, anal area narrowed. Legs regular, antero-ventral margin of fore femur with sparse and short spines (type A); tarsal claws simple, symmetrical, arolia present. Supra-anal plate transverse, two small sclerites present, cerci short. Subgenital plate roundly quadrated, hind margin setose, styli small, similar, wide apart. Genitalia: L1 with wide apart hind lobes; L8 with two sclerites, one is lamelliform, the other is stick-like; R2 thickened, with a large boundary connected with R3, two appendages present under R2.

Female. Wingless, with typical appearance of Polyphagini, body covered with many long setae. Head large, rounded; eyes small, ocelli absent, antennae short. Legs short; arolia absent. Supra-anal plate transverse, hind margin emarginated medially, cerci short. Subgenital plate wide, apex protruded and bulged, with a small incision.

Etymology. *Min* [闽] refers to the provincial abbreviation of Fujian Province. *Minpolyphaga* means ‘Polyphagini cockroach from Fujian’. The gender is feminine.

Distribution. China (Fujian).

Remarks. This new genus can be assigned to the tribe Polyphagini due to the apterous females.

Key to genera of tribe Polyphagini from China

(males)

1. Tegmina without Sc swelling. *Polyphaga* Bolívar, 1882
- Tegmina with Sc swelling. 2
2. Arolia absent. *Epipolyphaga* Qiu, Che & Wang, 2019
- Arolia present. 3
3. Body large, 22.3–36.8 mm including tegmina; subgenital plate curved and slightly concave; R2 without two appendages. *Eupolyphaga* Chopard, 1929
- Body small, 13.7–15.8 mm including tegmina; subgenital plate slightly convex; R2 with two appendages. *Minpolyphaga* Qiu, Wang & Che, gen. nov.

Minpolyphaga inexpectata sp. nov.

(Figs 1–24)

Type material. HOLOTYPE: ♂ (SWU): CHINA: FUJIAN: ‘Yundongyan Scenery Spot [云洞岩风景区], Longwen District [龙文区], Zhangzhou City [漳州市], N24°30′03.88″, E117°44′43.57″, alt. 50–59 m, 16.X.2017, Lu QIU leg.’ PARATYPES: 8 ♂♂ 5 ♀♀ (SWU), same data as the holotype.

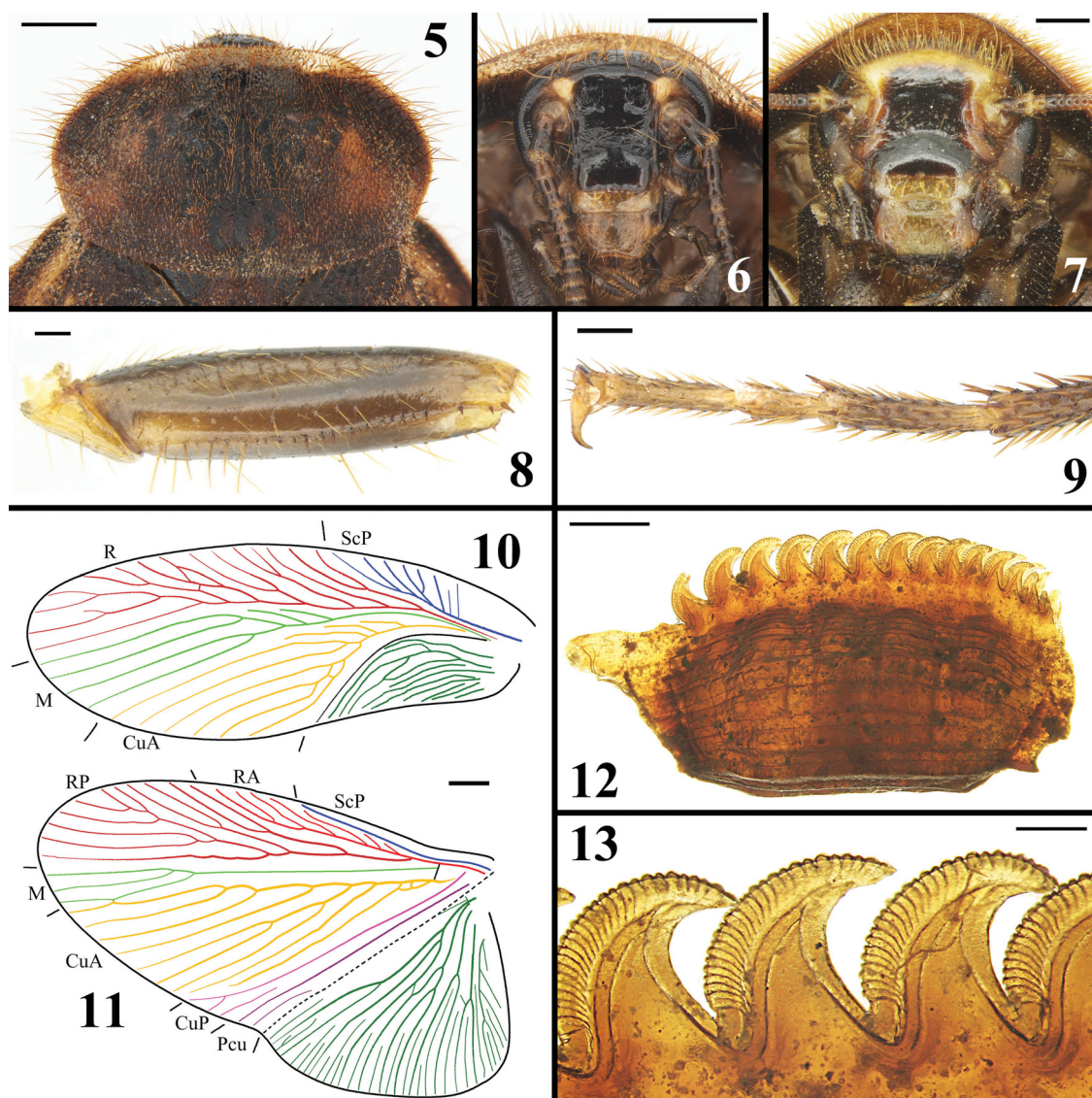
Additional material examined. Some nymphs and oothecae (SWU), same data as the holotype.

Description. Male (holotype). *General appearance.* Measurements (mm): body length 11.5, overall length including tegmina and wings 15.7, antennal length 8.5, pronotum length × width: 3.2 × 5.1, tegmen length: 12.7. Body small, dark brown; ocelli, ante-clypeus, labrum, anterior margin of pronotum, apex of coxae, trochanters, and base of the 1st tarsus yellowish (Figs 1–2).

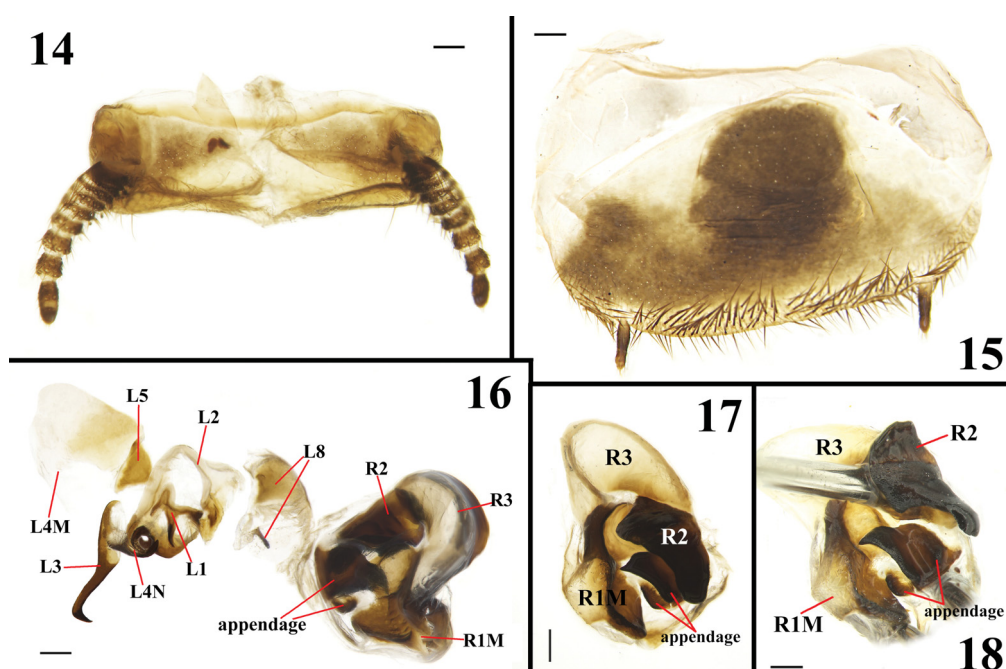
Head slightly exposed below pronotum, brownish black. Vertex setose, face raised, median slightly concave. Eyes small, wide apart, interocular space greater than the distance between ocelli, sub-equal to the distance between antennal sockets. Ocelli moderate in size, connected by an ocellar ridge (sparsely setose), under which there are two shallow pits. Antennae slightly shorter than the body length, antennomeres 1–9 smooth, the rest covered with short spinous pubescence. Post-clypeus small, smooth, the area above post-clypeus wrinkled; ante-clypeus wider than post-clypeus. Labrum quadrated, pubescent, concave at distal margin. Maxillary palpi and labial palpi dark brown, apical segment of maxillary palpi slightly enlarged (Fig. 6).

Pronotum transversely oval, widest in middle line, overall brown but anterior margin white-yellow; surface covered with many short spinous setae, anterior and lateral portions additionally with some long setae (Fig. 5).

Tegmina and wings exceeding the end of abdomen about 3.5 mm. Tegmina unicolored brown, apex rounded, Sc swelling present; ScP with many branches; R stretched toward tegmental apex; M bifurcated medially, each branch re-bifurcated, the four sub-branches generally paralleled; CuA with paralleled branches in apical portion. Wing with single ScP; RA with 6 short branches; RP stretched toward wing apex; M straight, apical portion with two branches, one of which fused with one branch of CuA; CuA with 8 paralleled branches; CuP and Pcu simple and long; anal area regularly fan-like (Figs 10–11).



Figs 5–13. Features of *Minpolyphaga inexpectata* gen. & sp. nov. 5 – pronotum, male; 6 – head, male; 7 – head, female; 8 – fore femur, male; 9 – part of tarsi and tarsal claws, male; 10 – tegmen; 11 – wing; 12 – ootheca; 13 – the serrations of oothecal. Scale bars: 1 mm for 5–7, 10–12; 0.2 mm for 8–9, 13.



Figs 14–18. Features of *Minpolyphaga inexpectata* gen. & sp. nov., male holotype. 14 – supra-anal plate, ventral view; 15 – subgenital plate, ventral view; 16 – genitalia, dorsal view; 17 – right phallomere (initial condition), right-ventral view; 18 – right phallomere (dissected), right-ventral view. Scale bars: 0.2 mm for all.

Legs. Surface with long setae; antero-ventral margin of fore femur with sparse and short spines, terminating in one larger spine (the terminal spine is only slightly larger than the rest of spines, the type of fore femur could be regarded as type A1) (Fig. 8); middle and hind femur with a large spine at apex; tarsus 1 longer than the total length of tarsi 2 to 5 in middle and hind legs, but sub-equal in length in fore legs; all segments of tarsus without spines at apex in fore legs, while with 2–4 spines at apex in tarsus 2–5 in middle and hind legs (tarsus 4 and 5 each usually with 4 spines, tarsus 2 and 3 each usually with two spines); pulvilli and arolia small (Fig. 9).

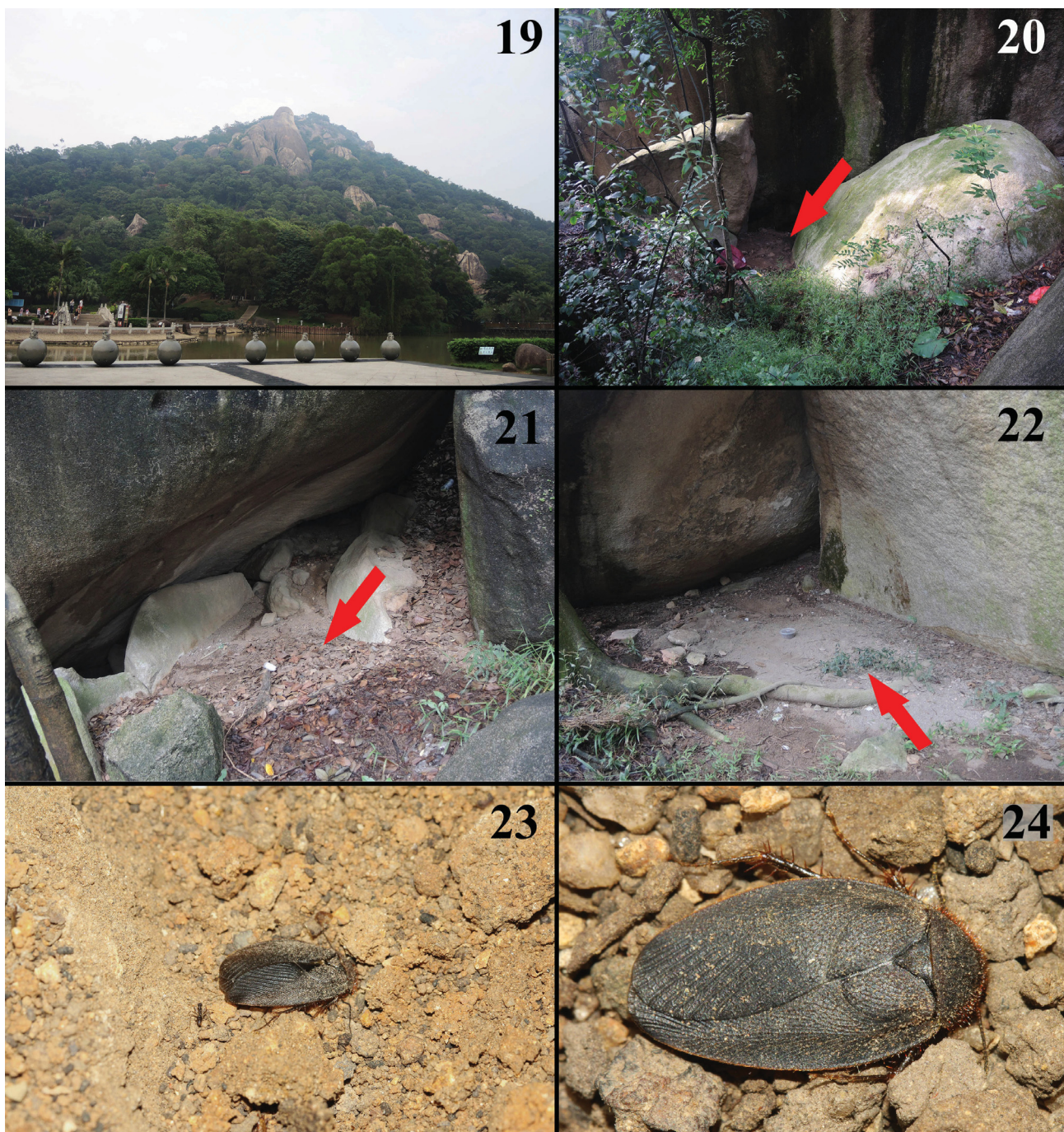
Abdomen. Supra-anal plate distinctly setose, apex slightly protruded; two median sclerites small; cerci short, apical segment oval (Fig. 14). Subgenital plate brownish

for the exposed part, styli symmetrical, slightly elongated (Fig. 15).

Genitalia: well sclerotized. Left phallomere: anterior of L1 protruded, with a long process towards its left side, hind portion with long lobes; L2 curved; L3 long, apex of hook sharp; pda (a process on the L4N) well developed, long; L4M lamelliform, thin; L5 triangular, slightly thickened; L8 large, with an additional stick-like process associated. Right phallomere: R1M hollowed, irregular; R2 irregular, with two irregular appendages (Figs 16–18).

Variation. Male paratypes similar to the holotype. Overall length 13.7–15.8mm.

Female. Length 12.8–13.5 mm. Apterous. Light brown to dark brown; in dorsal view, pronotum brown, mesonotum and metanotum yellowish brown medially, abdomen



Figs 19–24. Habitats of *Minpolyphaga inexpectata* gen. & sp. nov. 19 – Mt. Yundongyan, Zhangzhou, Fujian; 20–22 – microhabitat of the new species (indicated by red arrows); 23–24 – living adult males of *Minpolyphaga inexpectata* gen. & sp. nov. (all photos by Lu Qiu).

yellowish brown, with some small brown spots, each tergum with two large brown spots laterally, from metanotum to the apices with a brownish line; in ventral view, vertex yellow, trochanters and tarsi yellowish (Figs 3–4). Vertex with numerous yellow setae, eyes small (Fig. 7), antennae short. Pronotum semi-oval. Tarsomeres 2–5 with four spines at apex in middle and hind legs. Supra-anal plate emarginated medially. Hind margin of subgenital plate slightly arched and protruded medially.

Nymph. Similar to the female, usually light brown, with many dark brown spots.

Ootheca. Small (5.9–6.1 mm long, 2.9–3.2 mm wide), oval. Surface with longitudinal line, keel serrated, the serration curved, respiratory canals well developed in the serration (Figs 12–13). The size of the oothecae did not vary significantly in the examined samples.

Etymology. The species name is the Latin adjective *inexpectatus*, -a, -um referring to the unexpected discovery of the new species by the first author during his trip to Fujian.

Natural history. Individuals of the new species inhabit the typical environment of Polyphagini, i.e. beneath dry and loose soil under big stones in the forest (Figs 19–24). In the type locality, this species seems to have high population density and can be easily found in the soil. Sometimes the soil is covered by dead leaves; the microhabitat is sheltered from rain by big stones.

Distribution. China (Fujian Province).

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References

- BEY-BIENKO G. Y. 1954: Investigation of Blattoidea of Southeastern China. *Trudy Zoologicheskogo Instituta, Rossiyskaya Akademiya Nauk SSSR* **15**: 5–26 (in Russian).
- FENG P. & WOO F. 1999: (Blattaria). Pp. 41–61. In: HUANG B. K. (ed.): (*Fauna of Insects Fujian Province of China vol. 1*). Fujian Science and Technology Press, Fuzhou, 479 pp (in Chinese, English abstract).
- KIRBY W. F. 1903: Notes on Blattidae & C., with descriptions of new genera and species in the collection of the British Museum, South Kensington. No. 1. *Annals and Magazine of Natural History, Series* **7** **11**: 404–415.
- KIRBY W. F. 1904: *A synonymic catalogue of Orthoptera. Vol. 1. Orthoptera Euplexoptera, Cursoria, et Gressoria. (Forficulidae, Hemimeridae, Blattidae, Mantidae, Phasmodae)*. British Museum, London, 501 pp.
- KLASS K. D. 1997: The external male genitalia and the phylogeny of Blattaria and Mantodea. *Bonner Zoologische Monographien* **42**: 1–341.
- LI X. R., ZHENG Y. H., WANG C. C. & WANG Z. Q. 2018: Old method not old-fashioned: parallelism between wing venation and wing-pad tracheation of cockroaches and a revision of terminology. *Zoomorphology* **137**(4): 519–533.
- LIU X. W., ZHU W. B., DAI L. & WANG H. Q. 2017: *Cockroaches of Southeastern China*. Henan Science and Technology Press, Zhengzhou, 228 pp (in Chinese, English summary).
- PRINCIS K. 1963: (Blattariae: Suborde Polyphagoidea: Fam.: Homoeogamiidae, Euthyrrhaphidae, Latindiidae, Anacompsidae, Atticolidae, Attaphilidae; Subordo Blaberoidea: Fam. Blaberidae). Pp. 77–172. In: BEIER M. (ed.): *Orthopterorum Catalogus. Pars 4*. Uitgeverij Dr. W. Junk, s' - Gravenhage, 172 pp.
- QIU L., CHE Y. L. & WANG Z. Q. 2017: Revision of Eucorydia Hebard, 1929 from China, with notes on the genus and species worldwide (Blattodea, Corydioidea, Corydiidae). *ZooKeys* **709**: 17–56.
- QIU L., CHE Y. L. & WANG Z. Q. 2018a: Contributions to some Corydiinae genera (Blattodea: Corydioidea: Corydiidae) from China. *Journal of Natural History* **52**: 1433–1461.
- QIU L., CHE Y. L. & WANG Z. Q. 2018b: A taxonomic study of Eupolyphaga Chopard, 1929 (Blattodea: Corydiidae: Corydiinae). *Zootaxa* **4506** (1): 1–68.
- QIU L., YANG Z. B., WANG Z. Q. & CHE Y. L. 2019: Notes on some corydiid species from China, with the description of a new genus (Blattodea: Corydioidea: Corydiidae). *Annales de la Société Entomologique de France* **55**: 261–273.
- REHN J. A. G. 1951: Classification of the Blattaria as indicated by their wings (Orthoptera). *Memoirs of the American Entomological Society* **14**: 1–129.
- ROTH L. M. 2003: Systematics and phylogeny of cockroaches (Dictyoptera: Blattaria). *Oriental Insects* **37**: 1–186.
- WALKER F. 1868: *Catalogue of the Specimens of Blattariae in the Collection of the British Museum*. British Museum, London, 239 pp.
- WOO F. C., GUO Y. & FENG P. 1986: Notes on the genus Eucorydia of China (I). *Entomotaxonomia* **8**: 153–157 (in Chinese, English summary).
- WU C. F. 1935: *Catalogus Insectorum Sinensium, I*. The Fan Memorial Institute of Biology, Peiping, 367 pp.
- ZHAO X. F. 1982: *Checklist of Fujian insects*. Fujian Science and Technology Press, Fuzhou, 658 pp (in Chinese).