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New data on ambrosia-beetles of the genus *Sampsonius* EGGERS, 1935 with descriptions of two new species from Peru (Coleoptera: Curculionidae: Scolytinae)

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Abstract

Two new species of *Sampsonius* EGGERS, 1935 (Coleoptera: Curculionidae: Scolytinae) are described from Peru, namely *S. kuaizi*, and *S. sagittarius*. New records of *Sampsonius* species in Loreto, Huánuco and Junín Provinces of Peru are given and the biology of the ambrosia beetles in the genus is discussed.

Key words: Coleoptera, Curculionidae, Scolytinae, bark beetles, *Sampsonius*, Xyleborini, taxonomy, new species, Peru.

Introduction

At the moment the Neotropical Region can be still defined as “terra incognita” for entomologists. Up to the present time the South American fauna has been studied only fragmentarily. Every year brings descriptions of new insect taxa with strange forms, unusual behaviour and mode of living. Bark and ambrosia beetles of the subfamily Scolytinae (Coleoptera: Curculionidae) are not excluded from this rule (e.g. DOLE & COGNATO 2007). Recently WOOD (2007) published a long-awaited fundamental taxonomic monograph on Neotropical Scolytines. This monograph is the first attempt to analyze the Neotropical Scolytinae fauna as a whole, and is based on Wood’s own titanic efforts and long-term research on the Scolytines of Central and South America. However, it is absolutely clear that the future will bring findings of new beetle species, contributing significantly to the knowledge of the fauna of the South American region.

The present paper deals with only one Neotropical genus from the tribe Xyleborini: *Sampsonius* EGGERS, 1935. The genus *Sampsonius* was described by EGGERS (1935) in honor of the entomologist F. Winn Sampson. BRIGHT (1991) revised the genus and gave the history of its investigation. The beetles of this genus are characterized by the following combination of characters: the body is slender and elongate; the pronotum is elongate with the sides strongly converging anteriorly; most species possess two large median serrations at the apical pronotal margin; the antennal club is flattened with the first and second sutures moderately to strongly procurved; the elytral apex is usually acuminate, with a strongly flattened declivity and evident dorso-lateral margin. Besides, *Sampsonius* species possess an unusually slender protibia, strongly concave lateral edge of pronotum, flat submentum and other distinctive features. Males are very rare, wingless and much smaller than the females.

Eighteen valid species from the genus *Sampsonius* are known at present (BRIGHT 1991, SCHÖNHERR 1994, WOOD 2007). During the field work of the senior author in 2005–2008 in Peru, eight species of *Sampsonius* were collected, among which two species were recognized as new to science. This paper lists new findings, gives detailed descriptions and figures of the new species and also adds some biological notes.

Material

All specimens listed below were collected by A.V. Petrov and, unless indicated otherwise, are deposited in A.V. Petrov's private collection.

Abbreviations:

NMW	Naturhistorisches Museum Wien, Austria
ZISP	Zoological Institute RAS, St. Petersburg, Russia
ZMM	Zoological Museum of Moscow State University, Moscow, Russia

Sampsonius alvarengai BRIGHT, 1991 (Fig. 1)

MATERIAL EXAMINED:

P E R U: JUNÍN PROVINCE: Cananeden vill., left bank of Perene River, 8 km NNE from Puerto Ocopa, 1100 m a.s.l., 74°13'W 11°07'S, 19.I.2006 and 12.I.2007, in barrier trap, 2 ♀♀; LORETO PROVINCE: 70 km SSW from Iquitos to Nauta, 140 m a.s.l., 2.III.2008, in barrier trap, 1 ♀.

Sampsonius dampfi SCHEDL, 1940 (Fig. 2)

MATERIAL EXAMINED:

P E R U: JUNÍN PROVINCE: Cananeden vill., left bank of Perene River, 8 km NNE from Puerto Ocopa, 1100 m a.s.l., 74°13'W 11°07'S, 12.–19.I.2006; 7.–12.I.2007; 2.–7.III.2008, 69 ♀♀; HUÁNUCO PROVINCE: Cayumba vill., 26 km SSW from Tingo Maria, 780 m a.s.l., 75°59'W 9°29'S, 16.II.2007, 1 ♀; LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 1.–3.II.2007; 16.–22.II.2008, 46 ♀♀; 70 km SSW from Iquitos to Nauta, 1.–5.III.2008, 9 ♀♀; Gen Gen vill., Momon River, 20 km NNW from Iquitos, 120 m a.s.l., 6.II.2007, 1 ♀.

Sampsonius ensifer WOOD, 2007 (Fig. 3)

MATERIAL EXAMINED:

P E R U: JUNÍN PROVINCE: Cananeden vill., left bank of Perene River, 8 km NNE from Puerto Ocopa, 1100 m a.s.l., 74°13'W 11°07'S, 19.I.2006 and 12.I.2007, in wood of coffee tree, 4 ♀♀; LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 3.II.2007, 11.II.2007 and 22.II.2007, in wood of *Ficus* sp., 3 ♀♀; same locality, but 20.II.2008, 2 ♀♀.

Sampsonius obtusicornis SCHEDL, 1976 (Fig. 4)

MATERIAL EXAMINED:

P E R U: JUNÍN PROVINCE: Cananeden vill., left bank of Perene River, 8 km NNE from Puerto Ocopa, 1100 m a.s.l., 74°13'W 11°07'S, 12.I.2006, in light trap, 1 ♀; LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 22.II.2008, in barrier trap, 1 ♀.

Sampsonius prolongatus SCHÖNHERR, 1994 (Fig. 5)

MATERIAL EXAMINED:

LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 3.II.2006, leg. A.V. Petrov; 6 ♂♂, 5 ♀♀ same locality, but 21.–22.II.2008, leg. A.V. Petrov (two specimens in ZISP, 1 specimen in NMW, all others in A.V. Petrov private collection).

ECOLOGY: *Sampsonius prolongatus* was found in 2006 on the thin trunk of a cut tree under the canopy of the tropical rainforest. The galleries of this species were built near the entrance holes of *Dryocoetoides capucinus* (EICHHOFF, 1869) galleries. The entrance galleries were perpendicular to the bark surface, 2.5–3.0 cm long, and each contained a live female. The galleries did not reach the pith of the stem, and ended in chambers of irregular form (brood chambers), where larvae were found. Five to twelve larvae were found in a brood chamber. In 2008, females of *Sampsonius prolongatus* were collected in window traps set on trees that had been cut three days earlier.

***Sampsonius quadrispinosus* EGGERS, 1935**
(Fig. 6)

MATERIAL EXAMINED:

P E R U: JUNÍN PROVINCE: Cananeden vill., left bank of Perene River, 8 km NNE from Puerto Ocopa, 1100 m a.s.l., 74°13'W 11°07'S, 19.I.2006, 12.I.2007, 23.I.2007, 11.II.2007, 26.III.2008, in barrier trap, 5 ♀ ♀.

***Sampsonius kuaizi* sp.n.**
(Fig. 7)

TYPE LOCALITY: Peru, Loreto province, left bank of Amazon River, Itaya River.

TYPE MATERIAL: **Holotype** ♀ (ZMM): PERU: LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 5.II.2006, leg. A.V. Petrov. **Paratypes** (Petrov collection): PERU: LORETO PROVINCE: 2 ♀ ♀: Itaya River, left bank of Amazon River, 60 km SSW from Iquitos to Nauta, 120 m a.s.l., 22.II.2008, leg. A.V. Petrov; 1 ♀: Itaya River, left bank of Amazon River, 70 km SSW from Iquitos to Nauta, 120 m a.s.l., 24.II.2008, in window trap, leg. A.V. Petrov.

DESCRIPTION: Female: 4.7 mm long, 4.3 times as long as wide (Fig. 7). Body unicoloured, brown, shining. Frons convex. Central portion of the frons from apical margin up to the upper level of eyes darker compared to the vertex, roughly shagreened due to microreticulation, and covered with minute tubercles. Lower portion of the frons above epistoma with a shining spot without reticulation and tubercles. Frons covered with short yellow hairs above epistoma and up to the upper level of eyes; apices of the hairs oriented downwards, towards mandibles. Occipital portion light brown, with only slight microreticulation and without any hairs. Eyes large, coarsely faceted, weakly emarginated anteriorly. Antennae brown. Antennal club nearly round, as long as wide, with margins of 1st and 2nd sutures procurved.

Pronotum cylindrical, 1.6 times as long as wide, with sides parallel in basal half and evenly rounded towards anterior margin. Base of pronotum nearly straight, slightly sinuate at sides. Posterior half of the pronotum punctured by sparse and minute points, anterior half of the pronotum covered by rough rugosities. Apical margin of pronotum has several tubercles with the apices oriented upwards; two central tubercles are larger than their neighbours and have acuminate apices. Whole pronotal surface covered by erect pale hairs, longer at sides and in apical portion of the pronotum (in one paratype the central pronotal disc is glabrous). Lateral margin of pronotum when inspected from side shows the lateral emargination above the episternal area.

Scutellum not depressed, level with elytral surface. Scutellar depression absent.

Elytra brown, faintly shining, cylindrical, 1.7 times as long as pronotum. Sides parallel and tapering towards apex in posterior third. Elytral surface covered with pale hairs that are significantly longer and much more dense on the elytral declivity. Discal striae straight up to beginning of the declivity, coarsely punctured. Strial hairs in rows, short and recumbent. Interstriae with more sparsely set microscopic punctures. Elytral declivity occupies 1/3 of elytral length, its surface strongly impressed dorsally. Surface of declivity roughly shagreened, faintly

shining, nearly dull. Interstriae 1 on declivity weakly elevated, interstriae 2 weakly impressed, interstriae 3 slightly elevated. Interstriae 1–3 with numerous fine, scattered granules. Interstriae 7 forming lateral margin of declivity sharply elevated, strongly serrate. At elytral apex, along suture there are two rod-like, black, shining protrusions, touching each other for their whole length, and protruding beyond apex (Fig. 10a). The apices of the protrusions are oriented upwards and are slightly rounded.

Mesonotum and abdomen covered by sparse and shallow punctures and pale light hairs of moderate length. Abdominal sternites horizontal, with lower surface nearly parallel to the elytral margin. Femora of all legs thickened. Protibia narrow, darker coloured than profemora and prothorax. Legs covered with short yellow hairs.

Male unknown.

DIAGNOSIS: The new species is closely related to *Sampsonius buculus* SCHEDL, 1937, but can be distinguished by the smaller size, and especially by the form and position of the processes on the elytral declivity. In *S. buculus*, the process on each side is not in contact with its neighbour, and the apices are acuminate, not rounded, and located distant from each other (Figs. 8, 10b). The new species was directly compared to the holotype of *S. buculus* in the NMW.

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The species name relates to the similarity of the apical processes of the elytra to the chopsticks used in China to pick up food. Kuàizi is the Chinese word for chopsticks.

***Sampsonius sagittarius* sp.n.**
(Fig. 9)

TYPE LOCALITY: Peru, Loreto province, left bank of Amazon River, Itaya River.

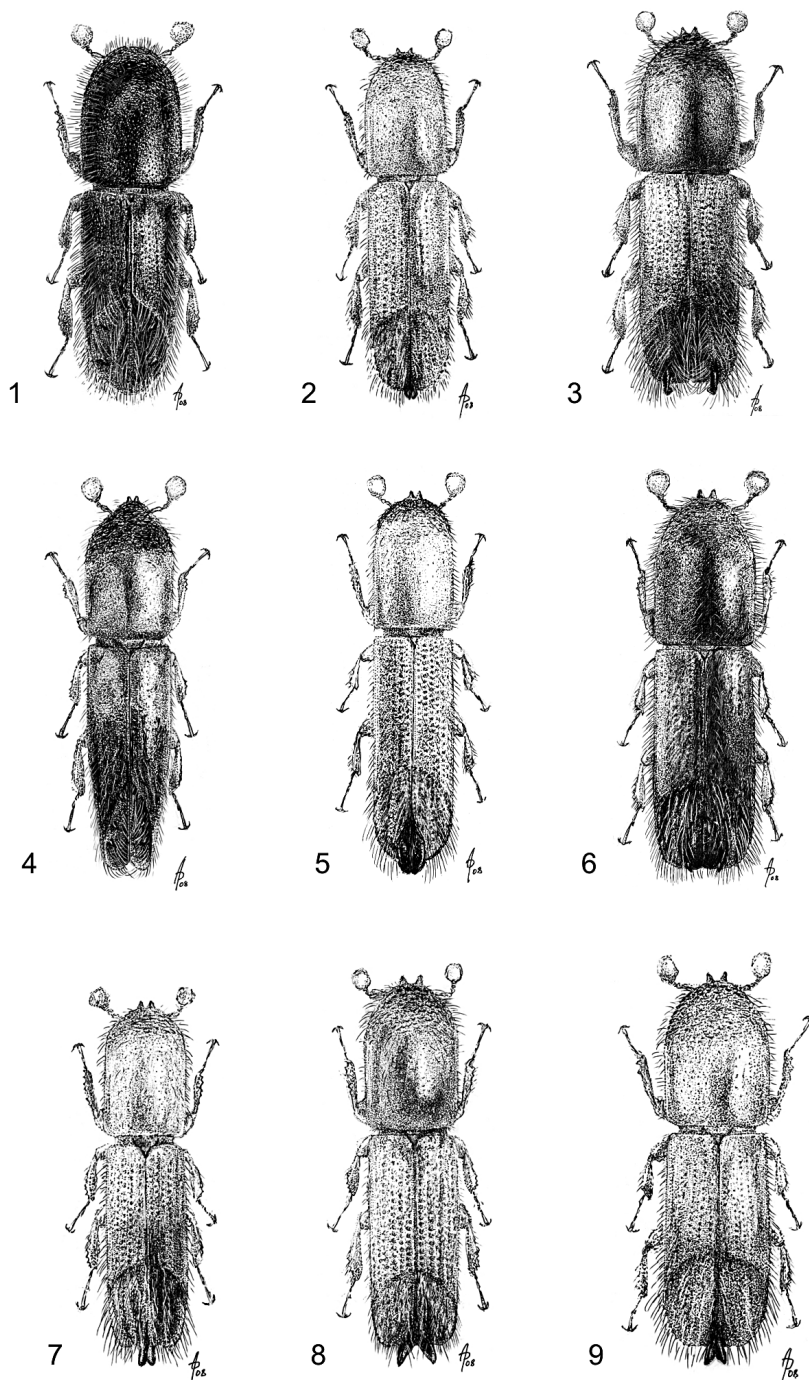
TYPE MATERIAL: **Holotype** ♀ (ZMM): PERU: LORETO PROVINCE: Itaya River, left bank of Amazon River, 58 km SSW from Iquitos to Nauta, 120 m a.s.l., 73°26'W 4°11'S, 1.II.2006, leg. A.V. Petrov. **Paratypes:** 3 ♀♀ same date and locality as the holotype, leg. A.V. Petrov; 2 ♀♀ same locality, but 18.–20.II.2008, leg. A.V. Petrov (one paratype in NMW, other paratypes in A.V. Petrov private collection).

DESCRIPTION: Holotype female 4.7 mm long, 3.5 times as long as wide (Fig. 9). Body unicoloured reddish-brown, shining.

Frons convex. Complete frontal surface roughly shagreened due to microreticulation and covered with tubercles. Central portion of frons above epistoma with a shining spot that has neither reticulation nor tubercles. Golden hairs cover the frons from epistoma up to the upper level of eyes; apices of the hairs oriented downwards, towards mandibles. Occipital portion light brown, with only gentle shagreen, without any hairs. Eyes large, coarsely faceted, weakly emarginate anteriorly. Antennae brown. Antennal club nearly round, as long as wide. Margins of sutures 1 and 2 procurved.

Pronotum cylindrical, with lateral sides parallel in basal half and evenly rounded towards anterior margin. Base of pronotum straight. Posterior part (more than half) of the pronotum with sparse and minute punctures, anterior part of the pronotum covered by rough rugosities. Apical margin of pronotum with several tubercles with apices oriented upwards, two central tubercles larger than their neighbours and with acuminate apices. Complete pronotal surface with golden hairs; these hairs longer and erect at sides and in apical portion of the pronotum (in one paratype the central pronotal disc is glabrous). Lateral margin of pronotum when inspected from side shows the lateral emargination above the episternal area.

Scutellum of triangular form, with slightly attenuated apex, its surface at same level as elytral surface. Scutellar depression absent.



Figs. 1–9: Drawings of habitus of 1) *Sampsonius alvarengai*, 2) *S. dampfi*, 3) *S. ensifer*, 4) *S. obtusicornis*, 5) *S. prolongatus*, 6) *S. quadrispinosus*, 7) *S. kuaizi*, 8) *S. buculus*, 9) *S. sagittarius*.

Elytra reddish-brown, faintly shining, cylindrical, 1.8 times as long as pronotum. Elytral sides parallel and evenly narrowed towards the apex. Strial punctures form straight lines on elytral disc up to beginning of the declivity. Interstriae with sparsely set microscopic punctures. Elytral surface covered with pale hairs that are significantly longer and much more dense on the elytral declivity. Hairs in rows short and recumbent. Elytral declivity occupies 1/3 of elytral length, its surface strongly impressed dorsally. Surface of elytral declivity roughly shagreened, faintly shining. Interstriae 1 weakly elevated with fine granules, interstriae 2 weakly impressed, interstriae 3 slightly elevated. Interstriae 1–3 with fine, numerous, scattered granules. Interstriae 7 forming lateral margin of declivity, sharply elevated, strongly serrate. At the elytral apex, along the suture each elytron with a triangular process. These elytral processes are joined for half of their length, and are then divergent and separated from one another at the apex; posterior parts of processes also divergent, forming an angle of about 45°.

Mesonotum and abdomen covered by sparse and shallow punctures and light hairs of moderate length. Abdominal sternites horizontal, with lower surface nearly parallel to the elytral margin. Femora of forelegs thickened. Legs covered with short yellow hairs.

Male unknown.

DIAGNOSIS: The new species can be distinguished from the closely related *Sampsonius dampfi* SCHEDL, 1940 by its greater length and by the broader and stouter body. The main diagnostic feature distinguishing the new species from *S. dampfi* is found in the form and orientation of the paired elytral processes (Fig. 10). In the new species, they are triangular and much larger compared to the processes seen in *S. dampfi*. The new species is easily distinguished from *S. buculus* because the paired processes are joined along most of their length, whilst in *S. buculus* the processes are strongly divergent. *Sampsonius sagittarius* can also be distinguished from *S. pedrosai* SCHOENHERR, 1994 by the form of the elytral processes. In the new species, they are triangular and divergent after half of their length; in contrast, in *S. pedrosai*, the apices of the triangular elytral processes are conjointly rounded and form a common rounded apex above the suture.

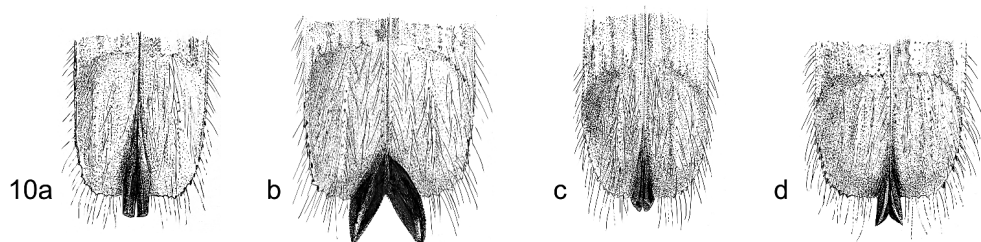


Fig. 10: Elytral processes of a) *Sampsonius kuaizi*, b) *S. buculus*, c) *S. dampfi*, d) *S. sagittarius*.

DISTRIBUTION: Known only from the type locality.

ECOLOGY: Beetles were collected in window traps, set on cut trees under the canopy of the tropical rainforest.

ETYMOLOGY: The species name refers to the body form, which resembles an arrow. “Sagitta” means an arrow in Latin.

Biological notes on *Sampsonius*

According to WOOD (2007), *Sampsonius* species are obligatory domicile parasites of other Xyleborini ambrosia beetles. The diameter of the entrance hole is considered to be the limiting

factor for entry of the *Sampsonius* female into a host gallery. After the host ambrosia beetle and its progeny are eliminated from the galleries, the *Sampsonius* female starts oviposition. Our observations do not entirely support this model of *Sampsonius* beetle habits. Based on the senior authors field observations in Peru, we consider the mode of *Sampsonius* parasitism as facultative, not obligatory. The senior author has observed parallel infestation of the same tree branches by females of *Sampsonius dampfi* and *Dryocoetoides capucinus* (EICHHOFF, 1869). Many females of *S. dampfi* were found in their own, recently started parental galleries near the galleries of *D. capucinus*. However, *Sampsonius* species usually colonize branches after the galleries of other Xyleborini are built so that the takeover and development of *Sampsonius* in non-native galleries is possible. It seems logical to suggest that *Sampsonius* females are bringing into host galleries the aggressive microorganisms making the host progeny development impossible but still suitable for *Sampsonius* parasite development. However, the senior author has not set special experiments to elucidate the microflora analysis prior to *Sampsonius* appearance in the galleries and later, and so far our suggestion is only a hypothesis. Alternatively, *Sampsonius* species may make use of the ambrosia fungi introduced by the Xyleborine species that had colonized the wood earlier.

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