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Taxonomic study of the genus *Pseudopodabrus* Pic, 1906 (Coleoptera, Cantharidae)

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Abstract. *Pseudopodabrus bigibbosicollis* (Pic, 1923) comb.nov. is transferred from *Rhagonycha* Eschscholtz, 1830. *P. semicircularis* Wittmer, 1995 is considered to be a junior synonym of *P. kubani* Wittmer, 1995. The type series of *P. kubani* contains two species, as, except for the holotype, all paratypes are attributed to *P. tuberculatus* Wittmer, 1983. Two new species are described from Thailand, *P. longiimpressus* sp.nov. and *P. murzini* sp.nov. Photos of male heads of the above species and a key to all known species are presented.

Keywords. Coleoptera – Cantharidae – *Pseudopodabrus* – new species – new synonym – new combination

Introduction

The genus *Pseudopodabrus* was proposed by PIC (1906) for *P. impressiceps* Pic, 1906, originally designated as the type species. It had been neglected for decades until WITTMER (1983) restudied this genus. WITTMER (1989, 1995) and ŠVIHLA (2004) added more species. Our recent study of *Pseudopodabrus* showed that one species of *Rhagonycha* Eschscholtz, 1830 should be transferred to this genus because of the presence of a fovea on the vertex of the male, it is *P. bigibbosicollis* (Pic, 1923) comb.nov. Furthermore, *P. semicircularis* Wittmer, 1995 is considered to be a junior synonym of *P. kubani* Wittmer, 1995, because the male type specimen has been showed to be a teratomorphous specimen which undoubtedly belong to the latter species. Moreover, the type series of *P. kubani* contains two species, as, except for the holotype, all paratypes are attributed to *P. tuberculatus* Wittmer, 1983. Finally, two new species, *P. longiimpressus* sp.nov. and *P. murzini* sp.nov. are described from Thailand. The genus now comprises a total of 16 species distributed in the Oriental Region, particularly in Indochina area.

Material and methods

The type specimens examined in this study are deposited in the Muséum national d'Histoire naturelle, Paris (MNHN) and the Naturhistorisches Museum Basel (NHMB).

The aedeagi were detached from the specimens under a stereoscopic microscope, cleared in 10% KOH solution for several minutes, then placed in a droplet of glycerol, and examined under a compound light microscope. Photographs of the types were taken with a Leica DFC320 and CombineZM. The digital images were then imported into Adobe Photoshop 9.0 for labelling and composing into a plate. Drawings were made with the aid of a camera lucida attached to a Leica MZ 12.5 stereomicroscope. The photographs were edited in CorelDraw 12.

Taxonomy

Pseudopodabrus Pic, 1906

Pseudopodabrus Pic, 1906: 81. Type species: *Pseudopodabrus impressiceps* Pic, 1906 (by monotypy).

Diagnosis. Body small in size, length 5.0–9.0 mm. Eyes moderately protruding in male, weakly in female; head with foveae on vertex in male, absent in female; apical maxillary palpomere longest, slightly widened near apex; antennae filiform and simple, at most extending up to middle of elytra. Pronotum subquadrate, wider in female than in male, lateral margins slightly converging anteriorly or parallel-sided. Elytra with lateral margins parallel-sided in male, slightly diverging posteriorly in female. All tarsal claws bifid in both sexes. Aedeagus: elongate, slightly narrowed apically, dorsal plates of parameres fused or reduced, ventral process of each paramere flattened and occupied dorsal-ventrally, laterophyses absent.

Distribution. South China, Vietnam, Thailand, Laos.

A key to male adults of *Pseudopodabrus*

1. Pronotum with lateral margins distinctly converging anteriorly; head behind eyes strongly widened. ..... ***P. sulcatus* Wittmer, 1983**
– Pronotum with lateral margins slightly converging anteriorly or parallel-sided; head behind eyes narrowed. ..... 2.
2. Pronotum distinctly longer than wide. ..... 3.
– Pronotum wider than or as wide as long. ..... 6.
3. Antennomere II slightly longer or as long as III. ..... 4.
– Antennomere II distinctly shorter than III. ..... 5.
4. Head with an oval fovea on each side of vertex. .... ***P. kabakovi* Wittmer, 1983**
– Head with a subquadrate fovea, occupying nearly the whole vertex. .... ***P. latiimpressus* Wittmer, 1995**
5. Head with a deep fovea near to anterior margin of pronotum, anterior to it with a small and rounded fovea on each side of vertex. .... ***P. impressiceps* Pic, 1906**
– Head with a shallow fovea near to anterior margin of pronotum, but without any fovea anterior to it. ..... ***P. atriceps* (Pic, 1922)**
6. Head with one fovea on vertex. ..... 7.
– Head with a fovea on each side of vertex. ..... 9.
7. Head with a shallow fovea, wrinkled on inner surface, all margins delimited. ..... ***P. bigibbosicollis* (Pic, 1923) comb.nov.**
– Head with a deep fovea, smooth on inner surface, not all margins delimited. ..... 8.

8. Fovea rectangle-shaped, about twice as long as wide. ..... ***P. brancuccii* Wittmer, 1983**
– Fovea horseshoe-shaped, wider than long. ..... ***P. prudeki* Švihla, 2004**
9. Foveae short, at most extending posteriorly to middle of vertex. ..... 10.
– Foveae long, extending posteriorly beyond middle of vertex. ..... 11.
10. Foveae narrow, vertex behind them distinctly convex in middle; antennomere II longer than III; pronotum slightly longer than wide. .... ***P. kubani* Wittmer, 1995**
– Foveae slightly wider, vertex behind them flat in middle; antennomere II shorter than III; pronotum slightly wider than long. .... ***P. murzini* sp.nov.**
11. Foveae narrow and grooved. ..... 12.
– Foveae wide and rounded. ..... 14.
12. Foveae not parallel, anterior and posterior parts diverging. .... ***P. malickyi* Wittmer, 1995**
– Foveae almost parallel. ..... 13.
13. Foveae wider and shorter, twice as long as wide, distinctly wider than distance from fovea to the eye. ..... ***P. biimpressus* Wittmer, 1983**
– Foveae narrower and longer, three times as long as wide, as wide as distance from fovea to the eye. ..... ***P. longiimpressus* sp.nov.**
14. Pronotum with anterior margin almost straight, lateral margins parallel-sided. ..... ***P. bezdeki* Švihla, 2004**
– Pronotum with anterior margin rounded, lateral margins diverging posteriorly. ..... 15.
15. Foveae shallow; pronotum orange. ..... ***P. tuberculatus* Wittmer, 1983**
– Foveae deep; pronotum mostly black. ..... ***P. bifoveiceps* (Pic, 1929)**

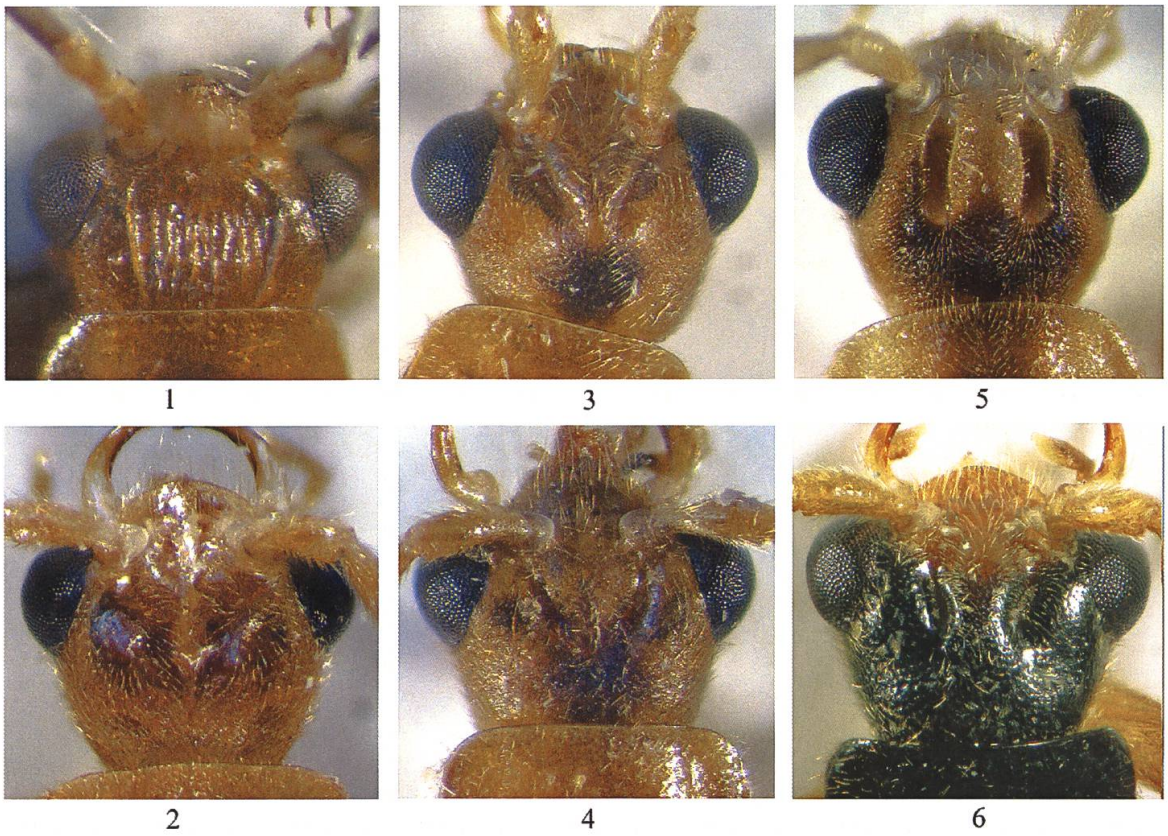
***Pseudopodabrus bigibbosicollis* (Pic, 1923) comb.nov.** (Fig. 1)

Rhagonycha bigibbosicollis Pic, 1923: 55.
Rhagonycha plicaticeps Pic, 1925: 15. – WITTMER (1989): 219 (synonymized).

Type material examined. Holotype ♀ of *Rhagonycha bigibbosicollis* Pic: "Tonkin, Hoa Binh" (MNHN). Holotype ♂ of *R. plicaticeps* Pic: "Tokin, Hoa Binh, de Cooman" (MNHN).
Additional material examined. 5♂♂, 3♀♀: "Tonkin, Hoa Binh" (MNHN). 2♂♂, 1♀: "Tonkin, Hoa Binh" (NHMB); 1♂, 1♀: "Vietnam, Cuc Phong, 22 March 1995, T. Niisato leg." (NHMB).

Distribution. Vietnam.

Remarks. This species should be placed in *Pseudopodabrus* because of presence of the fovea on the vertex of the male.



Figs 1–6. Male heads of *Pseudopodabrus* Pic, dorsal view: 1, *P. bigibbosicollis* (Pic, 1923) comb.nov.; 2, *P. tuberculatus* Wittmer, 1983; 3–4, *P. kubani* Wittmer, 1995 (3 – holotype, 4 – holotype of *P. semicircularis* Wittmer, 1995 syn.nov.); 5, *P. longiimpressus* sp.nov.; 6, *P. murzini* sp.nov.

Pseudopodabrus kubani Wittmer, 1995 (Figs 3–4)

Pseudopodabrus kubani Wittmer, 1995: 124.
Pseudopodabrus semicircularis Wittmer, 1995: 125. **syn.nov.**

Type material examined. Holotype ♂ of *P. kubani*: "China, Yunnan, Yipinglang, 2000m, 25°03′N, 101°55′E, 8–10 June 1993, Vit Kubáň leg." (NHMB). Holotype ♂ of *P. semicircularis*: "China, Yunnan, Yipinglang, 1800–2000m, 25°04′N, 101°55′E, 17–20 June 1994, Vit Kubáň leg." (NHMB).
Additional material examined. 1 ♂: "China, Yunnan, Weishan mt., 1800–2500m, 25°01′N, 100°21′E, 22–25 June 1992, Vit Kubáň leg." (NHMB).

Distribution. China.

Remarks. The type series of *P. kubani* Wittmer includes to two different species. All paratypes (3 ♂♂, 2 ♀♀: "China, Yunnan, Yipinglang, 1800–2000m, 25°04′N, 101°55′E,

17–20 June 1994, Vit Kubáň") are here attributed to *P. tuberculatus* Wittmer, 1983, which can be easily distinguished from the former by the wider and rounded foveae on the vertex of the male (Fig. 2).

We consider *P. semicircularis* to be a junior synonym of *P. kubani.* WITTMER (1995) described these species based on difference of the foveae on the vertex of males. According to our study, the single male type specimen of *P. semicircularis* has a deformed fovea. In fact, the semicircle-shaped fovea of *P. semicircularis* (Fig. 4) is made up by two foveae approaching each other posteriorly like those of *P. kubani* (Fig. 3), posterior to the foveae the vertex has been mechanically damaged rather than naturally shaped. Apart from this, there is little difference in morphology between these species. We were able to get more specimens of *P. kubani* from the same locality, but no *P. semicircularis*. Therefore, we suggest to consider *P. semicircularis* as a new synonym of *P. kubani*.

***Pseudopodabrus longiimpressus* sp.nov.** (Figs 5, 7–9)

Type material. Holotype ♂: "Thailand, Mae Hong Son, Ban Huai Po, 1600–2000m, 17–23 May 1991, J. Horák leg.". Paratypes: 1 ♂: same data as holotype; 1 ♂: "Thailand, Mae Hong Son, Ban Huai Po, 1600–2000m, 19°19′N, 97°59′E, 17–23 May 1991, L. Dembický leg." (the holotype and all paratypes in NHMB).

Description. Male. Body length: 6.3 mm; maximal width across elytra: 1.5 mm. Head orange, outside of and behind foveae black, mouthparts orange, apices of mandibles slightly brown, antennae black, antennomeres I–IV orange, pronotum orange, with a dark mark in middle of anterior margin, scutellum and elytra black, thoracic meso- and metasternites and abdomen orange, legs oranges, tarsi dark.

Head (Fig. 5): eyes moderately protruding; head width across eyes slightly wider than anterior margin of pronotum, behind eyes rounded and narrower, a longitudinal fovea on each side of vertex, between foveae slightly concave, surface densely and finely punctured; anterior and posterior margins of fovea rounded, inner and outer margins slightly arcuated, fovea about 3 times longer than wide, as wide as distance to eye; antennae extending to middle of elytra, antennomere II as long as III, from IV to X becoming gradually shortened apically, XI slightly longer than X.

Pronotum: longer than wide, anterior margin rounded, anterior angles rounded, lateral margins diverging posteriorly, posterior angles nearly right-angled, posterior margin almost straight; disc slightly depressed at anterior angles, densely and finely punctured.

Elytra: parallel-sided, slightly wider across humeri than posterior margin of pronotum, about 3.5 times longer than pronotum, densely and coarsely punctured.

Aedeagus (Figs 7–9): ventral process of each paramere narrow in ventral view, with apex tapered, inner margin strongly narrowed at basal part in dorsal view, a small part visible in lateral view. Similar to that of *P. bezdeki* Švihla, 2004.

Female. Unknown.

Variation in type series. Body length 5.2–6.3 mm, width 1.2–1.5 mm.

Distribution. Thailand

Etymology. The specific name is derived from Latin "*longus*" + "*impressus*" = long + fovea, referring to its longer foveae on vertex.

Differential diagnosis. This species is similar to *P. biimpressus* Wittmer, 1983, but can be distinguished by the following characters: foveae on vertex of the male narrower and longer, 3 times as long as wide, as wide as distance to the eye; antennomere II as long as III; pronotum mostly orange, slightly darkened in middle of anterior margins.

***Pseudopodabrus murzini* sp.nov.** (Figs 6, 10–12)

Type material. Holotype ♂: "Thailand, 100km N Chiang Mai, Chiang Dao hill resort, 600m, 19°26′N, 98°59′E, 25 June 2008, Sergei Murzin" (NHMB).

Description. Male. Body length: 5.3 mm; maximal width across elytra: 1.1 mm. Head black, frons brown, mouthparts brown, antennae black, antennomeres I orange, pronotum mostly black, dark red on posterior sides, scutellum and elytra black, thoracic meso- and metasternites and abdomen black, legs black, femora and base of tibiae orange.

Head (Fig. 6): eyes moderately protruding; head width across eyes slightly wider than anterior margin of pronotum, behind eyes rounded and narrower, a short fovea on each side of vertex, approaching posteriorly and extending to middle of vertex, vertex behind foveae almost flat in middle, surface densely and finely punctured; antennae extending to middle of elytra, antennomere II shorter than III, from IV to X becoming gradually shortened apically, XI slightly longer than X.

Pronotum: wider than long, anterior margin rounded, anterior angles rounded, lateral margins diverging posteriorly, posterior angles nearly right-angled, posterior margin almost straight; disc almost flat, densely and finely punctured.

Elytra: parallel-sided, slightly wider across humeri than posterior margin of pronotum, about 4 times longer than pronotum, densely and coarsely punctured.

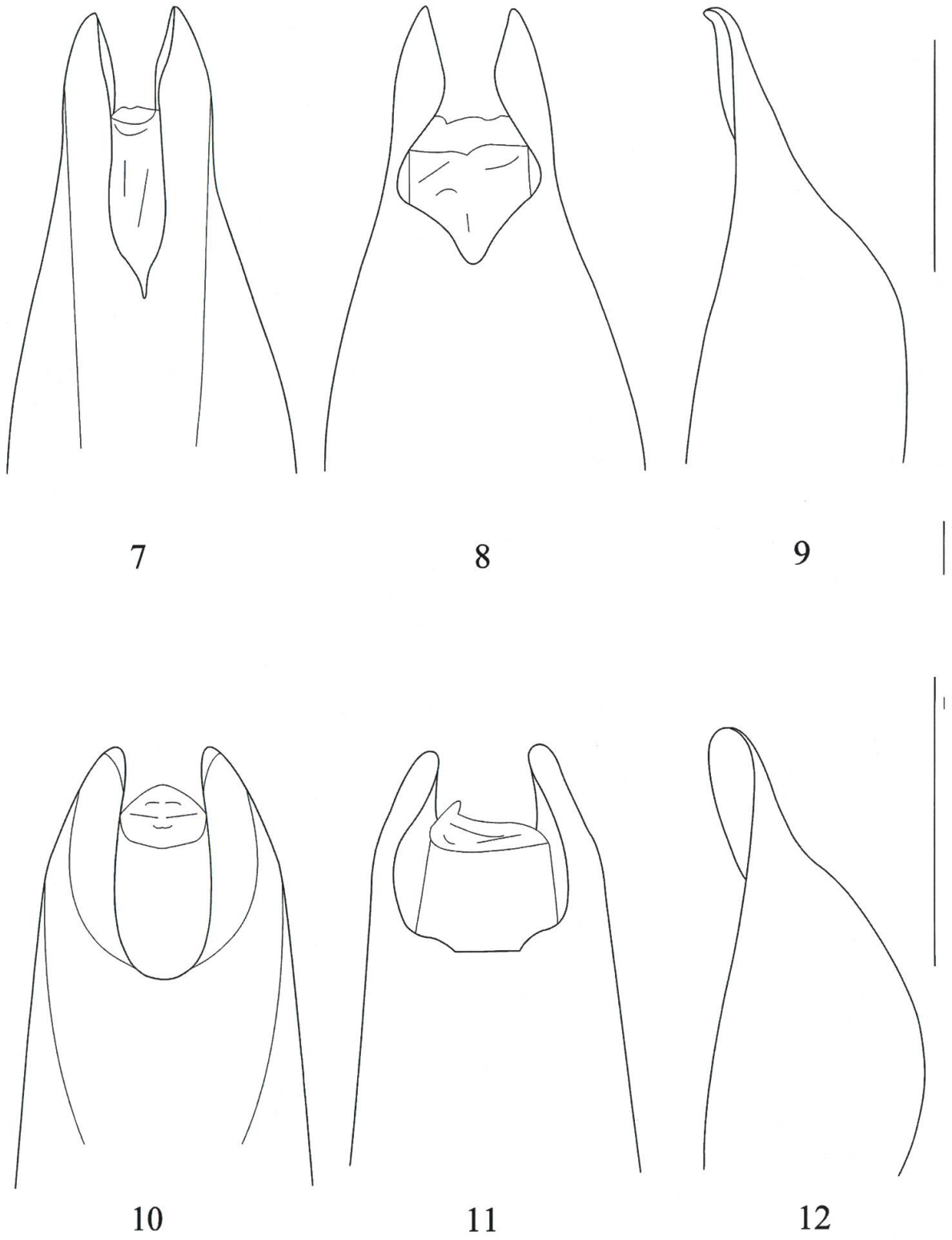
Aedeagus (Figs 10–12): ventral process of each paramere wide in ventral view, with apex rounded, inner margin nearly smooth in dorsal view, a large part visible in lateral view. Similar to that of *P. prudeki* Švihla, 2004.

Female. Unknown.

Distribution. Thailand

Etymology. The species is named after the collector, Dr. Sergei Murzin.

Differential diagnosis. This species is similar to *P. kubani*, but differs in the following characters: foveae on vertex slightly wider, vertex behind foveae flat in middle; antennomere II shorter than III; pronotum slightly wider than long; head mostly black, pronotum black, dark red on posterior sides.



Figs 7–12. Aedeagi of *Pseudopodabrus* Pic: 7–9, *P. longiimpressus* sp.nov.; 10–12, *P. murzini* sp.nov. (7, 10 – ventral view, 8, 11 – dorsal view, 9, 12 – lateral view. Scale bars: 0.5 mm.)

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