

## On the identity of *Chalcionellus orcinus* and *Chalcionellus libanicola* (Coleoptera: Histeridae)

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**Abstract.** The synonymy of *Chalcionellus libanicola* (Marseul, 1870) and *Chalcionellus orcinus* Reichardt, 1932 is rejected based on the examination of the type specimens of both species and *Chalcionellus orcinus* stat. restit. is reinstated as a valid species. The two species differ mainly in the structure of frontal disc, length of elytral striation, shape and punctuation of pronotum, absence/presence of slight metallic luster on the elytra and male genitalia. The lectotype of *Chalcionellus libanicola* is designated.

**Key words.** *Chalcionellus libanicola*, *Chalcionellus orcinus*, taxonomy, Saprininae, Histeridae, Coleoptera, Palearctic region.

### Introduction

The extremely rare species *Chalcionellus libanicola* was described from ‘Mt. Liban’, Lebanon by MARSEUL (1870) under the name *Saprinus libanicola*. This description was based on very incomplete specimens. Presently, only one of these specimens remains in the collection of MNHN, its sex cannot be recognized (genitalia lost) and it is generally in very poor condition. Without examining the type specimens, REICHARDT (1932) placed this species correctly into the genus *Chalcionellus* and in the same paper he described another species *Chalcionellus orcinus* from Kyrgyzstan; the species was later reported also from Uzbekistan and Turkey (KRYZHANOVSKIJ & REICHARDT 1976, MAZUR 1997b). MAZUR (1997a,b) synonymized *Ch. orcinus* with *Ch. libanicola* without examining the type specimen of *Ch. orcinus* (Mazur, pers. comm.), and examined an additional specimen belonging to *Ch. libanicola* from Turkey. ROZNER (2010) reported *Ch. libanicola* from Turkey without stating the number of collected specimens. One of the reported specimens (the single collected specimen?) has been preserved in the collection of P. Kanaar (Oegstgeest, the Netherlands) who had identified it. Kanaar’s collection has been bequeathed to RMNH and after having borrowed and examined this specimen I came to the conclusion that it belongs to the species *Ch. orcinus* (see below).

Both these species can be best separated from other congeners of the genus *Chalcionellus* by the key provided in KRYZHANOVSKIJ & REICHARDT (1976: 188). Their main distinguishing

characters are absence of pronotal foveae, absence of lateral pronotal stria, clypeus without lateral ridges and faint to no metallic luster.

Examination of all available material of both species resulted in conclusion that although these two species are very similar to each other, they slightly differ in their external morphologies as well as male genitalia. Male genitalia of *Ch. libanicola* and *Ch. orcinus* (except for the aedeagus the latter species that has already been illustrated by KRYZHANOVSKIJ & REICHARDT (1976: 193, fig. 391)) are herein depicted for the first time. *Chalcionellus orcinus* is also a very rare taxon, currently known from only a handful of specimens originating from Kyrgyzstan, Uzbekistan and Turkey, and is herein newly reported from Kazakhstan. *Chalcionellus libanicola* is presently known from two very badly preserved specimens from Lebanon and Syria, and one well-preserved specimen from Turkey.

### Material and methods

Beetles, after being removed from original cards, were side-mounted on triangle points and observed under binocular microscope Nikon 102 with diffuse light. Male genitalia were first macerated in 10% KOH solution for about 15 minutes, cleared in 80% alcohol and macerated in lactic acid with fuchsine heated up to 60°C for another hour. After that, they were treated with aceto-salicylate heated up to 60°C for 15 minutes and cleared in xylene. They were subsequently observed in  $\alpha$ -terpineol in a small dish. Digital photographs were taken by a Nikon 4500 Coolpix camera and edited in Adobe Photoshop CS4. Based on the photographs, observing the actual genitalia, pencil art was drawn; pen art followed, re-tracing the pencil art and making minor corrections. SEM photographs were taken by Hitachi S-2250N camera.

The following acronyms of museums and private collections are used throughout the text:

BMNH	The Natural History Museum, London, United Kingdom (R. Booth);
CTLA	Tomáš Lackner collection, Leiden, The Netherlands;
MNHN	Muséum National d'Histoire Naturelle, Paris, France (A. Taghavian);
MNHG	Muséum d'Histoire Naturelle, Geneva, Switzerland (G. Cuccodoro);
NMPC	Národní muzeum, Prague, Czech Republic (J. Hájek);
RMNH	Nationaal Natuurhistorische Museum 'Naturalis' [formerly Rijksmuseum van Natuurlijke Historie], Leiden, the Netherlands (A. van Aartsen);
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (B. Kataev).

Abbreviations of morphological measurements follow ÔHARA (1994) and are used throughout the text as follows:

APW	width between anterior angles of pronotum;
EL	length of elytron along elytral suture;
EW	maximum width between outer margins of elytra;
PEL	length between anterior angles of pronotum and apices of elytra;
PPW	width between posterior angles of pronotum.

Separate lines of the same label are marked by slash (/). Morphological terms generally follow LACKNER (2010).

## Results

### *Chalcionellus orcinus* Reichardt, 1932 stat. restit.

(Figs. 1–9, 10–16)

*Chalcionellus orcinus* Reichardt, 1932: 24, 91.

*Chalcionellus orcinus*: REICHARDT (1941: 264, 273); KRYZHANOVSKIJ & REICHARDT (1976: 189, 195, Fig. 391); MAZUR (1984: 82).

**Type locality.** Kyrgyzstan, Bishkek.

**Type material examined.** HOLOTYPE (ZIN): unsexed specimen (genitalia missing; most likely a male, since it possesses a longitudinal median line on the metaventricle and leaf-like scales on each protarsomere: known male characters of the Sapriniinae) with right mesotibia broken off, bearing the following labels (In Russian): ‘Pishpek [= Bishkek], Semir. / 7.ix.[1]912 / Shestoporov’ [hand-written], ‘Pishpek [=Bishkek] / 7.ix[19]12’ [pencil, hand-written], ‘*Saprinus* (*Chalc.*?) / *orcinus* sp. n. / Monotypus / A. Reichardt. det.’ [printed], ‘Holotypus’ [red label, hand-written], ‘Zoological / Institute Ras / St. Petersburg’ [yellow label, pencil handwritten], ‘09-064’ [pencil hand-written label added by myself].

**Additional material examined.** KAZAKHSTAN: 1 ♂, Karatau, Uroch. Aulie, 15.v.[1]974 Yanushev (ZIN); 1 ♂, Karatau, Kuyuk Pass, potoky [= streams], 2.vi.[19]80, K Hürka (CTLA); 1 ♂, S. Aktjübinsk [= Aqtöbe] reg., Emba vill., 15.v.2000, coll. H. Hebauer (MNHG). UZBEKISTAN: 1 ♂, Novyj [= New] Iskander [= Iskandar], r. Chirchik, L. Arnoldi, 8.v.1942 (ZIN). TURKEY: 1 ♂, Camlidere Isik d. [= Çamlidere-Işık Dağı], Anat. 23.vi.[19]47, Exp. N. Mus. ČSR (NMPC); 1 ♂, vill. Gümüşhane, Telme, 20.v.1987, leg. Rozner I., Coll. Rozner István (RMNH).

**Redescription** (based on the holotype). Body length: PEL: 2.10 mm; APW: 0.75 mm; PPW: 1.50 mm; EL: 1.25 mm; EW: 1.70 mm. Body (Figs. 1–2) oblong oval, moderately convex; cuticle shining, dark brown to black, without metallic luster; elytral humeri not prominent, legs, antennae and mouthparts reddish-brown.

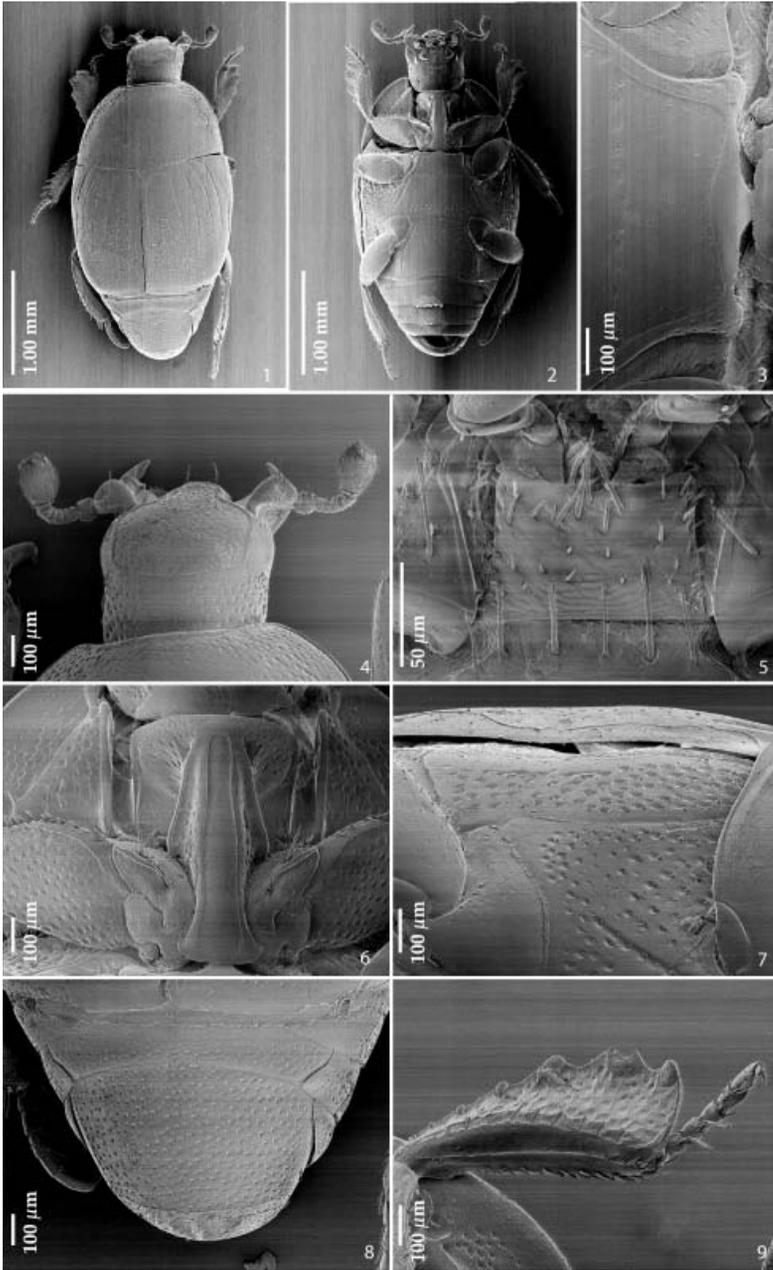
Antennal scape (Fig. 4) moderately dilated, apical part with strigulate impression, with two short setae; club without visible articulation, entire surface with short dense sensilla, intermingled with sparse longer sensilla; sensory structures of antennal club not examined.

Head: Mandibles coarsely punctate, sub-apical tooth on left mandible rather small, almost perpendicular, mandibular apex acutely pointed; labrum punctuated; disc convex, with two well impressed labral pits fringed with one single long seta each; mentum (Fig. 5) sub-rectangular, apical angles somewhat produced; anterior margin medially with a tiny notch (Fig. 5), medially with four long setae; disc of mentum covered with sparse, much shorter setae; lateral margins fringed with one row of short ramose setae; other parts of the mouth not examined.

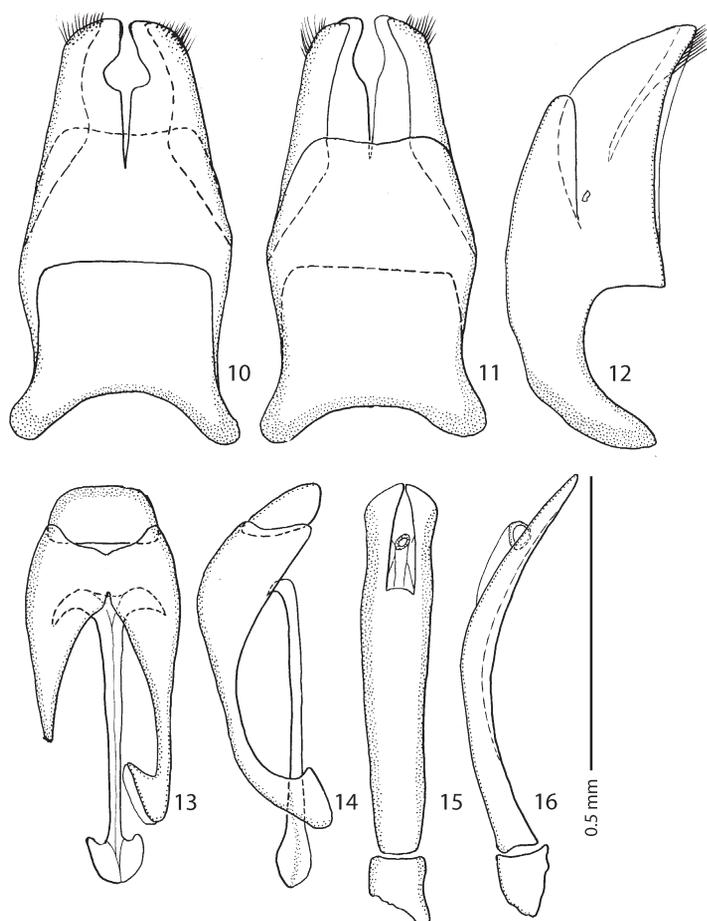
Clypeus (Fig. 4) slightly depressed on apical third, rounded laterally, coarsely punctate; frontal stria (Fig. 4) widely interrupted anteriorly, continued along lateral margins of clypeus, almost reaching its anterior angles; supraorbital stria well-impressed, fine; frontal disc with coarse punctuation, punctures separated by their own to twice their diameter; interspaces without microsculpture; eyes convex, well visible from above.

Pronotal sides (Fig. 1) moderately convergent anteriorly; apical angles blunt; pronotal foveae absent; disc entirely covered with fine punctuation, punctures separated by several times their diameter, laterally with a band of coarse punctuation running parallel to lateral margin; pronotal base with a row of coarse round punctures; marginal pronotal stria well impressed, fine, carinate, complete; pronotal hypomeron glabrous.

Elytral epipleuron almost smooth, with microscopic punctuation; marginal epipleural stria



Figs. 1–9: *Chalcionellus orcinus* Reichardt, 1932. 1 – habitus, dorsal view; 2 – same, ventral view; 3 – mesoven-trite; 4 – head, dorsal view; 5 – mentum; 6 – prosternum; 7 – lateral disc of metaventr-ite, metepisternum + fused metepimeron; 8 – propygidium and pygidium; 9 – protibia, ventral view.



Figs. 10–16: *Chalcionellus orcinus* Reichardt, 1932. 10 – eighth sternite and tergite, ventral view; 11 – same, dorsal view; 12 – same, lateral view; 13 – Ninth and tenth tergites, dorsal view + spiculum gastrale, ventral view; 14 – ninth and tenth tergites + spiculum gastrale, lateral view; 15 – aedeagus, dorsal view; 16 – same, lateral view.

well impressed, complete; marginal elytral stria well impressed, in tiny punctures; apically shortly prolonged onto elytron, apical elytral stria absent. Humeral elytral stria present on basal third, fine; inner subhumeral stria present as a median fragment; elytra with four dorsal striae 1–4, in small punctures; first and second shorter than third and fourth, approximately reaching elytral half apically; third and fourth somewhat longer, reaching about two-thirds of elytral length apically; fourth basally well connected with the sutural elytral stria; sutural stria complete but weakened, on apical two-thirds intermittent. Punctuation of elytral disc covering approximately posterior two-thirds, punctures separated by about their own to twice their own diameter; basal third of elytron with much finer and scattered punctuation.

Propygidium (Fig. 8) transverse, partly covered by elytra, with fine scattered punctuation

progressively becoming coarser basally, interspaces substrigulate; pygidium (Fig. 8) with much coarser and denser round punctures, separated by about their own diameter, interspaces substrigulate; punctuation almost disappears apically.

Anterior margin of median portion of prosternum (Fig. 6) almost straight; marginal prosternal stria shortly present anteriorly; pre-apical foveae well impressed, rather deep; prosternal process flattened; laterally with sparse, moderately-sized punctures, interspaces substrigulate; carinal prosternal striae well impressed, bisinuate, connected anteriorly, space between them almost smooth, only with few sparse punctures; lateral prosternal striae carinate, convergent anteriorly, terminating near apices of united carinal striae, but not connected. Anterior margin of mesoventrite (Fig. 3) emarginate medially, discal marginal mesoventral stria well impressed, slightly carinate; disc of mesoventrite with fine scattered punctuation; meso-metaventral sutural stria well impressed, undulate, slightly distanced from meso-metaventral suture; intercoxal disc of metaventrite with fine scattered punctures; along basal margin band of coarse punctures present; lateral metaventral stria well impressed, in deep punctures, straight, ending near hind coxa. Lateral disc of metaventrite (Fig. 7) with shallow sparse punctures becoming finer apically; metepisternum (Fig. 7) with much coarser and denser punctuation, punctures becoming sparser on fused metepimeron, metepisternal stria absent.

Intercoxal disc of first abdominal sternite completely striate laterally; disc laterally with fine sparse punctures; medially smooth.

Protibia (Fig. 9) slightly dilated, outer margin with three moderately large triangular teeth topped with tiny denticle, followed by three minuscule denticles, becoming progressively smaller in proximal direction; protarsal groove deep; outer row of setae regular, setae short; median row of setae regular, setae even shorter than those of outer row; anterior protibial stria shortened apically; near tarsal insertion two tiny tarsal denticles present; protibial spur very short, growing out from apical margin of protibia; outer part of posterior surface of protibia (Fig. 9) obscurely variolate, a row of regular short denticles separating it from finely strigulate median part of posterior surface; posterior protibial stria complete, terminating in three tiny inner posterior denticles; inner margin of setae double, setae short and dense.

Mesotibia slightly thickened, outer margin with two rows of moderately sized denticles; outer row of setae sparse, setae about as long as denticles, growing in size apically; median row of setae inconspicuous; posterior mesotibial stria shortened, present only basally; anterior surface of mesotibia substrigulate-punctate; anterior mesotibial stria almost complete, terminating in two tiny denticles; mesotibial spur moderately large; apical margin of mesotibia with several inner anterior denticles; claws of apical tarsomere slightly bent, about half its length. Metatibia slenderer than mesotibia, outer margin with much sparser and shorter denticles, growing in size apically, otherwise in all aspects similar to mesotibia.

Male genitalia (based on the specimen from Turkey: Çamlıdere-Işık Dağı): Eighth sternite (Figs. 10–11) in basal half longitudinally fused medially, in apical half slightly separated, apically with tiny inflatable membrane (velum); apex of eighth sternite laterally with single row of short sparse setae; eighth tergite and eighth sternite fused laterally (Fig. 12). Morphology of 9<sup>th</sup> tergite (Figs. 13–14) typical for the subfamily; spiculum gastrale expanded on both ends. Basal piece of aedeagus (Figs. 15–16) rather short, ratio of its length : length of

parameres 1:5; parameres fused along their basal three-fourths, slightly constricted before apex; aedeagus curved ventrad (Fig. 16).

**Variation.** The female specimen from Uzbekistan: Iskander is slightly larger in size and fourth dorsal elytral stria somewhat shortened, reaching approximately elytral half apically.

**Biology.** Unknown. In Kazakhstan, the species was found near mountain streams.

**Distribution.** Kyrgyzstan (Bishkek), Uzbekistan (Iskandar, Chirchik river near Toshkent), Turkey (Çamlıdere-Işık Dağı, near Ankara or Çankırı and Telme village near Gümüşhane). New to Kazakhstan (south-western Kazakhstan: Karatau, Uroch Aulie and Kujuk).

### *Chalcionellus libanicola* (Marseul, 1870)

(Figs. 17–21, 22–29)

*Saprinus libanicola* Marseul, 1870: 113.

*Chalcionellus libanicola*: REICHARDT (1932: 141); MAZUR (1984: 82); MAZUR (1997a: 32); MAZUR (1997b: 247); MAZUR (2004: 91).

**Type locality.** Lebanon.

**Type material examined.** LECTOTYPE (by present designation): specimen of unknown sex, but possibly a female, since it lacks the median longitudinal line on the metaventricle that is typical for males of this genus (MNHN): all legs and antennae missing, head, labrum, both mandibles, both elytra, thorax and parts of abdomen glued on a mounting card, bearing the following labels: with rounded yellow label (written): ‘*Saprinus / libanicola / m. Liban / Coq. ’68*’; with another printed label: ‘Museum Paris / Coll. De Marseul / 2842-90’; followed by another label, red-printed: ‘TYPE’; followed by another printed-written label: ‘*Chalcionellus / libanicola / 1996 det. S. Mazur*’; followed by another red label (written): ‘*Saprinus / libanicola / Marseul, 1872 / LECTOTYPE / des. T. Lackner ’09*’

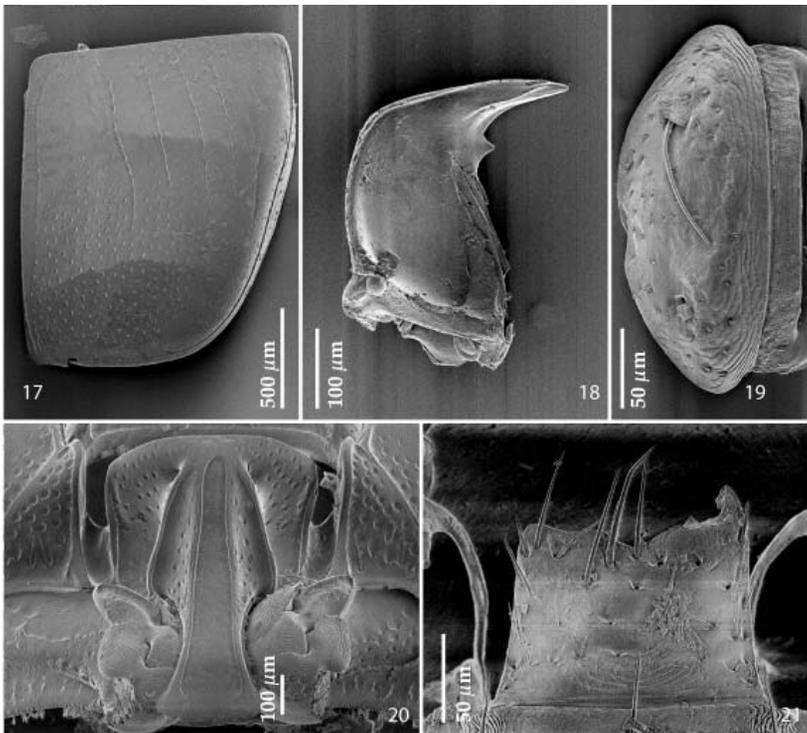
**Additional material examined.** SYRIA: 1 ♂, Seron? Syrie, Coye (BMNH). TURKEY: 1 ♂, Konya, Sertavul Geçidi [= Sertavul Pass], 1500-1600m, 25.iv.[19]78, / Besuchet Löbl (MNHG).

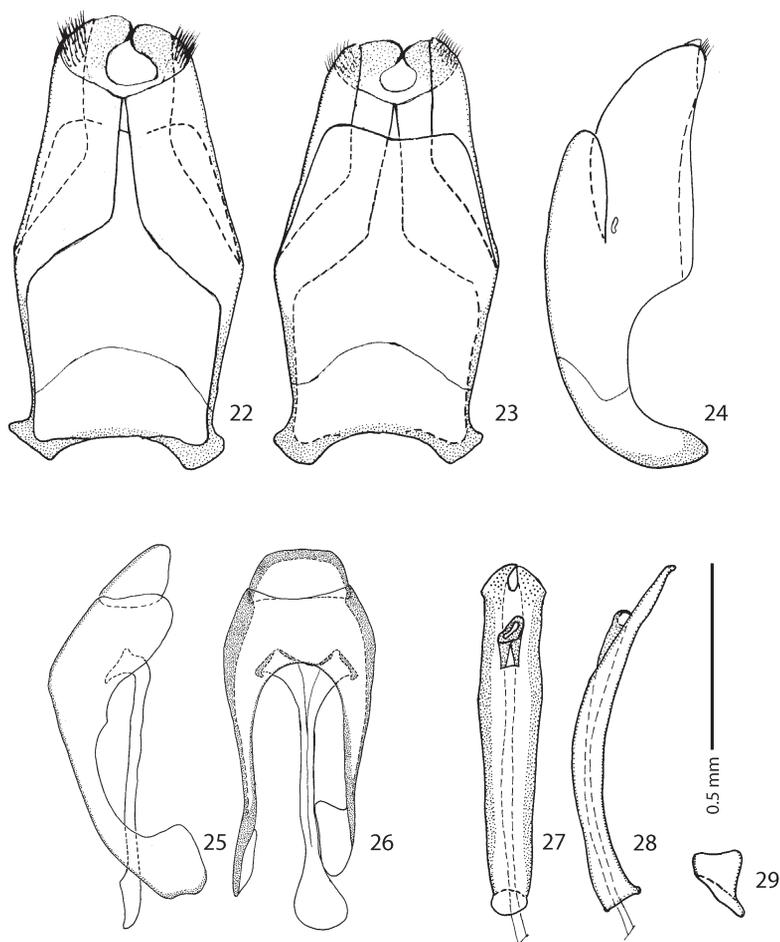
**Differential diagnosis.** *Chalcionellus libanicola* differs from *Ch. orcinus* by the following characters depicted in Table 1 as well as by the differently shaped spiculum gastrale that is apically more dilated in *Ch. libanicola* than in *Ch. orcinus* and aedeagus that is slightly more contracted before apex (compare Figs. 14–15 and 26–27).

**Redescription** (based on the lectotype). Very similar to the preceding species, but slightly larger; body length: 2.50 mm; width: 1.80 mm. Labrum and mentum likewise similar; labrum (Fig. 19) imbricate-punctate, somewhat depressed anteriorly; anterior margin of mentum (Fig. 21) with shallow median notch, surface around it fringed with several long setae, lateral margins with double row of much shorter setae, disc of mentum with scattered short setae. Clypeus also similar to that of *Ch. orcinus*, but not depressed, flat; frontal disc covered with moderately coarse and dense punctation, punctures separated by about their own diameter, on anterior half of frontal disc slightly depressed, interspaces between punctures with alutaceous microsculpture, this microsculpture also present on entire clypeus; on posterior fifth, near occipital stria medially with single deep fovea. Rest of frons and clypeus as with *Ch. orcinus*. Pronotal sides similar to *Ch. orcinus*, but almost parallel on posterior two-thirds, on apical third slightly convergent apically, apical angles obtuse. Pronotum very similar to that of preceding species, but punctuation not forming a lateral band like in *Ch. orcinus*. Elytral color light brown, shining, with metallic luster. Elytra (Fig. 17) very similar to that of *Ch. orcinus*, but the configuration of elytral striae somewhat different: first and third striae about the same length, not reaching elytral half apically, second and fourth striae longer, reaching

Table 1. Differential characters distinguishing *Chalcionellus orcinus* Reichardt, 1932 and *Ch. libanicola* (Marseul, 1870).

Character	<i>Chalcionellus orcinus</i>	<i>Chalcionellus libanicola</i>
<b>Pronotal sides, basal 2/3</b>	moderately convergent anteriorly	almost parallel-sided
<b>Pronotum, lateral band of coarse punctuation</b>	present	absent
<b>Clypeo-frontal region</b>	not depressed, punctate, interspaces without microsculpture	anteriorly depressed, punctate, interspaces with alutaceous microsculpture
<b>Elytral striae, length</b>	first and second reaching approximately elytral half, third and fourth approximately two-thirds of elytral length apically	first and third stopping short of elytral half, second and fourth reaching elytral half apically
<b>Metallic luster on elytra</b>	absent	slight metallic luster present
<b>Eighth sternite of male terminalia</b>	fused medially	entirely separated medially

Figs. 17–21: *Chalcionellus libanicola* (Marseul, 1870). 17 – right elytron, dorsal view; 18 – left mandible, dorsal view; 19 – labrum, dorsal view; 20 – prosternum; 21 – mentum, ventral view.



Figs. 22–29: *Chalcionellus libanicola* (Marseul, 1870). 22 – Eighth sternite and tergite, ventral view; 23 – same, dorsal view; 24 – same, lateral view; 25 – ninth and tenth tergites + spiculum gastrale, lateral view; 26 – ninth and tenth tergites, dorsal view + spiculum gastrale, ventral view; 27 – aedeagus, dorsal view; 28 – same, lateral view; 29 – phallobase (basal piece of aedeagus), lateral view.

approximately elytral half apically; elytral striae 1–3 in tiny shallow, almost inconspicuous punctures, fourth stria in much coarser and larger punctures; sutural elytral stria fine, thin, reaching approximately four-fifths of elytral length apically, next evanescent. Approximately apical elytral half covered with rather sparse elongate punctures, separated by about twice their diameter; on basal half and lateral sides of elytra (roughly) punctuation becomes much finer and sparser, punctures separated several times their diameter. Prosternum (Fig. 20): marginal prosternal stria absent; lateral sides of prosternal process substrigulate-punctate; lateral prosternal striae costiform; rest of prosternum as with *Ch. orcinus*. Mesoventrite and



Fig. 30: Distributinal map of *Chalcionellus orcinus* Reichardt, 1932 and *Ch. libanicola* (Marseul, 1870).

metaventrите: marginal mesoventral stria slightly emarginate anteriorly; discs with scattered microscopic punctures; rest of meso- and metaventrите otherwise identical to those of preceding species.

Male genitalia (based on the specimen from Syria): Very similar to those of *Ch. orcinus*, but eighth sternite (Figs. 22–23) widely separated medially; apex of eighth sternite laterally with several rows of short sparse setae; eighth tergite and sternite fused laterally (Fig. 24). Morphology of 9<sup>th</sup> and 10<sup>th</sup> tergites (Figs. 25–26) similar to those of *Ch. orcinus*, but spiculum gastrale (Fig. 26) more dilated apically than in *Ch. orcinus*. Basal piece of aedeagus (Figs. 29) and aedeagus (Figs. 27, 28) also very similar between the two species.

**Remarks.** MARSEUL (1870) mentioned that there were multiple specimens of this species available, but presently only a single specimen remains in the MNHN collection. This specimen is therefore designated as the lectotype.

**Distribution.** Lebanon (Mount Lebanon mountain range), Turkey (Sertavul Pass, between cities Karaman and Mersin) and Syria (illegible locality).

### Acknowledgements

I would like to thank Nicolas Dégallier (Paris, France) for the help with the translation as well as his suggestions and corrections of this manuscript; Slawomir Mazur (Warszawa, Poland), Giulio Cuccodoro (MNHG), Azadeh Taghavian (MNHN), Boris Kataev (ZIN), Alfred van Aartsen (RMNH) and Roger Booth (BMNH) are thanked for their help with the specimens. Thanks are also due to Masahiro Ôhara (Sapporo, Japan) and Martin Fikáček (Prague, Czech Republic) for the critical reading of the manuscript and Jessica Carroll (Sapporo, Japan) for the grammatical check of this manuscript. My wife Pepina Artimová has drawn the distribu-

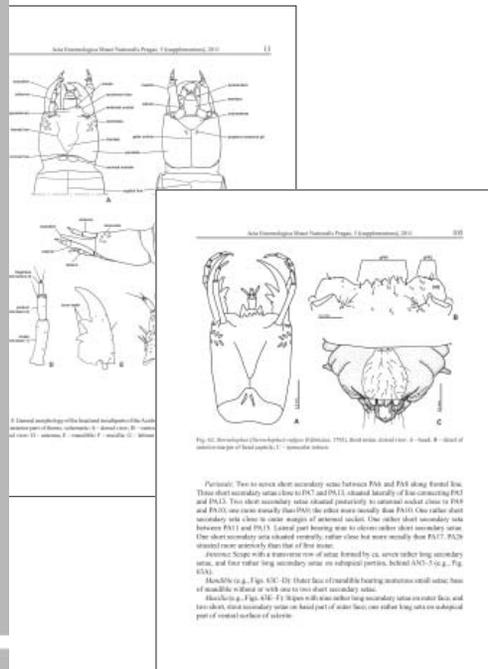
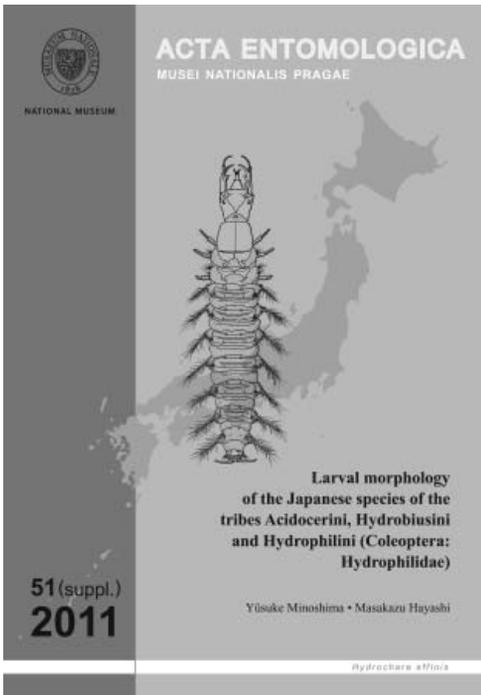
tional map of both species using Adobe Illustrator CS4 and I am deeply indebted to her for that. This article has been reviewed by Michael S. Caterino and Alexey K. Tishechkin (both Santa Barbara, USA) and I would like to express my gratitude for their time and help.

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## BOOK ANNOUNCEMENT

## Larval morphology of the Japanese species of the tribes Acidocerini, Hydrobiusini and Hydrophilini (Coleoptera: Hydrophilidae)



**MINOSHIMA Y. & HAYASHI M. 2011: Larval morphology of the Japanese species of the tribes Acidocerini, Hydrobiusini and Hydrophilini (Coleoptera: Hydrophilidae). *Acta Entomologica Musei Nationalis Pragae* 51(supplementum): 1–118.**

The volume contains a detailed treatment of larvae of three tribes of the water scavenger beetles (Hydrophilidae) of Japan. Larvae of 11 species belonging to 7 aquatic genera are described, including the information about larval chaetotaxy and transformations of morphological characters between larval instars. The volume also contains an identification key to the Japanese genera of the Hydrophilidae based on larval characters, and 67 high-quality plates illustrating all characters mentioned in the text.

The volume can be ordered from the Department of Entomology, National Museum, Prague, Czech Republic (aemnp.editors@gmail.com).