European Journal of Taxonomy 775: 1–14
https://doi.org/10.5852/ejt.2021.775.1539

ISSN 2118-9773
www.europeanjournaloftaxonomy.eu
2021 · Tshernyshev S.E.

Research article

urn:lsid:zoobank.org:pub:C57BC1CA-1ECF-41DC-B7B3-2D4DE8137E3F

Pectotibialis paghmanensis Tshernyshev gen. nov. – a new genus and species of soft-winged flower beetle (Coleoptera, Cleroidea, Malachiidae) from Afghanistan

Sergei E. TSHERNYSHEV [1,2]

[1] Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences, Frunze Street 11, 630091 Novosibirsk, Russia.

[2] Tomsk State University, Lenina prospekt 36, Tomsk 634050, Russia.

Email: sch-sch@mail.ru

urn:lsid:zoobank.org:author:C9CC4A86-BD1F-499A-B831-F727A111BBAA

Abstract. A new genus with a new species of soft-winged flower beetle, *Pectotibialis paghmanensis* Tshernyshev gen. et sp. nov. are described from Afghanistan. The new genus can be distinguished from the congeners of the tribe Apalochrini by the dark pectination in the apices of tibiae in both sexes, and the anterior tibiae which are hollowed at distal half, flattened and rounded femora, bituberculate basal parts of head and pronotum, two lamellate metathoracic appendages, tarsal comb above second tarsomere of anterior legs, and serrate antennae in the male. Based on the metathoracic appendages and comb in anterior legs would attribute this new species to the new genus *Dromanthomorphus* Pic, 1921, but all the other above-mentioned characters define its independent status and the designation of a new genus; *Pectotibialis* Tshernyshev gen. nov. The external appearance, special male characters and genitalia of the type species of the new genus are illustrated, and a distribution map is provided. A key to the *Apalochrus*-section of the tribe Apalochrini is provided.

Keywords. Afghanistan, soft-winged flower beetle, Apalochrini, *Pectotibialis*, new genus, new species, systematics.

Tshernyshev S.E. 2021. *Pectotibialis paghmanensis* – a new species and a new genus of soft winged flower beetle of the tribe Apalochrini (Coleoptera, Cleroidea, Malachiidae) from Afghanistan. *European Journal of Taxonomy* 775: 1–14. https://doi.org/10.5852/ejt.2021.775.1539

Introduction

Amongst the soft-winged flower beetles obtained by my colleague Oleg Pak in Afghanistan were several specimens of narrow, parallel-sided malachiids resembling representatives of the genus *Apalochrus* Erichson, 1840 and belonging to the tribe Apalochrini. The male has with a comb above the second tarsomere in the anterior legs, and this character allows this species to be placed near *Protapalochrus* Evers, 1987. Both genera, *Apalochrus* Erichson and *Protapalochrus* Evers, are distributed in Central Asia, and two species, *A. flavicollis* Schaufuss, 1870 and *P. (P.) fedtschenkoi* (Solsky, 1882), are known from Afghanistan (Mayor 2003, 2007; Tshernyshev 2015c, 2016b); however, the newly found taxon

differs from them by the monochromous dark colouration of its surface which lacks yellow-orange spots. Further study of the male has revealed characters previously unknown in any members of the tribe Apalochrini Mulsant & Rey, 1867. The metathorax is swollen and impressed in the middle, with two lamellate appendages located below, near distal edge, and above, closer to mesothorax. The metathoracic appendages allow placing this species near *Dromanthomorphus* Pic, 1921, but species of this genus have only one appendage at the base of metathorax which is not lamellate and a different shape, and they also have swollen intermediate tibiae. These characters show that the species found in Afghanistan is different from *Dromanthomorphus* Pic. Another genus of the tribe with a thorn-like metathoracic appendage, *Mimapalochrus* Tshernyshev, 2015, occurs in SE Asia and is distinguishable by the elytral apices impressed near the suture, swollen anterior and an intermediate femora, simple not emarginate anterior tibiae slightly widened posteriorly, the presence of pheromone glands on intermediate tibiae, and extremely large eyes. Hence, the newly found species does not belong to any known genera of the tribe Apalochrini and represents a new genus and new species.

The tribe Apalochrini unites soft-winged flower beetles with typical antennae possessing a second antennomere which is extremely small, round or oval, usually almost completely hidden by the scape, so that the antennae appear to be 10-segmented. The highest species diversity of the tribe occurs in SE Asia, Africa and Australia where species have a wide spectrum of male characters of importance to differentiate taxa. The taxonomic structure of the tribe has been recently discussed with special reference to southern Asian genera, and, a number of recent articles devoted to, or pertaining to, the Malachiidae Fleming, 1821 fauna of the Himalayas and an area of south-east Asia and Australia have been published (Yoshitomi 2008, 2010, 2014; Asano & Kojima 2009, 2013, 2014; Tshernyshev 2009, 2012b, 2015a–e, 2016a–d, 2018, 2020a–c; Asano & Kawashima 2010; Yoshitomi & Lee 2010; Asano & Yoshitomi 2011; Asano *et al.* 2011a, 2011b, 2018; Geiser 2011; Asano 2013a, 2013b, 2015, 2017, 2018; Asano & Okajima 2013; Plonski 2013, 2014a, 2014b, 2015, 2016, 2017; Plonski & Geiser 2014; Plonski & Michael 2014; Plonski & Puchner 2014; Constantin 2015; Liu *et al.* 2015, 2016, 2017; Yoshitomi *et al.* 2015; Tshernyshev & Kopetz 2018; Tshernyshev & Shcherbakov 2020); however, further revision is still necessary to clarify our knowledge of the taxonomy.

Amongst those genera currently known in the tribe Aplochrini, four generic groups are considered, namely *Apalochrus*-group (*Apalochrus* Erichson, 1840, *Paratinoides* L. Medvedev, 1964, *Protapalochrus* Evers, 1987, *Pectapalochrus* Tshernyshev, 2016, *Oculapalochrus* Tshernyshev, 2015), *Collops*-group (*Collops* Erichson, 1840, *Protocollops* Evers, 1991, *Troglocollops* Wittmer, 1965, *Simoderus* Abeille de Perrin, 1891), *Laius*-group (*Laius* Guérin-Méneville, 1831, *Intybia* Pascoe, 1866, *Troglointybia* Tshernyshev, 2015, *Dicranolaius* Champion, 1921, *Eulaius* Wittmer, 1996), and *Dromanthomorphus*-group (*Dromanthomorphus* Pic, 1921, *Hadrocnemus* Kraatz, 1895, *Mimapalochrus* Tshernyshev, 2015). Representatives of the four groups can be divided into two sections based on the modification of the basal antennomeres in the male. A key to the genera of the tribe Apalochrini with simple unmodified 1st, 3rd and/or 4th antennomeres, the *Apalochrus*-section, is given below. The species from Afghanistan discussed above belongs to this section; the key to the other section is given in another article, currently awaiting publication.

However, the complex of male special characters for the new Afghanistan species necessitates a new genus, *Pectotibialis* Tshernyshev gen. nov., as described below, with *Pectotibialis paghmanensis* Tshernyshev sp. nov. selected as the type species.

Material and methods

For descriptions, special male structures and genitalia were studied; 'special male structures' refer to the sculptured head and pronotum, swollen, impressed and appendiculate metathorax, and excavate anterior tibiae. Illustrations for the species were prepared using specimens from the type locality:

Pectotibialis paghmanensis Tshernyshev sp. nov. holotype, male and paratype, female — Afghanistan, Kabul Province, near Paghman village.

The specimens are currently deposited in the following institution, which is subsequently referred to by the acronym:

SCH_ISEA = the author's collection, which is housed in the Institute of Animal Systematics and Ecology, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia.

The beetles were studied using an Amscope trinocular stereomicroscope (Ultimate Trinocular Zoom Microscope 6.7X-90X Model ZM-2TY), and digital photographs were taken using a Carl Zeiss Stemi 2000 trinocular microscope and the AxioVision programme. Male genitalia, embedded in DMHF (Dimethyl hydantoin formaldehyde), were mounted onto a transparent card and pinned under the specimen.

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Suborder Polyphaga Emery,1886
Superfamily Cleroidea Latreille, 1802
Family Malachiidae Fleming, 1821
Subfamily Malachiinae Fleming, 1821
Tribe Apalochrini Mulsant & Rey, 1867

Pectotibialis Tshernyshev gen. nov.
urn:lsid:zoobank.org:act:D03DBCE5-498E-4993-97EF-C0F6B741D9E4

Type species

Pectotibialis paghmanensis Tshernyshev sp. nov. fixed by monotypy in the present paper.

Diagnosis

Moderately small sized (ca 3.8–4.1 mm) soft-winged flower beetles with the body elongate, narrow, parallel-sided, slightly expanded posteriorly, with two or three apical ventrites of the abdomen not covered by elytra. Metallic green upperside with yellow or yellow-brown parts, i.e., labrum, labium, mandibles, palpi, mouthparts and antennae, tibiae and tarsi in all legs, coxae and trochanters of anterior legs and areas of joining between them in intermediate and posterior legs. Antennae weakly flabellate, not long, expanding over the base of elytra, with the 3rd antennomere wide triangular. Head small, narrower than pronotum, interocular area slightly impressed and sculptured, frons tuberculate, eyes simple, not large, slightly protruding. Pronotum almost completely equilateral, narrowly transverse, impressed near basal margin, disk convex with wide subtriangular tubercle in the middle and looking bituberculate, basal side and basal half of lateral sides slightly flattened and distinctly marginate, and anterior side indistinctly marginate. Elytra parallel or slightly widened just below the middle, not covering two or three apical segments of the abdomen, coarsely punctured, with distinct and weakly protruding shoulders; apices evenly rounded, simple. Hind wings normally developed (in both sexes). Anterior tarsi with distinct transverse small comb above the 2nd tarsomere and wide triangular 1st tarsomere; claws very short and hidden by round transparent plates at base. Anterior tibiae strongly excavate dorsally in apical half with elongate tip looking like initial tarsomere, not swollen; intermediate and posterior tibiae simple, not

swollen or emarginate, with the setae similar to that in tarsal comb arranged in apical edge near tarsus. Femora wide, roundly swollen, anterior with a dent in middle. Anterior trochanters oval and impressed to the basal half of the femur.

Metathorax swollen and impressed in the middle with two appendages, one lamellate transverse above, and the other longitudinal with a vertical round semi-transparent plate at apex. Pygidium elongate, equilateral, evenly rounded distally, ultimate abdominal ventrite bilaciniate, narrow, transverse, evenly narrowed dorsally and emarginate in the middle, aedeagus simple, weakly curved dorsally, narrow, with elongate narrow apical lamella, endophallus with a few denticles at apex of inner sac, tegmen long, narrow, with thin, short pointed parameres.

Comparison

Special male characters differentiating *Pectotibialis* Tshernyshev gen. nov. from all other members in the tribe Apalochrini are given in the key below. The new genus is similar to the genera *Dromanthomorphus* Pic and *Oculapalochrus* Tshernyshev in the presence of appendages on the metathorax and tarsal comb above the second tarsomere in the anterior legs of the male, but typical characters that differentiate it are as follows: distinguished from *Dromanthomorphus* Pic by simple, not widened intermediate tibiae and from *Oculapalochrus* Tshernyshev by simple eyes; the strongly excavate anterior tibiae in combination with the abbreviated elytra of the new genus are different from both genera.

Notes

This species and genus are known only from Afghanistan, Central Asia.

List of species in the genus Pectotibialis:

1. *P. paghmanensis* Tshernyshev gen. et sp. nov. (Afghanistan: Paghman).

Pectotibialis paghmanensis Tshernyshev sp. nov.
urn:lsid:zoobank.org:act:93EC6FFD-B1D1-409F-B12A-081E1D5B96F5
Figs 1–2

Material examined

Holotype

AFGHANISTAN • ♂; Kabul Province, near Paghman village, 34°35′ N, 68°57′ E, 2600 m a.s.l.; 12 Jul. 2009; O. Pak leg.; SCH_ISEA_000123.

Paratypes

AFGHANISTAN • 6 ♀; same collection data as for holotype; SCH_ISEA_000124–129.

Description

Holotype, male (Fig 1A–B)

Body. Elongate, subparallel, slightly expanded posteriorly, elytra not covering two ultimate segments of the abdomen.

Labrum, labium, mandibles, palpi, mouthparts and antennae. Yellow-brown, except for black spots on upper side of the 1st antennomere (Fig. 2D), tibiae and tarsi in all legs, coxae and trochanters in anterior legs and commissure parts between them in intermediate and posterior legs and membranes of abdominal ventrites yellow, other body parts black–brown; upper surface of head, pronotum and elytra with a weak green metallic tint. Surface evenly covered with yellow-white dense fine long erect and curved hairs. Vesicles white-yellow, and thoracic mesepimera black.

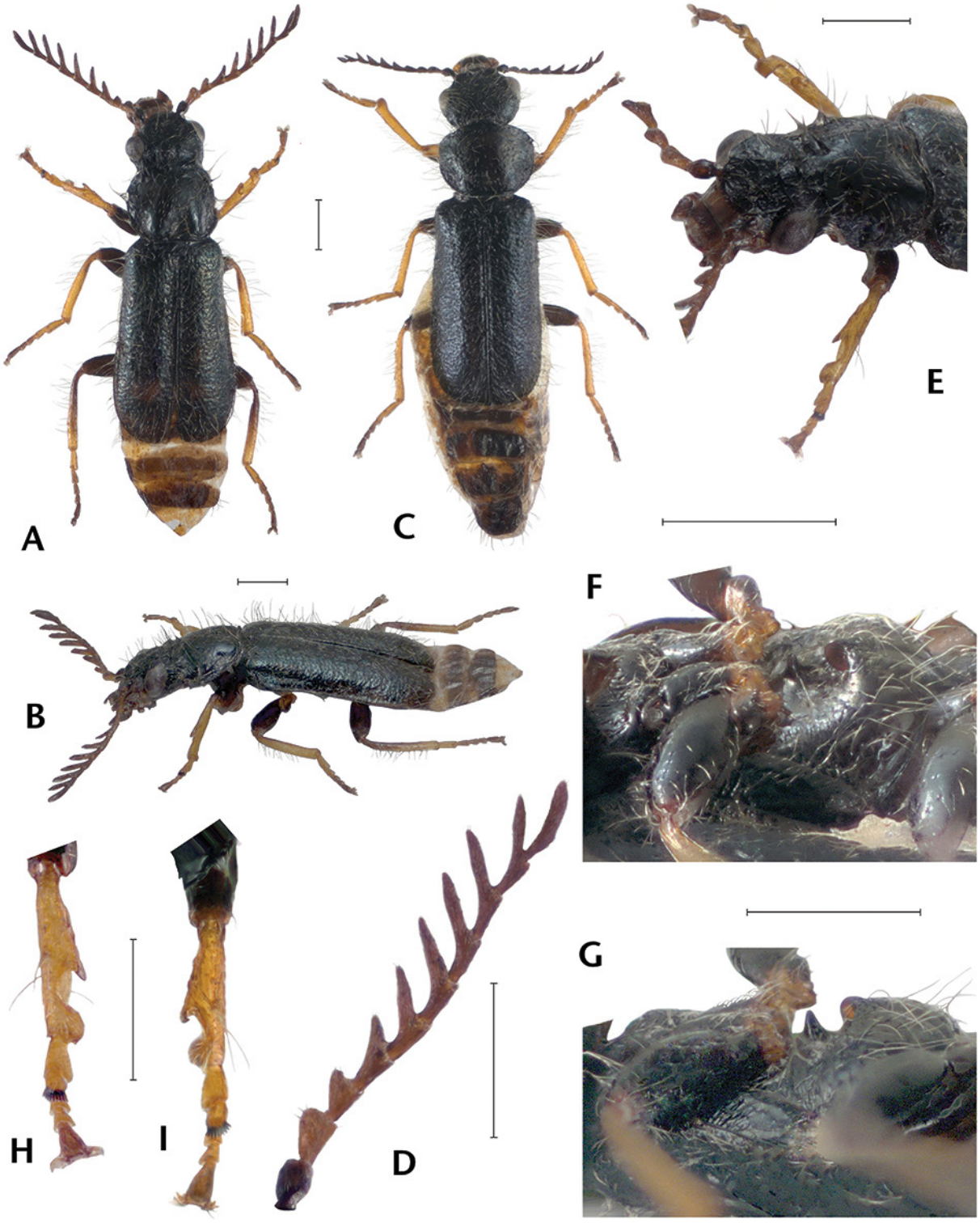

Fig. 1. *Pectotibialis paghmanensis* Tshernyshev gen. et sp. nov. **A, B, D–I**. Holotype, ♂ (SCH_ISEA_000123). **C.** Allotype, ♀. **A**, **C**. External appearance, dorsal view. **B**. External appearance, lateral view. **D**. Right antenna. **E**. Head, pronotum and scutellum, subdorsal view. **F**. Metathorax, subdorsal view. **G**. Metathorax, lateral view. **H**. Left anterior tibia and tarsus, ventral view. **I**. Left anterior tibia and tarsus, dorsal view. Scale bars: 0.5 mm.

Head. Not wider than pronotum, interocular area slightly impressed and edged with thin carina, frons with two tubercles, eyes small, oval, weakly protruding; genae short and straight; clypeus narrow, transverse, straight; labrum narrow, transverse; palpae simple with apical segment slightly widened and securiform; surface of head dull, sparsely indistinctly punctured lacking microsculpture, evenly covered with light fine long and curved pubescence.

Antennae. Weakly flabellate from 6th to 11th antennomeres (Fig. 1D), 1.7 mm long, reaching the base of elytra; 1st antennomere enlarged, round-oval, 2nd antennomere small, round, almost completely invisible, hidden by the 1st antennomere, 3rd and 4th antennomeres triangular, the 3rd is 1.2 times as long and wide as the 4th antennomere, 5th antennomere triangular with elongate outer edge and is as long as the 3rd antennomere, but considerably narrower than it, 6th to 10th antennomeres with extended outer edges, apical segment elongate, thin, subcylindrical, slightly curved in basal third; surface evenly covered with short, yellow-white adpressed pubescence with single erect longer light hairs on outer sides of the antennomeres.

Pronotum. Almost completely equilateral, narrowly transverse impressed near basal margin, disk convex with wide subtriangular tubercle in a middle and look bituberculate at base; anterior margin slightly convex; posterior margin straight; lateral sides almost completely straight with rounded angles; basal side and basal half of lateral sides slightly flattened and distinctly marginate, anterior side indistinctly marginate; surface glabrous, with sparse smoothed punctures lacking microsculpture, evenly covered with fine long curved light hairs.

Scutellum. Small, triangular with rounded tip, almost completely covered by pronotum, sparsely punctured and covered with light semi-erect hairs.

Elytra. Oblong, parallel or slightly widened just behind the middle and evenly rounded distally, not covering three apical segments of the abdomen, at base not wider than pronotum; humeri small, slightly protruding; apices evenly rounded, simple; disc indistinctly marginate on external sides and along suture, lateral edge in middle near epipleura slightly impressed; surface dull, coarsely punctured and wrinkled, with smoothed microsculpture, evenly covered with yellow-white long erect hairs.

Hind wings. Normally developed.

Legs. Not long; posterior femora not reaching elytral apices; anterior tibiae not swollen but widened distally and with a strong rectangular excavation inwardly in apical half so that the tip of the tibiae looks like a 1st tarsomere (Fig. 1H–I), intermediate and posterior tibiae simple, not swollen or emarginate, with the setae similar to that in tarsal comb arranged in apical edge near tarsus, femora wide, roundly swollen, anterior with tooth in middle (Fig. 2A–B), anterior trochanter oval and impressed to the basal half of the femur, all tarsi 5-segmented, slightly compressed and elongate, 2nd tarsomere in anterior tarsi with small transverse comb above, the 1st tarsomere enlarged, triangular, 1.3 times as long as the 2nd tarsomere, 2 times as long as the 3rd tarsomere and 3 times as long as the 4th tarsomere, claw-segment flattened, as long as the 1st tarsomere, claws very short and thin, almost completely hidden by round semi-transparent membrane at base. Surface of legs covered with light short semi-erect pubescence and sparse white long erect hairs.

Ventral body surface. Sparsely punctured, shining, evenly and sparsely covered with long, fine, semi-erect white hairs; metathorax swollen and complicatedly sculptured: impressed in a middle, and with two protuberances, one lamellate transverse above, and the other longitudinal and possessing vertical round semi-transparent plate at apex (Fig. 1F–G). Pygidium slightly elongate, almost equilateral, evenly rounded distally, with long dark erect hair on outer side (Fig. 2C), ultimate abdominal ventrite is bilaciniate, narrow, transverse, evenly narrowed dorsally and emarginate in the middle (Fig. 2D), aedeagus simple, weakly curved dorsally, narrow, with elongate narrow and ventrally curved apical lamella, endophallus with three

denticles at apex near lamella (Fig. 2F), tegmen long, narrow, with thin and short pointed parameres those are 2.3 times as short as the base of tegmen (Fig. 2G).

Length. 3.8 mm, width (at elytral base) 0.8 mm.

Female differs in having simple head and pronotum lacking sculpture, anterior tarsi simple, lacking a comb above the 2nd tarsomere, antennae dentate with the 3rd and 4th antennomeres narrow-triangular, and of the equal shape and length, anterior tibiae lacking excavation, but with stretched outer edge bearing the 1st tarsomere, anterior femora lacking tooth, metathorax evenly convex lacking appendages, inner side of the apex of anterior and intermediate tibiae with a row of setae similar to that in tarsal comb of male, abdomen long, with four segments extending beyond apex of the elytra.

Length. 4.3 mm, width (at elytral base) 1.0 mm.

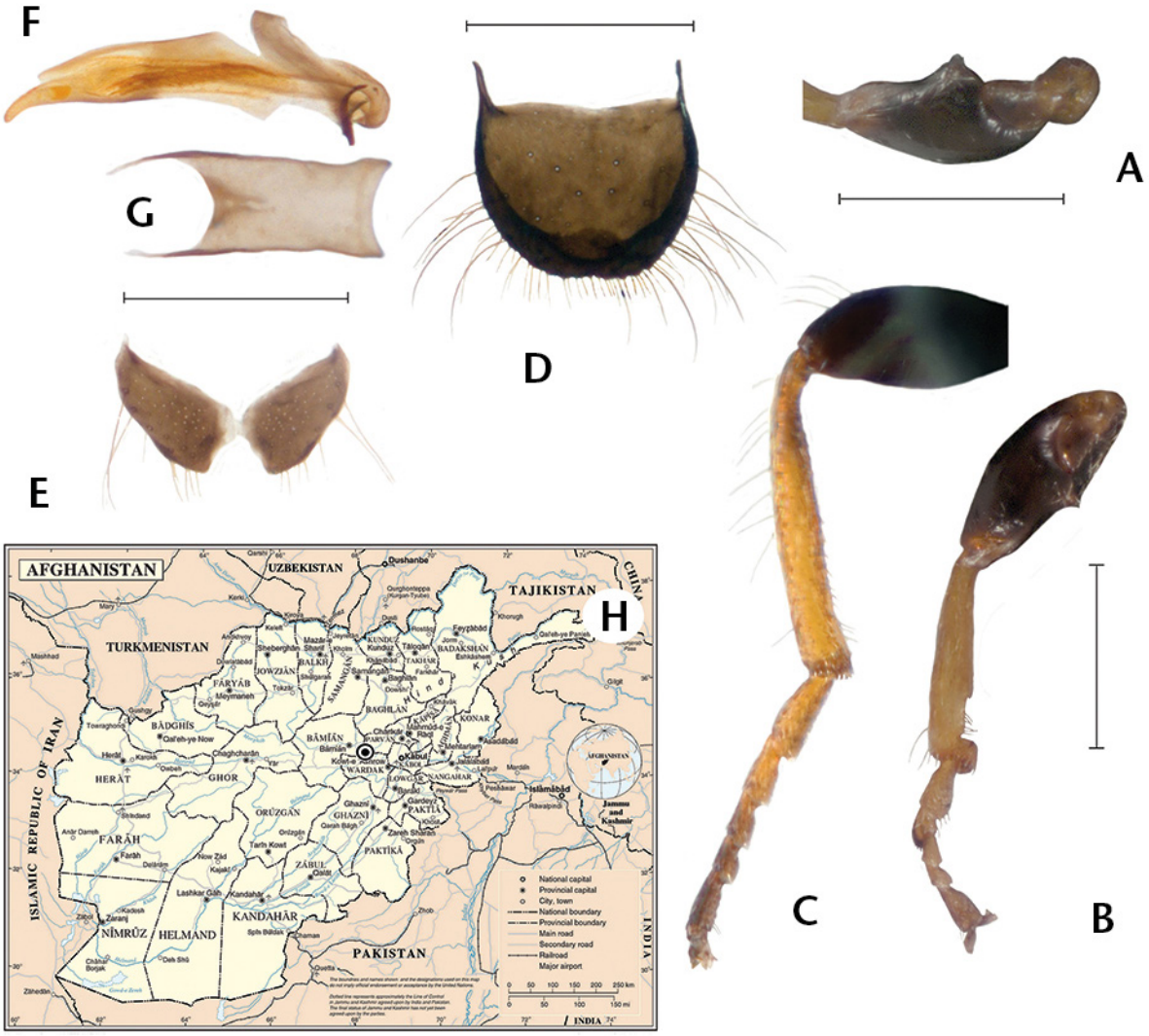

Fig. 2. *Pectotibialis paghmanensis* Tshernyshev gen. et sp. nov., holotype, ♂. **A**. Femur of left anterior leg. **B**. Left anterior leg, ventral view. **C**. Left intermediate leg, ventral view. **D**. Pygidium. **E**. Ultimate abdominal ventrite. **F**. Aedeagus, dorsal view. **G**. Tegmen. **H**. Distribution map. Scale bars: 0.5 mm.

Distribution

Known from type locality only, Afghanistan: Paghman environs (Fig. 2H).

Key to the genera of the tribe Apalochrini with simple not modified 1st, 3rd and 4th antennomeres

1. Male special structures are indistinct, antennae filiform or flabellate 2
– Male special structures distinct and located on head, antennae, pronotum, metathorax, sternites or legs 10
2. Second segment of anterior tarsi lacking a comb above, elytra with green or blue metallic lustre ..... ***Apalochrus*** Erichson, 1840
– Second segment of anterior tarsi with a comb above, elytra entirely black, sometimes with metallic lustre 3
3. Body of staphylinoid shape, narrow, black, lacking metallic lustre, elytra strongly shortened and not covering abdomen, wings reduced, antennae filiform ..... ***Paratinoides*** Medvedev, 1964
– Body typical of Malachiidae, elytra completely covering the abdomen 4
4. Anterior tibiae simple, not widened or impressed, antennae flabellate of filiform 5
– Anterior tibiae widened or impressed distally, antennae flabellate 9
5. Antennae filiform 6
– Antennae flabellate 7
6. Antennomeres simple, not widened and slightly flattened, lacking impressions or grooves, anterior femora simple, lacking emarginations; surface of the body covered with long erect and short adpressed black pubescence ..... ***Protapalochrus*** Evers, 1987
– Intermediate 3rd and 6th antennomeres widened, dorsal side of 5th–10th antennomeres sulcate in middle, anterior femora with oval emargination in apical half covered with white pubescence; surface of the body covered with short semi-erect and adpressed black-brown pubescence ..... ***Acroapalochrus*** Tshernyshev, 2020
7. Pronotum simple, lacking longitudinal grooves ..... ***Pectapalochrus*** Tshernyshev, 2016
– Pronotum bisulcate in middle ..... ***Airomalachius*** Pic, 1950
9. Anterior tibiae compressed and widened in apical half, intermediate tibiae impressed and flattened in outer side with weakly widened and curved apices, pronotum convex and narrowly depressed at base, elytra and pronotum uniformly dark with green or blue metallic lustre and covered with long erect grey hairs ..... ***Mesapalochrus*** Tshernyshev, 2020
– Anterior tibiae slightly widened anteriorly and weakly impressed dorsally, intermediate tibiae simple, not widened and not flattened, pronotum convex, not depressed at base, orange with longitudinal green-bronze stripe in a middle, elytra orange-yellow, each with two bronze metallic oval-triangular spots, surface covered with short erect fine white pubescence ..... ***Nudopectinus*** Evers, 1987
10. Anterior tibiae simple, not widened or emarginate, male special structure is located in apical half of the pronotum as transverse fissure with elevate side and protuberance behind, anterior tarsi with a comb above the 2nd tarsomere, posterior tibiae slightly but distinctly swollen in basal fourth ..... ***Simoderus*** Abeille de Perrin, 1891
– Anterior tibiae slightly but distinctly widened, simple or emarginate, pronotum simple or with protruding process in anterior side, male special structures located in femora or tibiae, head, metathorax or abdominal ventrites; anterior tarsi with a comb above 2nd tarsomere or lacking it 11
11. Anterior tibiae simple, not emarginate, anterior tarsi with a comb above 2nd tarsomere 15
– Anterior tibiae emarginate at apical part, anterior tarsi with a comb above 2nd tarsomere or lacking it 12
12. Head with emarginations and protuberances, antennae serrate or flabellate, abdomen simple 13
– Head simple, lacking emarginations and protuberances, antennae filiform 14
13. Pronotum with narrow horn-like process protruding over the head, antennae serrate ..... ***Troglolaius*** Wittmer, 1952
– Pronotum simple, antennae flabellate ..... ***Trogloapalochrus*** Pic, 1919

14. 4th and 5th abdominal ventrites modified and with thorn-like process in the middle 15
– 4th and 5th abdominal ventrites simple, lacking process 16
15. Intermediate tibiae slightly widened and swollen, with the inner side emarginate at apical quarter, trochanters of anterior legs simple ..... ***Opisthapalochrus*** Evers, 1987
– Intermediate tibiae simple, not widened or emarginate, trochanters of anterior legs dentate .....***Spinapalochrus*** Pic, 1919
16. 2nd tarsomere in anterior legs with a comb above 17
– 2nd tarsomere in anterior legs lacking a comb above, antennae serrate, anterior tibiae evenly emarginate, intermediate tibiae widened and narrowly emarginate, with pheromone glands ..... ***Mesopezus*** Jacobson, 1911 (= ***Epitinus*** Evers, 1987)
17. Eyes extremely large, antennae flabellate 18
– Eyes simple, not large 19
18. Metathorax swollen with appendage in the middle, elytral apices impressed near suture, anterior and intermediate femora swollen, intermediate tibia slightly widened posteriorly and possessing pheromone glands ..... ***Mimapalochrus*** Tshernyshev, 2015
– Metathorax weakly swollen, lacking appendage in a middle, elytral apices not impressed, simple, all legs simple, not widened or curved, without glands ..... ***Oculapalochrus*** Tshernyshev, 2015
19. Metathorax strongly swollen and possessing gladiate or rudimentary appendage with hairs in the middle 20
– Metathorax slightly swollen, lacking appendage or hairs 18
20. Anterior tibiae slightly emarginate, intermediate tibiae swollen with apical margin simple and lacking setae, pronotum and head simple, lacking relief sculpture, metathorax possesses gladiate appendage in the middle directed to intermediate coxae, elytra completely covering the abdomen .....***Dromanthomorphus*** Pic, 1921 (= ***Pectinus*** Evers, 1987)
– Anterior tibiae deeply emarginate in apical quarter, apical margin of anterior and intermediate legs surrounded with pectinate setae similar to that in tarsal comb; intermediate tibiae slightly widened, not stout, with longitudinal groove within, pronotum with protuberance in basal half, forehead bituberculate, metathorax slightly swollen and impressed in the middle with two appendages, one lamellate transverse above, and the other appendage longitudinal with vertical round semi-transparent lamellate apex below, elytra not covering two apical segments of the abdomen .....***Pectotibialis*** Tshernyshev gen. nov.
21. Anterior tibiae strongly modified, deeply emarginated with lamellate processes, inner spurs of the anterior legs modified, antenna flabellate or filiform 22
– Anterior tibiae slightly widened or weakly emarginate, simple, spurs short and simple, antenna filiform 23
22. 1st tarsomere in anterior legs enlarged and compressed, leaf-shaped, dorsally with a row of golden hairs forming a tuft, 2nd tarsomere very short, almost completely covered by the vane-shape longitudinal comb, anterior tibiae strongly emarginate, with a stretched apex bearing enlarged hook-like spur, intermediate tibiae strongly widened and modified, emarginate within and possessing a row of long hairs inside the emargination, antennae flabellate .....***Hapalochrops*** Bourgeois, 1908
– 1st tarsomere in anterior legs slightly enlarged and swollen, round-quadrate, 2nd tarsomere with a simple short comb above, outer spur in anterior tibiae long and strong, thorn-like, intermediate tibiae with deep emargination in apical quarter, and a long narrow appendage bearing hair tuft in apex of inner side of the emargination, antennae filiform .....***Tibipectinus*** Tshernyshev, 2020
23. Anterior tibiae weakly widened distally, not emarginate, intermediate tibiae widened in apical half and sulcate in the middle of inner side, lacking emarginations .....***Protopectinus*** Tshernyshev, 2020
– Anterior tibiae weakly emarginate in dorsal or ventral side, intermediate tibiae stout and emarginate or thin and not emarginate 24
24. Anterior tibiae emarginate in dorsal side, intermediate tibiae strongly dilate and convex, with triangular perpendicular process in a middle of inner side and strongly emarginate beneath it .....***Hadrocnemus*** Kraatz, 1895

– Anterior tibiae emarginate in ventral side, intermediate tibiae not widened and with a row of long erect thin hairs on inner side ..... ***Setapalochrus*** Evers, 1988

Discussion

38 genera are currently listed in the tribe Apalochrini worldwide, of which 23 genera, *Acroapalochrus* Tshernyshev, 2020, *Airomalachius* Pic, 1950, *Apalochrus* Erichson, 1840, *Dromanthomorphus* Pic, 1921 (= *Pectinus* Evers, 1987), *Hadrocnemus* Kraatz, 1895, *Hapalochrops* Bourgeois, 1908, *Mesapalochrus* Tshernyshev, 2020, *Mesopezus* Jacobson, 1911 (= *Epitinus* Evers, 1987) (Tshernyshev, 2003), *Mimapalochrus* Tshernyshev, 2015, *Nudopectinus* Evers, 1987, *Oculapalochrus* Tshernyshev, 2015, *Opisthapalochrus* Evers, 1987, *Paratinoides* Medvedev, 1964, *Pectapalochrus* Tshernyshev, 2016, *Pectotibialis* Tshernyshev gen. nov., *Protapalochrus* Evers, 1987, *Protopectinus* Tshernyshev, 2020, *Setapalochrus* Evers, 1988, *Simoderus* Abeille de Perrin, 1891, *Spinapalochrus* Pic, 1919, *Trogloapalochrus* Pic, 1919, *Troglolaius* Wittmer, 1952 and *Tibipectinus* Tshernyshev, 2020, are belonging to the group "with simple not modified 1st, 3rd and 4th antennomeres in male*"* and 15 genera, *Collops* Erichson, 1840, *Dicranolaius* Champion, 1921, *Eulaius* Wittmer, 1996, *Flabellolaius* Wittmer, 1952, *Heterolaius* Champion, 1920, *Intybia* Pascoe, 1866, *Laius* Guérin-Méneville, 1831 (= *Nossibeus* Evers, 1994), *Myrmecospectra* Motschulsky, 1858 (= *Myrmecophasma* Bourgeois, 1885), *Notointybia* Liu, Ślipiński & Pang, 2020, *Protocollops* Evers, 1991, *Stenolaius* Wittmer, 1995, *Syndesmolaius* Evers, 1986, *Zelotypus* Abeille de Perrin, 1900, *Troglocollops* Wittmer, 1965 and *Troglointybia* Tshernyshev, 2015, belong to the group "with specific male structures located on 1st, 3rd and/or 4th antennomeres".

Representatives of the first group are typical residents of Eurasia, Indo-China, South East Asia, Australia and Africa with high species diversity in southern regions (Tshernyshev 2011, 2012a). Species of the second group are also occurring in these regions, but most diverse in Australia and also represented in American continent. Due to the absence of their fragments in fossil remains, the tribe Apalochrini can be considered as the youngest in the family Malachiidae, and, probably originated from the tribe Illopini, that is also similar to Malachiini due to the small size of the second antennomere. The wide species distribution, from Africa to Arctic region of Eurasia, allows a high evolutionary potential of the tribe in adaptation to different type of habitats to be assumed. The tribe is at present being actively studied, and the description of several new species from southern regions is to be expected in the nearest future. The present generic revision can help in the understanding of the taxonomic diversity of the family Malachiidae and the remarkable tribe Apalochrini.

Acknowledgments

The author is grateful to Dr Roman Yakovlev (Barnaul State University, Russia) for his help in obtaining the Malachiidae, to Mr Oleg Pak (Donetsk, Ukraine) for collecting soft-winged flower beetles in Afghanistan, to Isidor Plonski (Vienna, Austria) for help regarding literature sources and discussion of Malachiidae taxonomy, and to Prof. Mark Seaward (Bradford University, UK.) for advice and linguistic revision of the text. This study was supported by the Russian Foundation for Basic Research (grant no. 19-04-00465-a), as well as the Program of Basic Scientific Research (FNI) of the State Academies of Sciences, project no. 0247-2021-0004.

References

Asano M. 2013a. Early instar larvae of *Intybia niponicus* (Lewis) (Coleoptera, Malachiidae) and comparison with a clerid lst instar: the foetomorphic larva in Malachiidae, II. *Japanese Journal of Systematic Entomology* 19 (1): 21–27.

Asano M. 2013b. New combinations and redescriptions of six species of the tribe Ebaeini Portevin (Coleoptera, Malachiidae) in Japan. *Japanese Journal of Systematic Entomology* 19 (2): 275–284.

Asano M. 2015. Taxonomic notes on some Malachiid beetles of Taiwan, with description of a new species of the genus *Intybia* Pascoe (Coleoptera: Malachiidae). *Japanese Journal of Systematic Entomology* 21 (1): 77–82.

Asano M. 2017. Morphology and biology of *Malachius prolongatus* (Coleoptera: Melyridae: Malachiinae). *Acta Entomologica Musei Nationalis Pragae* 57 (2): 603–615. https://doi.org/10.1515/aemnp-2017-0092

Asano M. 2018. Taxonomy and biology of the genus *Attalus* Erichson of Japan with description of the new species (Coleoptera: Melyridae). *Japanese Journal of Systematic Entomology* 24 (1): 55–66.

Asano M. & Kawashima I. 2010. Discovery of the genus *Dicranolaius* (Coleoptera, Malachiidae) from Japan with description of a new species. *Japanese Journal of Systematic Entomology* 16 (2): 261–266.

Asano M. & Kojima H. 2009. On the mature larvae of the genus Laius (Coleoptera, Malachiidae) from Japan. Japanese Journal of Systematic Entomology 15 (2): 481–486.

Asano M. & Kojima H. 2013. Description of the early instars of *Laius asahinai* Nakane (Coleoptera: Malachiidae): first discovery of a foetomorphic larva in Malachiidae. *The Coleopterists Bulletin* 67 (1): 40–45. https://doi.org/10.1649/072.067.0109

Asano M. & Kojima H. 2014. Occurrence of the genus *Hypomixis* Wittmer, 1995 in Japan (Coleoptera: Malachiidae). *Japanese Journal of Systematic Entomology* 20 (2): 301–303.

Asano M. & Okajima Sh. 2013. First record of the genus *Dromanthomorphus* (Coleoptera, Malachiidae) from Laos, with notes on the sexual dimorphism. *Japanese Journal of Systematic Entomology* 19 (2): 257–260.

Asano M. & Yoshitomi H. 2011. The larva of *Carphurus pengaronae* Champion (Coleoptera, Malachiidae, Carphurinae). *Japanese Journal of Systematic Entomology* 17 (2): 225–229.

Asano M., Kawashima I. & Satou F. 2011a. Taxonomic status of *Malachius okinawaensis* Nakane (Coleoptera, Malachiidae), with description of the male. *Japanese Journal of Systematic Entomology* 17 (2): 219–224.

Asano M., Kojima H. & Okajima Sh. 2011b. The Malachiid-Beetles (Coleoptera) collected at rice paddies and its surroundings in Laos. *Japanese Journal of Systematic Entomology* 17 (2): 405–408.

Asano M., Ikeda H., Kamezawa H. & Nomura Sh. 2018. Revision of six species of the subtribe Ebaeina of Japan, with description of a new species (Coleoptera: Melyridae). *Japanese Journal of Systematic Entomology* 24 (1): 141–149.

Constantin R. 2015. Le genre *Laius* Guerin-Meneville, 1830 dans l'Ocean Indien occidental, avec la description de quatre especes nouvelles (Coleoptera: Malachiidae). *Contribution à l'étude des coléoptères de La Réunion: et des archipels de l'Océan Indien occidental* 1: 78–85.

Geiser M. 2011. Nomenclatural note on *Opistapalochrus* Evers, 1987 (Coleoptera, Cleroidea, Malachiidae). *Japanese Journal of Systematic Entomology* 17 (2): 402–404.

Liu Z., Ślipiński A. & Pang H. 2015. Notes on Australian Laius Guerin-Meneville, *Dicranolaius* Champion and *Intybia* Pascoe with description of new species related to *Dicranolaius c-purpureus* (Lea) (Coleoptera: Melyridae: Malachiinae). *Zootaxa* 3936 (2): 272–280. https://doi.org/10.11646/zootaxa.3936.2.7

Liu Z., Ślipiński A. & Pang H. 2016. Contribution to the knowledge of the Australian *Dicranolaius* Champion (Coleoptera: Melyridae: Malachiinae). *Annales Zoologici* 66 (1): 101–112. https://doi.org/10.3161/00034541ANZ2016.66.1.007

Liu Z., Ślipiński A. & Pang H. 2017. Revision of the soft-winged flower beetle genus *Dicranolaius* Champion, 1921 (Coleoptera: Melyridae: Malachiinae) from Australia. *Annales Zoologici (Warszawa)* 67 (3): 405–548. https://doi.org/10.3161/00034541ANZ2017.67.3.001

Mayor A.J. 2003. Nomenclatorial corrections for Dasytidae and Malachiidae (Coleoptera). *Insecta Mundi* 17 (1–2): 85–96.

Mayor A.J. 2007. Family Malachiidae Fleming, 1821, pp. 415-454. In: Löbl I, Smetana A. eds. *Catalogue of Palaearctic Coleoptera*, *Volume 4. Elateroidea, Derontoidea, Bostrichoidea, Lymexyloidea, Cleroidea, Cucujoidea.* Apollo Books, Stenstrup: 935.

Plonski I.S. 2013. Studies on the genus *Intybia* Pascoe (Coleoptera: Malachiidae) I. Some nomenclatorial acts and faunistic records. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 65: 61–68.

Plonski I.S. 2014a. Studies on the genus *Intybia* Pascoe, part II. Faunistic and taxonomic notes, with description of a new species of the *I. plagiata*-group (Coleoptera: Malachiidae). *Koleopterologische Rundschau* 84: 313–320.

Plonski I.S. 2014b. Studies on the genus *Intybia* Pascoe (Coleoptera: Malachiidae) IV. Notes on the fauna of the Philippines. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 66: 39–45.

Plonski I.S. 2015. Studies on the genus *Stenolaius* Wittmer (Coleoptera: Malachiidae) I. Faunistic and ecological notes on known species. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 67: 39–43.

Plonski I.S. 2016. Studies on the genus *Intybia* Pascoe, 1866 (Coleoptera: Malachiidae) V. Contribution to internal classification and taxonomy, with faunistic and nomenclatorial notes. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 68: 17–38.

Plonski I.S. 2017. *Colotrema socotrana sp. nov.* from Socotra Island, with new records of the genus from Yemen (Coleoptera: Malachiidae). *Acta Entomologica Musei Nationalis Pragae (supplementum)* 57: 125–131.https://doi.org/10.1515/aemnp-2017-0113

Plonski I.S. & Geiser M. 2014. Studies on the genus *Intybia* Pascoe (Coleoptera: Malachiidae) III. On *Intybia rubrithorax* (Pic) and related taxa. *Zeitschrift der Arbeitsgemeinschaft Osterreichischer Entomologen* 66: 31–38.

Plonski I.S. & Michael F. 2014. Geiser studies on the genus *Intybia* Pascoe (Coleoptera: Malachiidae) III. On *Intybia rubrithorax* (Pic) and related taxa. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 66: 31–38.

Plonski I.S. & Puchner A. 2014. Description of *Laius alfredpuchneri* sp. n. (Coleoptera: Malachiidae) from Thailand. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 66: 47–50.

Tshernyshev S.E. 2003. *Epitinus* Evers, 1987 a junior synonym of *Mesopezus* Jacobson, 1911 (Coleoptera, Malachiidae). *Euroasian Entomological Journal* 2 (1): 61–62. [In Russian with English abstract.

Tshernyshev S.E. 2009. *Anthomalachius*, a new genus of soft-winged flower beetles (Coleoptera, Malachiidae). *Zootaxa* 1651: 65–68. https://doi.org/10.11646/zootaxa.2094.1.3

Tshernyshev S.E. 2011. A review of soft-winged flower beetles (Coleoptera, Malachiidae) of the fauna of Russia and the adjacent territories. 5. Keys to supraspecific taxa. *Euroasian Entomological Journal* 10 (3): 341–348. Colour plate V. [In Russian, with English abstract].

Tshernyshev S.E. 2012a. A review of soft-winged flower beetle fauna (Coleoptera, Malachiidae) of North Asia. *Euroasian Entomological Journal* 11 (6): 575–587. [In Russian with English abstract].

Tshernyshev S.E. 2012b. Two new species of soft-winged flower beetles of the genus *Kuatunia* Evers, 1945-48 (Coleoptera, Malachiidae) from China and northeastern Russia. *Zootaxa* 3191: 56–64. https://doi.org/10.11646/zootaxa.3191.1.5

Tshernyshev S.E. 2015a. A new species of soft-winged flower beetles of the genus *Platyebaeus* Wittmer, 1995 (Coleoptera, Cleroidea, Malachiidae) from the Philippines. *Zootaxa* 3941 (2): 289–293. https://doi.org/10.11646/zootaxa.3941.2.9

Tshernyshev S.E. 2015b. A new species of soft-winged flower beetles of the genus *Kuatunia* Evers, 1945-48 (Coleoptera, Cleroidea, Malachiidae) from Nepal. *Zootaxa* 3941 (2): 255–260. https://doi.org/10.11646/zootaxa.3941.2.6

Tshernyshev S.E. 2015c. A review of species of the genus *Apalochrus* Erichson (Coleoptera, Malachiidae). *Zootaxa* 3941 (3): 358–374. https://doi.org/10.11646/zootaxa.3941.3.3

Tshernyshev S.E. 2015d. Taxonomic problems in the genus *Sceloattalus* Wittmer, 1966 (Coleoptera, Malachiidae). In: Hartmann M. & Weipert J. (eds) *Biodiversitat und Naturasstattung im Himalaya*, *volume 5*. Erfurt: Verein der Freunde & Förderer des Naturkundemuseums Erfurt e.V: 381–387.

Tshernyshev S.E. 2015e. Soft-winged flower beetles (Coleoptera, Malachiidae) of the Himalayan region, with notes on Apalochrini. In: Hartmann M. & Weipert J. (eds) *Biodiversitat und Naturasstattung im Himalaya*, *volume 5*. Erfurt: Verein der Freunde & Förderer des Naturkundemuseums Erfurt e.V: 389–405.

Tshernyshev S.E. 2016a. *Pectapalochrus* gen. nov., a new genus of soft-winged flower beetles of the tribe Apalochrini (Coleoptera, Malachiidae). *Zoologicheskii zhurnal* 95 (3): 300–305. https://doi.org/10.7868/S0044513416030041 [In Russian with English abstract].

Tshernyshev S.E. 2016b. A review of species of the genera *Protapalochrus* Erichson and Paratinoides L. Medvedev (Coleoptera, Malachiidae). *Zootaxa* 4139 (3): 369–390. https://doi.org/10.11646/zootaxa.4139.3.3

Tshernyshev S.E. 2016c. The genus *Dromanthomorphus* Pic, 1921 (Coleoptera, Cleroidea: Malachiidae) in South-East Asia. *Zootaxa* 4139 (4): 551–565. https://doi.org/10.11646/zootaxa.4139.4.7

Tshernyshev S.E. 2016d. Taxonomic revision of *Intybia* Pascoe, 1886 species (Coleoptera, Malachiidae) of Thailand and Philippines. *Zootaxa* 4147 (2): 101–123. https://doi.org/10.11646/zootaxa.4147.2.1

Tshernyshev S.E. 2016e. New taxa of soft-winged flower beetles (Coleoptera, Malachiidae) in Baltic and Rovno amber. *Paleontological Journal* 50 (9): 953–962. http://doi.org/10.1134/S0031030116090021

Tshernyshev S.E. 2018. *Himalacolotes*, a new genus of soft-winged flower beetles of the tribe Colotini (Coleoptera, Malachiidae) from the Himalayan Region. In: Hartmann M., Barclay M. & Weipert J. (eds) *Biodiversitat und Naturasstattung im Himalaya*, *volume 6*. Erfurt: Verein der Freunde & Förderer des Naturkundemuseums Erfurt e.V: 455–489.

Tshernyshev S.E. 2020a. *Acroapalochrus* gen.n. – a new genus of soft-winged flower beetles (Coleoptera, Malachiidae) from West Africa. Journal of Insect Biodiversity 14 (1): 1–5. https://doi.org/10.12976/jib/2020.14.1.1

Tshernyshev S.E. 2020b. *Protopectinus pseudoparatinus* – a new species and a new genus of soft-winged flower beetle of the tribe Apalochrini (Coleoptera: Malachiidae) from East Africa. *Russian Entomological Journal* 29 (1): 69–72.

Tshernyshev S.E. 2020c. *Mesapalochrus* gen. nov. – a new species and a new genus of soft winged flower beetle of the tribe Apalochrini (Coleoptera: Malachiidae) from Africa. *Invertebrate Zoology* 17 (2): 195–201. https://doi.org/10.15298/invertzool.17.2.09

Tshernyshev S. & Kopetz A. 2018. *Myrmecospectra* Motschulsky, 1858 – the real name for *Myrmecophasma* Bourgeois, 1885 (Coleoptera, Cleroidea, Malachiidae), with review of species and description of a new species from the Himalayas. In: Hartmann M., Barclay M. & Weipert J. (eds) *Biodiversitat und Naturasstattung im Himalaya*, *volume 6*. Erfurt: Verein der Freunde & Förderer des Naturkundemuseums Erfurt e.V: 443–453.

Tshernyshev S.E. & Shcherbakov M.V. 2020. A new genus and species of soft winged flower beetle of the tribe Apalochrini (Coleoptera: Malachiidae) from Africa. *Far Eastern Entomologist* 416: 1–9. https://doi.org/10.25221/fee.416.1

Yoshitomi H. 2008. Contribution to the taxonomy of the genus *Laius* Guerin-Meneville in Indonesia, with description of a new species (Coleoptera: Malachiidae). *Koleopterologische Rundschau* 78: 285–290.

Yoshitomi H. 2010. A new species of the genus *Laius* (Coleoptera, Malachiidae) from Mauritius. *Japanese Journal of Systematic Entomology* 16 (1): 1–4.

Yoshitomi H. 2014. Comparative morphology of the endophallic structures of the genus *Laius* (Coleoptera, Melyridae), with the descriptions of three new species. European Journal of Taxonomy 97: 1–29. https://doi.org/10.5852/ejt.2014.97

Yoshitomi H., Ahn K.J. & Ogawa N. 2015. Some new distributional records of the genus *Laius* (Coleoptera, Melyridae). *Elytra, New Series* 5 (1): 115–119.

Yoshitomi H. & Lee Ch.F. 2010. Revision of the Taiwanese and Japanese species of the genus *Laius* (Insecta: Coleoptera: Malachiidae). *Zoological Studies* 49 (4): 534–543.

Manuscript received: 2 March 2021
Manuscript accepted: 2 September 2021
Published on: 14 October 2021
Section editor: Max Barclay
Topic editor: Nesrine Akkari
Desk editor: Fariza Sissi