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The genus ***Holcophloeus* gen. nov.** is here proposed to include *Trachyphloeus cruciatus* Seidlitz, 1868, and two new species native to North Africa, based on a phylogenetic analysis and an evaluation of the diagnostic characters. The taxonomic position of *Holcophloeus* in relation to the tribes Trachyphloeini Lacordaire, 1863, and Holcorhinini Desbrochers, 1898, is discussed, and the new genus is attributed to the Holcorhinini. ***Holcophloeus laurae* sp. nov.** from south-eastern Morocco and ***Holcophloeus weilli* sp. nov.** from northern Libya are described and illustrated and a key to the species of the new genus is given. The lectotype of *Trachyphloeus cruciatus* Seidlitz, 1868, is designated. The genus *Massimiellus* Borovec, 2009, is transferred from Trachyphloeini to Holcorhinini.

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ADDITIONAL KEYWORDS: Bayesian analysis – *Holcophloeus* – Holcorhinini – new species -taxonomy – Trachyphloeini.

INTRODUCTION

Trachyphloeus cruciatus Seidlitz, 1868, was described from Oran (Algeria) and differentiated from all the other species of *Trachyphloeus* by the presence of a narrow V-shaped stria, transversely impressed between base of rostrum and head and with acute apex of the 'V' directed towards frons. This character, and the rounded apex of the protibia, were used by Stierlin (1884) and Formánek (1907) to separate *T. cruciatus* from the other species of the genus. Since Formánek's revision, *T. cruciatus* has only been listed in catalogues (Winkler, 1932; Lona, 1937).

Trachyphloeus cruciatus is known from two Algerian localities, Oran and Constantine, and only material collected at the end of the 19th century is available (Borovec, 2009). Two more species recently collected in Morocco and Libya share with *T. cruciatus* its key traits; they form thus a species-group, whose classification and phylogenetic position are here investigated.

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Borovec (2009) redefined the genus *Trachyphloeus* Germar, 1817, and the tribe Trachyphloeini Lacordaire, 1863, based on a phylogenetic analysis. The former *T. cruciatus* was excluded from the tribe because of the transverse frontal stria, and assigned to the tribe Holcorhinini Desbrochers, 1898; however, a proper generic classification for this species was not given. In the taxonomic discussion of this paper the species-group composed of the former *T. cruciatus* and the two new species is defined as '*cruciatus* group'.

The tribe Trachyphloeini is composed of 13 genera and about 260 species (Borovec, 2009); however, Borovec recognized it to be a polyphyletic assemblage of genera, a relatively common case in Curculionidae. It is mainly defined by dorsum of rostrum with welldefined borders along the entire length, base as wide as the interocular space at the anterior margin of the eyes, scrobes furrow-shaped or triangular in lateral view, visible or not in dorsal view, rostrum wide and very short, elytra without expanded humeri, dorsum densely covered with scales, and gonocoxites with long and slender styli in apical position.

The genera of Holcorhinini, as defined by Reitter (1913), were revised by Pelletier (2012), but this study was not based on a phylogenetic analysis. In Pelletier's concept the tribe includes 16 genera and 56 species and is characterized by the presence of a frontal transverse stria, antennal scrobes broadened outwards in dorsal view, and connate claws. In some genera tarsomere 3 is larger in males than in females, but this state is not always present. The other genera listed in Holcorhinini by Alonso-Zarazaga & Lyal (1999), which belong to the former tribe Cyclopterini Reitter, 1913, lack the transverse stria and were not covered in Pelletier's study.

Based on the characters expressed in the three species, the '*cruciatus* group' cannot be positively assigned to either of the two tribes. It is similar to the Holcorhinini in the presence of the V-shaped transverse stria and to the Trachyphloeini in the dorsum of rostrum with well-defined borders along the entire length. The '*cruciatus* group' shares several character states with the monotypic genus *Massimiellus* Borovec, 2009, from Morocco: connate claws, A-shaped female sternum VIII (as defined in Borovec, 2009) with indistinct sclerotization of basal margin of plate, ventrite I distinctly longer than ventrite II, and suture between ventrites I and II straight. In Borovec (2009: fig. 18), *Massimiellus* was the sister group to a clade including *Caenopsis* Bach, 1854, *Stuebenius* Borovec, 2009, *Trachyphilus* Faust, 1887, and *Trachyphloeosoma* Wollaston, 1869.

In order to clarify the placement of the genus *Massimiellus* and to define the status and relationships of the '*cruciatus* group', a phylogenetic analysis based on a morphological character matrix including genera of Trachyphloeini and Holcorhinini was carried out. The significance of the traits so far applied to the definition of the tribes was also evaluated.

MATERIAL AND METHODS

Phylogenetic analysis

The taxa and characters selected by Borovec (2009) were used as the basis for the phylogenetic analysis. Representatives of the tribe Holcorhinini were added, namely *Holcorhinus hispidulus* Thon, 1833, type species of the genus, *Aigelius mskalicus* Escalera, 1914, *Aigelius dilatipes* (Pic, 1896), and *Aigelius machadoi* Pelletier, 2007 (one specimen available for each species), and eight additional characters were considered. See Borovec (2009) for discussion of characters 1–42. All these characters are binary (see Table 1 for the matrix), and constant amongst the specimens. All available specimens of the '*cruciatus* group' were examined.

New characters

43. Length of the scape when folded: 0, exceeding the anterior margin of pronotum; 1, barely reaching the anterior margin of pronotum.

Table 1. Matrix of the character-states. Characters 1 to 42 were described by Borovec (2009); characters 43 to 50 were selected for this study

Peritelini	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
Caenopsis	00000	00000	00111	10000	10000	00000	01000	00000	01010	10000
Cathormiocerus	00000	10000	00000	00000	00000	10100	01010	00000	01110	10010
Massimiellus	00001	00011	01100	00000	10100	00000	01000	00000	01110	10100
Pelletierellus	00010	00000	00010	00010	01101	00000	01000	00000	01010	10001
Pseudocneorhinus	11010	00000	00010	01000	01100	00000	01100	00000	01010	10001
Rhinodontodes	01010	00000	10000	01100	01100	00000	01100	00000	01010	10001
Rhinodontus	11010	00000	10010	01100	01100	00110	01100	00000	01010	10001
Romualdius	00010	00000	00010	00000	01110	00100	00110	00100	01010	10001
Stuebenius	01000	00000	00110	00001	10000	00000	11001	11011	01110	10000
Trachyphilus	00000	10100	00111	00111	10000	00001	01010	11011	11010	10000
Trachyphloeosoma	00001	00000	00100	00011	00000	10001	01011	11011	11010	10000

44. Scrobes: 0, dorsally placed; 1, laterally placed.
45. Vestiture: 0, round scales; 1, hair-like scales.
46. Basal part of dorsum of rostrum: 0, narrower than interocular space; 1, as wide as interocular space.

47. V-shaped stria on rostrum: 0, stria absent; 1, stria present.
48. Ventrite I vs. ventrite II: 0, ventrite I as long as ventrite II; 1, ventrite I distinctly longer than ventrite II.
49. Integument of ventrites: 0, densely covered with matte scales; 1, glossy.
50. Elytral shape: 0, oblong; 1, globular.

Parsimony analysis (maximum parsimony, MP) was performed with TNT 1.1 (Goloboff, Farris & Nixon, 2008). Ten thousand replications of stepwise addition with random addition sequence (RAS) of taxa and tree-bisection-reconnection (TBR) branch swapping were used to find the best trees, both under equal (EW) and implied weights (IW). The analysis with implied weights was repeated with different values of the constant of concavity, K (K =1, 2, 3, 4, 5, 6) (Goloboff, 1993). Group support was computed with 10 000 bootstrap replications; results are reported as percentages of bootstrap frequency and bootstrap frequency differences (GC) (Goloboff *et al*., 2003).
The maximum likelihood (ML) tree was found with raxmlGUI 1.1 (Stamatakis, 2006; Silvestro & Michalak, 2011) using a binary MarkovK +G model (G means that heterogeneity of substitution rates among characters was modelled with a discretized gamma distribution). Group support was computed with 10 000 bootstrap replications.
Bayesian inference (BI) was performed using MrBayes 3.2 (Ronquist *et al*., 2012). We ran two runs with four chains, each for 10 000 000 generations under a binary MarkovK +G model, sampling every 500 generations, with default settings. We used a uniform prior (range 0–200) for the G shape parameter (a), and we assumed equal state frequencies for all characters. Flat (default) priors were chosen for topology and branch length. The first 25% of generations were discarded (burn-in) and convergence was evaluated with the average standard deviation of split frequencies (0.002). Goodness of mixing was assessed by looking at the acceptance rate of swaps between adjacent chains, following Ronquist, Mark & Huelsenbeck (2009).

As two alternative topologies were found for the clade including *Massimiellus* and the '*cruciatus* group' (here described as *Holcophloeus* gen. nov., and indicated as such in Figs 1–4), we computed the Bayes factor (Kass & Raftery, 1995) of the two topologies to compare further the respective likelihoods. Marginal likelihood was estimated with a stepping stones algorithm (Xie *et al*., 2011) running two analyses with 50 steps, 20 million generations, in MrBayes 3.2, and sampling every 2000 generations. In the first run the '*cruciatus* group'-*Massimiellus* clade (Fig. 2A) constraint was enforced to be monophyletic (H0), in the other run the '*cruciatus* group'-*Aigelius-Holcorhinus* group (Fig. 2B) constraint was enforced to be monophyletic (H1). We used the same model and priors as the above analysis (except the topological prior). The Bayes factor (B_{10}) was calculated as the ratio of the marginal likelihood of the two models (H1/H0).

To discover 'strong' synapomorphies for the Holcorhinini clade (i.e. synapomorphies that are not influenced by the topological uncertainty outside the clade), we generated 2013 suboptimal trees (up to five steps longer than MP trees) with 10 000 replications under RAS +TBR, and with the topology of Fig. 1B constrained to be monophyletic. Then we mapped common synapomorphies (with parsimony characters reconstruction) with TNT 1.1. Synapomorphies were mapped on MP (IW, k =1), ML, and Bayesian trees to verify those that were shared amongst all these trees.

ANALYSIS OF MORPHOLOGY Specimens were measured in lateral view from the anterior border of the eyes to the apex of the elytra. All other parts of the body were measured in dorsal view, always as the maximum length or maximum width. The length of the rostrum was measured from the anterior border of the eyes to the anterior border of the epistoma. Dissections were carried out by excision of the whole abdomen, which was subsequently treated for about 10 min in a 10% KOH solution. The ventrites were mounted on the same card as the respective specimen, the female genitalia were embedded in Solakryl (Medika, Prague) on the same card as the respective specimen, and the male genitalia were mounted dry by the side of the specimen. Terminology of the rostral structures follows Oberprieler (1988); terminology of the female genitalia mainly follows Borovec (2006), with the exception of the use of gonocoxites instead of hemisternites. Photographs were taken with a Nikon P6000 camera fixed to the 10 or 20 ¥ ocular of a Leica stereomicroscope. A series of photographs were taken and a stack was performed with Zerene Stacker 1.04 (Zerene Systems LLC). The final images were elaborated with Photoshop CS3 (Adobe Systems Inc.). The map was taken from Microsoft Encarta Encyclopedia Plus (Microsoft Corp.) and elaborated with Photoshop CS3.

DEPOSITORIES BMNH, The Natural History Museum, London, UK; IRSN, Institut Royal des Sciences Naturelles de

Belgique, Brussels, Belgium; JPE, Jean Pelletier private collection, Monnaie, France; NMP, National Museum, Prague, Czech Republic; NMW, Naturhistorisches Museum, Wien, Austria; PWE, Patrick Weill private collection, Pau, France; RBO, Roman Borovec private collection, Sloupno, Czech Republic; SMT, Staatliches Museum für Tierkunde, Dresden, Germany; ZSM, Zoologische Staadtssamlung München, Munich, Germany.

RESULTS

Four well-supported clades were recognized in all of the MP, ML, and BI consensus trees (majority rule 50%) (Fig. 1). These clades are in partial agreement with the topology reported by Borovec (2009: fig. 18). Clade A includes the *Trachyphloeus* lineage; in the BI and ML trees *Cathormiocerus* was sister to this clade, basal to the *Trachyphloeus* group, but this topology was either not or only moderately supported, depending on the method (in this work we use 'not supported' if support value is below 50, 'moderately supported' if in the range 51–90, 'strongly supported' if above 90). Clade B includes a group of genera from Eastern Europe and Asia, and corresponds to subgroup III in Borovec (2009). Clade C includes three related genera, the Mediterranean *Stuebenius* Borovec, 2009, and two genera from Asia, *Trachyphilus* Faust, 1887, and *Trachyphloeosoma* Wollaston, 1869. Clade D includes the taxa of special interest to the present study. In this clade the genus *Massimiellus* is basal to the '*cruciatus* group' (indicated as *Holcophloeus* in the figures) and the sister taxa *Holcorhinus/Aigelius*. *Massimiellus* was previously referred to the Trachyphloeini, but our analysis strongly rejects this classification.

The position of the '*cruciatus* group' within the Holcorhinini clade had to be carefully determined in order to propose an accurate classification for these species. Partly depending on the method that was implemented, it was relatively uncertain, and two alternative topologies were found with MP (Fig. 2). In one case the '*cruciatus* group' formed a monophyletic taxon together with *Massimiellus*, and this was sister to another monophyletic taxon composed of *Holcorhinus/Aigelius* (topology H0, Fig. 2A); the alternative topology (H1) was that of clade D discussed above, with the same tree length (TL = 92) and consistency index (CI = 0.543). When implied weights were used, the resulting topology was H1 when k was

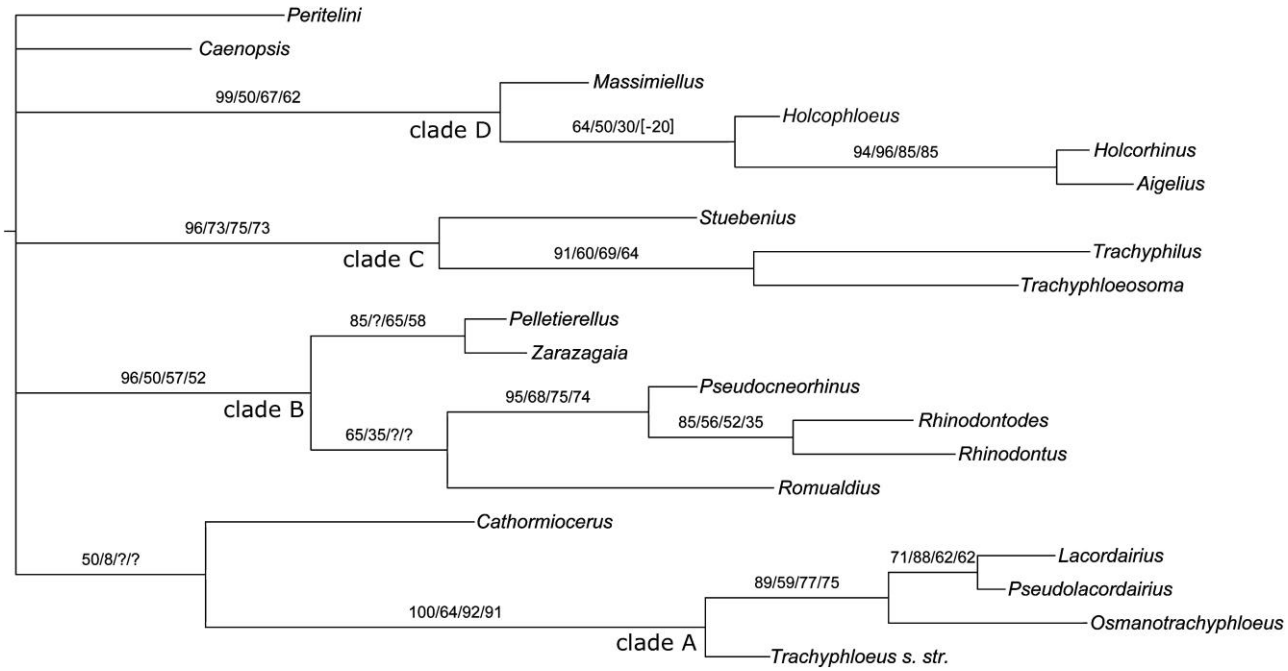
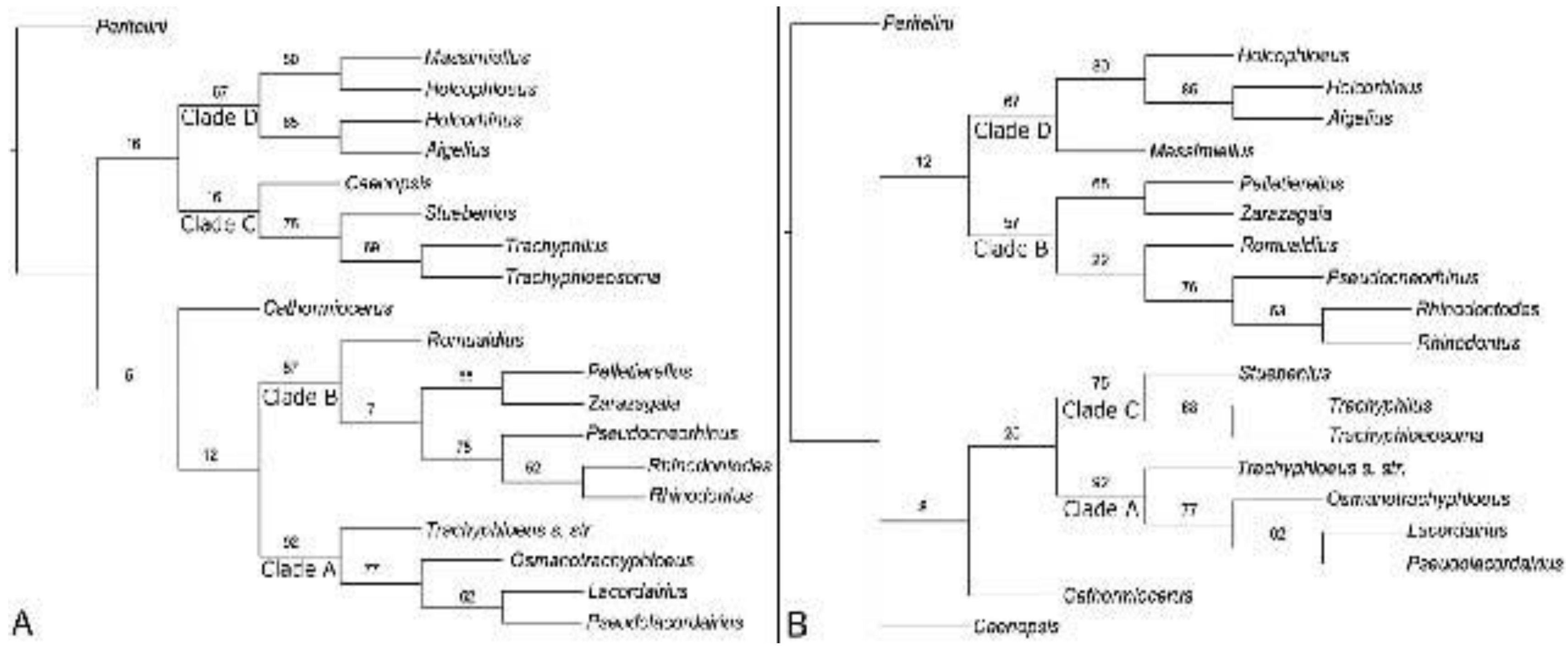


Figure 1. Bayesian consensus tree, groups with posterior probability below 50% were collapsed. Clades supported by all analyses (BI, ML, MP) are indicated below branches on root of clade. Percentages of clade supports are plotted on branches in the following order: posterior probability (BI), bootstrap values (ML), bootstrap values and bootstrap value difference (MP). Missing values (?) are reported for those clades which were not present in ML tree or in MP trees. The negative value in brackets [-20] for bootstrap values difference in the branch between the *Massimiellus* and the *Holcophloeus* nodes indicates that the alternative topology found with Parsimony (ew) (Fig. 2A) was supported at 50%. In this and the other figures the genus name *Holcophloeus* is assigned to the '*cruciatus* group'.


A
Clade D
Clade C
Clade B
Clade A
Massimellus
Holcophloeus
Holcorhinus
Algelius
Cesenopsis
Stuebenius
Trachyphilus
Trachyphloeosoma
Romualdius
Pelletierellus
Zarazagaia
Pseudocneorhinus
Rhinodontodes
Rhinodontus
Trachyphloeus s. str.
Osmanotrachyphloeus
Lacordairius
Pseudolacordairius
B
Clade D
Clade B
Clade C
Clade A
Holcophloeus
Holcorhinus
Algelius
Massimellus
Pelletierellus
Zarazagaia
Romualdius
Pseudocneorhinus
Rhinodontodes
Rhinodontus
Trachyphloeus s. str.
Osmanotrachyphloeus
Lacordairius
Pseudolacordairius

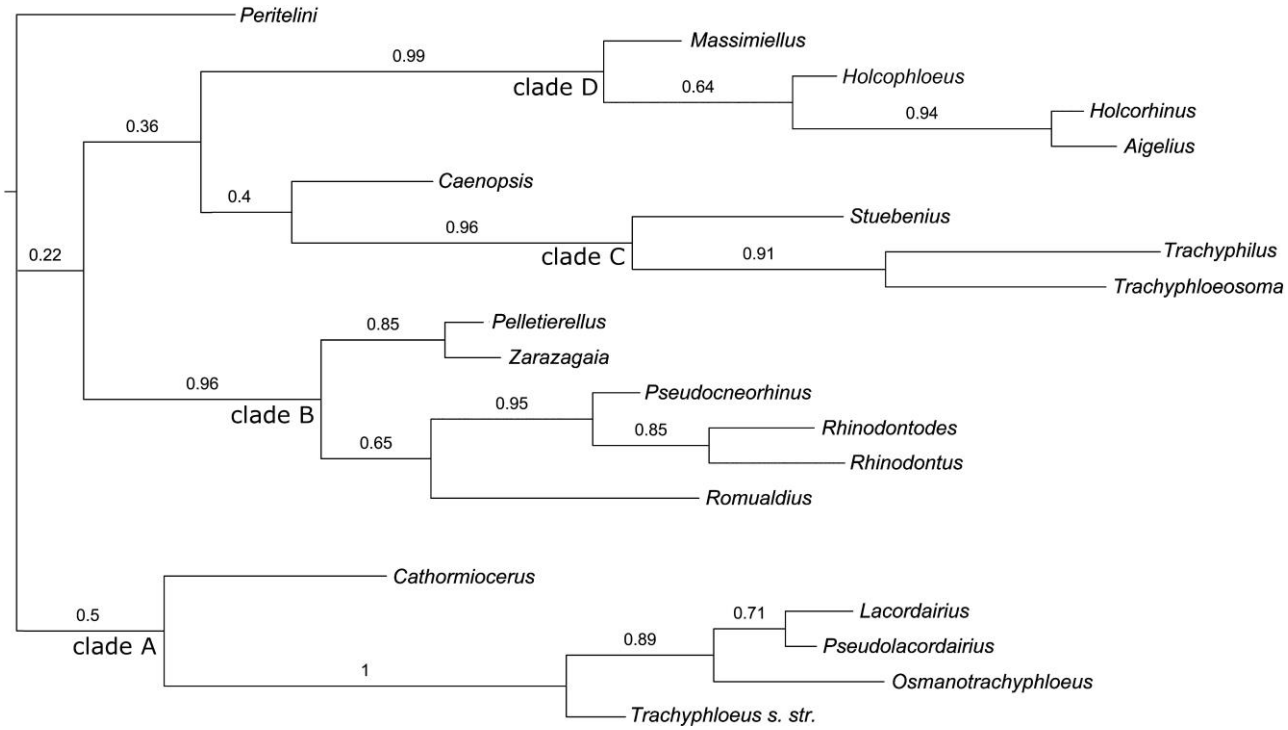


Figure 3. Bayesian consensus tree, all groups. Percentages of posterior probabilities are plotted on the branches. Same analysis as Fig. 1.

set to = 1 (TL = 95) (Fig. 2B), and H0 when *k* was set to = 2, 3, 4, 5, 6 (TL = 94).

Both BI consensus and ML trees resulted in topology H1. However, the support for the position of *Massimiellus* and the '*cruciatus* group' was moderate (respectively, 64 and 50). To try and solve the uncertainty, the marginal likelihoods of the two constrained models were estimated. Ln marginal probability of H0 and H1 resulted as -419.51 and -416.75 respectively. The Bayes factor, computed as 2LnB_{10}, was 5.52, which, according to Kass & Raftery (1995), should be interpreted as positive evidence for H1 over H0.

Hence, we assumed H1 to be the most likely topology for the clade encompassing the '*cruciatus* group'. On this basis, the species referred to the '*cruciatus* group' were transferred to their own genus, here erected as *Holcophloeus* gen. nov. This is the only possible treatment, as any other classification would result in a paraphyletic taxon. This clade, with *Massimiellus* at its base and including the genus *Holcorhinus*, can be considered as the Holcorhinini clade. A Holcorhinini clade so composed has moderate to strong statistical support.

The BI consensus tree showing all groups illustrates hypothetical relationships amongst the four clades (Fig. 3). Most importantly, clades C and D appear to be reciprocally related, with *Caenopsis* Bach, 1854 basal to clade C. This topology also resulted with MP EW (Fig. 2A), and corresponds to the topology found by Borovec (2009). Clades C and D also resolved as sister taxa in ML; however, in this analysis *Caenopsis* fell in a polytomy along with clades C and D. Clades A and B were grouped together in MP (ew, Fig. 2A), but bootstrap value (12) does not support this hypothesis. In MP EW two main monophyletic groups were delimited, one including clades C + D and one with *Cathormiocerus* basal to clades A and B, as in Borovec (2009). Conversely, in the BI tree, clade B was weakly associated with clades C and D. The ML tree resulted in the polytomy A, B, and the group C + D + *Caenopsis*. Finally, MP IW resulted in a topology with clade B sister to clade D and clade A sister to clade C, with *Cathormiocerus* basal to clades A and C and *Caenopsis* in the basal polytomy (Fig. 2B).

Even though it was not within the scope of this study, the polyphyly of the tribe Trachyphloeini is confirmed, at least if the Holcorhinini are considered as an independent tribe.

The 'strong' synapomorphies (those that are not influenced by the topological uncertainty, Fig. 4) along the Holcorhinini clade are here discussed:

1. Synapomorphies for the Holcorhinini clade, including *Massimiellus*, as defined above.

Character 12. Epistoma barely developed. A clearly distinct epistoma is the normal condition for the other

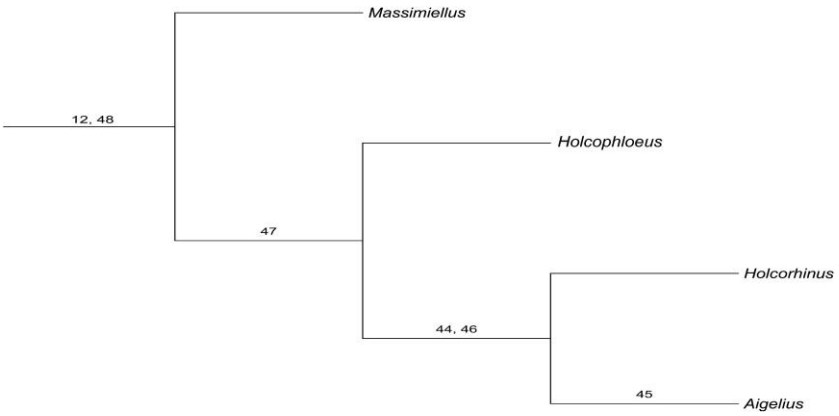


Figure 4. Clade D, with the 'strong' synapomorphies indicated on the branches. The numbers refer to the character list.

taxa considered here, and is relatively frequent in Entiminae, with some exceptions, such as the Omiini Schuckard, 1840. In the Holcorhinini clade it is very strongly reduced and barely visible.

Character 48. Ventrite I twice as long as ventrite II. Ventrite I as long as or only moderately longer than ventrite II is the normal state in Entiminae. This synapomorphy is exclusive to the clade Holcorhinini.

2. Synapomorphies for *Holcorhinus*, *Aigelius*, and *Holcophloeus*.

Character 47. Presence of a V-shaped stria in interocular space. This structure is frequently present in extra-Palaearctic Entiminae, mainly those native to the Ethiopian region, belonging to different tribes, such as Otiorhynchini Schoenherr, 1826, Embrithini Marshall, 1942, Oosomini Lacordaire, 1863, and others, but not to the Trachyphloeini (about five genera and almost 30 species, R. Borovec, unpubl. data). In the Palaearctic taxa a stria is present in a few genera of several tribes: Blosyrini Lacordaire, 1863, Cneorhinini Lacordaire, 1863, Psallidiini Lacordaire, 1863, Tanymecini Lacordaire, 1863, and in the Holcorhinini. The genus *Bosporomias* Korotyaev & Yunakov, 2005, has a transverse stria in the interocular space, but it was not formally assigned to any tribe (Yunakov & Korotyaev, 2005). All the known species currently referred to the tribe Trachyphloeini lack the stria. In our analysis this character is synapomorphic for the *Holcophloeus* clade; however, it seems to be a generally homoplastic state occasionally expressed by parallelism in distantly related lineages of Entiminae.

Some of the other states, even though at least in part plesiomorphic, are worthy of further comment because they further support the exclusion of *Massimiellus* and *Holcophloeus* from the Trachyphloeini.

Character 22. Ventrite II, ventrite III, and ventrite IV equal in length. This state is uncommon in the Entiminae and is also expressed in clade C. In *Massimiellus* ventrite II is slightly longer, nearly as long as ventrites III and IV together, but shorter than in other taxa of the Entiminae.

Character 23. Suture between ventrite I and ventrite II straight. This state is shared amongst the species of Holcorhinini, and is also expressed in the taxa belonging to clade C. Possible relationships between these clades are indeed suggested by our analysis.

Character 28. Apex of protibia without strongly developed lobes. This is the plesiomorphic state, shared by all Entiminae. A strongly lobed apex of the protibia is a unique synapomorphy of the genus *Trachyphloeus*.

Character 32. Metatibial corbels glabrous and glossy. All the species of Holcorhinini, Omiini, and Peritelini have metatibial corbels glabrous and glossy, the plesiomorphic state. Only *Trachyphloeus* species have metatibial corbels squamose and matte.

Character 34. Claws connate at midlength. The connate claws are apparently the plesiomorphic state. Free claws are synapomorphic for the Trachyphloeini clade, with a few notable reversals in a few genera of the tribe.

Massimiellus and *Holcophloeus* thus share with the tribe Holcorhinini (as defined by the type genus *Holcorhinus*) some apomorphic states, whereas they lack most of the apomorphies typical of the tribe Trachyphloeini (as defined by the type genus *Trachyphloeus*). The attribution of the two genera to the tribe Holcorhinini is therefore fully supported by our evaluation of the most significant morphological traits. We wish to add that it was not the aim of this study to define or delimit the tribes Trachyphloeini and Holcorhinini, which are very varied and probably polyphyletic in their present composition. However, it was possible to detect some characters that may help in proposing a more accurate definition.

TAXONOMY *HOLCOPHLOEUS* BOROVEC &MEREGALLI **GEN. NOV.** *Type species: Trachyphloeus cruciatus* Seidlitz, 1868 by present designation. The genus name is masculine.

Description: Body length (rostrum excluded): 2.4–3.1 mm. Body black, antennae and legs entirely or partly red-brownish. Vestiture: entire body, except for funicle, club, and tarsi densely covered with irregularly rounded or oval adherent scales, longitudinally striate, completely hiding integument and sometimes partly overlapping; elytra with a single, regular row of semierect, spatulate setae on each interval, of variable density; pronotum and head with similar setae, irregularly scattered; elytra in fresh specimens irregularly spotted by light grey-brownish and dark brownish scales, pronotum with three longitudinal, narrow stripes of dark brownish scales; antennal scape with erect, legs with semierect, subspatulate, or narrow setae; antennal funicle with erect, long, blackish bristles; club with very dense, short, adherent hair-like setae. Ventral side densely squamose, shiny, with semierect setae.

Rostrum very short, 1.6–1.9 times longer than wide, with sides arched, parallel, or widened anteriad; dorsum wide, separated from the rest of the head by a V-shaped stria starting either in anterior or in posterior edges of eyes and with point directed towards frons; frons squamose; epistoma not developed; scrobes in dorsal view visible in anterior half of rostrum or along its entire length, in lateral view triangular, dorsal border parallel with dorsal border of rostrum and extended above the eye, ventral border reaching middle or bottom part of eye, dorsal border of scrobe forming a low bump above the eye, visible mainly in dorsolateral view; rostrum in lateral view lying at the same level as remaining part of head; eyes moderately large, in dorsal view prominent from outline of head, in lateral view placed in ventral half of head. Antennae with moderately robust scape, slightly longer than funicle, reaching but not exceeding anterior margin of pronotum when folded, curved at midlength, gradually thickened to apex in apical half, at apex about as wide as or slightly wider than club; antennal funicle 7 segmented, antennomeres 1 and 2 slender, conical, antennomeres 3–7 transverse; club small, pointed.

Pronotum strongly transverse, distinctly constricted at anterior border, with strongly rounded sides, and with feebly arched posterior border, lateral part of anterior margin without ocular lobes; disc regularly convex, without any differentiated structure. Procoxal cavities contiguous, semiglobular, situated at midlength of pronotum.

Scutellum not visible.

Elytra oval, with regularly rounded sides, widest at midlength; striae visible, very narrow, intervals much wider than striae, flat or slightly convex, even and odd intervals of the same width. Mesocoxae semiglobular, mesoventral process about as wide as one tenth of width of mesocoxae; metacoxae transverse, metacoxal process as wide as width of metacoxae, obtuse.

Femora edentate. Apex of protibiae moderately enlarged laterally and on inner side, rounded, in *Holcophloeus cruciatus* and *Holcophloeus weilli* with short, shallow indentations, with five to seven fine, yellowish, short and small or longer, bristle-shaped spines; internal angle with long, hook-shaped spine, longer than the others; metatibial corbels open, glabrous, shiny; tarsi slender, long; tarsomere 3 deeply bilobed, only slightly wider than segment 2, onychium much longer than tarsomere 3; claws connate in basal half.

Ventrite I more than twice as long as ventrite II; ventrite II shorter than ventrites III and IV combined, ventrite V slightly wider than long, longer than ventrites III and IV, rounded; sutures between ventrites straight, deep, and broad. Sexual dimorphism: in males of *H. cruciatus* protibial apex with lobes and spines slightly less developed than in females, although conforming to the same pattern.

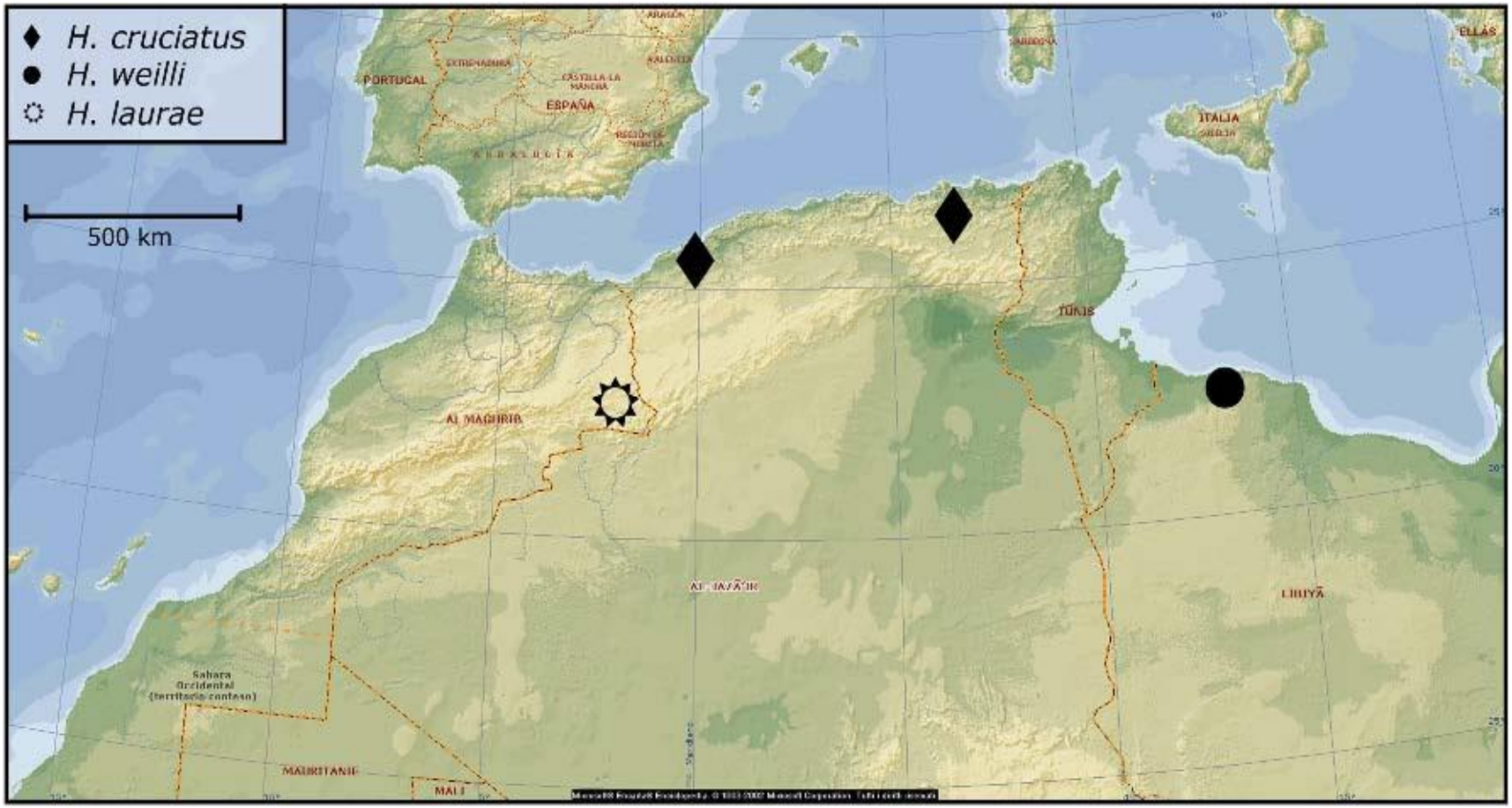
Male genitalia: aedeagus of medium length, well sclerotized; tegmen with long manubrium and short parameroids, internal sac without sclerotized armature; apodemes short, about as long as aedeagus.

Female genitalia: sternum VIII with apodeme of medium length, terminated just inside plate; plate umbrella-shaped, longer than wide, basal and apical margins not sclerotized, bearing short setae; gonocoxites flat, triangular, regularly tapered apicad, with a cylindrical stylus bearing setae at apex in *Holcophloeus laurae* sp. nov., styli reduced, microscopic in *H. weilli* sp. nov.; spermatheca C-shaped, with slender and long cornu and well-differentiated ramus and nodulus.

Reproduction: Holcophloeus cruciatus is bisexual; the newly described species, *H. laurae* and *H. weilli*, are both known only from two females.

Distribution: Western part of north Africa: Morocco, Algeria, and Libya (Fig. 5).

Etymology: Combination of *Holco* – and – *phloeus*, suggested by the genus belonging to the tribe Holcorhinini, although at first sight it resembles species of the genus *Trachyphloeus*.


H. cruciatus
H. weilli
H. laurae
500 km
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ESPAÑA
ITALIA
ELLÁS
TŪNIS
AL MAGHRIB
LIBIYĀ
Sahara Occidental (territorio contesto)
MAURITANIE
MALI

KEY TO SPECIES OF ***HOLCOPHLOEUS*** **GEN. NOV.**

1. Dorsum of rostrum distinctly tapered anteriad in frontal view (Fig. 6I). Apex of protibia armed with seven to eight slender, moderately long, bristle-shaped spines. Raised elytral setae short, in apical part of elytra shorter than half an interval width, dense, interval 7 with about 30 setae from base to apex. Morocco..... .....***Holcophloeus laurae*** **sp. nov.**

1′. Dorsum of rostrum with subparallel sides. Apex of protibia armed with five to six short spines. Raised elytral setae long, in apical part of elytra distinctly longer than half an interval width, less dense, interval 7 with about 20 setae from base to apex.....2

2. Pronotum strongly expanded outwards at midlength (Fig. 6M). Elytral setae vertically inserted. Rostrum wide, 1.8–1.9 times wider than long, with arcuated sides. Head with a prominent bump above eyes, mainly visible in lateral view. Eyes small, in lateral view diameter of eye half the height of head above eye. Onychium short, 2.2 times longer than tarsomere 3. Algeria.....***Holcophloeus cruciatus*** (Seidlitz) **comb. nov.**

2′. Pronotum regularly rounded at midlength (Fig. 7D). Elytral setae oblique. Rostrum narrow, 1.6–1.7 times wider than long, parallel-sided. Head above eyes without distinct bump in lateral view. Eyes large, in lateral view diameter of eye equal to height of head above eye. Onychium long, 2.7–3.0 times longer than tarsomere 3. Libya. .....***Holcophloeus weilli*** **sp. nov.**

Figure 6. ***Holcophloeus laurae*** **sp. nov.**, paratype. Body (A, B); elytra (C); pronotum (D); antenna (E); apical part of fore tibia (F); rostrum, dorso-lateral (G), lateral (H), frontal (I). ***Holcophloeus cruciatus*** (Seidtlitz, 1868) **comb. nov.**, Oran. Body (J, K); elytra (L); pronotum (M); antenna (N); apical part of fore tibia (O); rostrum, dorso-lateral (P), lateral (Q), frontal (R). Scale bar = 1 mm.

Included taxa: The genus includes three species, *H. cruciatus* (Seidlitz, 1868) and the two species newly described in this paper.

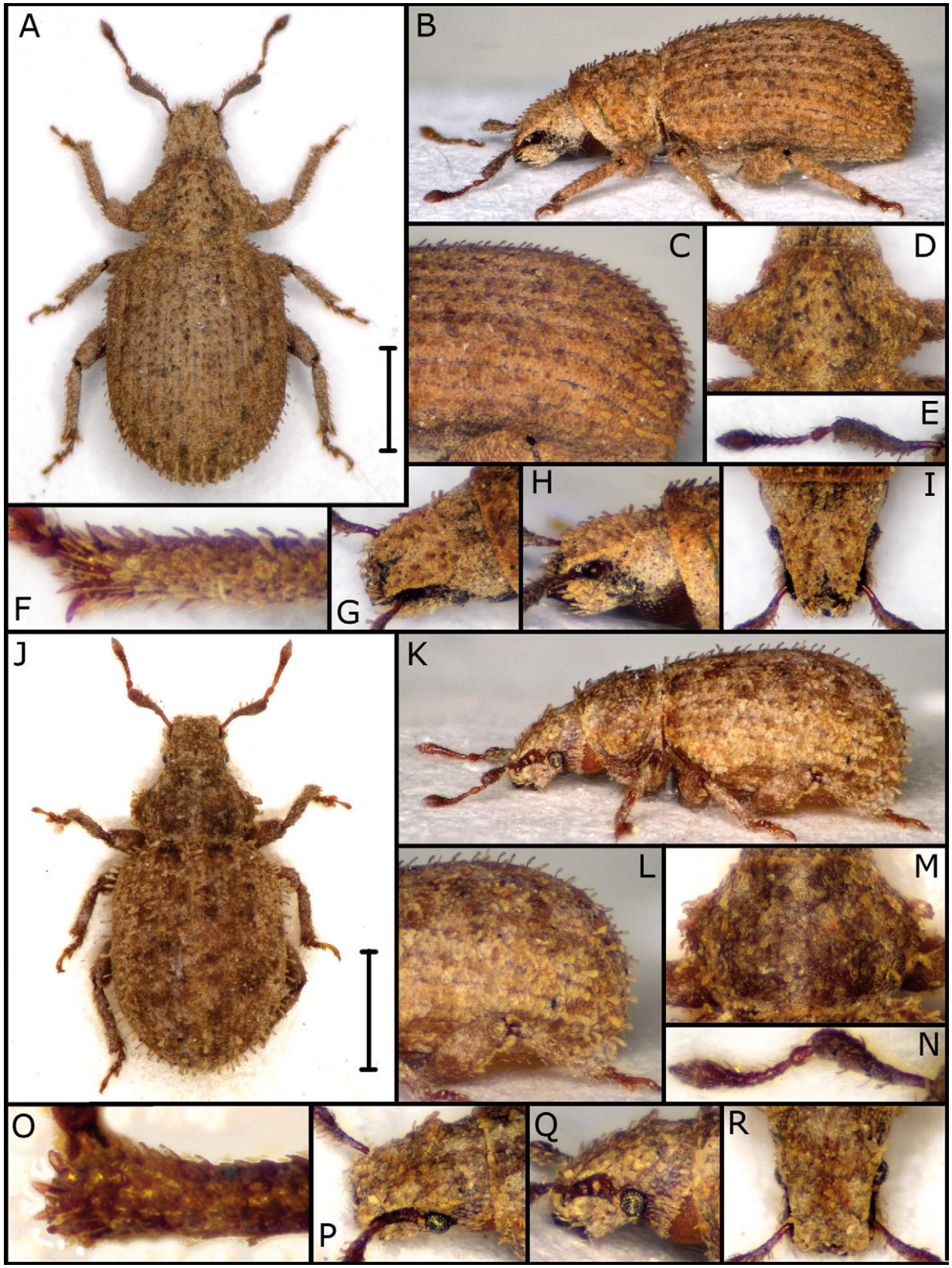
HOLCOPHLOEUS CRUCIATUS (SEIDLITZ, 1868) **COMB. NOV.** (FIGS 6J–R, 8A, C, E)

Trachyphloeus cruciatus Seidlitz, 1868: 103.
Trachyphloeus cruciatus: Marseul, 1873: 611; Stierlin, 1884: 80; Formánek, 1907: 144; Winkler, 1932: 1436; Lona, 1937: 321; Borovec, 2009: 68.

Type specimens: Lectotype (here designated). Seidlitz (1868) described this species based on 'Drei Exemplare aus Oran von Herrn Reiche mitgetheilt' and clearly defined the species as having a very short rostrum and head with a clearly visible, slender transverse stria. One of the authors [R. B.] examined eight specimens standing under the name *cruciatus* in Seidlitz's collection. One of them, a 2.53-mm-long specimen, was selected as the lectotype. The other seven specimens, although some of them come from the type locality, have different labels from the lectotype, and also a different type of preparation; they are glued to various paper cards, whereas the lectotype is pinned. They are not considered to be part of the type series. The lectotype is labelled as follows: Oran [handwritten, dark blue label]/Rch. [handwritten, dusky label]/*Trachyph cruciatus* Sdlz Type [handwritten in pencil]/Type von *Trachypl cruciatus* Seidlitz [partly printed, partly handwritten, orange red label]/ LECTOTYPE *Trachyphloeus cruciatus* Seidlitz, R. Borovec desig. 2012 [printed, red]/*Holcophloeus cruciatus* (Seidlitz), R. Borovec det. 2012 [printed]. The other seven specimens are labelled either Oran or Oran 90 Vauloger or have no locality label. The lectotype represents a valid species and bears all the typical characters defined by Seidlitz (1868) and all the characters that we state in the present paper as typical of *Holcophloeus* gen. nov. The lectotype is designated in order to stabilize nomenclature according to Article 74.7.3 of the Code (ICZN, 1999).

Other specimens examined: ALGERIA: one ♀ Constantine (Allard) [36°21′N, 06°36′E] (SMT); three ♀♀ Oran [35°42′N, 00°38′W] (SMT); three ♀♀ Oran, 1890 (Vauloger) (NMW); three ♀♀, two ♀♀ Oran (Vauloger) (JPE); two ♀♀ Oran (Marquet) (IRSN); one ♀, one ♀ Oran (RBO); two ♀♀ Oran (NMP).

Redescription: Body length (rostrum excluded): 1.88–2.87 mm. Body black, antennae with club and tarsi red-brownish, antennal scape in some specimens darker. Vestiture as typical of the genus; scales on dorsum of body oval, overlapping; elytra irregularly spotted with light grey-brownish and dark brownish scales, sutural interval lighter than disc of elytra; elytral setae moderately dense, regularly spaced, slightly longer than half the width of one elytral interval, inserted vertically; pronotum and head with rostrum with similar semierect setae, irregularly scattered, on pronotum visibly exceeding outline at sides and about as long as elytral setae; on head and rostrum setae narrower and shorter than on elytra.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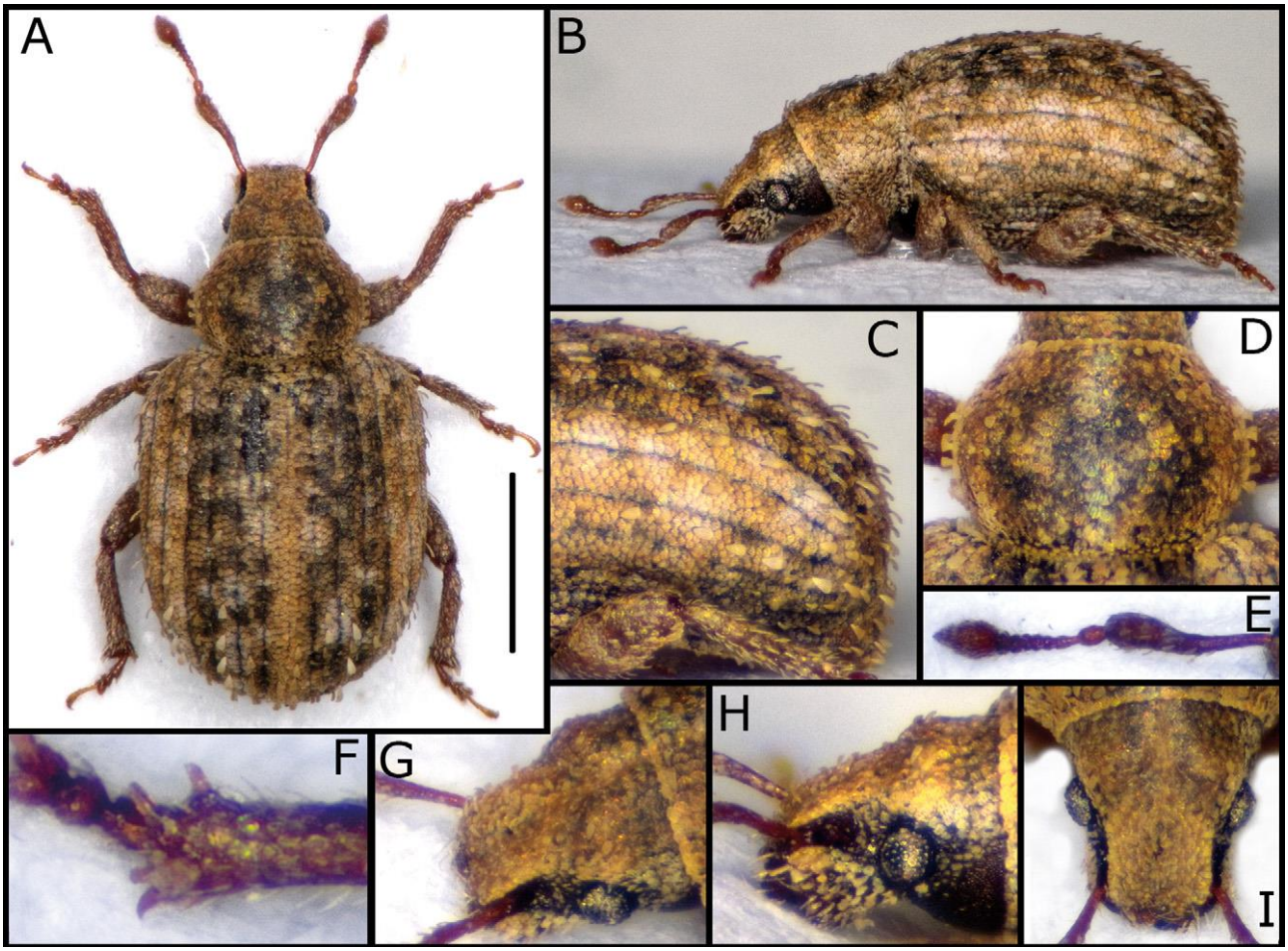

Figure 7. ***Holcophloeus weilli*** **sp. nov.**, paratype. Body (A, B); elytra (C); pronotum (D); antenna (E); apical part of fore tibia (F); rostrum, dorso-lateral (G), lateral (H), frontal (I). Scale bar = 1 mm.

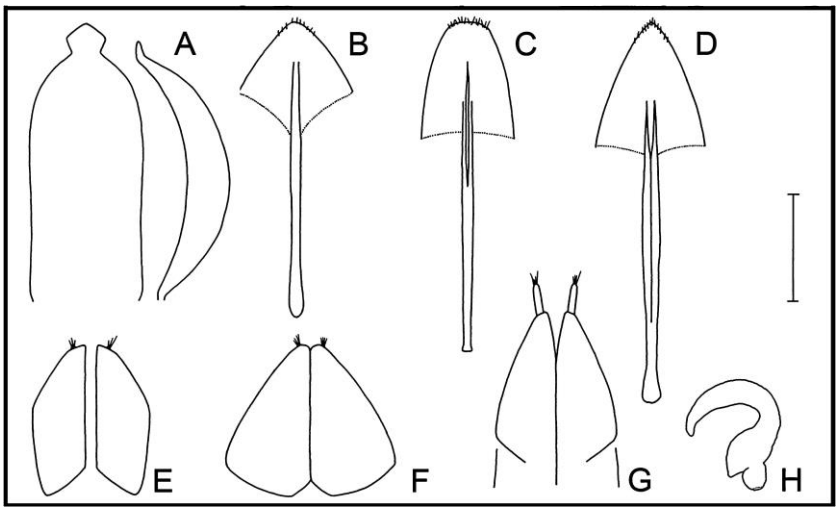

Figure 8. Genitalia. Aedeagus of *H. cruciatus* (Seidtlitz, 1868), Oran: dorsal and lateral view (A). Sternum VIII of: ***H. weilli*** **sp. nov.**, paratype (B), ***H. cruciatus***, Oran (C), ***H. laurae*** **sp. nov.**, paratype (D). Gonocoxites of *H. cruciatus* (E), *H. weilli* (F), *H. laurae* (G). Spermatheca of *H. weilli* (H). Scale bar = 0.25 mm.

Rostrum very short, 1.78–1.93 times wider than long, with straight sides, only slightly widened anteriad; dorsum very short and wide, slightly tapered anteriad with straight sides and with a distinct longitudinal median furrow, crossing transverse stria between eyes and extended to space behind posterior edges of eyes; scrobes in dorsal view visible as a slender furrow along the entire length of dorsum; in lateral view triangular, dorsal border parallel with dorsal border of rostrum and extended to upper part of eye, ventral border clearly curved downwards, reaching middle of eye; dorsal border of scrobe forming a low bump above eyes, mainly visible in dorsolateral view; rostrum in lateral view lying at the same level of remaining part of head, V-shaped furrow reaching eyes at their anterior border; eyes small, strongly convex. Head long, distance between eyes and pronotal margin longer than diameter of eye.

Antennal scape short, curved at midlength, gradually enlarged apicad from midlength, at apex as wide as club but narrower than protibia at its midlength; scape 1.3–1.4 times longer than funicle; funicle slender, antennomere 1 conical, 1.5 times longer than wide and 1.4–1.5 times longer than antennomere 2, which is twice as long as wide; antennomere 3 1.2–1.3 times longer than wide; antennomere 4 as long as wide; antennomeres 5 and 6 1.3 and antennomere 7 1.6–1.7 times wider than long.

Pronotum transverse, 1.45–1.52 times wider than long, sides very strongly rounded, expanded outwards in median part, maximum width slightly behind midlength, more strongly tapered anteriad than posteriad; disc regularly vaulted, behind anterior border with hardly visible shallow constriction; pronotum almost flat in lateral view, anterior margin slightly sinuate.

Elytra oval, 1.28–1.32 times longer than wide, maximum width at midlength. Striae narrow, hidden by adherent scales, intervals slightly convex; elytra in lateral view almost flat.

Protibia straight, short, and robust; medial edge slightly bisinuate, inner side feebly widened, broadly rounded, with indistinct lobes and four to five yellowish, short spines of equal size, regularly spaced, and with one longer, brownish, hook-shaped spine in inner angle; median part with two spines, inner and lateral parts with one spine each, lateral part in some specimens with two spines, the most external spine much smaller than the others; apex of male protibia with barely distinct lobes and shorter spines. Tarsi slender, long; tarsomere 2 longer than wide, deeply bilobed; tarsomere 3 1.2–1.3 times wider than long and 1.5–1.6 times wider than tarsomere 2; onychium slender, two times longer than tarsomere 3; claws connate to midlength.

Male genitalia: aedeagus short, along the entire length almost parallel-sided with slightly concave sides, apex with distinctly prominent point, arrowshaped; in lateral view feebly and regularly curved, with curved slender point.

Female genitalia: apodeme of sternum VIII about three times as long as plate, widest at midlength, terminated just inside plate, stick-shaped; plate moderately large, approximately umbrella-shaped, longer than wide, basal margin of plate not sclerotized, apical margin weakly distinct, slender, bearing short setae. Gonocoxites subtrapezoid, flat, with microscopic styli and a clump of setae at apex. Spermatheca not examined.

Ecology: No data are known.

Differential diagnosis: Holcophloeus cruciatus differs from the other two species in the long, vertically inserted setae; moreover, *H. laurae* sp. nov. has dorsum of rostrum tapered apicad in frontal view, and *H. weilli* sp. nov. has sides of pronotum regularly rounded, not expanded outwards.

HOLCOPHLOEUS LAURAE BOROVEC &MEREGALLI **SP. NOV.** (FIGS 6A–I, 8D, G)

Type specimens: HOLOTYPE, female, MOROCCO: Jbel Bouârfa, 90 km north-west of Figuig, 32°34.990′N, 01°57.728′W, 7.v.2009, 1547 m, R. Borovec collected (BMNH{E} 2012-149). PARATYPE, one female, same data as the holotype, M. Meregalli collected (RBO).

Description: Body length (rostrum excluded): Holotype 2.69 mm; paratype 3.09 mm. Body black, basal part of antennal scape, complete funicle with club and tarsi red-brownish. Vestiture as typical of the genus; scales on dorsum of body irregularly oval, on pronotum and head with rostrum partly depressed in the middle; elytra irregularly spotted by light grey-brownish and dark brownish scales; elytral intervals with a regular, dense row of semierect, spatulate, light brownish, relatively short setae, slightly shorter than half the width of one elytral interval; pronotum and head with rostrum with similar semierect setae, irregularly scattered, on pronotum wider, visibly exceeding outline of sides and on head and rostrum setae narrower than on elytra.

Rostrum very short, 1.76–1.88 times wider than long, with arched sides, feebly widened anteriad; dorsum wide, strongly tapered anteriad with straight sides and with longitudinal median furrow, hidden by scales, crossing transverse stria behind eyes and extended to space behind posterior edges of eyes; scrobes in dorsal view visible in anterior half of

rostrum, furrow-shaped, in lateral view triangular, dorsal border parallel with dorsal border of rostrum and extended significantly above eyes, ventral border reaching middle of eyes; dorsal border of scrobe forming a low bump above eyes near basal part of dorsal margin, mainly visible in dorsolateral view; eyes moderately large. Head long, distance between eyes and pronotal margin about twice as long as diameter of eye.

Antennal scape in basal third feebly S-shaped, slender, in apical two thirds gradually enlarged apicad, at apex 1.2 times wider than club and about as wide as protibia at midlength; funicle slender, antennomere 1 conical, 1.8–1.9 times longer than wide and 1.4–1.5 times longer than antennomere 2, which is two times longer than wide; antennomeres 3–5 as long as wide, antennomere 6 1.3 and antennomere 7 1.5–1.6 times wider than long.

Pronotum strongly transverse, 1.36–1.39 times wider than long, maximum width at midlength or just behind it, with very strongly rounded sides, expanded outwards, more tapered anteriad than posteriad; disc regularly vaulted, behind anterior border with transverse shallow constriction; dorsum feebly vaulted in lateral view, anterior margin obliquely subtruncated towards anterior coxae.
Elytra oval, 1.31–1.34 times longer than wide, widest at midlength; striae narrow, hidden by adherent scales, intervals much wider than striae, feebly vaulted.

Protibia straight, inner side very feebly bisinuate, apex feebly widened in median part, lateral edge straight, moderately rounded, without lobes, with seven to eight yellowish, slender, moderately long spines and with one long, hook-shaped spine in inner angle. Tarsi slender, long; tarsomere 2 1.6–1.7 times wider than long, deeply bilobed; tarsomere 3 1.1–1.2 times wider than long and 1.4 times wider than tarsomere 2; onychium slender, 1.6–1.7 times as long as tarsomere 3; claws connate to midlength.
Female genitalia: apodeme of sternum VIII about three times longer than plate, widest in midlength, terminated just inside plate, shortly bifurcated; plate small, approximately umbrella-shaped, isodiametric, basal margin not sclerotized, apical margin slender, bearing short setae; gonocoxites almost regularly tapered apicad, flat, large, styli apical, elongated, with a group of setae at apex. Spermatheca unknown.

Ecology: Both the specimens were collected by sifting roots of grasses and low xeric scrubs (*Thymus* sp. and *Artemisia* sp.), in a steep, shaded, narrow valley on the northern slopes of the hills north of Bouârfa, together with several specimens of *Baris* spp.

Etymology*:* The species is named after Dr Laura Guglielmone, our Italian botanist friend who took part in the Moroccan trip with us; she seems to be strictly thermophilous, enjoying the same warm weather and climatic conditions as this newly described species.

Differential diagnosis: Holcophloeus laurae sp. nov. is easily distinguished from both the other species of the genus by the dorsum of rostrum strongly tapered anteriad.

HOLCOPHLOEUS WEILLI BOROVEC &MEREGALLI **SP. NOV.**
(FIGS 7A–I, 8B, F, H) *Type material:* HOLOTYPE, female, LIBYA: Tajura [32°52′54″N, 13°21′02″E], 10.i.2010, P. Weill [collected] (PWE). PARATYPE, one female, LIBYA: Al Aziziyah [32°31′55″N, 13°01′03″E], 28.iii.2008, P.W. [P. Weill collected] (PWE).

Description: Body length (rostrum excluded): Holotype 2.38 mm; paratype 2.69 mm. Body black, legs and antennae red yellowish, femora darker, redbrownish. Vestiture as typical of the genus; adherent scales on elytra very dense, partly overlapping, irregularly rounded; raised setae on elytra in basal half curved against the body, on elytral declivity semierect, aligned in a relatively dense, regular row on each interval; setae on intervals 3, 5, and 7 spatulate, white greyish, slightly longer than half one interval width and slightly wider than diameter of a scale; setae on even intervals subspatulate, as long as half one interval width and as wide as diameter of a scale; pronotum on disc with setae similar to those on even intervals, setae on sides similar to those on odd intervals, both slightly shorter than elytral setae; head with rostrum with fine, inconspicuous, short, irregularly scattered setae. Elytra contrastingly coloured – intervals 1 and 5–7 light grey-brownish, intervals 2–4 and 8–10 dark brownish, with small, irregular, light grey-brownish spots; pronotum with a brownish stripe on disc and with wide, light grey-brownish lateral stripes. Rostrum light grey-brownish.

Rostrum very short, 1.63–1.69 times wider than long, almost parallel-sided, with indistinctly concave sides; dorsum very wide, with slightly concave sides and with wide, shallow, irregularly triangular longitudinal depression in apical part; V-shaped transverse stria wide, shallow, starting in anterior part of eyes, continuing into a longitudinal wide shallow furrow along entire length of head; scrobes in dorsal view visible as a narrow furrow along entire length of rostrum; in lateral view triangular, ventral border reaching bottom edge of eye, dorsal border subparallel to dorsal margin of rostrum; eyes strongly vaulted. Head large, in dorsal view as long as diameter of eyes or longer, strongly convergent anteriad.

Antennae slender; antennal scape reaching anterior border of pronotum when folded, about half as long as funicle, curved at midlength, slender in basal half, regularly broadened to apex after midlength, at apex slightly narrower than club; antennomere 1 conical, 1.6–1.8 times longer than wide, 1.3–1.4 times longer than antennomere 2, this 1.8 times longer than wide; antennomere 3 as long as wide; antennomeres 4 and 5 1.3–1.4 times wider than long; antennomere 6 1.5–1.6 times wider than long; antennomere 7 1.8–1.9 times wider than long; antennal club short, 1.5–1.6 times longer than wide.

Pronotum strongly transverse, 1.4–1.5 times wider than long, maximum width behind midlength, sides strongly and regularly curved from base to midlength, not strongly expanded outwards, more strongly tapered anteriad; dorsum regularly vaulted.

Elytra oval, 1.23–1.26 times longer than wide, maximum width at midlength, in lateral view slightly vaulted. Intervals wide, slightly vaulted.

Apex of protibia strongly enlarged laterally and slightly broadened in median part; outer edge rounded, with three yellowish spines, inner half with a shallow indentation armed with a fourth spine, smaller than the others. Internal angle with a fifth, longer, hook-shaped brownish spine. Tarsi slender, long, tarsomere 1 about three times longer than wide; tarsomere 2 1.2–1.3 times wider than long; tarsomere 3 bilobed, 1.3–1.4 times wider than long and only 1.2 times wider than tarsomere 2; onychium 2.7–3.0 times longer than tarsomere 3; claws long, connate in basal half, parallel-sided.

Ventrites densely squamose; ventrite I twice as long as ventrite II; ventrite II slightly shorter than ventrites III and IV combined; all sutures straight, narrow. Metaventral process dull, obtuse, about as wide as width of metacoxa.

Genitalia. Apodeme of sternum VIII of medium length, terminated just inside plate, which is umbrella-shaped, basal and apical margins not sclerotized, barely distinct, apical margin bearing short setae; spermatheca with long, slender, and regularly curved cornu; corpus large; ramus about as long as wide, about twice as long and wide as nodulus; gonocoxites flat, triangular, regularly tapered apicad with a clump of setae at apex, styli microscopic.

Ecology: No data are known.

Etymology: The new species is named after its collector, our French friend Patrick Weill, who collected extensive material of Curculionidae during his two years' stay in Libya.

Differential diagnosis: Compared with the other species of the genus, *H.* weill*i* sp. nov. has pronotum scarcely expanded outwards at midlength, longer onychium and larger eyes, placed more dorsally in lateral view.

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