

Research articleSubmitted: April 5th, 2018 - Accepted: May 28th, 2018 - Published: June 29th, 2018**Description of three new *Paratrichius* Janson, 1881, from Indochinese peninsula (Coleoptera: Scarabaeidae, Cetoniinae)**

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Abstract

A recent increase in quality collecting activities in Laos and Vietnam, particularly by local collectors, has added significantly to our knowledge of the insect faunas in these countries. The genus *Paratrichius* Janson, 1881 is no exception, new species are being discovered regularly. In the current study, three new species closely related to *Paratrichius vicinus* (Bourgoin, 1915) are described.

Key words: Scarabaeidae, Cetoniinae, *Paratrichius*, new species, Oriental Region.

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Introduction

During the past decade, an abundance of insect specimens from Laos and Vietnam has been made available through the activities of several collectors, but particularly through the efforts of local people. Among the *Trichiini* material, I have been able to study recently a series of specimens that heretofore would have been labelled *Paratrichius vicinus* (Bourgoin, 1915), all having the same basic dorsal coloration, with similarly distributed yellowish chalky markings, and similar, but variable, parameres. However, a study of variation in external morphology and parameres shape lead me to conclude that these specimens belong to four different species, three of which are new and are herein described. Two of the new species come from northern Vietnam, the third from the mountains of central Vietnam.

Material and methods

Specimens length was measured between the apex of the pygidium and the anterior margin of clypeus. Specimen width is the maximum distance across the elytra. Clypeal length was measured laterally, between the anterior margin and basal attachment of the antenna.

Photographs were taken using a Nikon Coolpix P7700 attached to one of the eyepieces of a Wild dissecting microscope. All photos were processed with photo stacking software (Zerene Stacker Version 1.04 Build T201711041830, <http://www.zereneystems.com> [accessed 6 Apr. 2018]) and backgrounds were removed using GIMP 2.8.22, in or-

der to increase contrast. Individual photograms were finally merged to generate composite images using the same GIMP software.

The following abbreviations are used to denote the housing location of the study material:

- ERPC** Enrico Ricchiardi collection, Torino, Italy
- NHM** The Natural History Museum, London, Great Britain
- NHMB** Natural History Museum Basel, Switzerland
- ZFMK** Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany

Results

Specimens of *Paratrichius* with coloration and distribution of yellowish chalky markings close to figures 1-4 and inhabiting the mountains of northeastern Laos and northern Vietnam are normally determined as *Paratrichius vicinus* (Bourgoin, 1915). A current abundance of recently collected specimens has allowed a more detailed study of the variation exhibited within these series and has convinced me that, indeed, the area is inhabited by three very similar, but morphologically distinctive species. Two of these species, *Paratrichius coopertus* **new species** and *Paratrichius diversus* **new species** are describe below.

A third new species, quite close to the others, *Paratrichius dangnocoivani* **new species**, inhabits the Annamensis Range, at an elevation of 1700 m, in a small area about 700 km from known ranges of the other three species.

The genus *Paratrichiis* is one of more speciose genera within the Oriental *Trichiina* and one in which new species are being discovered frequently. Currently, the genus includes 63 described species, three additional species are described in this paper, and one more new species from Nepal is being described (Ricchiardi, in press), bringing the total to 67 species. Many others are anticipated.

Taxonomy

Paratrichiis coopertus new species (Fig. 1)

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Type series. Laos: HT ♂ (ZFMK), Hua Phan, Ban Saleui, Phou Pan Mts. (20°12'N, 104°01'E), 1300–1900 m, 11 Apr/15 May 2012, C. Holzschuh legit. 5PT ♂ 2PT ♀ (ERPC), 1 PT ♀ (ZFMK) same data as HT. 37 PT ♂, 1 PT ♀ (ZFMK), 5 PT ♂ (ERPC), same data as HT but 1/31 May 2011. 1 PT ♂, 3 PT ♀ (NHMB), Hua Phan, Phou Pan Mts. 1340–1870 m, 10 May/ 16 Jun 2009 M. Brancucci & Local Collectors leg. Vietnam: 1 PT ♂ (ERPC), Lao Cai, Chapa (Sa Pà).

Description of holotype ♂. Length: 13.5 mm. maximum width 6.3 mm.

Elongate, with slender legs; colour black, with legs, scutel-

lum, antennae and clypeus fulvous, elytron with a fulvous band at margins; body decorated with pale yellowish chalky material as follows: frons with a narrow band interrupted mesally, vertex with a narrow longitudinal band at sides of frons (Fig. 1 D); pronotum with a narrow band along margins, a narrow longitudinal line not reaching anterior margin at centre and a narrow V-shaped line on each side of disk; elytra with a narrow, sinuate band anterior and posterior to the middle, which does not reach margins; juxtascutellar portion of suture and a narrow band posteriorly on 2st interstria; pygidium and greater part of ventral surface (except anal sternites) completely covered.

Clypeus. Wider than long, widest basally, sides broadly rounded, anterior margin emarginate, not reflexed medially; surface longitudinally reticulate anteriorly, transversely so posteriorly, sparsely punctate in the middle.

Frons. Transversely reticulate anteriorly, longitudinally so posteriorly.

Antennal club. Long, about twice length of clypeus.

Pronotum. Octagonal, wider than long, moderately convex, longitudinal hollowed medially, sides convergent anteriorly before the middle, almost parallel at the middle, widely rounded posteriorly, anterior angles obtuse, rounded at apex, posterior angles rounded and slightly project-

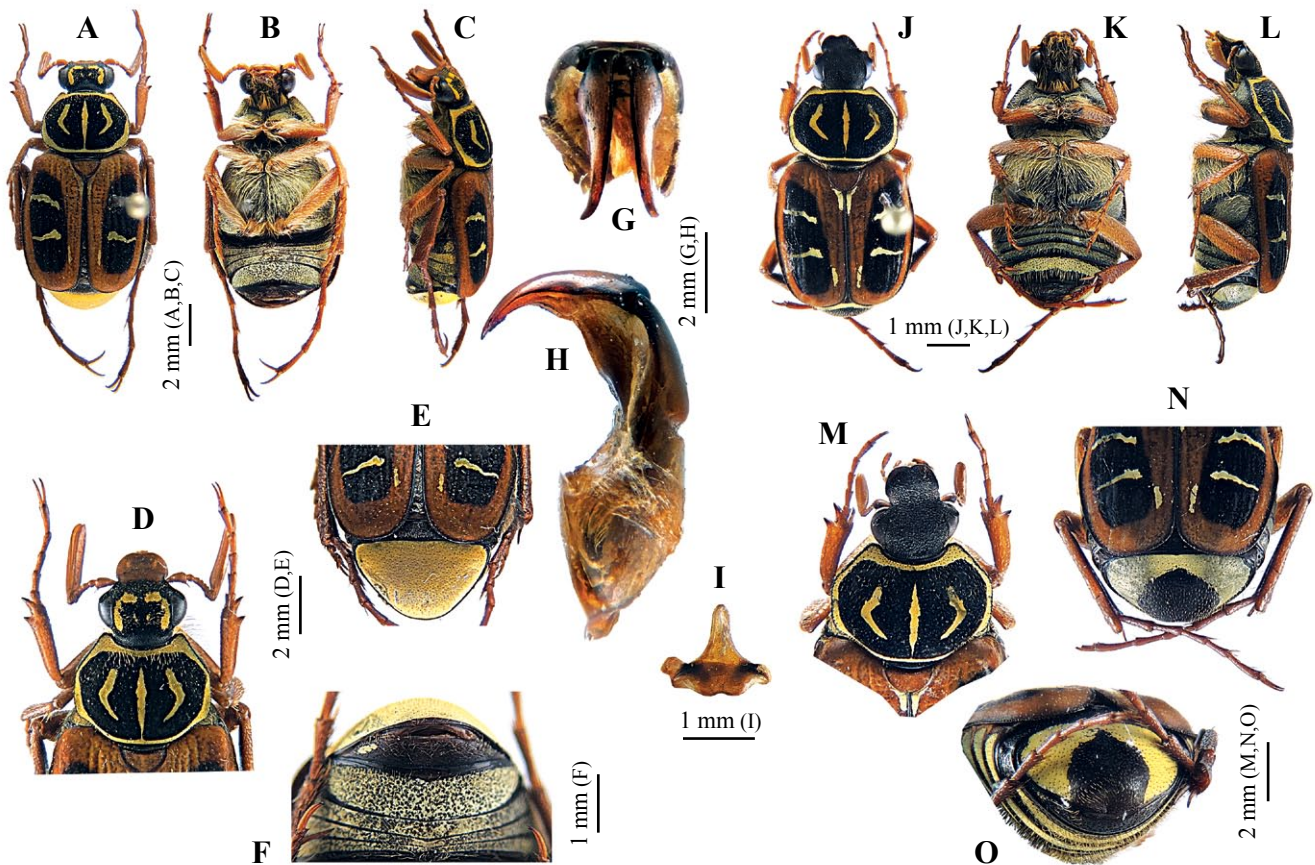


Fig. 1 – *Paratrichiis coopertus* sp.n. HT ♂ (ZFMK): A, dorsal habitus. B, ventral habitus. C, lateral habitus. D, head. E, pygidium. F, anal sternites. G, parameres frontal view. H, parameres, lateral view. I, spiculum gastrale. PT ♀ (ERPC): J, dorsal habitus. K, ventral habitus. L, lateral habitus. M, head. N, pygidium, dorsal view. O, pygidium, apex view.

ing posteriorly, posterior margin broadly emarginate medially; margins clothed with scattered, pale yellow setae; surface covered with black pruinosity and with scattered, rounded, large, shallow punctation.

Scutellum. Triangular, wider than long, sides arcuate, apex rounded, surface sparsely punctate.

Elytra. Longer than wide, widest before the middle, each elytron with seven striae, six dorsally, one on lateral declivity.

Pygidium. Convex, wider than long, nearly glabrous, with apex rounded.

Protibia. Bidentate, lacking terminal spur; metatarsus very sparsely clothed with minute setae on dorsal face.

Mesotibia. Posterior margin with a very weak tooth at middle.

Metatibia. Posterior margin with a noticeable small tooth at middle; first metatarsomere as long as second; metatarsi with some of pale yellow bristles at apex of metatarsomeres.

Anal sternites. Not hollowed.

Genitalia. As shown in Figs 1 G-H.

Description of ♀ (differences only). Length: 13.5 mm, width: 6.6 mm.

Slightly more robust than male, the female of *P. cooperatus* differs little from the male in colour and pattern: the clypeus is black, the frons and vertex without yellowish chalky material. Protibia wider. Antennal clubs as long as clypeus. Pygidium with a central, longitudinal bare area, without yellowish chalky material and apex hollowed (Fig. 1 O).

Type series variability. The length of the males varies from 11.5 to 13.5 mm, the maximum width proportional; length of females varies from 13.5 to 14 mm, the maximum width proportional. In both sexes, the color of the integument and the distribution of the yellowish chalky material does not vary.

Derivatio nominis. The name derives from the pygidium of ♂, completely covered (*coopertus* in Latin) by yellowish chalky material.

Diagnosis. Male *P. cooperatus* can be separated from other Indochinese species with the same coloration and pattern of yellowish chalky material by the anterior margin of clypeus not lobed centrally and pygidium completely covered by yellowish chalky material. Parameres shape is also distinctive. The apex of pygidium being completely black and hollowed in apical third will distinguish the female.

Paratrichius dangngocvani new species (Fig. 2)

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Type series. Vietnam: HT♂ (NHM), Kon Tum, Ngoc Linh Mt. (about 15°04'07" N, 107°58'26E), 1700 m, Jun 2016, Dang Ngoc Van legit. 1 PT♂ (ERPC), same data of HT.

Description of holotype ♂. Length: 11.7 mm, width: 5.4 mm.

Elongate, with slender legs; colour black, with disk of scutellum dark fulvous; pro- and meso legs of mixed dark fulvous/black; pro-meso tarsi black; meta legs and metatarsomeres dark fulvous; elytra with a dark fulvous band at margins; body decorated with pale yellowish chalky material as follows: pronotum with a narrow band along margins (slightly interrupted medially), a narrow longitudinal line not reaching anterior and posterior margins at centre and a narrow V-shaped line on each side of disk (Fig. 1A); elytra with narrow, sinuate transverse bands, positioned before and behind middle, which do not reach margins; pygidium entirely covered with yellowish chalky material with the exception of a bare, wide band from base to apex; most of ventral surface (except anal sternites and first two visible sternites) fully covered.

Clypeus. Wider than long, widest basally, sides straight, parallel; anterior corners rounded, anterior margin emarginate, obviously reflexed medially; surface longitudinally reticulate anteriorly, transversely so posteriorly, sparsely punctate in the middle.

Frons. Transversely reticulate anteriorly, longitudinally so posteriorly.

Head. Covered with short, erect, slightly dense, whitish setae.

Antennal clubs. Long about 2.4 times the clypeal length.

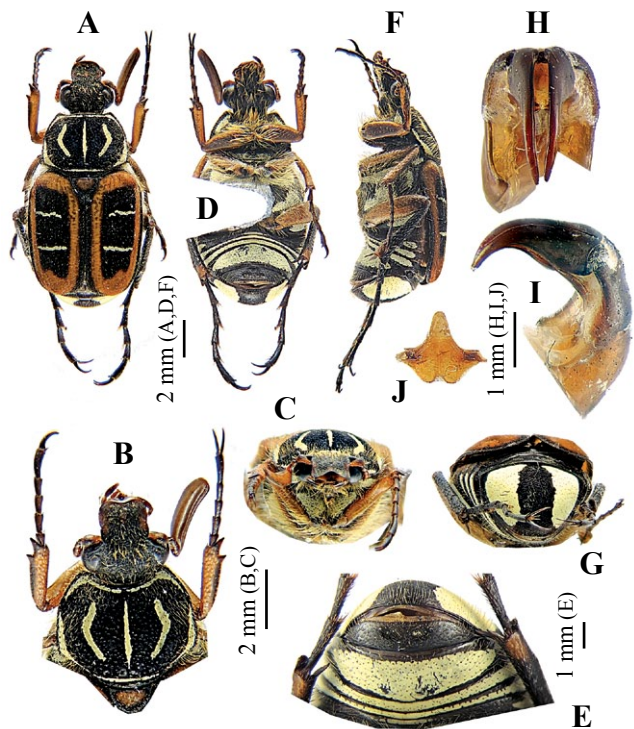


Fig. 2 – *Paratrichius dangngocvani* sp.n. Holotype ♂ (NHM): A, dorsal habitus. B, head, head, frontal view. D, ventral habitus. E, anal sternites. F, lateral habitus. G, pygidium. H, parameres, frontal view. I, parameres, lateral view. J, spiculum gastrale.

Pronotum. Octagonal, wider than long, moderately convex, longitudinal hollowed medially, sides abruptly convergent anteriorly before the middle, almost parallel from middle to base, widely rounded posteriorly, anterior angles obtuse, rounded at apex, posterior angles rounded and slightly projecting posteriorly, posterior margin broadly emarginated medially; margins clothed with scattered, pale yellow setae; surface covered with black pruinosity and with scattered, rounded, large, shallow punctuation.

Scutellum. Triangular, wider than long, sides arcuate, apex rounded, surface sparsely punctate.

Elytra. Longer than wide, widest before the middle, each elytron with seven striae, six dorsally, one on lateral declivity.

Pygidium. Convex, wider than long, nearly glabrous, with apex rounded.

Protibia. Bidentate, lacking terminal spur; metatarsus very sparsely clothed with minute setae on dorsal face.

Mesotibia. Posterior margin with medial tooth obsolete.

Metatibia. Posterior margin with a noticeable tooth medially; first metatarsomere slightly longer than second; metatarsi with some of pale yellow bristles at apex of tarsomeres.

Anal sternites. Hollowed medially.

Genitalia. As shown in Figs 2 H-J.

Derivatio nominis. From the name of collector, Mr. Dang Ngoc Van.

Type series variability. The two type specimens are identical to each other.

Diagnosis. *Paratrichi* *dangngocvani* can be separated from other Laotian and Vietnamese species with same coloration and pattern of yellowish chalky material by having a prominent central lobe in the middle of anterior clypeal margin (Fig. 2 C) and very long antennal clubs. The parameres shape is also distinctive (Figs 2 H-I).

Remarks. The female is unknown.

Paratrichi *diversus* **new species** (Fig. 3)

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Type series. Laos: HT ♂ (ZFMK), Hua Phan, Ban Saleui, Phou Pan Mts. (20°12'13.5" N, 103°59'05"/104°01" E), 1300–1900 m, 11 Apr/15 May 2012, C. Holzschuh legit. 200 PT ♂, 33 PT ♀ (ZFMK), 30 PT ♂, 7 PT ♀ (ERPC), same data as HT. 2 PT ♂ (ZFMK), 5 PT ♂, 4 PT ♀ (ERPC), same data as HT but 1/31 May 2011. 1 PT ♂ (ERPC), same data as HT but 25 May 2010. 1 PT ♂ (NHMB), Hua Phan, Phou Pan Mts., 1340–1870 m, 10 May/ 16 Jun 2009 M. Brancucci & Local Collectors leg.

Description of holotype ♂ ZFMK. Length: 12.7 mm, width: 5.9 mm.

Elongate, with slender legs; colour black, with disk of

scutellum, antennae (except scape) and clypeal margins fulvous; pro- and mesothoracic legs coloration mixed fulvous/black; pro- and mesotarsi fulvous; metathoracic legs and first two metatarsomeres black, other metatarsomeres fulvous; elytra with fulvous band around margins; body decorated with pale yellowish chalky material as follows: frons with a narrow band interrupted medially, vertex with a narrow longitudinal band at sides (Fig. 3D); pronotum with a narrow band along margins (briefly interrupted at middle laterally), a narrow longitudinal line not reaching anterior or posterior margins at centre, and a narrow V-shaped line at each side of disk; elytra with narrow, transverse sinuate bands before and behind middle, which do not reach mesal or lateral margins; juxtascutellar area of suture and small maculae posteriorly on 2st interstria; pygidium entirely covered except for an uncovered band from middle of disk to apex; greater part of ventral surface (except anal sternites) fully covered.

Clypeus. Wider than long, widest basally, sides straight, parallel; anterior corners rounded, anterior margin emarginate, not reflexed medially; surface longitudinally reticulate anteriorly, transversely so posteriorly, sparsely punctate in the middle.

Frons. Transversely reticulate anteriorly, longitudinally so posteriorly.

Antennal clubs. Long, about twice the clypeus length.

Pronotum. Octagonal, wider than long, moderately convex, longitudinal hollowed medially, sides abruptly convergent anteriorly before the middle, almost parallel from middle to base, widely rounded posteriorly, anterior angles obtuse, rounded at apex, posterior angles rounded and slightly projecting posteriorly, posterior margin broadly emarginated medially; margins clothed with scattered, pale yellow setae; surface covered with black pruinosity and with scattered, rounded, large, shallow punctuation.

Scutellum. Triangular, wider than long, sides arcuate, apex rounded, surface sparsely punctate.

Elytra. Longer than wide, widest before the middle, each elytron with seven striae, six dorsally, one on lateral declivity.

Pygidium. Convex, wider than long, nearly glabrous, with apex rounded.

Protibia. Bidentate, lacking terminal spur; metatarsus very sparsely clothed with minute setae on dorsal face.

Mesotibia. Posterior margin with a very weak tooth medially.

Metatibia. Posterior margin with an obsolete, small tooth medially; first metatarsomere as long as the second; metatarsi with some pale yellow bristles at apex of tarsomeres

Anal sternites. Hollowed medially.

Genitalia. As shown in Figs 3 F-H.

Description of paratype ♀ (ERPC) (differences only). Length: 15.7 mm, width: 7.7 mm.

More robust than male, the female of *P. diversus* differs also in the head lacking yellowish chalky material. Clypeus

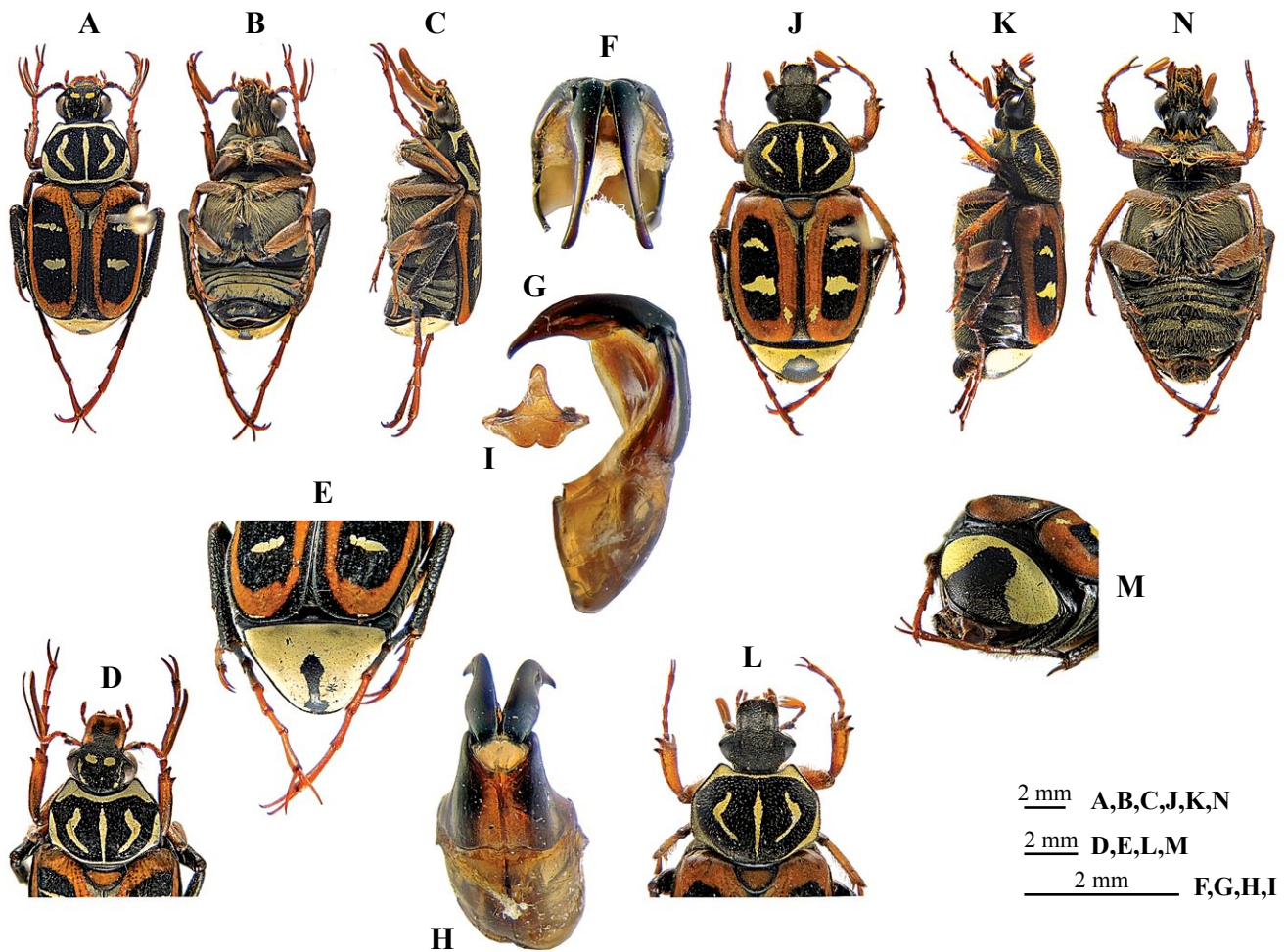


Fig. 3 – *Paratrichius diversus* sp.n. Holotype ♂ (ZFMK): **A**, dorsal habitus. **B**, ventral habitus. **C**, lateral habitus. **D**, head. **E**, pygidium. **F**, parameres, frontal view. **G**, parameres, lateral view. **H**, parameres, dorsal view, **I**, spiculum gastrale. PT ♀ (ERPC); **J**, dorsal habitus. **K**, lateral habitus. **L**, head. **M**, pygidium latero-dorsal view. **N**, ventral habitus.

black. Protibia wider. Posterior yellowish chalky material band of elytra enlarging toward suture. Antennal clubs in length long as clypeus. Pygidium with longitudinal central bare area much broader than in male and apex rounded, not hollowed apically. Anal sternites not hollowed medially.

Derivatio nominis. From Latin *diversus*, different.

Diagnosis. Males of *P. diversus* can be separated from other Indochinese species with same color pattern by having the pygidium not completely covered by yellowish chalky material (figure 3 E), clypeal anterior margin not lobed medially and anal sternites hollowed medially. The parameres are also distinctive (Figs 3 F-H). Females can be separated from the same species in having the pygidium completely black and not hollowed at apex (Fig. 3 M).

Type series variability. In both sexes, size, colour of the integument and distribution of yellowish chalky material does not vary.

Paratrichius vicinus (Bourgoin, 1915). Fig. 4.

Studied types. Vietnam: HT ♂ (NHM), Haut Tonkin, Lao-Kay (Lao Cai), Bourgoin Coll. 1938-252, 1912, Vitalis de Salvaza R. legit. 1 PT ♂, 1 PT ♀ (NHM), Tonkin, Bourgoin Coll. 1938-252, 1912, Vitalis de Salvaza R. legit.

Other studied material. Vietnam: 1 ♂ (ERPC), Lao Cai, Chapa (Sa Pa), Mar 1916; 1 ♀ (ERPC), Yen Bai, Mu Chang Cai, 1700 m, May 2017, local collectors leg.

Remarks. Bourgoin (1915) described *Trichius vicinus* from northern Vietnam, and Paulian (1961: Pages 20-21) reported what Bourgoin wrote without adding anything to the knowledge of the species and without mentioning that Schenckling (1922) had assigned the species to *Paratrichius*. Males of this species can be separated from other Indochinese *Paratrichius* with the same coloration and yellowish chalky material pattern, by the pygidium being fully covered with yellowish chalky material and the clypeus being fulvous (Fig. 4 D). Females can be separated from

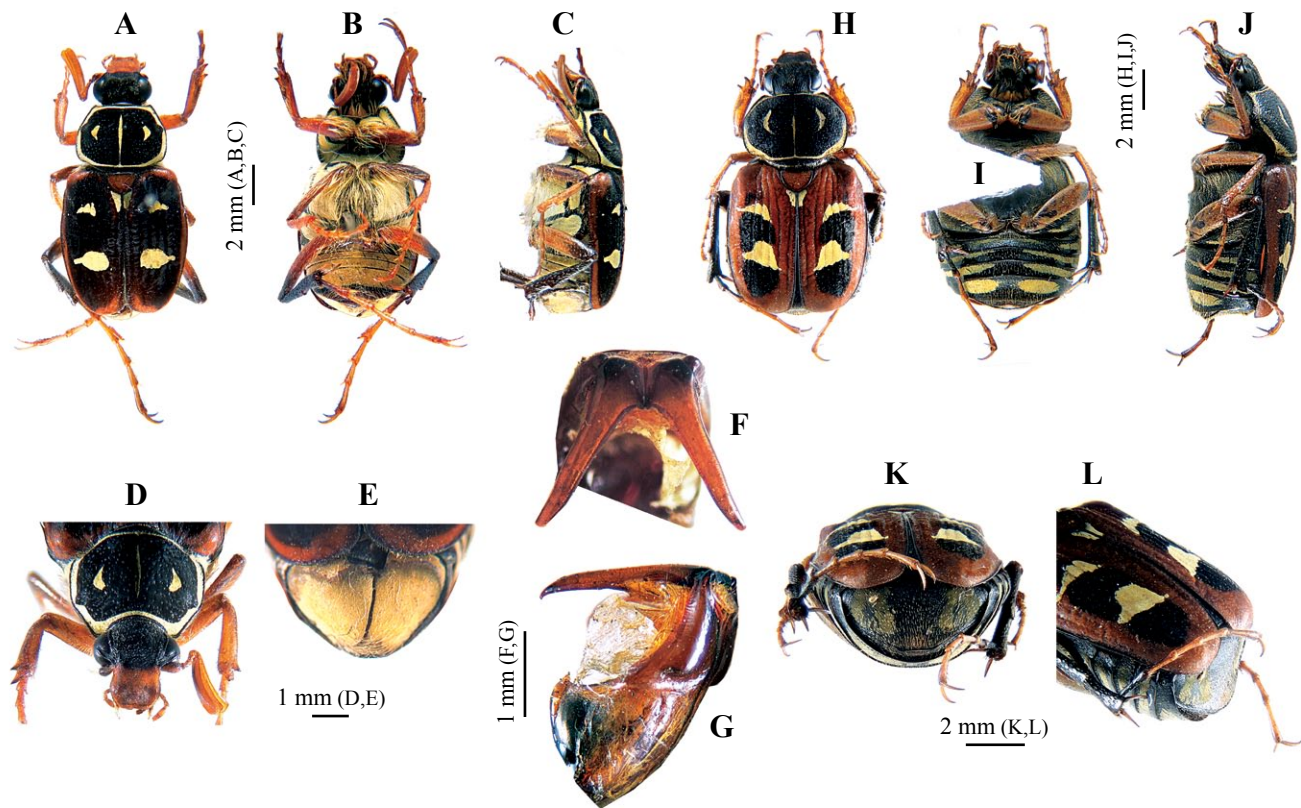


Fig. 4 – *Paratrichiurus vicinus* (Bourgoin, 1915). Holotype ♂ (NHM): **A**, dorsal habitus. **B**, ventral habitus. **C**, lateral habitus. **D**, head. **E**, pygidium. **F**, parameres, frontal view. **G**, parameres, lateral view. ♀ (ERPC): **H**, dorsal habitus. **I**, ventral habitus. **J**, lateral habitus. **K**, pygidium. **L**, pygidium, dorso-lateral view.

other species by having apex of the pygidium hollowed horizontally (Fig. 4 L). Moreover, in both sexes the yellowish chalky material line in posterior half of elytra is wider (Figs 4 A and H) than in the others. The holotype is long 13.4 mm.

Key to Indochinese Peninsula *Paratrichiurus* species sharing “*P. vicinus* pattern”

- 1. Abdomen arched in lateral view; antennal clubs longer (1.6-2.4 times) than clypeus male
- Abdomen not arched in lateral view; antennal clubs long as clypeus. Protibia wider female

Males

- 1. Anterior margin of clypeus sinuate, with an elevated central lobe (Fig. 2 C); antennal clubs long more than 2.4 times length of clypeus. Pygidium black, covered with yellowish chalky material markings only at sides *dangngocvani* new species
- Anterior margin sinuate, without central lobe; antennal clubs shorter, about 1.6-2.2 times the clypeus length. Pygidium black, completely covered with yellowish chalky material or not 2
- 2. Pygidium not completely covered with yellowish chalky material. Anal sternites hollowed medially *diversus* new species
- Pygidium completely covered with yellowish chalky material markings (Fig. 1 E); anal sternites hollowed medially or not 3

- 3. Anal sternites hollowed medially *vicinus* (Bourgoin, 1915)
- Anal sternites not hollowed medially *coopertus* new species

Female (female of *P. dangngocvani* is unknown)

- 1. Pygidium hollowed apically, testaceous or not at apex 2
- Pygidium not hollowed at apex, completely black *diversus* new species
- 2. Pygidium with apical third deeply hollowed (apex view. Fig. 1 O), black at apex *coopertus* new species
- Pygidium shallower and more broadly hollowed at apex (lateral view. Fig. 4 L), black with testaceous apex *vicinus* (Bourgoin, 1915)

Acknowledgments – I thank Paul Lago for the careful correction of the English language.

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