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Research article

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A new West African genus of Bostrichidae (Coleoptera), and a key to the Afrotropical genera of tribe Xyloperthini

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Abstract. A new genus, *Plesioxylion* Liu & Beaver gen. nov., is described for *Amintinus gambianus* Borowski, 2018 from West Africa with a more detailed description and new records of both sexes. We also provide a key to the ten Afrotropical genera in the tribe Xyloperthini Lesne, 1921 as the baseline information for a future study.

Keywords. New genus, *Plesioxylion*, *Amintinus gambianus*, Afrotropical region, Xyloperthini.

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Introduction

The tribe Xyloperthini Lesne, 1921 is the most genus-rich tribe in the Bostrichidae Latreille, 1802, and currently includes 36 genera (Borowski & Węgrzynowicz 2007; Park *et al.* 2015; Liu *et al.* 2016; Liu & Beaver 2017; Liu 2021; Liu & Sittichaya 2022; Zhang *et al.* 2022). Nine genera of Xyloperthini are distributed throughout the Afrotropical region. The tribe is characterised by the lamelliform intercoxal process of the first abdominal ventrite, which is visible only as a narrow carina, and does not have a distinct ventral face, and by the mandibles which cross at their tips (Lesne 1921; Fisher 1950; Liu & Schönitzer 2011). The species are not major economically important pests, and as a result, there is little information available on their biology. A few species have been studied by Beeson & Bhatia (1937) and Liu *et al.* (2008). The adults are polyphagous, usually attacking a taxonomically wide variety of host trees, although they may appear to show some host preferences. They bore into twigs and branches, where they construct a short gallery, usually consisting of a circumferential, and one or more longitudinal branches in which the eggs are laid (Liu *et al.* 2008). The larvae bore through the wood making extensive galleries filled with fine wood particles and excreta. The new generation of adults emerges through the bark, but may reattack the same stem, so that the whole of the sapwood is eventually converted into fine powder (Liu *et al.* 2008).

Borowski (2018) described a new species, *Amintinus gambianus*, collected from Gambia and provided SEM photos of the antennae and elytral declivities of both sexes. The senior author received two male and one female specimens of this species from Institut royal des Sciences naturelles de Belgique, Brussels, Belgium (RBINS), and one female specimen from Mr Klaus-Ulrich Geis. After examining and comparing them with specimens of eight species (seven described and one undescribed) of *Amintinus* Anonymous, 1939, and the description of *A. sakalavus* Lesne, 1939, we considered that the species was sufficiently distinct from all other species of *Amintinus* to warrant its separation into a new genus. In this paper, we describe the new genus and provide new records from Mali and Senegal, West Africa, photos of both sexes, and illustrate the aedeagus of the male. A key to the ten Afrotropical genera of Xyloperthini is provided.

Material and methods

Specimens of the new genus were loaned from the Institut royale des Sciences naturelles, Brussels and donated by Mr Klaus-Ulrich Geis to the senior author. The generic status of the beetles has been ascertained from studies by the senior author of all available xyloperthine types, and other specimens, in the major European museums. We have examined types or reliably identified specimens of 33 out of 36 genera included in the tribe, and have checked the descriptions of the remaining three genera.

The following abbreviations are used for museum and other collections:

LYL = Liu, Lan-Yu's private collection, Taiwan

RBINS = Institut royal des Sciences naturelles de Belgique, Brussels, Belgium

Photographs were taken with a Panasonic Lumix GX8 camera, combined using the program Combine ZP, and optimized with Adobe Photoshop CS5.

Results

Taxonomy

Class Insecta Linnaeus, 1758
Superfamily Bostrichoidea Latreille, 1802
Family Bostrichidae Latreille, 1802
Subfamily Bostrichinae Latreille, 1802
Tribe Xyloperthini Lesne, 1921

Genus *Plesioxylion* gen. nov.

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Type species

Amintinus gambianus Borowski, 2018.

Diagnosis

A member of the tribe Xyloperthini characterized by the antennal club segments elongated, the mandibles crossed at the tips, and the lamelliform intercoxal process of the first abdominal ventrite (Lesne 1901; Fisher 1950; Liu & Schönitzer 2011). The new genus is distinguished from other genera of Xyloperthini by the following combination of characters: frons weakly convex, without long upwardly directed hairs on the head in either sex. Mandibles symmetrical, sharply pointed. Antenna with ten antennomeres, including a 5-segmented funicle and 3-segmented club, antennomeres of club lacking stiff, erect hairs, without clear sensory maculae; antero-lateral angle of pronotum with a moderately strong recurved uncinete tooth, pronotum without a lateral carina; posterior part of elytral disc without costae or teeth,

elytral declivity obliquely sloping, simple in male, female with a broadly truncate emargination in middle one-third of posterior margin; 5th abdominal ventrite of male with pleural pieces swollen towards midline of posterior margin; 4th abdominal ventrite of female with long, thick, golden hairs on anterior part of median impression, and 5th abdominal ventrite strongly emarginate in middle.

Etymology

The genus name means ‘near’ (Greek: ‘πλησίον’) the genus *Xylion*.

Description

Male (Figs 1–2)

MEASUREMENTS. 2.4–3.2 mm long, about 2.9–3.1× as long as wide.

COLORATION. Dark brown to black with the antennae, palps, femora, tibiae except for protibiae yellowish-brown. Coxae and protibiae brown. Posterior part of last abdominal ventrite and pleural pieces yellowish-brown.

HEAD (Fig. 1B–C). Moderately convex. Frons longitudinally rugose with sparse, semi-erect, short hairlike setae, except shiny and impunctate in narrow median area, and immediately above fronto-clypeal suture. Clypeus granulate, anterior margin weakly emarginate with short erect hairlike setae. Labrum shiny and

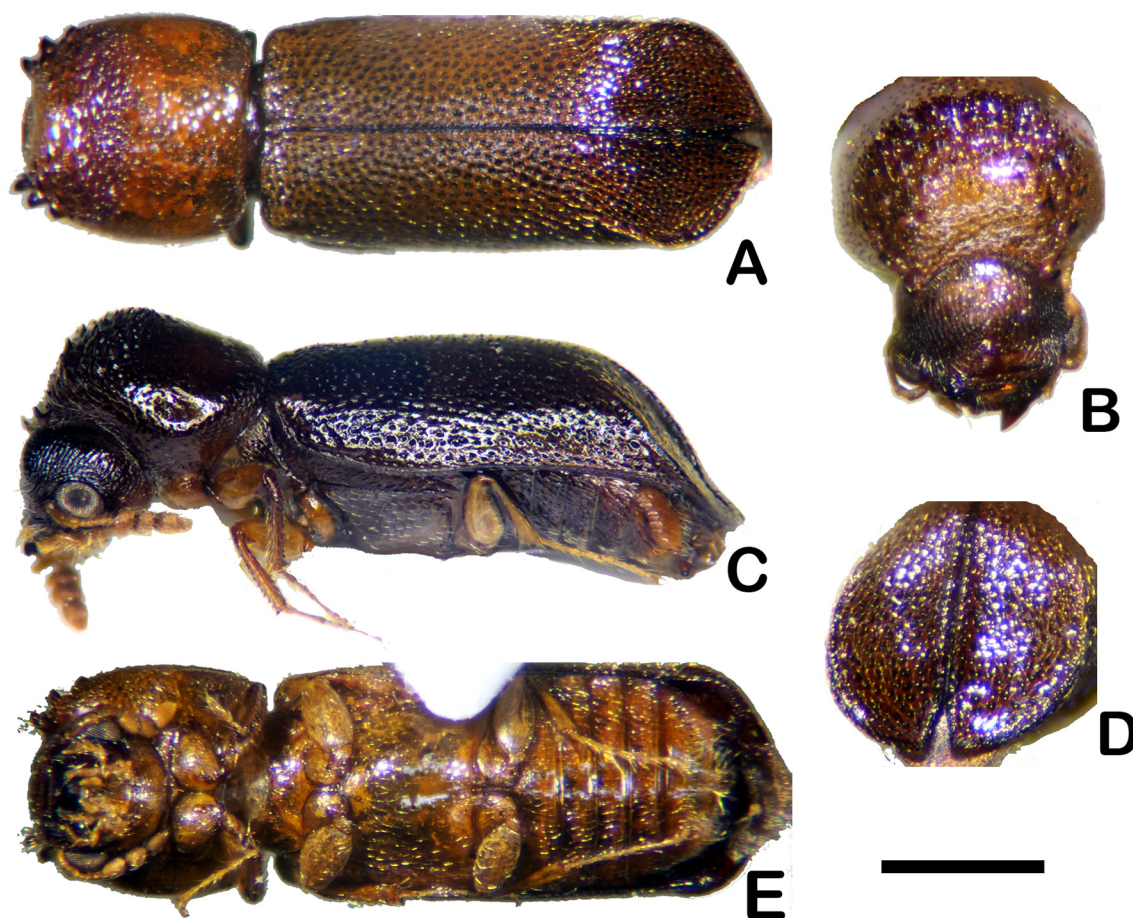


Fig. 1. *Plesioxylion gambianus* (Borowski, 2018) gen. et comb. nov., ♂ (RBINS beside C in LYL). A. Dorsal view. B. Front view of head and pronotum. C. Lateral view. D. Posterior view of elytral declivity. E. Ventral view. Scale bar: A, C, E = 1 mm; B, D = 0.75 mm.

punctate. Eyes of moderate size, clearly separated from the genae posteriorly. Antennae 10-segmented, scape elongate, 2nd antennomere slightly shorter than scape; 3–7 antennomeres together distinctly longer than the last club antennomere in length. Club antennomeres without sensory maculae, with sparse erect hairlike setae on the anterior face of 8th and 9th antennomeres.

PRONOTUM (Fig. 1A–C). As long as wide to slightly wider than long, sides evenly curved in basal two-thirds, narrowing anteriorly; anterior angle with a moderately strong recurved uncinuate tooth; anterior margin strongly, slightly angularly emarginate between the anterior teeth. Anterior slope rugose above margin without distinct asperities, sparse punctures between the rugosities; upper part of anterior slope to summit with small, slightly transverse asperities more or less concentrically arranged. Posterior angles rounded without lateral carinae. Pronotal disc mostly shiny, smooth; coarsely granulate-punctate in middle behind summit; punctures smaller and sparser posteriorly, fine and very sparse on sides; punctures with short, whitish, semi-appressed hairlike setae.

SCUTELLUM. Small, tuberculiform.

ELYTRA (Fig. 1A, C–D). 1.8–1.9× as long as wide, slightly narrower than pronotum at base, widening slightly towards apex. Parallel-sided, moderately shiny. Basal margin of elytra with a short carina on

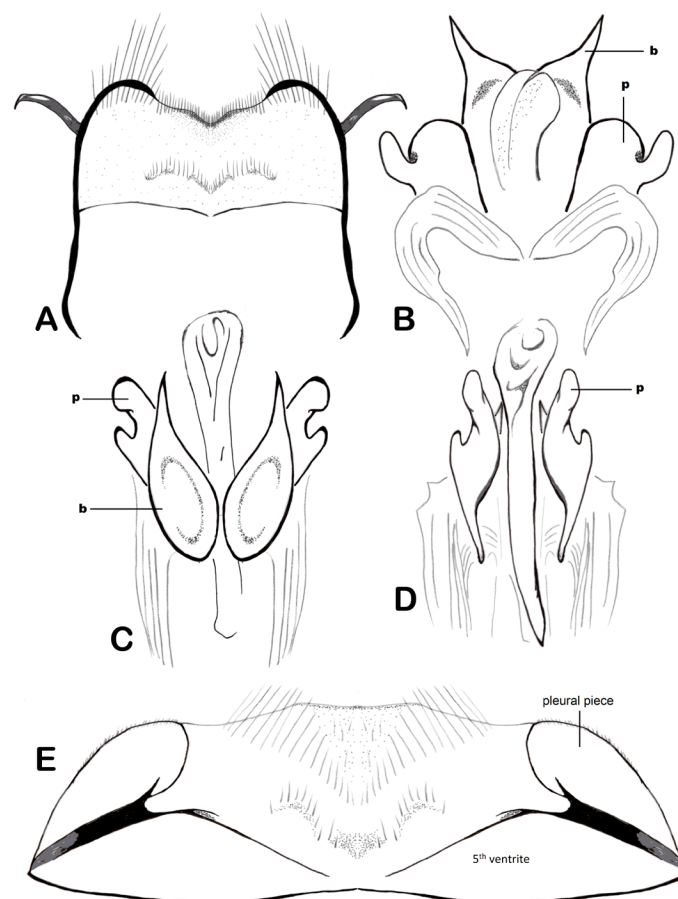


Fig. 2. *Plesioxylion gambianus* (Borowski, 2018) gen. et comb. nov., ♂. Last visible abdominal segment and aedeagus. **A.** Ventral view of last tergite. **B.** Posterior view of aedeagus. **C.** Ventral view of aedeagus. **D.** Dorsal view of aedeagus. **E.** Rear view of last ventrite. Abbreviations: b = basal piece; p = paramere (refer to Lesne 1940).

each side of scutellum. Disc densely, moderately finely granulate-punctate dorsally, the sides more sparsely punctured except close to elytral declivity. Declivity steep, obliquely truncate, its lateral margin raised and costate except on upper margin, the punctures denser and coarser than on dorsal surface; suture swollen on upper two-thirds of declivity and coarsely punctured; a weak impression on each side of suture. Elytral apices separated by a V-shaped emargination. Vestiture of short, whitish, recumbent hairlike setae, longer, yellower and denser on declivity.

LEGS. Protibiae parallel-sided without teeth on external side. Long hairlike setae on inner side of all tibiae, and on ventral surface of tarsi.

ABDOMEN (Figs 1C–D, 2E). Ventrites 1–4 almost equal in length, their posterior margins straight; shiny, finely, rather sparsely punctured with short, recumbent, whitish hairlike setae. 5th ventrite with posterior margin evenly rounded except in middle where concave, the concavity with dense, short yellowish hairlike setae; pleural pieces rather swollen towards midline, densely setose.

AEDEAGUS (Fig. 2B–D). Penis elongate, cylindrical with expanded apex. Basal pieces droplet-like, sharply pointed apically. Parameres narrowed at base where attached to stout, thick muscles, broadened in middle part with a short lateral lobe, apex finger-like with rounded tip.

Female (Figs 3–4)

MEASUREMENT. 3.0 mm long, 2.8–3.0× as long as wide.

COLORATION. Reddish brown with the antennae, palps, coxae, femora, tibiae, except for protibiae, yellowish-brown. Protibiae brown.

HEAD. Generally as in male, but median shiny area above fronto-clypeal suture reduced.

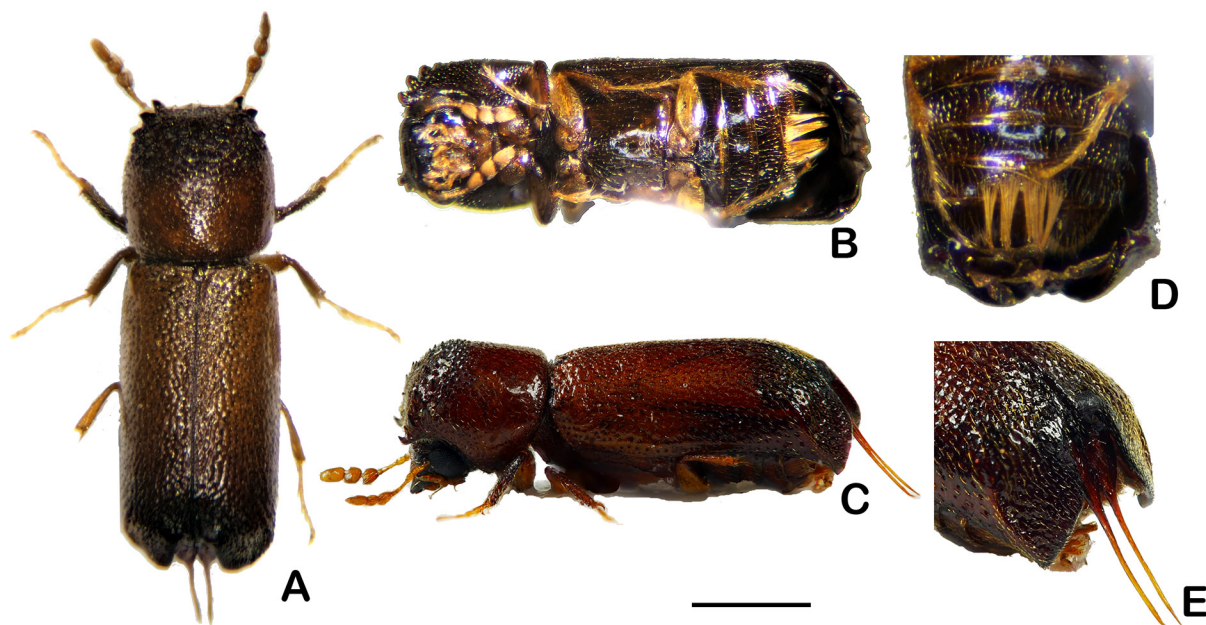


Fig. 3. *Plesioxylion gambianus* (Borowski, 2018) gen. et comb. nov., ♀ (LYL). **A.** Dorsal view. **B.** Ventral view. **C.** Lateral view. **D.** Ventral view of abdominal ventrites. **E.** Postero-lateral view of elytral declivity. Scale bar: A–C = 1 mm; D–E = 0.75 mm.

PRONOTUM (Fig. 3A, C). Generally as in male, but emargination of anterior margin between teeth on anterior angles shallower, and more evenly curved; pronotal disc behind summit smoother and more shiny, with sparse punctures, becoming smaller and sparser posteriorly.

SCUTELLUM. As in male.

ELYTRA (Figs 3C, E, 4A). Elytral disc and sides generally as in male. Upper margin of declivity indistinct, slightly longitudinally impressed next to suture, broadly convex on each side beyond the impressions. Declivity very deeply, very widely emarginate (Fig. 4A), its lateral margins raised and costate, the surface shiny, weakly convex, coarsely granulate-punctate on upper part, punctures sparser and finer, and granules weaker towards apex, apical angles moderately acute (Figs 3E, 4A); truncated emargination on middle of posterior margin filled by a pair of spatulate processes ending in very elongate, needle-like tips extending well beyond elytral apices (Figs 3E, 4A). Vestiture of disc similar to male, declivity with longer, yellowish hairs on upper part, shorter and sparse apically; processes glabrous.

LEGS. Similar to male but protibiae with a row of teeth on the external side.

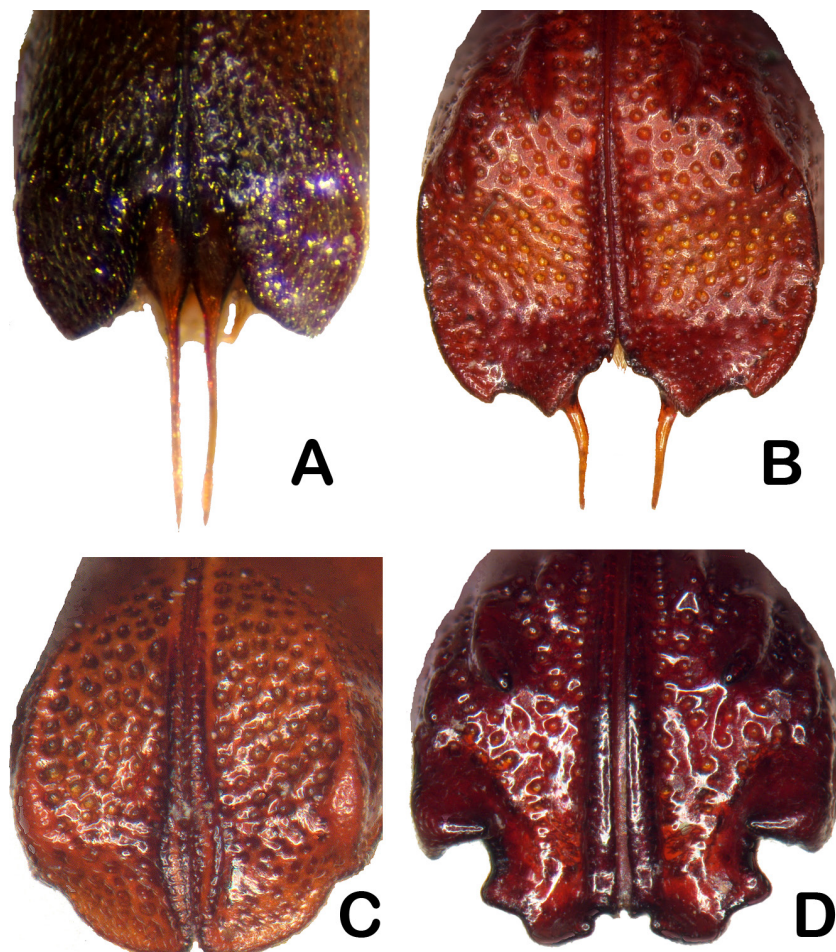


Fig. 4. Declivity of female of the representatives of selected genera. **A.** *Plesioxylion gambianus* (Borowski, 2018) gen. et comb. nov. **B.** *Mesoxylion collaris* (Erichson, 1842). **C.** *Amintinus minutissimus* Damoiseau, 1968. **D.** *Xylion securifer* Lesne, 1901.

ABDOMEN (Fig. 3B, D). Ventrites 1–3 almost equal in length, posterior margin straight; 4th ventrite slightly shorter with a strongly concave median area posteriorly; just anterior to this a thick brush of golden hairs (Fig. 3D), more than twice as long as ventrite; 5th ventrite strongly concave with a broadly concave apical margin fringed by dense golden hairlike setae. Ventrites shiny, finely, rather sparsely punctured with short, recumbent, whitish hairlike setae.

OVIPOSITOR. Similar to other genera of bostrichids (Lesne 1924), narrow, very elongate, pointed with a pair of short palpiform appendages at apex, adapted for piercing wood.

Plesioxyllion gambianus Borowski, 2018 gen. et comb. nov.

New records

MALI • 1 ♀; Prov. Koulikoro, Kreis Kati, Kenieroba, Umgebung; 11–15 Jun. 2016; M. Egger leg.; LYL.

SENEGAL • 2 ♂♂, 1 ♀; Park National / du Niokolo Koba; 24 Dec. 1997; C. Tendi! / leg.; (Mag. Num. 1978); RBINS • 1 ♂; same collection data as for preceding; LYL.

These new records indicate that the species is distributed more widely in West Africa than its original location in Gambia.

Key to the Afrotropical genera of Xyloperthini Lesne, 1921

Lesne (1901) offered the first key to the genera of Xyloperthini. Since that time many new genera have been added to the tribe (see Introduction). Liu & Sittichaya (2022) provided a key to the Oriental genera of the tribe. Here we add a key to the ten genera present in the Afrotropical region (only the three (ex 17) species of *Xylopsocus* which occur in the region have been included).

1. Antennae with 9 segments 2
– Antennae with 10 segments 3
2. Antennal club segments 1–2 with distinct sensory maculae near anterior margin; frons with erect, long hairlike setae; pronotum without lateral carinae and postero-lateral angles rounded *Enneadesmus* Mulsant, 1851
– Antennal club without distinct sensory maculae; frons without long hairlike setae; pronotum with lateral carinae and postero-lateral angles almost rectangular
..... *Xylopsocus capucinus* (Fabricius, 1781)
3. Asymmetrical pronotum with more accentuated development of the right anterior part
..... *Amintinus* Anonymous, 1939
– Symmetrical pronotum 4
4. Frons with long hairlike setae 5
– Frons without long hairlike setae 6
5. Smaller species, 3–4.5 mm long. Pronotum without lateral carinae; postero-lateral angles rounded; a pair of long spines on sides of 3rd ventrite, and posterior margin of 5th ventrite of female sinuate
..... *Xylionopsis* Lesne, 1937
– Larger species, 5.5–8.5 mm long. Pronotum with lateral carinae which form distinct postero-lateral angles; ventrites simple in female *Xylothrips* Lesne, 1901

6. Antennal club without distinct sensory maculae; last ventrite of male without pleural pieces; ventrites simple in female 7
 – Antennal club segments 1–2 with distinct sensory maculae near anterior margin; last ventrite of male with pleural pieces; ventrites modified in female 8
7. Body: 3.3–10 mm long. Pronotum without lateral carinae, postero-lateral angles rounded; apical margin of declivity with tiny, V-shaped emargination with raised sides . *Xyloperthella* Fisher, 1950
 – Body: 3–5 mm long. Pronotum with lateral carinae forming distinct postero-lateral angles; apical margin of declivity entire with slightly raised apex
 *Xylopsocus* Lesne, 1901 (*castanoptera*, *sellatus*)
8. Length of body greater than 6 mm. Postero-lateral angles of pronotum obvious; apical margin of declivity with U-shaped emargination with raised sides, and a deep emargination of postero-lateral margin on each side near to apex; female ventrites modified on 5th ventrite only
 *Plioxylion* Vrydagh, 1955
 – Length of body less than 6 mm. Postero-lateral angles of pronotum rounded; apical margin of declivity with V-shaped emargination in both sexes, or at least in male; female ventrites modified on 4th or 3rd and 4th ventrites 9
9. Antennal club segments 1–2 without distinct sensory maculae *Plesioxylion* gen. nov.
 – Antennal club segments 1–2 with distinct sensory maculae near anterior margin 10
10. Elytral declivity with 3 pairs of spines, the largest pair in middle of upper margin; apical margin with V-shaped emargination with raised margins, and a deep emargination on each postero-lateral margin. Female abdomen with modified 3rd to 5th ventrites *Xylion* Lesne, 1901
 – Elytral declivity with two pairs of small spines on upper margin; apical margin with a small V-shaped emargination with raised margins, but without emargination of postero-lateral margin. Female abdomen with modified 4th and 5th ventrites *Xylionulus* Lesne, 1901

Discussion

Table 1 compares the characters of the new genus with the three genera that are morphologically closest to it (*Amintinus*, *Mesoxylion* Vrydagh, 1955, and *Xylion*). The four genera listed in Table 1 all have ten antennomeres, lack lateral carinae on the pronotum, and the last visible abdominal ventrite of the male has pleural pieces. They are of similar size and proportions (Table 1). It is clear that *Plesioxylion* gen. nov. is most similar to *Amintinus*, the genus in which *P. gambianus* was originally described. Here we justify the separation of the species into a new genus.

Amintinus differs from *Plesioxylion* gen. nov. in the asymmetry of its mandibles, head and pronotum. Vrydagh (1956) emphasised the asymmetry after examining more than 20 specimens of three species of *Amintinus*: “Enfin, le thorax lui-même est asymétrique la corne prothoracique droite étant nettement plus longue que la gauche ce qui entraîne un développement plus accentué de la partie antérieure droite du thorax. Si l’on regarde l’insecte par sa face dorsale on remarque que le bord antérieur du thorax est déplacé obliquement vers l’angle antérieur droit”.

The asymmetrical form of *Amintinus* was also noted by Damoiseau (1968a, 1968b) in two additional species of the genus. It is in fact present in all species of the genus (LYL, pers. obs.), although the reasons for its occurrence and persistence over evolutionary time are unknown. Asymmetry is also present in *Mesoxylion* but affects only the mandibles (Vrydagh 1955). In contrast, the mandibles, head and pronotum of *Plesioxylion* gen. nov. are symmetrical.

Table 1. Comparison of characters of *Plesioxylion* gen. nov. with selected genera of Xyloperthini Lesne, 1921.

Character	Genus <i>Aminitinus</i> Anonymous, 1939	<i>Mesoxylion</i> Vrydagh, 1955	<i>Plesioxylion</i> gen. nov.	<i>Xylion</i> Lesne, 1901
Length of body (mm)	3.5~5	4.5~6	2.4~3.2	3~6
Ratio of L/W	2.3~3	2.25~3	2.9~3.1	3~3.5
Mandibles	Asymmetrical	Asymmetrical	Symmetrical	Symmetrical
Sensory areas on antennal club	All antennomeres of club matt, without distinct sensory maculae	1 st and 2 nd antennomeres of club with 2 distinct maculae near apex, 3 rd with two distinct impressions in apical half	All antennomeres of club matt, without distinct sensory maculae	1 st and 2 nd antennomeres of club with 2 distinct maculae near apex, 3 rd with two distinct impressions in middle
Pronotum	Asymmetrical	Symmetrical	Symmetrical	Symmetrical
Prothoracic unciniate horns	Unequal in size	Equal	Equal	Absent
Elytral declivity of female (see also Fig. 4)	Convex or concave, upper margin without spines	Steep, upper margin with 2 pairs of spines	Steep, upper margin without spines	Concave, upper margin with 3 pairs of spines with largest in middle
4 th and 5 th ventrite structure of female	4 th ventrite with a pair of processes of variable form on posterior margin	5 th ventrite variously modified	Anterior middle of 4 th ventrite with a wide tuft of long, dense, golden hairs extending over last ventrite with a deep, broad emargination in middle of posterior margin	Variably modified in both ventrites
Distribution	East Africa and Congo	Australia, New Zealand	West Africa (Mali, Senegal, Gambia)	Africa

The elytral declivity of both sexes of *Amintinus* varies with species from convex to concave, with simple or slightly sinuate apical margin. There is no marked sexual dimorphism. This differs greatly from the situation in *Plesioxylion gambianus*. Here the male elytral declivity is steep and simple, whereas the female declivity is strongly emarginate with a pair of long processes. It may be noted that the female of *Mesoxylion collaris* (Erichson, 1842) has somewhat similar, but smaller, needle-like spines at the apex of the female elytral declivity to *P. gambianus* (Fig. 4A–B), but these appear to be a parallel adaptation, the function of which has yet to be determined.

The aedeagus of two species of *Amintinus* (*A. lootensi* Damoiseau, 1968 and *A. minutissimus* Damoiseau, 1968) has been illustrated, but not described (Damoiseau 1968a: fig. 10; 1968b: fig. 4). The form of the basal pieces and parameres differs considerably between the two species, but in both they appear to be very broad. The basal pieces of *Plesioxylion gambianus* are much narrower and are sharply pointed apically (Fig. 2B–C). The parameres are much narrower, and have only a short lateral lobe, unlike the very elongate process seen in *A. lootensi* (Damoiseau 1968a: fig. 10). The penis of *P. gambianus* is distinctly expanded at the tip (Fig. 2C–D), while the penis of the two species of *Amintinus* is narrowly cylindrical.

The females of *Amintinus* have the fourth ventrite modified with a pair of processes on the posterior margin in the different species (Lesne 1939). In *P. gambianus*, the fourth ventrite has no processes, but a long, thick brush of golden hairlike setae projecting over the fifth ventrite.

Plesioxylion gen. nov. is more easily distinguished from the genera *Xylion* and *Mesoxylion*, by the absence of sensory maculae on the segments of the antennal club, and the absence of spines on the upper margin of the elytral declivity (Table 1). *Xylion* also lacks the uncinatate pronotal horns present in *Plesioxylion*.

The tribe Xyloperthini now includes 37 genera, with 10 genera occurring in the Afrotropical region. Following a series of revisions of genera of the tribe Xyloperthini (Liu *et al.* 2016, 2021; Liu & Beaver 2017; Liu 2021; Liu & Sittichaya 2022), this study added to knowledge of the Afrotropical fauna, and provided baseline information for a future study, which will revise the tribe Xyloperthini.

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