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Research

Report on the undescribed flightless Lucanidae species of New Guinea (Coleoptera: Scarabaeoidea: Lucanidae)

뉴기니의 미기재 보행성 사슴벌레 1종의 보고 (딱정벌레목: 풍뎅이상과: 사슴벌레과)

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초록

뉴기니에 서식하는 미기재종으로 판단되는 보행성 사슴벌레 1종을 임시명 *Pelekysaegus*으로서 보고한다. *Pelekysaegus*는 형태학적으로 *Pachistaegus* de Lisle, *Tumidaegus* Bomans, *Cherasphorus* Bomans, *Microlucanus* Bomans & Bartolozzi, *Gnaphaloryx furfuraceus* (de Lisle)와 밀접한 관계를 갖는 것으로 보인다. 현존하는 사슴벌레속에 포함되지 않는 것으로 판단되지만, 추후의 연구를 통해 본 종에 대한 기재와 정확한 분류학적 위치의 규명이 필요할 것으로 보인다. 추가적으로 *Cherasphorus inflatus* Bomans의 속날개의 퇴화를 확인했다.

Abstract

The undescribed flightless Lucanidae species from New Guinea is reported under the provisional name, *Pelekysaegus*. *Pelekysaegus* shows morphological similarities between *Pachistaegus* de Lisle, *Tumidaegus* Bomans, *Cherasphorus* Bomans, *Microlucanus* Bomans & Bartolozzi, and *Gnaphaloryx furfuraceus* (de Lisle). The species has not been assigned to any currently recognized Lucanidae genera. Further studies are required to describe the new species and determine its taxonomic placement. Additionally, the wing atrophy of *Cherasphorus inflatus* Bomans is discovered.

Keywords: Brachypterous; *Pachistaegus*; *Tumidaegus*; *Cherasphorus*; *Microlucanus*

Introduction

Flightless stag beetles are distributed throughout the world. In New Guinea, *Pachistaegus* de Lisle and *Tumidaegus* Bomans are recorded as flightless stag beetle genera (Scholtz, 2000). de Lisle (1967) described the genus *Pachistaegus* in Dorcinae to describe the species *P. besucheti* and a questionable species, *Aegus furfuraceus* later (de Lisle, 1970). *A. furfuraceus* resembles *Pachistaegus*. Mizunuma & Nagai (1994) suggested that *A. furfuraceus* might be a species of *Gnaphalroyx*, but did not make the change. Bartolozzi *et al*. (2011) listed this species as *Gnaphaloryx*. Yamamoto & Qodri (2022) pointed out the similarity between *G. furfuraceus* and *P. besucheti*. Further studies for the generic placement of this species are required.

Bomans (1988) described *Tumidaegus* for the description of *T. variolosus* and *Cherasphorus* for *C. inflatus*. Bomans & Bartolozzi (1996) described the genus *Microlucanus* and *M. greensladeae* from Guadalcanal and noted that this genus is related to *Pachistaegus* and *Tumidaegus*. One undescribed species that morphologically resembles these genera is reported under the provisional name *Pelekysaegus*. Additionally, the wing atrophy of *C. inflatus* is reported for the first time.

Materials & Methods

Photographs of the specimens were taken using a digital camera (Canon EOS 650D) with a macro lens [Tamron Auto Focus 60mm f/2.0 SP DI II LD IF 1:1 Macro Lens]. Image stacks and editing were processed using Adobe Photoshop. Terminology mainly follows Holloway (2007) and Bomans & Bartolozzi (1996).

The following materials were examined:

Lucanidae sp. (referred to as *Pelekysaegus* as the provisional name in this work): 1 male, Papua New Guinea, Morobe, Aseki, VIII. 2002 (coll. S.J. Chang)

Cherasphorus inflatus Bomans, 1988: 2 male, 1 female, Papua New Guinea, Eastern Highlands, Okapa, Kume/Kanioitasa, 1800m, IX. 2024 (coll. S.J. Chang)

Tumidaegus variolosus Bomans, 1988: 1 male, Papua New Guinea, Morobe, Aseki, VIII. 2006 (coll. S.J. Chang)

Microlucanus greensladeae Bomans & Bartolozzi, 1996: 1 female, Solomon, Guandalacanal Is., Mt. Austen, 1~6. XII. 2016 (coll. S.J. Chang)

The following literature was consulted for comparison: Bomans (1988), Bomans & Bartolozzi (1996), de Lisle (1967, 1970), Mizunuma & Nagai (1994), and Fujita (2010).

Results

Taxonomy

***Pelekysaegus* sp. (provisional name)**

Figure 1-2. *Pelekysaegus* sp. (provisional name) 1) Dorsal habitus. 2) Lateral habitus.

Description. Male (Fig. 1-2). Length. 17mm including mandibles. Dorsal surface shiny black, covered with punctures and golden setae. **Head.** Broader than long, deeply excavated, forming wide triangular depression; a pair of unpunctured tubercles located diagonally above the eyes. Clypeus visible in dorsal view. Eye canthus narrow, fully dividing eye (Fig. 6-7), similar to *Tumidaegus* Bomans (Fig. 8-9). Antennae geniculate, with 10 antennomeres, with a 3-segmented club. Mandibles densely punctured, slightly longer than head, with axe-shaped inner teeth, slightly curved upwards. **Pronotum.** Broader than long, wider than head or elytra, hexagonal shaped, sharply narrowed posteriorly from median angle to posterior angle; lateral margin crenulated, not parallel; posterior margin narrower than elytra; posterolateral corners strongly emarginate; median angle prominent, posterior angle rounded; pronotal disc marked by a median longitudinal depression; middle of disc concave. Scutellum small but visible, broader than long. **Elytra.** Fused along the suture, convex; base region concave; three lines formed by long golden setae. Wings not fully developed, brachypterous.

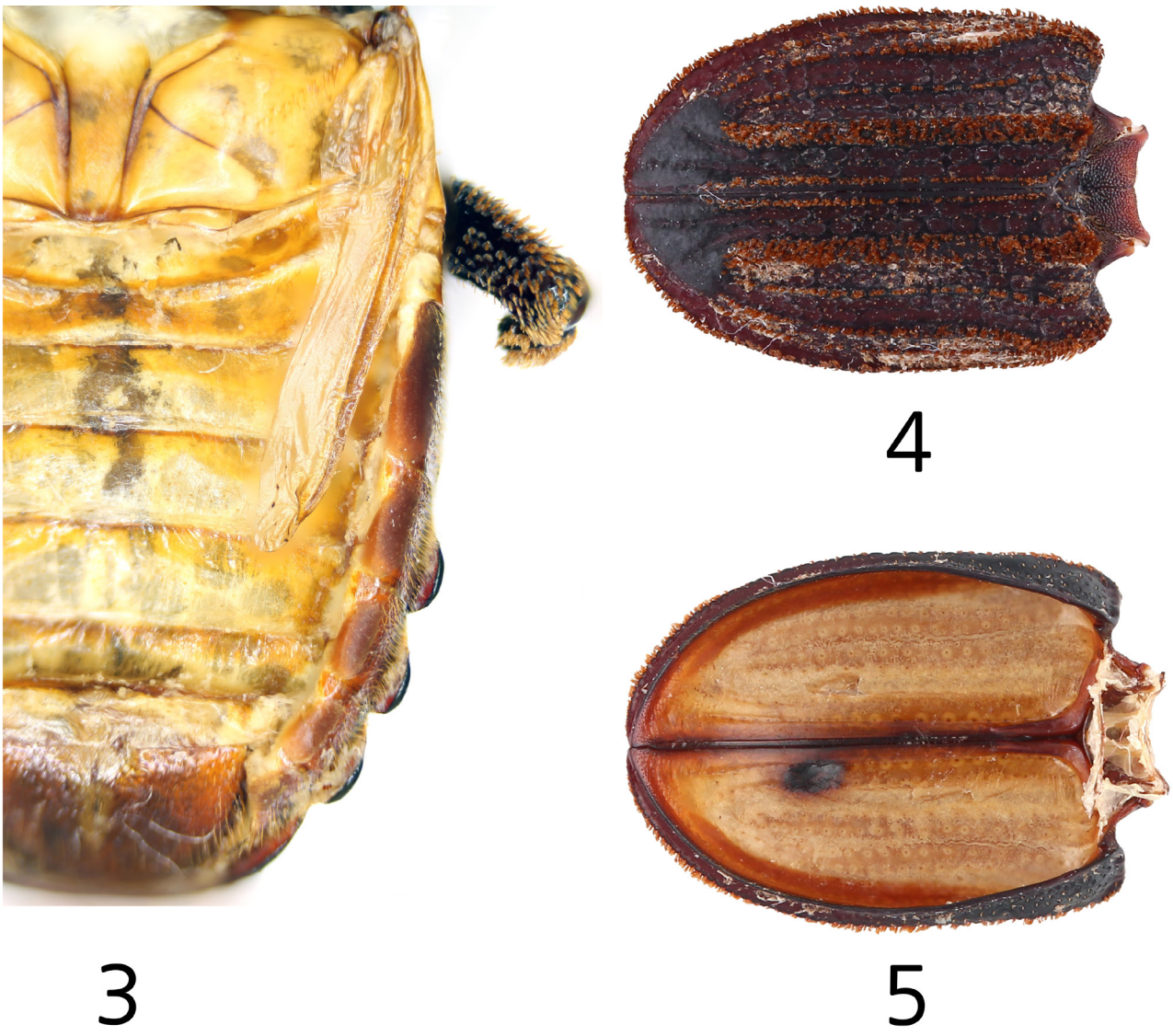

Figure 3-5. *C. inflatus*. 3). Atrophied wing of male. 4-5). Elytra. 4). Dorsal view. 5). Ventral view.

Distribution. Papua New Guinea.

Remarks. The name '*Pelekysaegus*' for this species is provisional, and thus does not hold any validity. This provisional name has been proposed solely for the convenience of reference in this paper and cannot be cited as a valid nomenclature. The formal description was not possible due to the lack of specimens.

Wing atrophy of *C. inflatus*. Elytra of *C. inflatus* are fused along the suture and the hind wings are atrophied in both sexes (Fig. 3-5). Whether the other species of *Cherasphrous* are brachypterous is unknown.

Discussion

Pelekysaegus shows general morphological similarities to the following genera and species (Table 1): the genera *Pachistaegus*, *Tumidaegus*, *Cherasphorus*, *Microlucanus*, and the species *G. furfuraceus*.

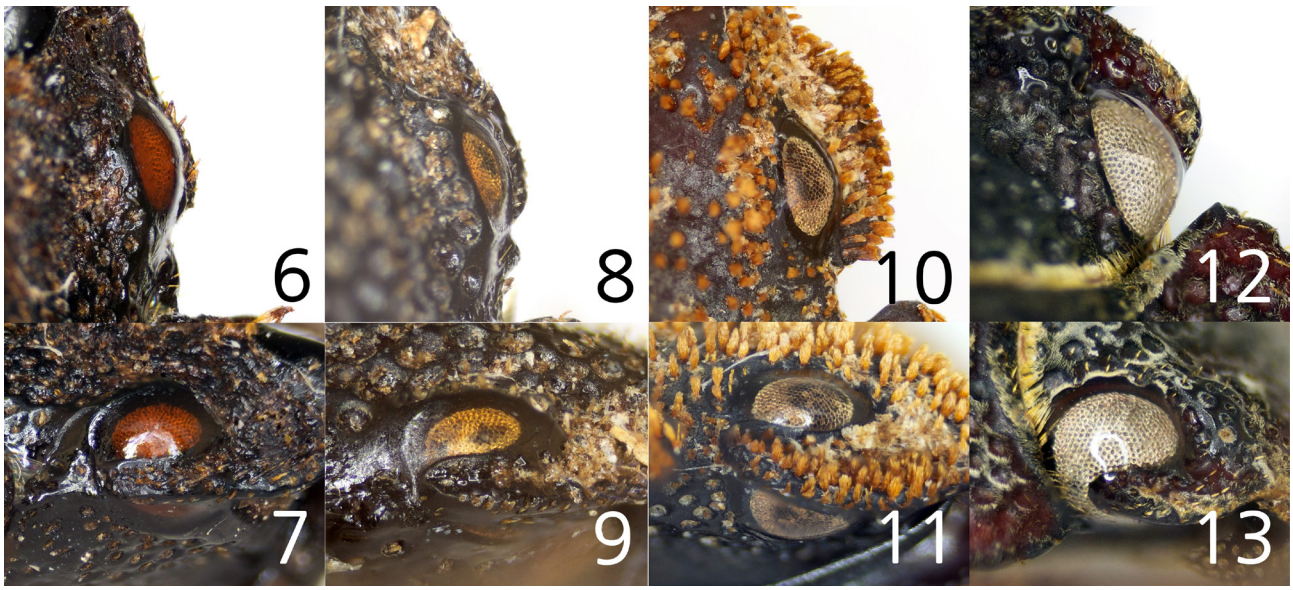

Figure 6-13. Eyes. 6-7). *Pelekysaegus* sp., male, eyes fully divided by canthi. 6). Dorsal view. 7). Lateral view. 8-9). *T. variolosus*, male, eyes fully divided by canthi. 8). Dorsal view. 9). Lateral view. 10-11). *C. inflatus*, male, eyes fully divided by canthi. 10). Dorsal view. 11). Lateral view. 12-13). *M. greensladeae*, female, eyes partially divided by canthi. 12). Dorsal view. 13). Lateral view.

	Pelekysaegus	*Pachistaegus*	*Cherasphorus inflatus*	*Tumidaegus*	*Microlucanus*
Median longitudinal depression of pronotum	O	O	O	X	O
Hind wings not fully developed (brachypterous)	O	O	O	O	O
Eyes fully divided	O	X	O	O	X
Concavity of pronotal disc present	O	O	X	X	O
Lateral margin of pronotum crenulated	O	O	X	O	O

Table 1. Morphological similarities between *Pelekyaegus* and the related genera.

Pachistaegus can be distinguished from *Pelekysaegus* by the following features: eyes partially divided by a canthus; clypeus not visible in dorsal view; mandibles bidentate; lateral margin of pronotum subparallel. *Tumidaegus* can be distinguished by the following features: middle of pronotum not concave; pronotal disc lacking median longitudinal depression; posterolateral corners very weakly emarginate; elytra less convex. *Cherasphorus* can be distinguished by the following features: eye canthus thick (Fig. 10-11); middle of pronotum not concave; lateral margin of pronotum smooth and subparallel; scutellum rather large; elytra less convex. – Only *C. inflatus* was examined in this work. *Microlucanus* can be distinguished by the following features: eyes partially divided by a canthus (Fig. 12-13); lateral margin of pronotum subparallel; margin of elytra crenulated. *G. furfuraceus* can be distinguished from *Pelekysaegus* by the following features: mandibles bidentate; lateral margin of pronotum subparallel.

Phylogenetic relationships for these genera and species are unknown, but Shibata (2023) noted that *Tumidaegus*, *Cherasphorus*, and *Microlucanus* are thought to be associated with *Aegus* W.S.

Macleay. de Lisle (1967) described *Pachistaegus* under *Dorcinae* and indicated the relationship between the two genera. Considering the general similarity between *Pelekysaegus* and these taxa, *Pelekysaegus* might be also correlated to them. Further studies are required to verify the phylogenetic relationships of this group.

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