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Image key to the Corimaliini (Brentidae: Nanophyinae) - A transition to AI-supported image recognition

by
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with **82** figures

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Abstract. For the first time an image key is presented for 31 species and subspecies of the Corimaliini (Curculionoidea: Nanophyinae) from the Western Palaearctic as well as 10 additional species for a large part of the Central Asia and South Africa. Habitus of males and females as well as the aedeagus are illustrated (focus stacking), and information on distribution is provided. Lectotype designations are presented for *Corimalia aliena* (Faust, 1890), orig. *Nanophyes*; *Corimalia chinensis* (Faust, 1890), orig. *Nanophyes*; *Corimalia fausti* (Reitter, 1890), orig. *Nanophyes*; *Corimalia mongolica* (Faust, 1890) orig. *Nanophyes*; *Corimalia exsanguis* Voss, 1960; *Allomalia gemmaria* (Faust, 1887), orig. *Nanophyes*; *Hypophyes exiguus* Faust, 1890, orig. Nanophyes. *Corimalia multilineata* (Peyerimhoff, 1930) is downgraded to a subspecies of *Corimalia bilineata* (Tournier, 1868). This work is primarily intended to pave the way for future AI-supported image recognition methods. For this purpose, the Curculio Institute (www.curci.de) is simultaneously providing high-resolution images with many detailed illustrations of all the species mentioned here in its catalogues of "Le Charançon", most of which have not yet been seen in the print media or on the Internet (http://www.nanophyinae.curci.de).

Keywords. Identification keys, image key, focus stacking, artificial intelligence, image recognition, Coleoptera, Curculionoidea, *Corimalia, Hypophyes, Allomalia, Titanomalia*, Western Palaearctic region, Central Asia, morphology, taxonomy.

Introduction

In the epilogue of the 5th identification key to the transalpine Apionidae, I, responsible for the digital identification work (**D**igital **W**eevil **D**etermination), which has been published for almost a decade and a half, stated: '*Pictures say more than thousand words.* Automated image pattern recognition of insects is making enormous progress in the face of ever-improving algorithms in artificial intelligence research, which has long been in full swing.' (Stüben et al. 2019) That was already foreseeable at the time. My colleagues - and I in particular - increasingly realised that, given the rapid development of modern image recognition methods, our elaborately designed image keys could only be a transitional solution between the classic, largely text-based identification keys and AI-supported insect identifications (e.g. on the Internet). After all, we ourselves provided the material-based and 'recognition service' prerequisites for this AI trend with thousands of focus stacking images of almost 1500 European weevils (albeit initially only unintentionally)! No convincing and learning image recognition AI can do without hundreds or better thousands of image templates. This is also a truism.

Word has probably got around that this can have advantages and disadvantages. On the one hand, whether morphological knowledge will fall by the wayside or, as with DNA metabarcoding, species will become abstract OTUs (Operational Taxonomic Units) and taxonomists themselves will become an 'extinct species' is not yet entirely clear. On the other hand, for the ecological and biological study of species and ecosystems, this makes time-consuming determination of species over the next years and decades superfluous, apart from a few morphological validations. Not seeing this or resisting it makes one blind to the opportunities it presents (Förster et al. 2023). In this way, the appeal of studying the enormous diversity of insects should reawaken the interest of many who have previously spared time and effort. What would otherwise have taken years of training to identify species in identification books and lengthy identification keys could unleash unprecedented synergies in biodiversity research, behavioural biology or the study of larvae, pupae and host plants, e.g. of weevils. In view of the extinction of species on our planet, we should definitely not lose sight of the opportunities offered by imaging and molecular methods. After all, we don't have much time left.
But does this also make the taxonomist, the species recogniser, superfluous? What role could morphological taxonomy still play in this undoubtedly necessary transformation process? It is no longer a secret that the percentage of misidentifications (up to 30% are mentioned) in gene and biobanks is increasing from year to year, while at the same time the number of species experts is decreasing. Anything that is built on such losses - e.g. with the BLAST tool in GenBank - is on shaky ground! (Hofstetter et al. 2019, Pentinsaari et al. 2020)
As a precaution, experienced barcoders rely directly (and without detours via gene banks) on validations by taxonomists and their morphological expertise. This is no less true for illustrations. It is a well-known phenomenon that erroneous images, and even erroneous drawings, are persistently passed on from generation to generation in the identification literature. This requires both the selective, morphological control of our molecular reference libraries and the actual assignment of barcodes to the types deposited in our museums and the corresponding species names. And it goes without saying that the AI-generated images and the underlying image pool itself must be monitored and controlled at least selectively. Otherwise we run the risk of creating independent parallel worlds in both cases – the molecular and imaging technique - without any reference to our predominantly morphologically driven scientific history. This is also part of our reality. Because nothing would be more foolish than to forgo the knowledge and findings of over 250 years of predominantly morphologically driven entomology in theory and practice. We should not make this mistake (and 97% OTUs considered on their own are such misjudgements)!

Sometimes it helps to think outside the box. As an amateur lepidopterist, I am always amazed at how reliably butterflies and even the sheer endless abundance of micro-lepidoptera (micromoths) can be identified using relevant AI-supported image recognition software on the Internet - from month to month more and more reliably, always even more impressive than before. There seems to be an army of butterfly colleagues with powerful digital cameras (often already with an internal focus stacking function) at work here. As a sceptic, I submit the preparations determined in this way to the specialists for validation. If the colleague has concerns, this is almost always accompanied by the remark that there is another sister species that can hardly be distinguished externally, which can only be determined by direct comparison of the genital apparatus (or, even more cryptically, by molecular comparison). That's it in 95% of cases ... if it weren't for the lack of genital images for identifying the moths on the internet. But how much longer do we have to wait for it? - Until tomorrow or the day after tomorrow!

This is exactly where the following image identification key for the tiny Corimaliini, which have so far been largely ignored on the Internet, comes in. These very similar-looking species are not (yet) suitable for numerous live photographs with AI-relevant differentiation potential. With a length of 1-2 mm and their fragile body, they already pose a challenge for the preparator. The removal of the male genitalia or e.g. the spermatheca of the females requires the utmost concentration and a corresponding great dexterity. They are therefore already a photographic challenge. In this sense, the following image key is also intended to make an initial conscious contribution to the transformation described above. In the end, we may soon have a largely automated AI image software based on labeled images of the Corimaliini.

And there are numerous of them in the 4 genera *Allomalia* Alonso-Zarazaga, 1989 (5 taxa), *Corimalia* Gozis, 1885 (37 taxa), *Hypophyes* Reitter, 1916 (8 taxa) and *Titanomalia* Alonso-Zarazaga, 1989 (2 taxa) (see also Alonso-Zarazaga et al. 2024). What appears to be morphologically very clear in the image key presented below, splitting to the genera, is not according to our first molecular analyses (in progress). The most extensive genus of the Corimaliini, the *Corimalia* species, is by no means monophyletic. Some of its representatives fall under the *Hypophyes* species, while others nest among the *Allomalia* species. What appears to be so elegant in the morphological separation according to the number of antennomeres of the flagellum is obviously based on a single (mutated) gene in the evolution of the reducing (or multiplying) homonomous segments (known e.g. from *Miccotrogus* (now *Tychius*), *Neosirocalus* (now *Ceutorhynchus*) or *Saetiacalles* subg. (now *Calacalles* s.str.); Clark 1976; Caldara 1990; Colonnelli 1984, Astrin & Stüben 2009). In all these cases, the different number of antennomeres (6 or 7 antennomeres) is certainly not genus-specific.

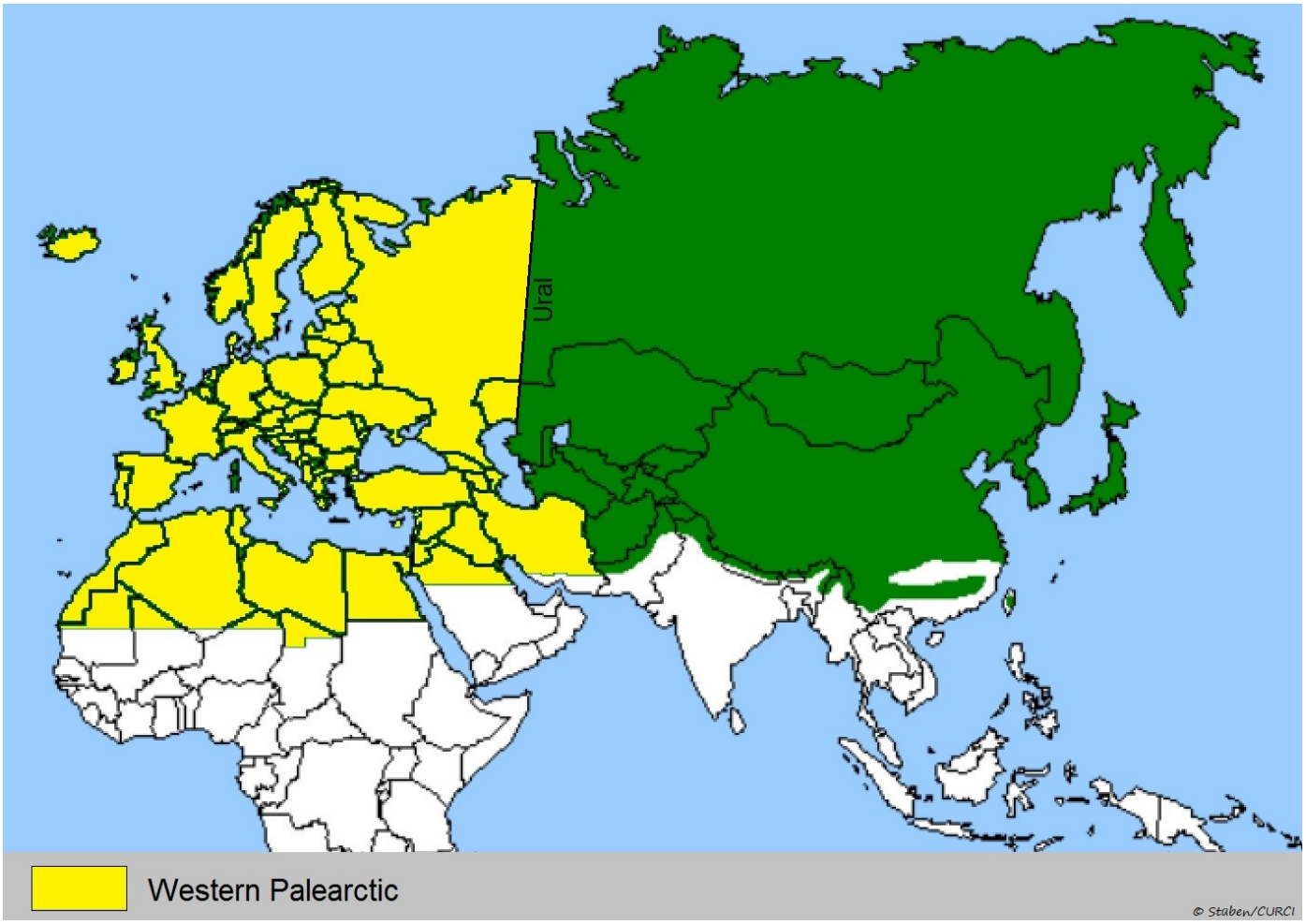


Fig. I. Western Palaearctic Corimaliini species (up to the Urals) are highlighted in ***bold*** in the text; species originating from the Eastern Palaearctic or South Africa (only a single species) are marked in light grey and in *semi-bold*.

As with the Nanophyini, this key is primarily concerned with the 31 Western Palaearctic species of Corimaliini (Fig. I), although I have tried to include Central Asian species where I had reliable identifications or type material (species names highlighted in light grey).

Missing list

6 *Corimalia*-Taxa
convexipennis Pic, 1925 (Nanophyes) A: Iraq
maculaticeps Pic, 1929 (Nanophyes) E: Hungary
obscurithorax Pic, 1897 (Nanophyes) N: Egypt
rufosuturalis Pic, 1938: 11 (Nanophyes) E: " Macedonia"
….
exsanguis kaszabi Zherikhin, 1976 A: Mongolia
gurjevae Zherikhin, 1972 A: Mongolia

1 *Hypophyes*-Taxon
exiguus bulganensis Zherikhin, 1976 (*Corimalia*) A: Mongolia

Again, some very rare taxa and the types described by M. Pic are missing (as in the Nanophyini key), which for a few years have neither been made available on loan to taxonomists in the Muséum national d'Histoire naturelle (MNHN), nor have they been accessible for viewing on site under tolerable conditions (see Stüben 2023). (I assume that the above-mentioned *Corimalia* by Pic are already known Mediterranean species, subspecies or their variations). However, it would be welcome if the management of the Paris museum would spare neither personnel nor costs in the foreseeable future to make it possible to study the type material again.

The most conspicuous morphological feature that immediately separates the two tribes of the Nanophyinae (Brentidae), the Nanophyini and Corimaliini, is the division of the antennal club (Fig. II). A further ecological exclusion feature is the absence of the Nanophyini on Tamaricaceae, which - in this comparison - are reserved exclusively for the Corimaliini as host plants.

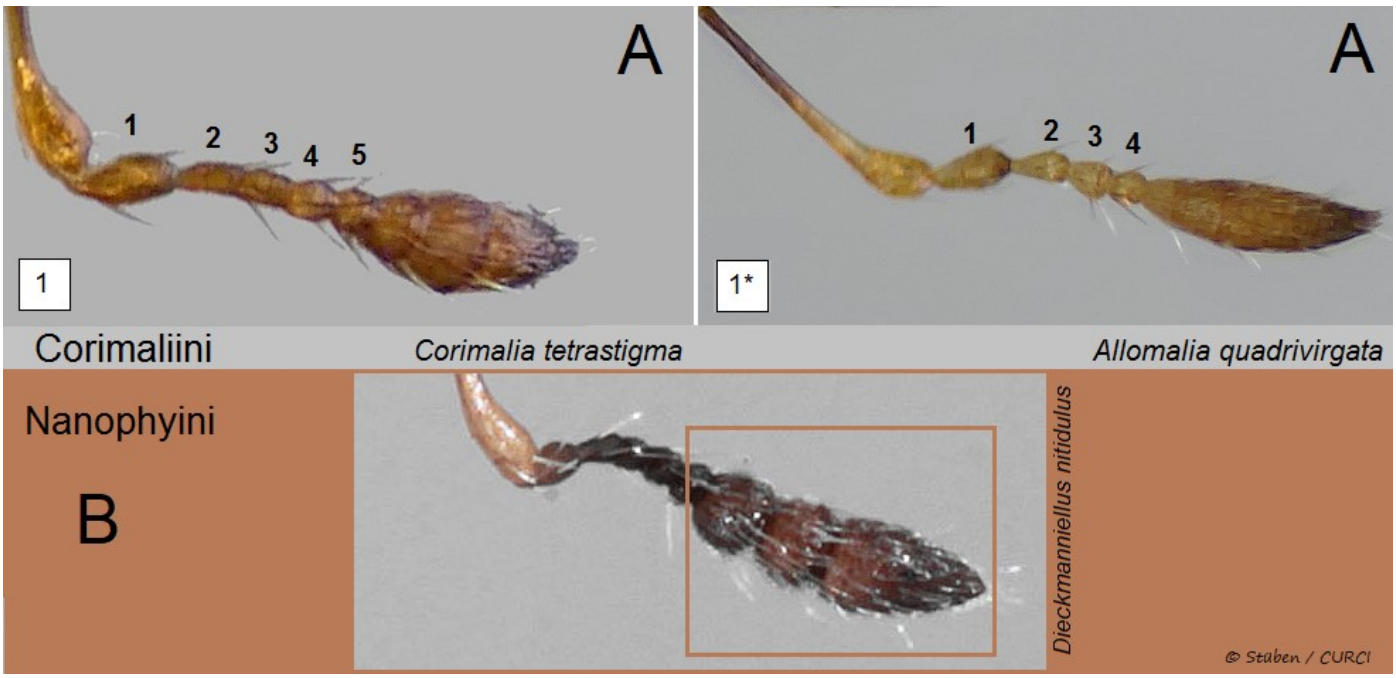


Fig. II. A. The antennae with oval club, the segments are separated only by sutures. (Corimaliini, part A);
B. The antennal club with segments, these are clearly separated from each other. (Stüben 1.1.2024, part B):
https://nanophyinae.curci.de/pdf_key/nanophyini-key.pdf; https://curci.de/data/weevilnews/weevilnews_111.pdf

Like all Corimaliini, the Western Palaearctic species probably also develop as 'ovarian gall-makers' in the flowers (Germann & Moretti 2009), where they can be collected in large numbers - often in their hundreds - with the beating tray, especially during the flowering period at midday in the strongest sunlight. The exhaustor must be used with haste, as the tiny Nanophyinae, which are 1.1 - 2.1 mm in size and barely stand out from the light-coloured background of the beating tray, quickly leave it again in flight. With their light yellow to yellow-reddish-brown colouring they resemble withered tamarisk flowers, and with their spherical shape they imitate the fruits of the plants (Formánek 1916). It is therefore not easy to spot them at all on the beating tray among the flowers and fruits - as long as they are not moving. (Fig. III) The collection of several dozen specimens, if possible, and their preparation with removal of the male genitalia is strongly recommended in any case, as in most cases there are two or even three species that only reveal themselves as members of different genera and species groups under the microscope due to their extremely variable intra-species elytra markings (up to the complete absence of any band or spot markings). Thus, most species can only be distinguished or identified - but then very easily - by the shape of the aedeagus. In order not to cause any major damage when preparing these tiny specimens, I recommend opening up or removing the last 5 abdominal sternites immediately behind the metacoxae.

Fig. III. *Corimalia tamarisci* (France, Tanos-Plage). Like all Corimaliini, this species is also excellently camouflaged - due to its spherical shape and light yellow coloring - and is practically undetectable after failing onto the beating tray for a short period of a cataleptic immobility together with flowers and buds.

In a PDF Internet version, which is ultimately intended for a print medium, not all of the important illustrations in the text on morphology, ecology and host-plant relationships can be passed on to the reader. Therefore, I would like to refer to the further material, the exact locality data and distribution maps with entries on the locus typicus and successful mtCO1 sampling, as well as the high-resolution illustrations and the numerous life photos in our joint Nanophyinae catalogue by Karel Schön and the author on of the CURCULIO Institute website (see also bibliography):
https://nanophyinae.curci.de/

A

Key to the Corimaliini:
Corimalia, Allomalia, Hypophes and *Titanomalia*

Note. Knowledge of the male genital is indispensable for this key and is easy to obtain, as Corimaliini can usually be tapped off *Tamarix* flowers, for example, in large numbers. Females can then usually be assigned to the males!
L.t.: Locus typicus.

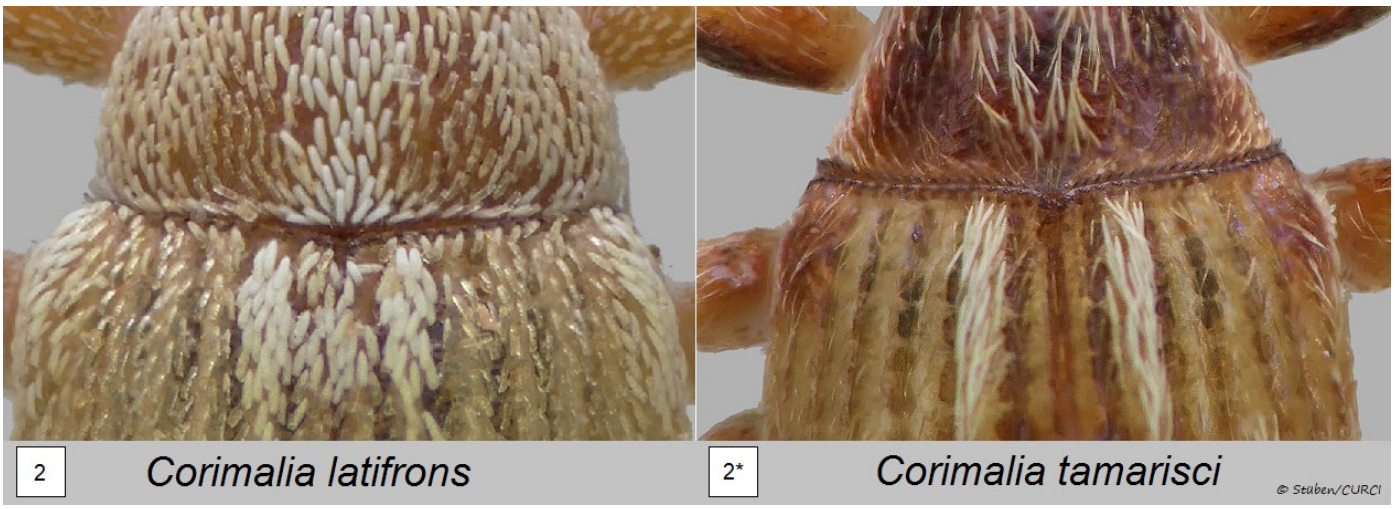
1 Antennal flagellum with 5 antennomeres (includes *Corimalia fausti* with a 6th pseudo-antennomere, which probably belongs to the 4- segmented antennal club, termed 'pseudotetramerous' by Wanat (2001).

***Corimalia* des Gozis 2**

1* Antennal flagellum with 4 antennomeres (in some species with a 5th pseudo-antennomere which, however, is somewhat separated from the 4-segmented antennal club).

..... 33

Genus: ***Corimalia***
Antennal flagellum with 5 antennomeres



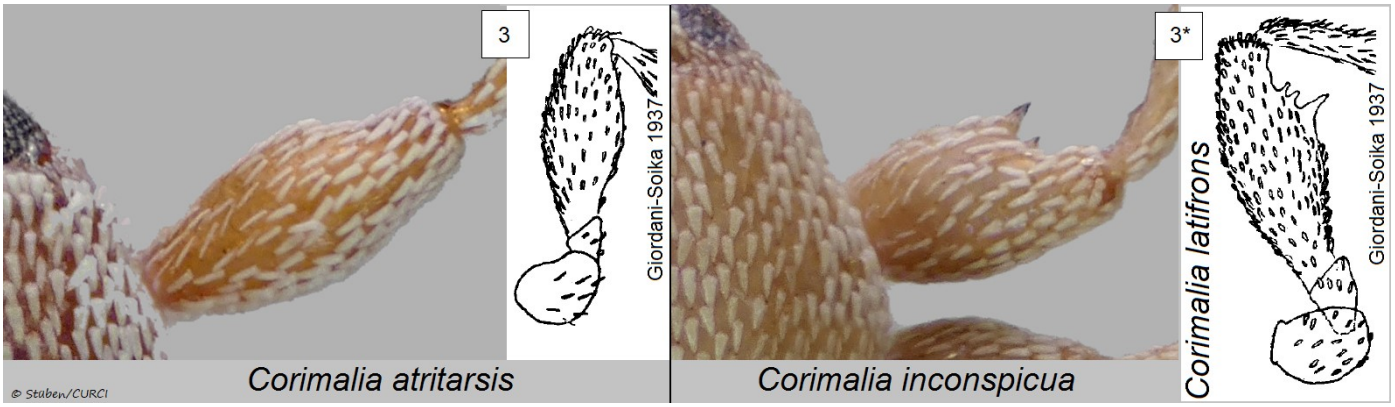
2 Elytra and pronotum always with distinctly broader, wedge-shaped or long-oval scales at most 3.5x longer than broad, especially in the vicinity of the scutellum (hereafter called "elytral (more or less square) base spot"), in addition to the prevailing cover of slightly longer scales.

..... 3

2* Elytra and pronotum with exclusively long, filiform scales; if white, elytral basal stripes are present on the 2nd interval, then the long, filiform, rarely parallel-sided scales (or bristles) may be somewhat broader, but are at least 6x longer than broad.

..... 6

Short-bristled species

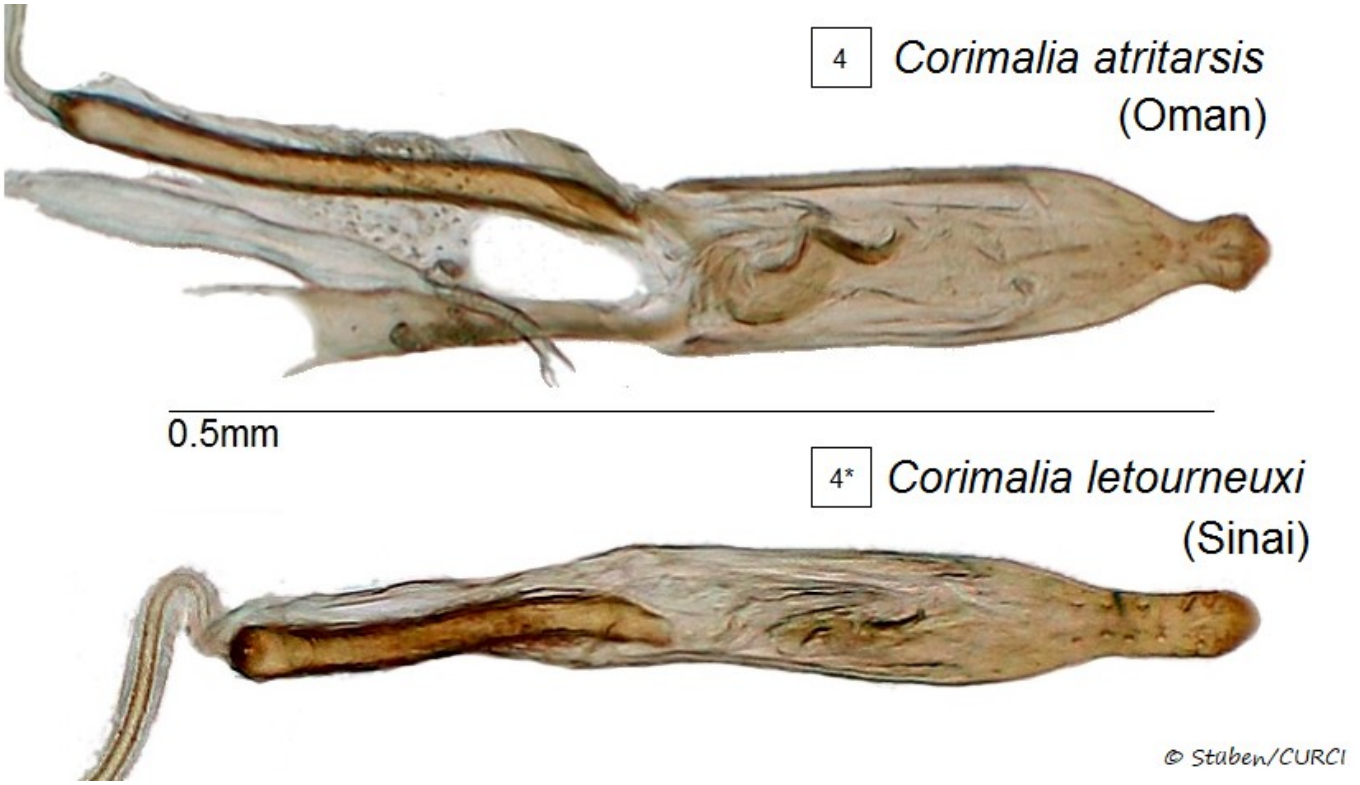


3 Femoral teeth absent.

..... 4

3* Femoral teeth present.

..... 5

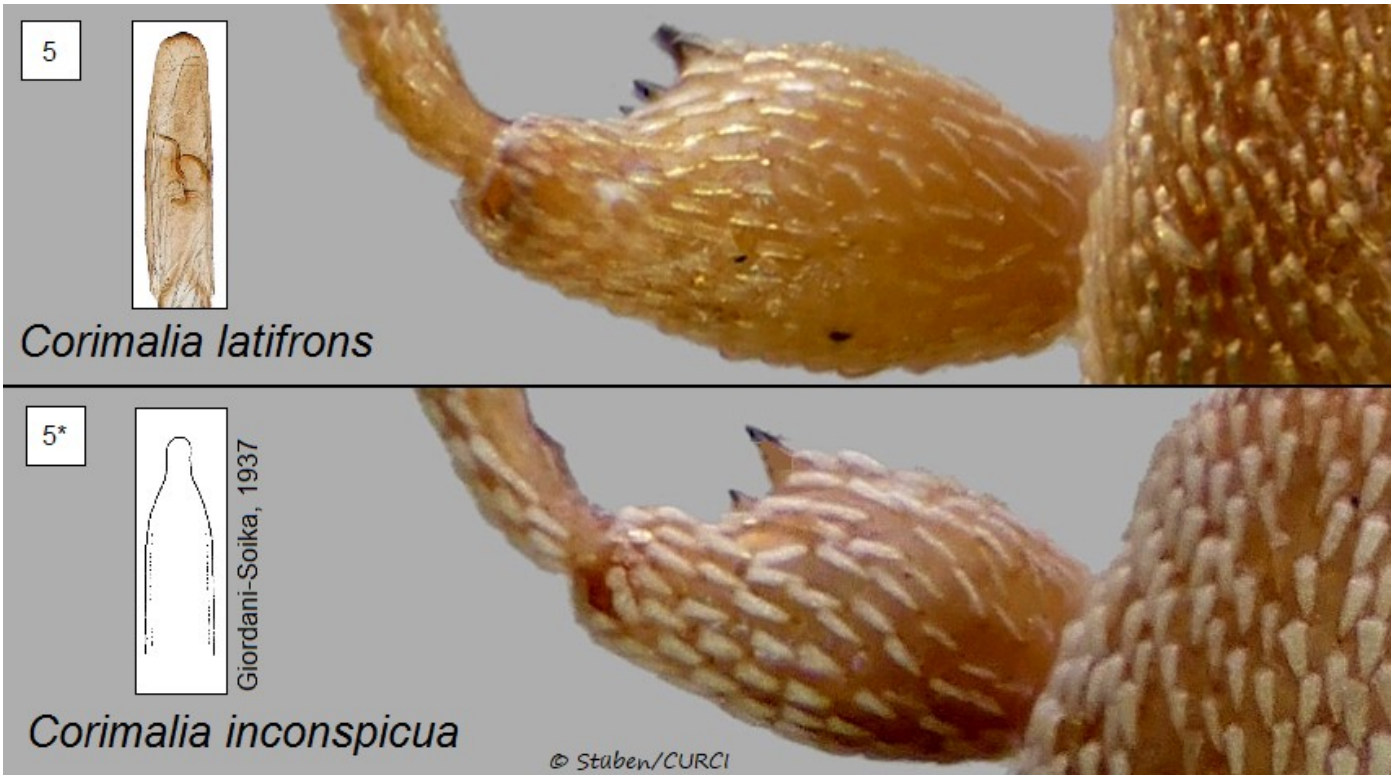


4 Aedeagus (ventral): Median lobe strongly constricted (bottle-necked), abruptly narrowed in front of apex. Length: 1.1 - 1.5 mm. L.t.: Egypt. Distribution: **N:** AG EG **A:** OM EG (Sinai) **AFR.**

[Fig. 1] ……. *Corimalia atritarsis* (Pic, 1925)

4* Aedeagus (ventral): Apex of median lobe parallel-sided, without anterior constriction. Length: 1.2 - 1.5 mm. L.t.: Egypt. Distribution: **N:** EG **A:** OM.

[Fig. 2] ……. *Corimalia letourneuxi* (Pic, 1919)



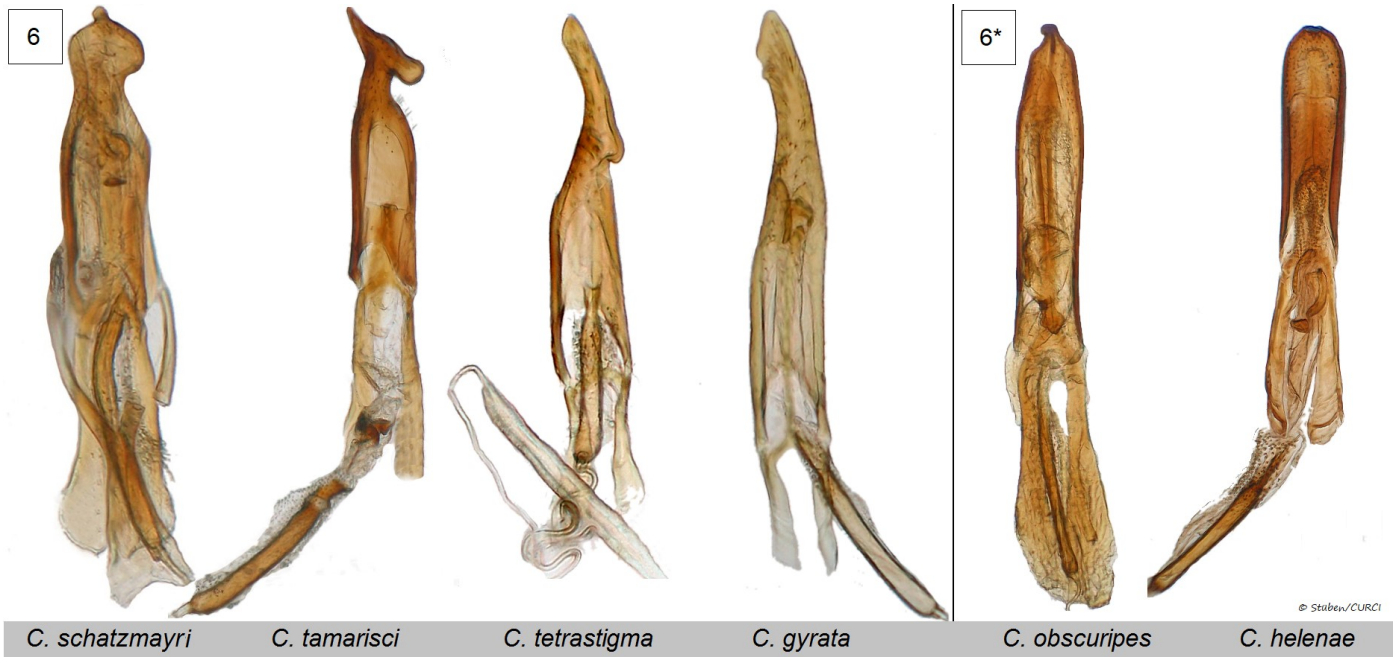
5 Fore femora with 3 denticles; rostrum nearly straight, longer than head and pronotum together; median lobe of aedeagus broadly rounded; clearly larger species: 1.6 -2.0 mm. L.T.: Egypt: Ismaʿilia / Saqqarak. Distribution: **N:** AG EG LB TU **A:** IS JO EG (Sinai).

[Fig. 3] ……. *Corimalia latifrons* (Pic, 1897)

5* Fore femora with 2 fine denticles; rostrum more curved, shorter than head and pronotum together; median lobus of aedeagus strongly constricted far in front of apex; smaller species: <1.5mm. L.T. Algeria: Biskra. Distribution: **N:** AG.

[Fig. 4] ……. *Corimalia inconspicua* (H. Brisout de Barneville, 1869)

Long-haired species
C. tamarisci group



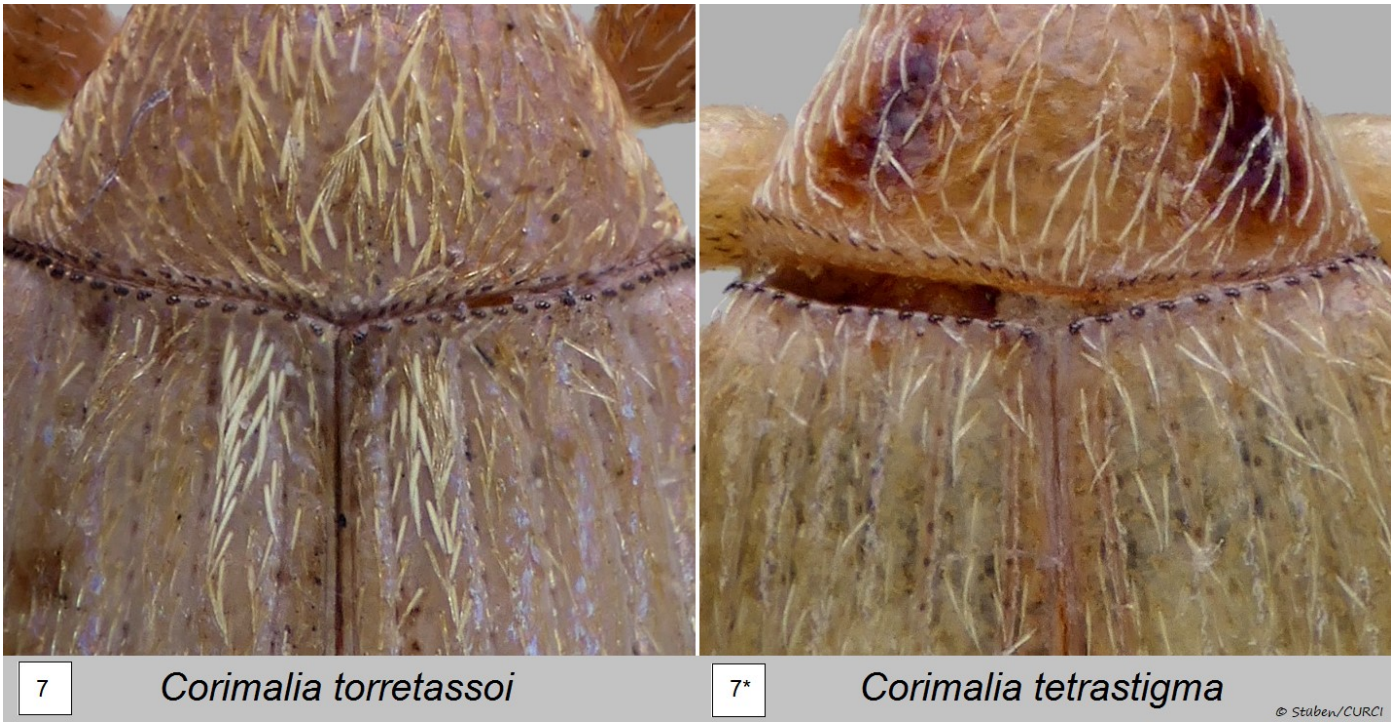
6 Aedeagus (ventral) conspicuously **asymmetrical**.

.....7

6* Aedeagus (ventral) **symmetrical** (sometimes the outermost tip slightly twisted).

..... 12

Aedeagus asymmetrical

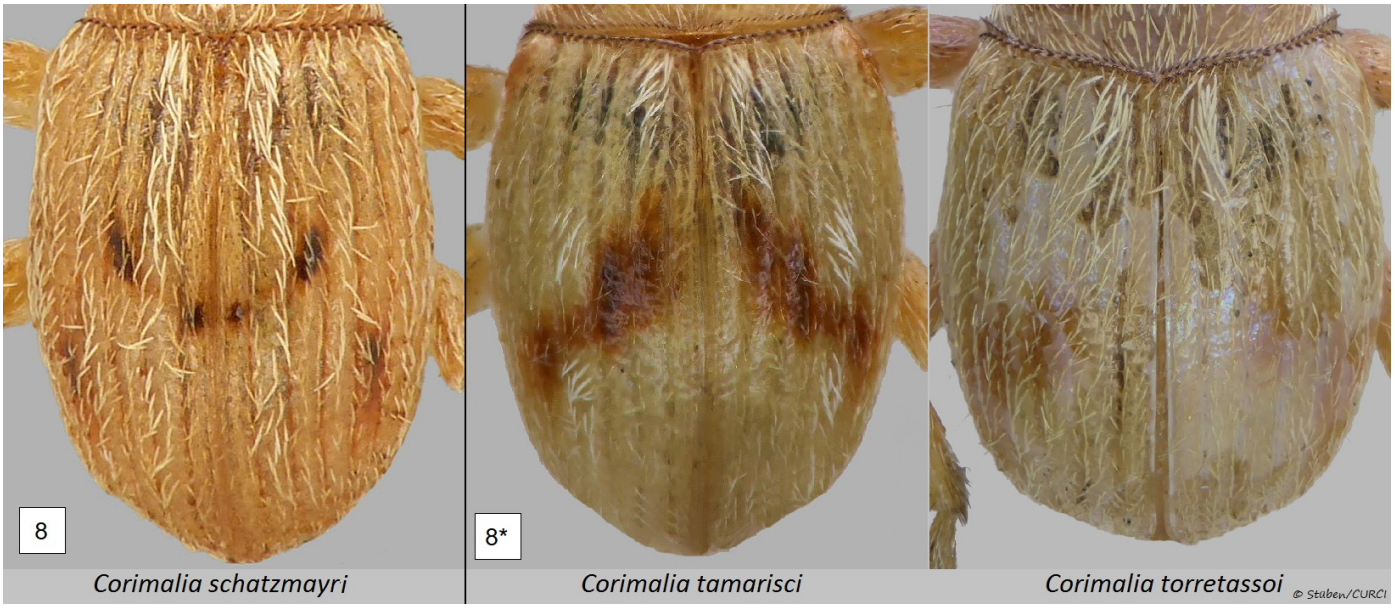


7 Elytral vestiture generally fine and sparse, but denser, brighter and occasionally broader in the middle of the pronotum and of the elytral base on the 2nd intervals.

..... 8

7* Pronotum and elytra exclusively with uniform vestiture of hair-like scales, not compacted in front of the elytral base on the 2nd intervals or along the median line of the pronotum.

..... 10

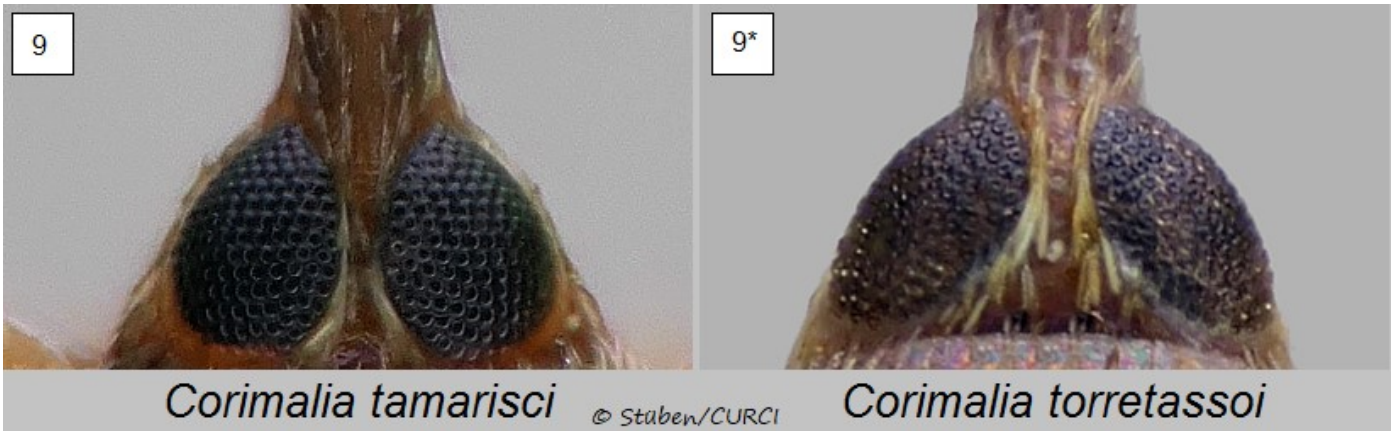


8 Elytra with a brown-black, U-shaped (partly resolved into dots) fascia in the middle. [Easily confused by habitus - but not by aedeagus - with *C. lunulata* (see guide digit 31 below). Both species occur in the Canary Islands, albeit on different islands; for other differential characters, see: Stüben 2022]. Length: 1.2 - 1.7 mm. L.t. Palestine: Jericho. Distribution: **N:** AG CI (Fuerteventura) MO TU A: IS JO.

[Fig. 5A,B] ……. *Corimalia schatzmayri* (Giordani-Soika, 1937)

8* Elytral fascia absent or with a different pattern.

……. 9



9 Elytra uniformly long-ovally rounded and more contrastingly patterned (almost always with a brown, oblique band, Fig. 8*, left); eyes appear larger when viewed from above, almost completely visible. Length: 1.9 - 2.3 mm. L.t.: habitat in Gallia meridionali, Lusitania. Distribution: **E:** FR GR (Ródos I.) IT MA PT SP **N:** AG LB MO TU.

[Fig. 6] ……. *Corimalia tamarisci* (Gyllenhal, 1838)

9* Elytra broader and stouter, duller pale yellow (rarely with faintly indicated brown spots, Fig. 8*, right); eyes not fully visible from above, more lateral. Length: 1.8 - 2.0 mm. L.t. Palestine: Jericho. Distribution: **A:** IS.

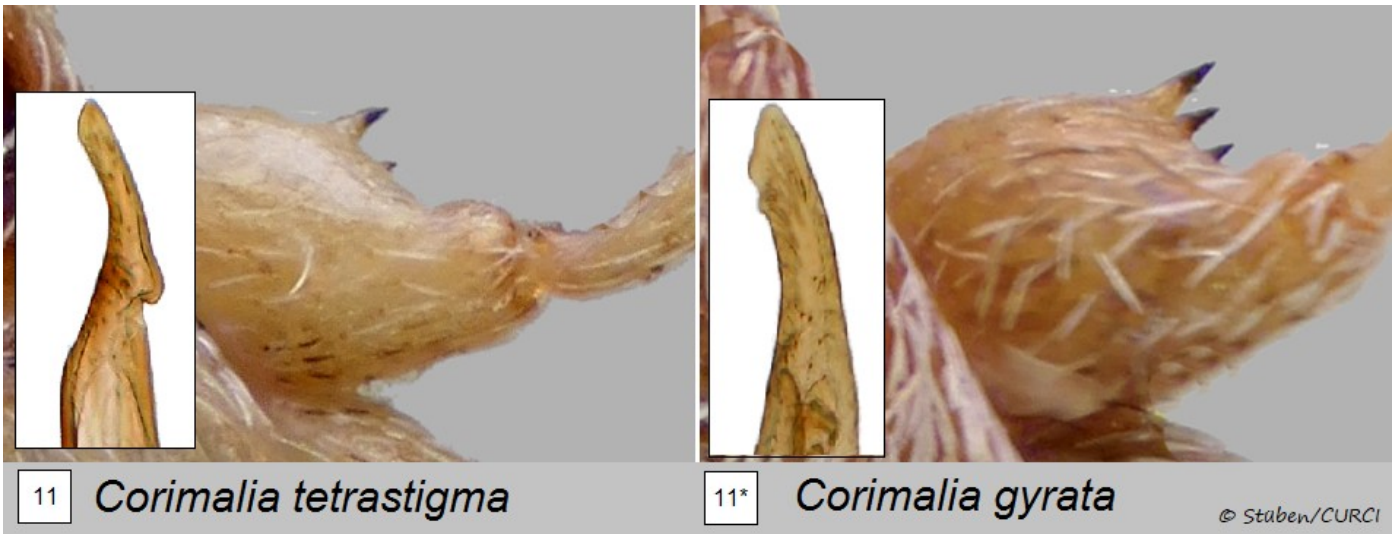
[Fig. 7] ……. *Corimalia torretassoi* Giordani-Soika, 1937

10 The very large, round, protruding eyes occupy almost half of the side of the head; always with a blackish-brown, broad long stripe (lateral view) on the two outermost elytra intervals in the same dark color as the mesothorax. (Aedeagus very similar to that of *A. armeniaca* with 4 anntenal segments). Length:1.4 - 1.9 mm. L.t.: Namibia: Svakop River. Distribution: **AFR:** Namibia.

[Fig. 31.2] ……. *Corimalia damarensis* Marshall, 1927

10* The small, flat eyes do not protrude from the head; the outermost eytra intervals are without a distinctive longitudinal stripe or at most show indications of a shorter, mostly light brown, longitudinal spot.

……. 11



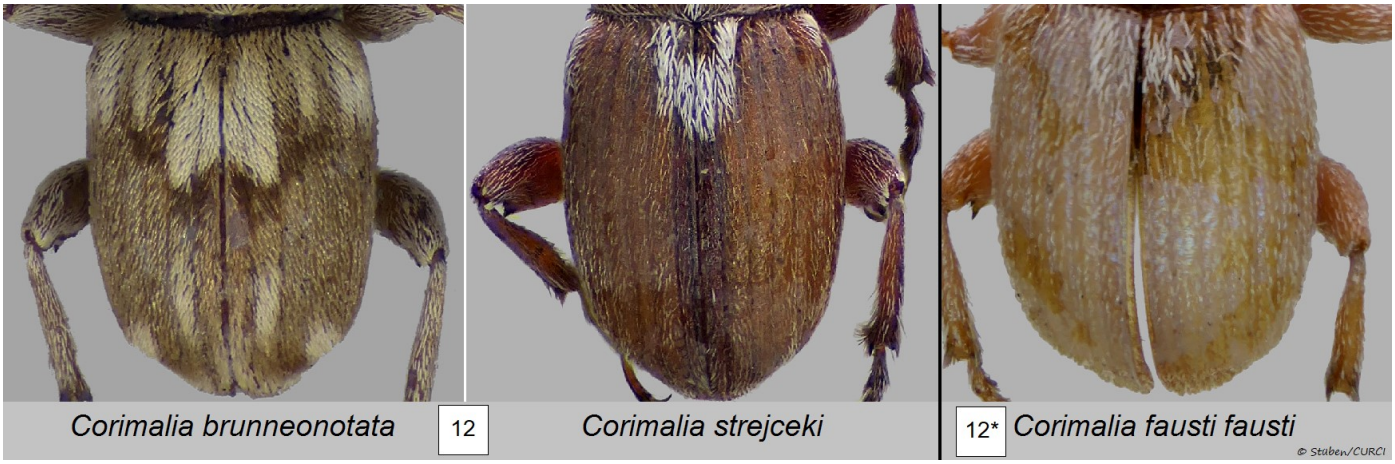
11 Fore femora with one large tooth and another tiny tooth; rostrum in both sexes shorter than head and pronotum together; elytra flat; median lobe of aedeagus (ventral) with hooked tip. Length: 1.4 - 1.6 mm. L.t.: France: Narbonne. Distribution: **E:** FR IT PT SP **N:** AG TU **AFR**.

[Fig. 8] ……. *Corimalia tetrastigma* (Aubé, 1863)

11* Fore femora with 3 denticles (rarely with only 2 larger denticles); rostrum in both sexes longer than head and pronotum together; elytra more rounded, almost spherical; median lobe of aedeagus (ventral) with thickened tip. Length: 1.4 - 1.8 mm. L.t.: Algeria: Sahara central (Ahaggar). Distribution: **N:** AG EG **AFR.**

[Fig. 9] ……. *Corimalia gyrata* (Peyerimhoff, 1929)

Aedeagus symmetrical



12 Elytra predominantly brown to dark brown, almost completely covered with a dense vestiture of hair-like scales; predominantly large species: > 2.5 mm. This also includes the species *C. lukjanovitshi* Zherichin 1991 and *C. pantherina* Zherichin 1991 from Central Asia.

……. 13

12* Elytral integument predominantly pale yellow or tan, clearly evident between the much more widely-spaced hairs.

……. 17

13 Elytra unicoloured (dark) brown except for the white basal spot and the darkened suture stripe (see Fig. 12, right).

……. 14

13* Elytra patterned white, dark brown and brown-beige (reminiscent at first sight of the elytra patterns of the Nanophyini; see Figure 12, left).

……. 15

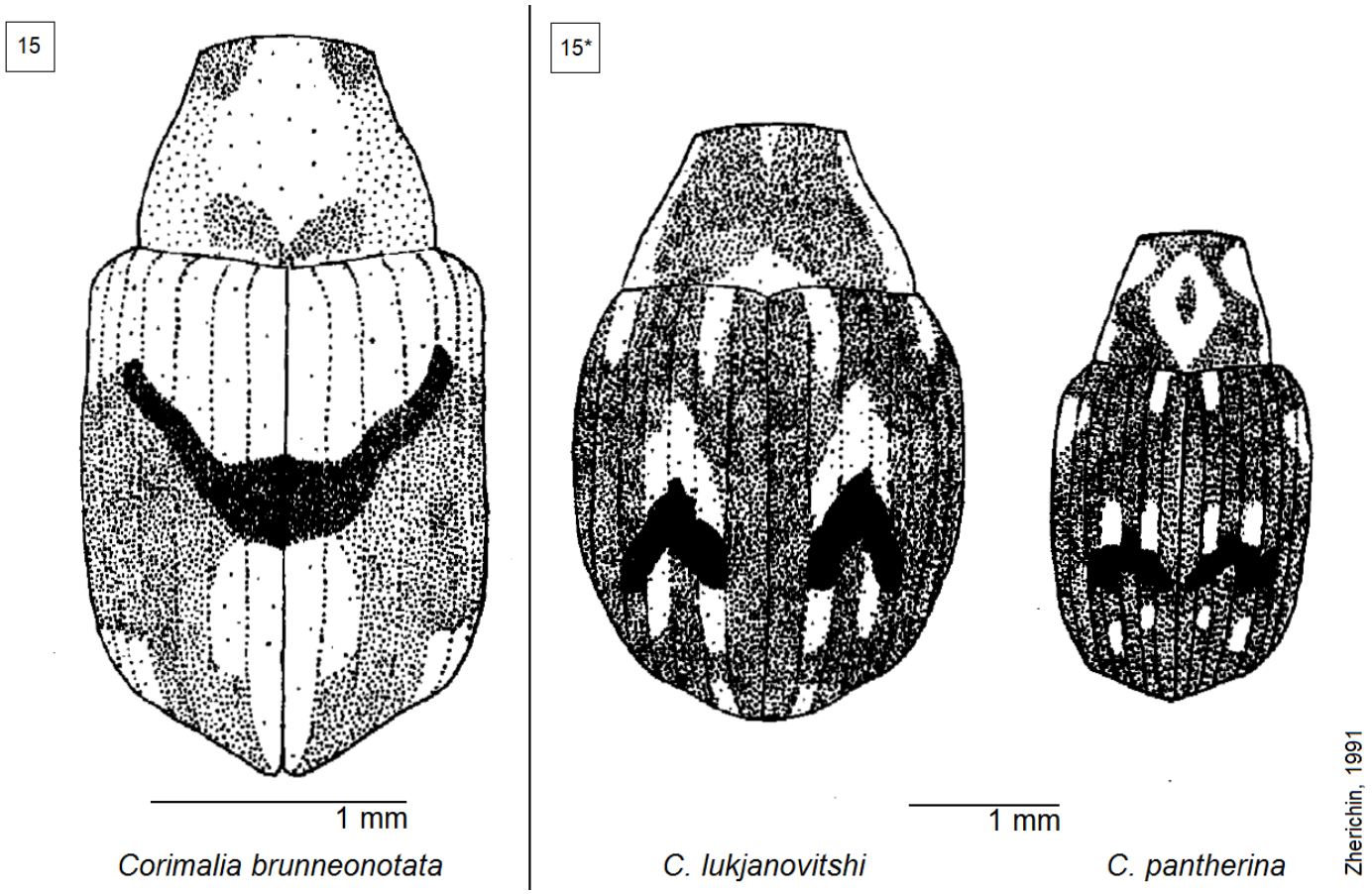
14 Mucrones at the end of the meso- and meta-tibiae of males larger; median lobe of aedeagus (ventral) wider and with a narrow, laterally compressed tip. Length: 2.92-3.25 mm. L.t.: Russia: Teberda, 1500 m. Distribution: **A:** ST (Caucasus, Russia).

[Fig. 10] ……. *Corimalia strejceki* (Schön & Skuhrovec, 2016)

14* Mucrones at the end of the meso- and meta-tibiae of males smaller; median lobe of aedeagus (ventral) narrower with a simply rounded, narrow tip. Length: 2.8-3.0 mm. L.t.: "Mongolia". Distribution: **A:** A: ES KZ MG TD TR WS.

Nanophyes alienus Faust, 1990: **Designation of a lectotype** by Stüben: 1 ♀, „Mongolia, Hammarstr[öm]“, coll Senckenberg, Museum of Zoology (Dresden). See also the images of the lectotype (habitus) with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 32] …… *Corimalia aliena* (Faust, 1890)



15 Smaller species (<3 mm); the dark elytral band **W**-shaped and clearly separated from the pale scale spots in front of it; L.t.: "Mésopotamie, bords de l'Euphrate". Distribution: **A:** IQ QA SY.

[Fig. 11] ……. *Corimalia brunneonotata* (Pic, 1913)

15* Larger species from Central Asia (>3.5 mm); the dark elytra band **M**-shaped, the area before it mostly dark.

……. 16

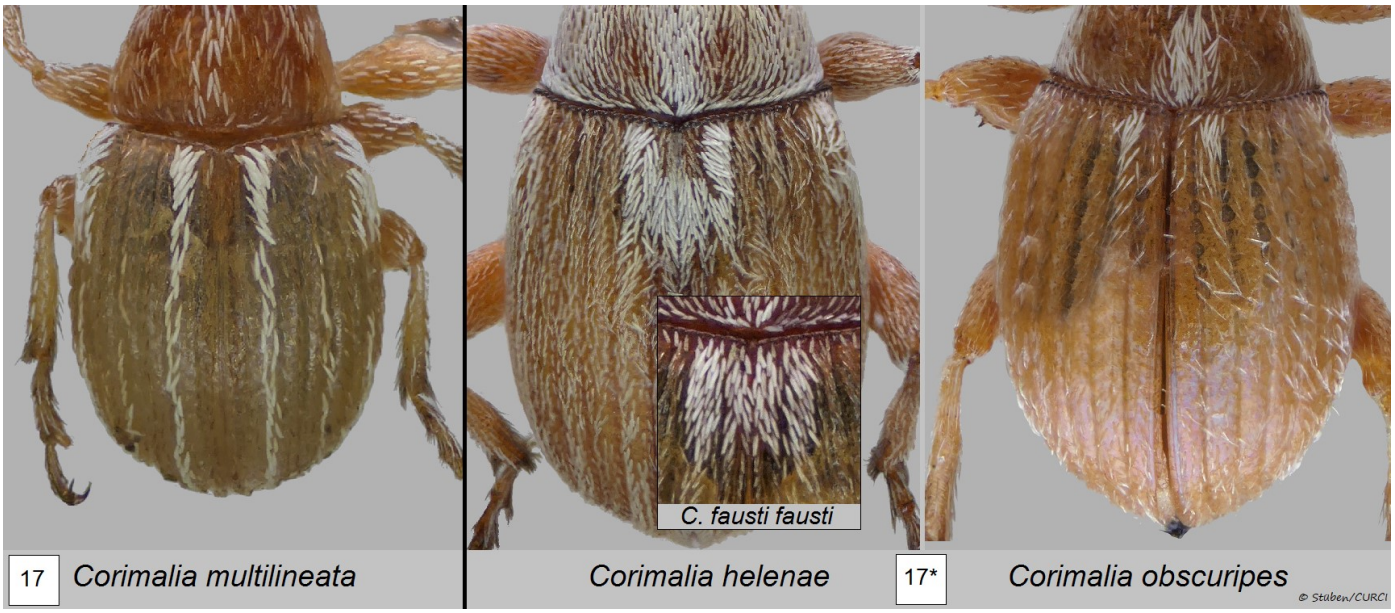
16 Elytra broader, with convex sides (see Figure 15*, left); vestiture consisting of dense scales almost obscuring the ground colour; rostrum more curved in profile; length: 4.2 - 4.6 mm. L.T.: Turkmenistan: Kyzylkum. Distribution: **A:** TM UZ.

……. *Corimalia lukjanovitshi* Zherichin, 1991

16* Elytra narrower, with subparallel sides (see Figure 15*, right); vestiture consisting of a few fine hairs which do not obscure the ground colour except for the pale spots; rostrum only weakly curved in profile. Length: 3.6 - 3.7 mm. L.T. Turkmenistan, Krasnovodsk district: Distribution: **A:** TM.

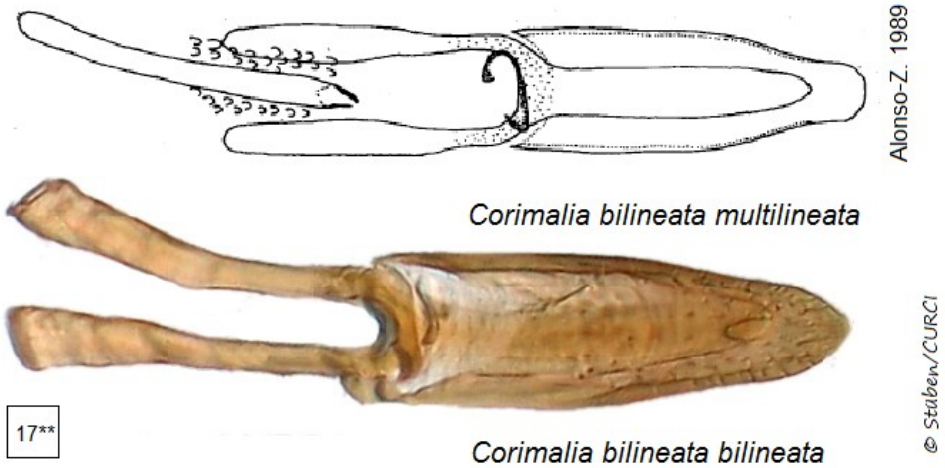
……. *Corimalia pantherina* Zherichin, 1991

Elytral integument pale yellow or tan



17.1 With stripes of **thicker** setae on interstriae 2, 4, 6 and on humeri, giving the elytra a striped appearance (see Fig. 17). Median lobe of aedeagus more broadly rounded towards apex (see Fig. 17**); length: 1.1 mm. L.t.: Central Sahara: Mouydir: Tahount-Arak; Hoggar: In-Aurdjel. Distribution: **N:** AG EG **A:** GG SY TR **AFR.**

[Fig. 12] ……. *Corimalia bilineata multilineata* (Peyerimhoff, 1930) stat. nov.



17.2 The nominotypic taxon *Corimalia bilineata* (Tournier, 1868) must obviously be distinguished from this subspecies. Peyerimhoff (1930) quotes Pic, who remarks that the syntypes of Tournier in the Muséum national d'histoire naturelle (Paris) are in a very bad condition and recourse to them is no longer possible. In his original description, however, Tournier describes his new species *C. bilineata* as follows: *"Élytres avec les angles huméraux et le second interstrie couverts d'une pubescence blanche tranchant sur le fond, ce qui produit, vu de dessus et sur chaque élytre, l'effet d'une petite tache humérale et d'une ligne longitudinale blanche. ... Thorax orné de chaque côté d'une ligne longitudinale blanche par pubescence."* I received a small series of this subspecies from Lutz Behne at the Senckenberg, Deutsches Entomologisches Institut (Müncheberg), to which this description by Tournier could fit very well. Even though these specimens from Syria (Deir-ez-Zor) are not from the locus typicus in Algeria (Sétif), they show more densely packed setae only on the 2nd elytra interval, the humeri and the sides of the pronotum, as well as a somewhat differently shaped aedeagus with a more pointed median lobe (ventral view) than in the subspecies *C. bilineata multilineata* (see Fig. 17**); length: 1.2 mm. L.t. Algeria: Sétif; distribution: **E:** ST **N:** AG EG SY.

[Fig. 13] ……. *Corimalia bilineata bilineata* (Tournier, 1868)

17* Elytra without such a prominent stripe pattern.

……. 18

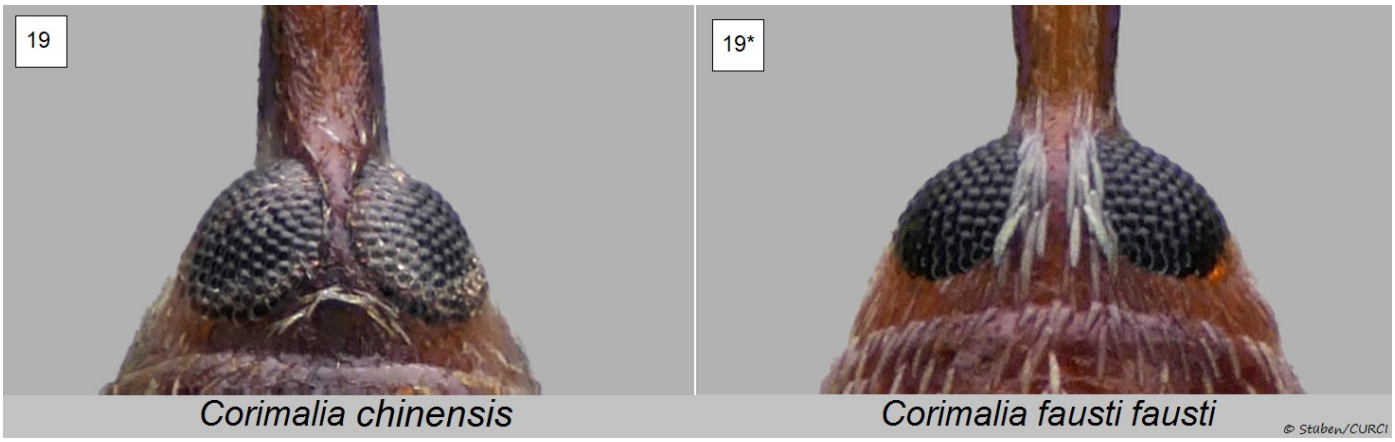
18 With an often rectangular elytral base spot of broader, white, more dense scales (see Fig. 17*, left), often continuing to the middle of the pronotum (in *C. pruinosa* these scales are less dense, but broad and short, never filiform).

..... 19

18* Elytral base spot absent, at most with a few long filiform (spindle-like) hair-like scales that are more dense on the second interval near the base of the elytra and on the basal midline of the pronotum (see Fig. 17*, right).

..... 23

With an elytral (more or less square) base spot
'*C. fausti* group'

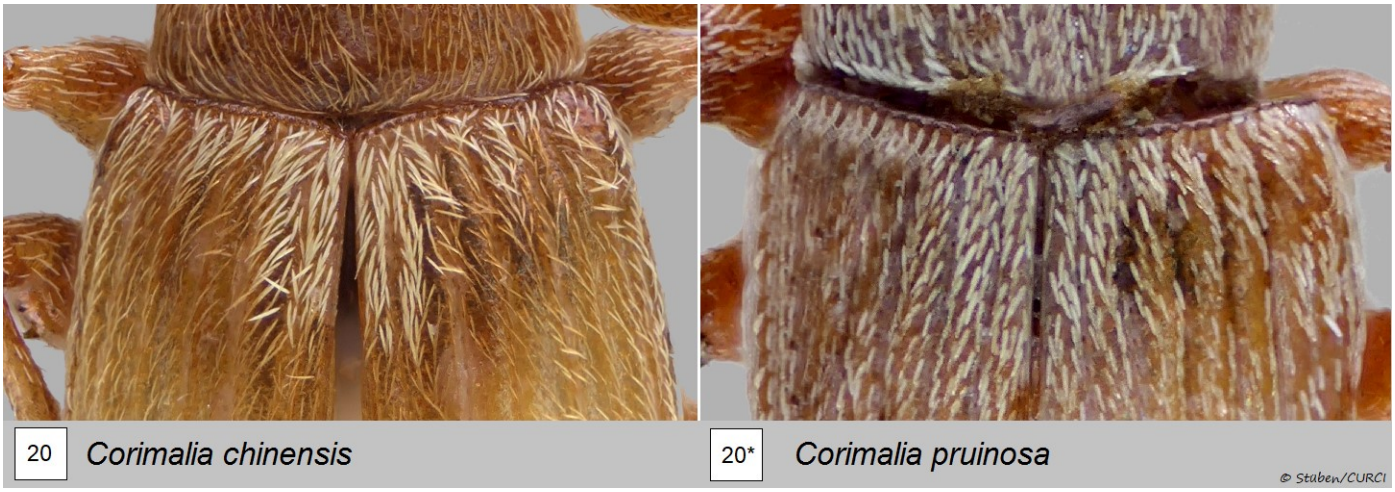


19 Distance between eyes narrow, max. ¼ of the width of the rostrum; antennal club dark brown to black, clearly separated in colour from the lighter antennomeres.

..... 20

19* Distance between eyes distinctly wider, at least half the width of the rostrum; antennal culb yellow or yellow-red.

..... 21

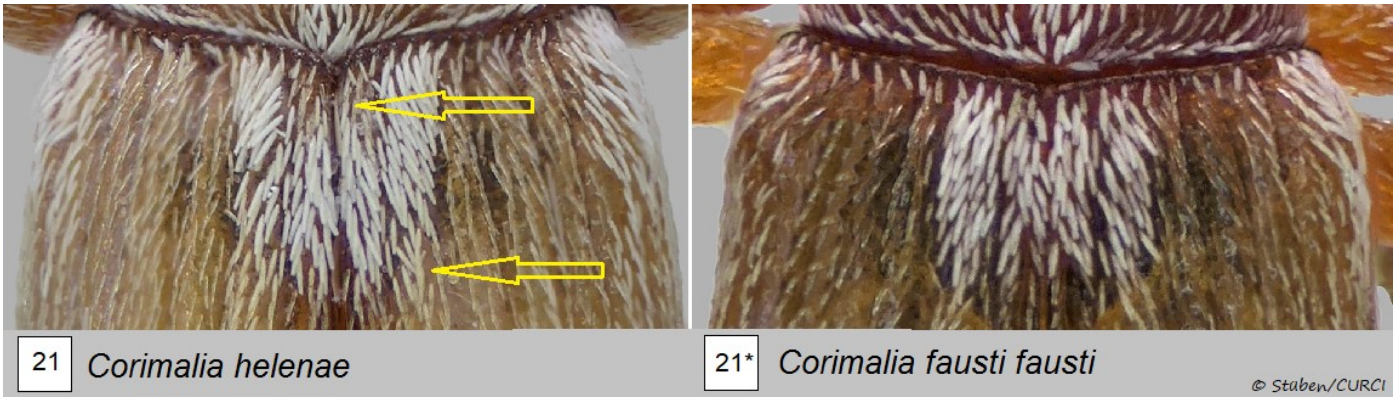


20 Larger species: 2.8 mm. Scales on pronotum and elytra much longer, hair-like and more widely spaced; around eyes with few bristles; aedeagus (lateral view) with a curved tip. L.t.: China, Gansu. **A:** GAN.
Nanophyes (Corimalia) chinensis Faust, 1890: **Designation of a lectotype** by Stüben: 1 ♂ „chinensis Faust" (handwriting), small golden label, coll. Museum of Zoology (Dresden), here also 1 ♀ as paralectotype. See also the images of the lectotype (habitus & aedeagus) and paralectotype with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 33] ..... *Corimalia chinensis* (Faust, 1890)

20* Smaller species: 1.2 mm. Scales on pronotum and elytra broader, at most half as long and much more densely packed (especially on elytral basal spot); eyes with a conspicuous ring of broad, white, and closely spaced scales; aedeagus (lateral view) without a curved tip. L.t.: Uzbekistan, Margilan. Distribution: **A:** UZ.

[Fig. 34] ..... *Corimalia pruinosa* (Faust, 1885)



21 Elytral base spot less densely scaled immediately behind the scutellum, **rounded posteriorly**, followed by a broad, dark brown suture stripe; the trapezoidal pronotum much more densely scaled overall. The prominent, parallel-sided scales distinctly longer. Length: 1.9 - 2.65 mm. L.t. Dagestan: Kochubei. Distribution: **E:** ST **A:** AB AR IN IQ KI KZ MG SY TD TM UZ.

[Fig. 14] ……. *Corimalia helenae* Korotyaev & Zherichin, 1996

21* Elytral base spot rectangular and evenly scaled (also immediately behind the scutellum); suture stripes more weakly developed; the pronotum, slightly rounded at the base, clearly less densely scaled. The spindle-shaped, white scales shorter.

……. 22

22 Smaller subspecies: 1.5 - 2.0 mm; rostrum smooth-glossy, not keeled. L.t.: Azerbaijan: Ordubad (Araxes valley). Distribution: **E:** BU GR CY ST **A:** AB TR.

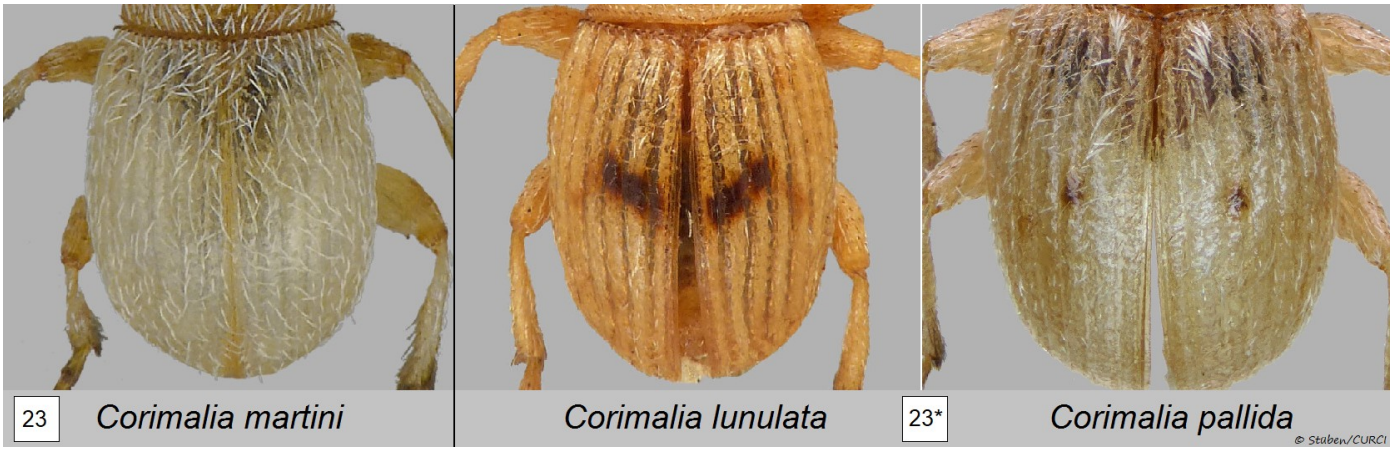
Nanophyes faust Reitter, 1890: **Designation of a lectotype** by Stüben: 1 ♂ „Caucasus, Araxesthal, Leder. Reitter“, coll Senckenberg, German Entomological Institute / Col. 17847 (Müncheberg, here also 6 further paralectotypes). See also the images of the lectotype (habitus & aedeagus) and paralectotype with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 15] ……. *Corimalia fausti fausti* (Reitter, 1890)

22* Larger subspecies: 2.0 - 2.2 mm. Rostrum less shiny, keeled up to the antennal insertions and more strongly punctate. Flagellum with a 6th false segment, not connected to the club. Length: 2 - 2.2 mm. L.T.: Mongolia: `ур.Ёлхон, 30 км юго-восточнее Алтая‘ (Zherichin). Distribution: **A:** MG.

[Fig. 35] ……. *Corimalia fausti orientalis* Zherichin, 1972

Elytral base spot absent
‘*C. pallida* group‘



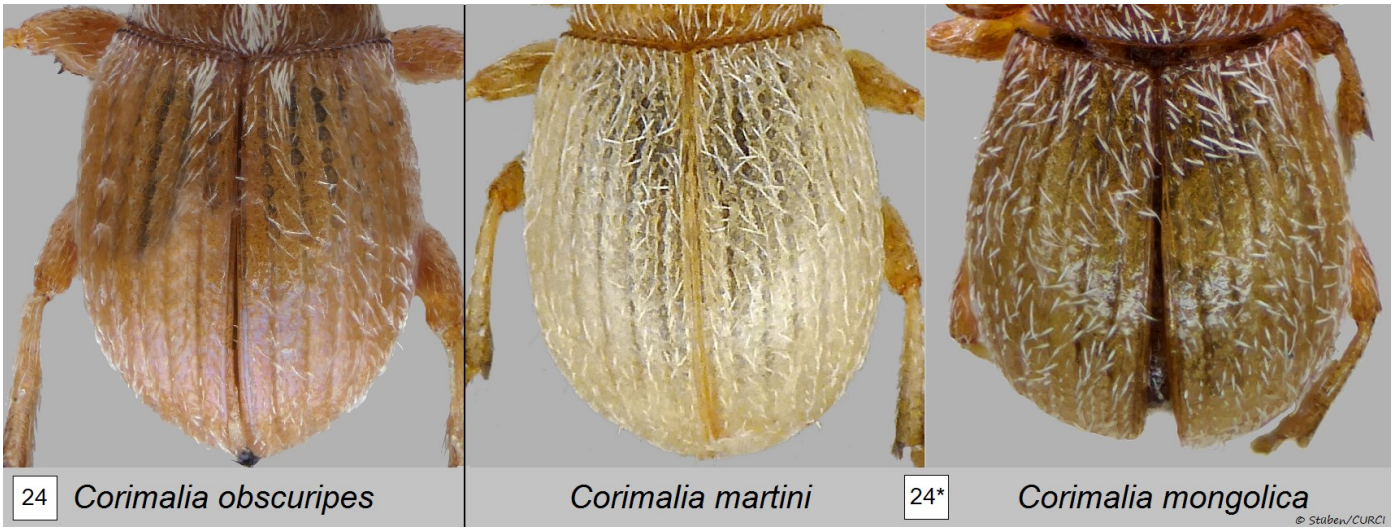
23 Elytra unicoloured, without a prominent elytral mark. (As the central, punctate elytral mark is also occasionally absent in *C. pallida*, this species is also considered here).

……. 24

23* Elytra bicoloured, with dotted, spotted, sutured and/or banded markings. (Always use several specimens from one locality for this identification).

……. 27

Elytra unicoloured

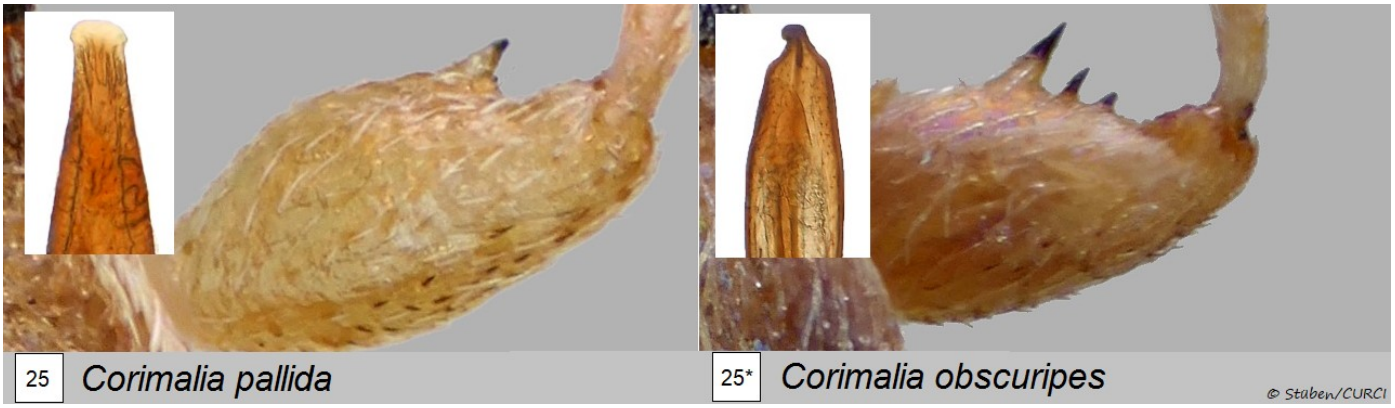


24 Elytra slender, elliptical; rostrum distinctly longer, in males as long as head and pronotum, in females distinctly longer than head and pronotum together; clearly larger species: >1.8 mm.

..... 25

24* Elytra altogether broader, stockier or box-shaped; rostrum much shorter, not reaching the length of head and pronotum together; smaller (tiny) species: <1.4 mm.

..... 26



25 Fore femora with 1 denticle: Aedeagus (ventral) broadened towards tip. Length: 1.8 - 2.25 mm. L.t. Portugal. Distribution: **E:** CR FR GR IT MA PT SP **N:** AG EG LB TU **A:** IS LE SY.

[Fig. 16] ..... *Corimalia pallida* (Olivier, 1807)

25* Fore femora with 3 denticles; aedeagus (ventral) with narrowly tapering tip. Length: 1.9 - 2.1 mm. L.t. Iraq. Distribution: **A:** IQ ?TD. **Note.** V.V. Zherikhin and B. A. Korotyaev described a new species of *Corimalia* from Tajikistan in 2023: *Corimalia tadzhika* [Holotype (♂): Surkhku, Mt. Range, Nurekskoe Reservoir, 30 km upstream of Nurek City, on *Tamarix smyrnensis* Bunge, at spring, 12.V.1983] and first stated that it was closely related to *C. fausti* (Reitter) and belonged to what they called the „*C. fausti* group“, which in their opinion differed from other Corimaliini species by a very small mucro on the tip of the posterior tibiae of males. However, *C. fausti* is characterised above all by an almost square and white scutellar spot, a completely differently shaped aedeagus with notched tegminal plate and, in both sexes, a distinctly shorter and broader rostrum (about in comparison with *C. tadzhika*), which is shorter than the head and pronotum combined (see images of the lecto- and paralectotypes of *C. fausti fausti* in this catalogue). In fact, *Corimalia tadzhika* described by them, if it is indeed to be a new taxon, seems to be very closely related to *Corimalia obscuripes* (Pic, 1913), which is supported by the extremely bottle-necked curved tip of the symmetrical aedeagus. The extreme and sudden tapering of the tip of the median lobus is indeed unique among the Corimaliini (see also Korotyaev 1996, Figs 5-7). This latter species was described from Iraq (Mesopotamia), and - also like the species from Tajikistan, whose fore femora have several denticles, too - does not seem to have a continuous, white-scaled, square scutellar spot. Whether the new species with its basal, white rows of scales on the 2nd elytral interval actually belongs to or is closely related to *Corimalia obscuripes* (and here to the *C. pallida* group!) cannot be answered conclusively at this point. It is also not clear whether this species from Iraq has also long hairs on the inside of the hind tibia of the males like the new (and some other Corimaliini) species. This would first require knowledge of the lecto- and paralectotypes from the Pic collection of the Muséum national d'histoire naturelle (Paris), which is currently inaccessible to us (neither cooperation nor lending), as well as molecular surveys, which of course should no longer be missing in a modern first description of morphologically very similar or nearly cryptic species.

[Fig. 17] A: IQ ..... ***Corimalia obscuripes* (Pic, 1913)**

[A: TD].....**? = *Corimalia tadzhika* Zherikhin & Korotyaev, 2023**

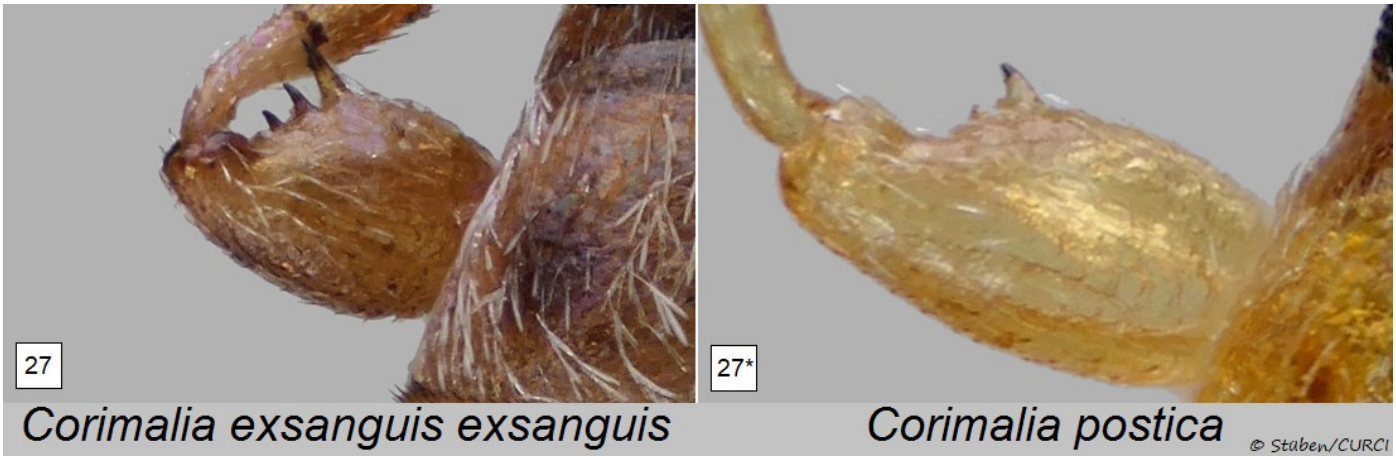
26 Body pale yellow (Fig. 24*, left); somewhat larger species (1.1 - 1.4mm); adeagus (ventral) broadly rounded towards apex. Length: 1.1 - 1.6 mm. L.t.: Distribution: **E:** SP **N:** AG CI (Fuerteventura) EG MO TU **A:** IS YE AFR.

[Fig. 18] ..... *Corimalia martini* (H. Brisout de Barneville, 1883)

26* Body yellow-red (Fig. 24*, right), pronotum darker; smaller species (< 1.1 mm); adeagus (ventral) with flattened, broad apex (with concave sides in front of apex); even smaller species: 0.8 - 1.15 mm. L.t. Central Mongolia: Etsine River. Distribution: **A:** MG.
Nanophyes mongolicus Faust, 1890: **Designation of a lectotype** by Stüben: 1 ♂ „Mongol.“ / „Nanoph. mongolicus m.“ (handwriting), coll Senckenberg, German Entomological Institute / Col. 17854 (Müncheberg, here also 2 further paralectotypes). See also the images of the lectotype (habitus & aedeagus) and paralectotype with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 36] ..... *Corimalia mongolica* (Faust, 1890)

Elytra bi-coloured



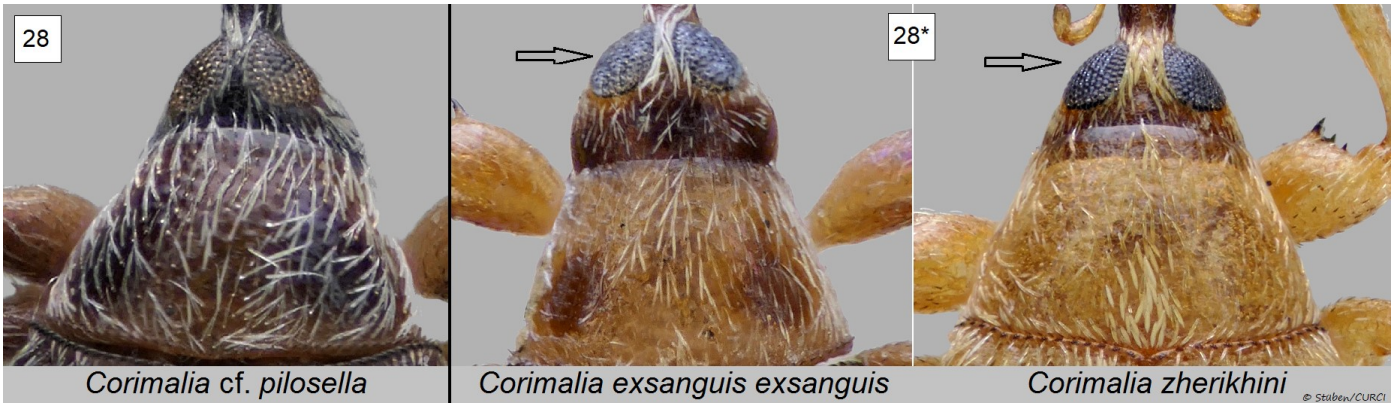
27 Fore femora with 3, usually very strong teeth.

..... 28

27* Fore femora with only 1, much smaller, tooth and sometimes with another tiny denticle.

..... 30

Fore femora with 3 teeth



[28 Body darker overall, pronotum, humeri, head and rostrum, as well as antennae, conspicuously dark brown; elytra strongly rounded, hardly longer than broad. Distribution: Mongolia: Bayankhongor Province.

[Fig. 37] ..... *Corimalia* cf. *pilosella* Voss, 1960**]**

28* Body pale yellow, pronotum, rostrum and antennae clearly yellow-brown; elytra slender, more elongated.

..... 29

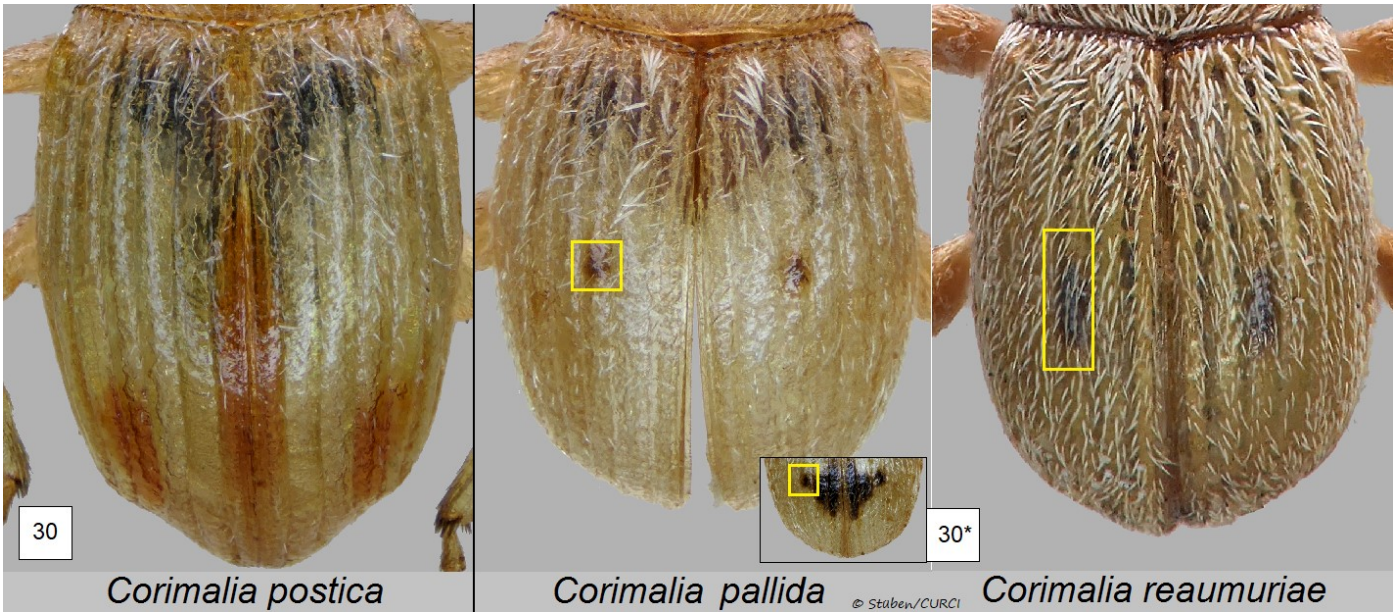
29 Smaller species: 1.2-1.8 mm; distance between eyes at most ¼ of the width of the rostrum (see Fig. 28*, left). (The first author was able to study lecto- and paralectotypes from the SDEI (Müncheberg) and the Senckenberg, Museum of Zoology (Dresden). This investigation revealed no 6th flagellar antennomere in this species, as claimed by Voss (1960). This 6th pseudoflagellar segment is the 4th, somewhat separated, segment of the club. His subgenus *Pseudocorimalia* is thus probably invalid). L.t. Afghanistan: Kandahar. Distribution: **A:** TM AF IN.
Corimalia exsanguis Voss, 1960: **Designation of a lectotype** by Stüben: 1 ♂, „S. Afghan. 1953, J. Klapperich“ / Kandahar 950 m, 13.II.“, coll Senckenberg, Museum of Zoology (Dresden). 1 ♂, 1 ♀, paralectotypes, same locality (label), coll Senckenberg, Museum of Zoology (Dresden). 1 ♀, paralectotype, same locality (label), coll. Senckenberg, German Entomological Institute / Col. 17472 (Müncheberg). See also the images of the lectotype (habitus & aedeagus) and paralectotype with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 38] ..... *Corimalia exsanguis exsanguis* Voss, 1960

29* Larger species: 1.6 - 2.0 mm; greater distance between eyes: at least half the width of the rostrum (see Fig. 28*, right). The extremely strong spines of the femora and in males the long pubescence on the inner sides of the hind tibiae are very noticeable features. L.t. Turkey: Ankara.

..... *Corimalia zherikhini* Schön in litt.

Fore femora with (1-2) smaller teeth



30 Elytra with a broad, dark, orange or reddish-brown (partial) longitudinal stripe on the suture and the first interval; frequently with an additional orange longitudinal stripe on the 3rd and 4th interval of the elytral descent. Length: 1.4 - 2.4 mm. Lt: Southern France. Distribution: **E:** FR IT SP **N:** AG EG TU.

[Fig. 19] ……. *Corimalia postica* (Gyllenhal, 1838)

30* Elytra without a darkened, broad stripe on the suture **and** the first interval (occasionally, however, with an indistinct narrow and darker stripe which is confined to the suture).

……. 31

31 Endemic species on Gran Canaria (Canary Islands). Unique selling point: In lateral view, the wavy aedeagus and the elytral transverse band (occasionally broken up into dots, see Fig. 20A/B). Length: 1.3 - 1.6 mm. L.t. Gran Canaria. Distribution: **N:** CI (Gran Canaria).

[Fig. 20A/B] ……. *Corimalia lunulata* (Wollaston, 1863)

31* Species from the Mediterranean and Asia. (Here rarely with the hint of a narrow longitudinal stripe, which is, however, restricted to the suture).

……. 32

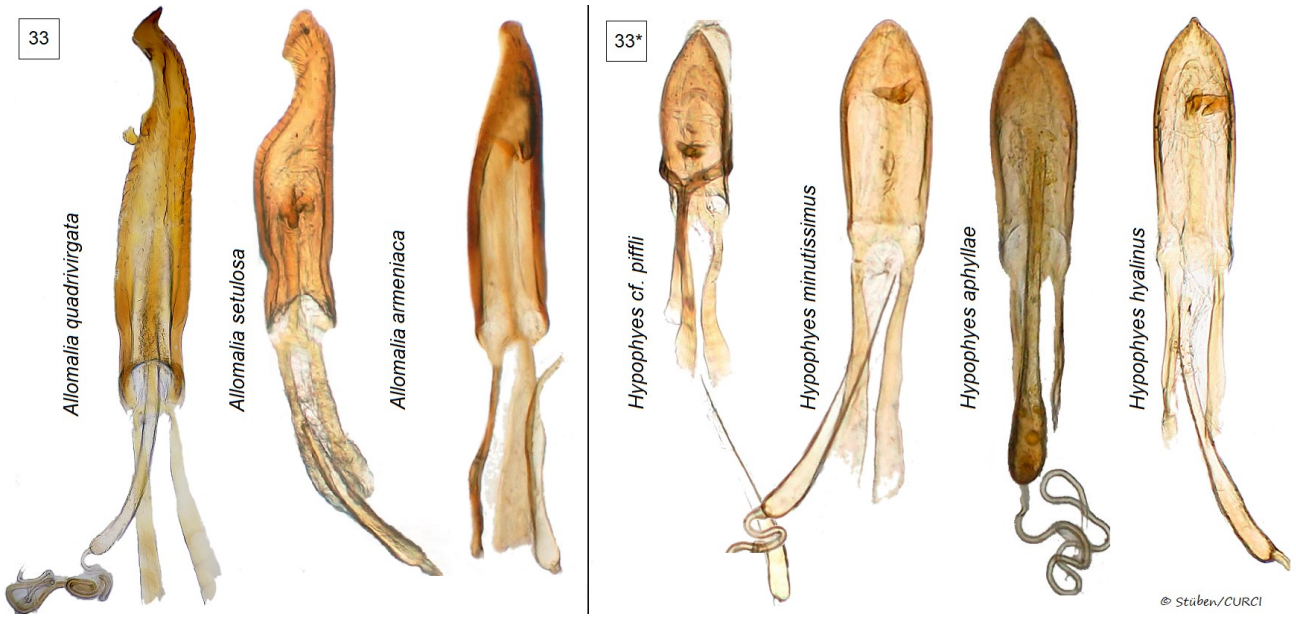
32 Elytra short-oval, paler, yellow; more sparsely set with fine hair-like scales; 3rd elytral interval often with a small brown-black spot in the middle (but there may be a completely different elytra pattern here (see Fig. 30* left, below) or no markings at all, see guide number 25 above). A species on *Tamarix* spp. Length: 1.8 - 2.25 mm. L.t.: Portugal. Distribution: **E:** CR FR GR IT MA PT SP **N:** AG EG LB TU **A:** IS LE SY.

[Fig. 16] ……. *Corimalia pallida* (Olivier, 1807)

32* Elytra more elongate, darker, yellow-brown, more densely covered with long hair-like scales; 3rd elytra interval with an elongate brown-black spot in the middle (see Fig. 30* right). This species is said to live on *Reaumuria soongorica* (Pall.) Maxim (e.g. by Zherikhin 1984). Length: 1.7-2.5 mm. L.t. Kyrgyzstan: Lake Issyk-Kul. Distribution: **A:** ES KI MG

[Fig. 39] …… *Corimalia reaumuriae* (Zherikhin, 1984)

Antennal flagellum with 4 antennomeres



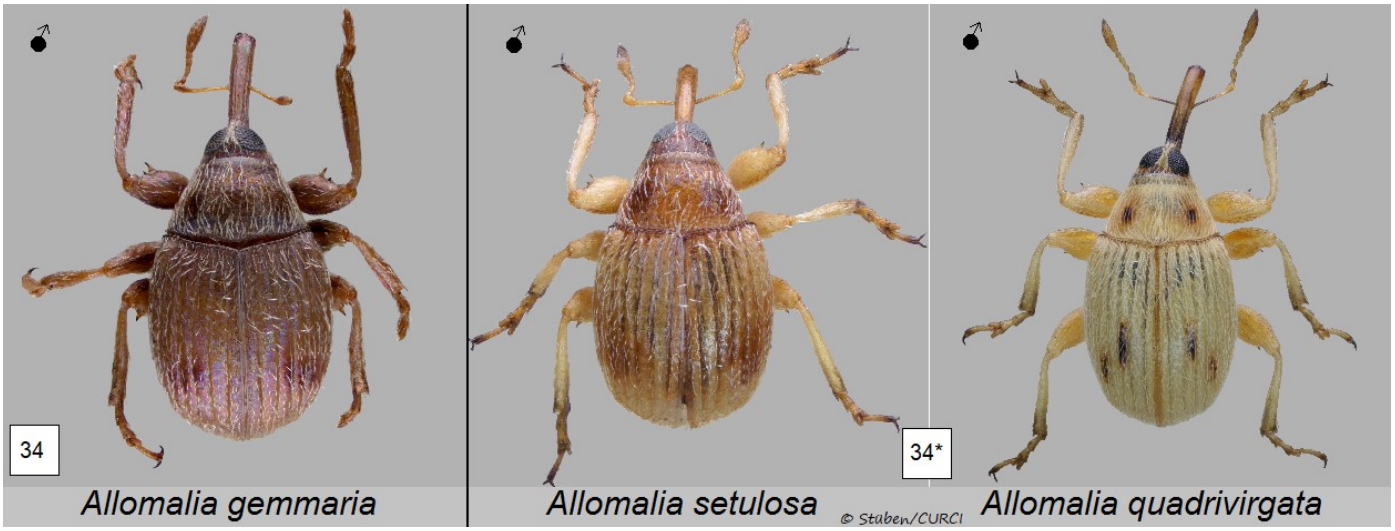
33 Median lobe of the aedeagus elongated, asymmetrical. [Not so easy for the author to comprehend: ‚Basal margin of the elytra with distinct crenulations.' Alonso-Zarazaga, 1989.]

Allomalia **Alonso-Zarazaga 34**

33* Median lobe of aedeagus shorter, symmetrical. [‘Crenulations on the basal margin of the elytra indistinct‘: This feature, included by Alonso-Zarazaga, 1989, is not clear as the teeth are fused with, and show the same colour as, the basal edge.]

Titanomalia **Alonso-Zarazaga /** ***Hypophyes*** **Reitter 38**

Genus: ***Allomalia***



34 Brown to dark brown species. (Very similar to *Allomalia setulosa* - also in the male genitalia! - and perhaps only a subspecies or merely a colour variant of the species already described by Tournier in 1868). Length: 1.3 - 1.7 mm. L.T.: Syria, Distribution: **A:** SY YE, OM, IQ.
Nanophyes gemmarius Faust, 1887): **Designation of a lectotype** by Stüben: 1 ♀ „Syria, Dohrn“, coll Senckenberg, Museum of Zoology (Dresden, here also 4 further paralectotypes). See also the image of the lectotype (habitus) with the original labels in our catalogue Stüben & Schön 2024.

[Fig. 21] ..... ***Allomalia*** **(?*setulosa*)** ***gemmaria*** **(Faust, 1887)**

34* Yellow to yellow-red species.

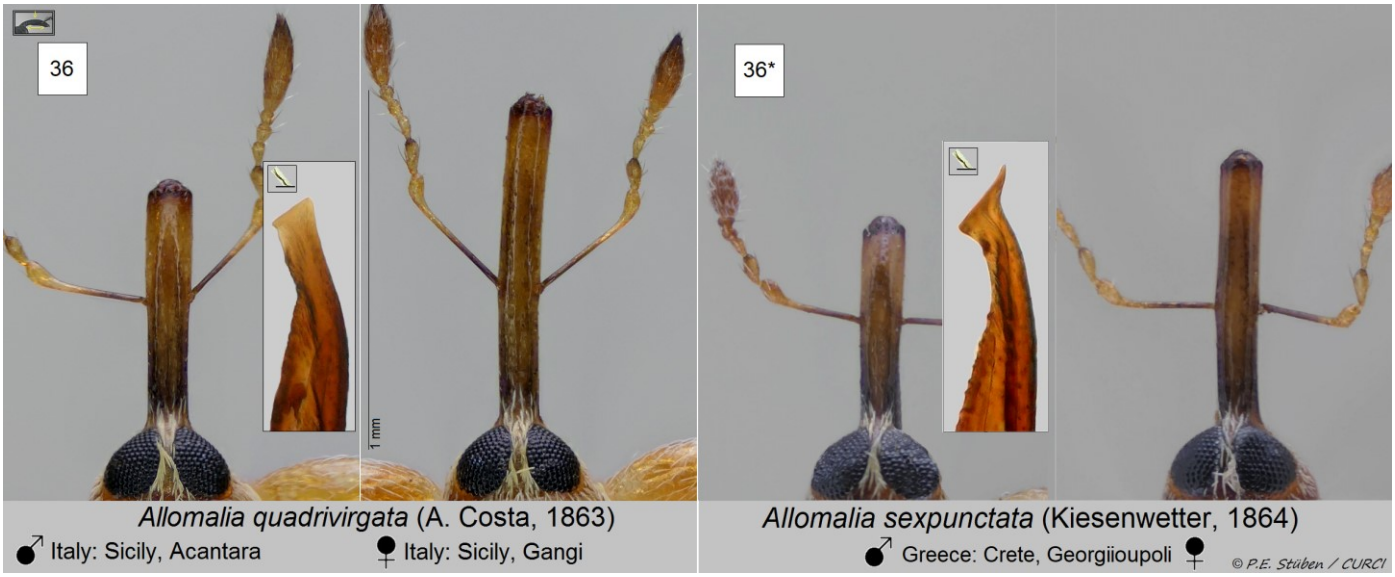
..... 35

35 Larger species: 1.8 - 2.2 mm; if the elytra are spotted (which should always be the case in a series with several specimens), then staggered on the 2nd (in the middle) and 4th intervals (behind the middle) with long, narrow, dark brown markings (elytra thus in total with 4 long, line-like spots; see Fig. 34*, right)

..... 36

35* Smaller species: 1.1 - 1.6 mm; if markings are present, then only behind the middle **at the same level** on the 2nd and 4th (sometimes as a continuous spot, see Fig. 34*, left) or only on the 4th interval as a broad bar.

..... 38

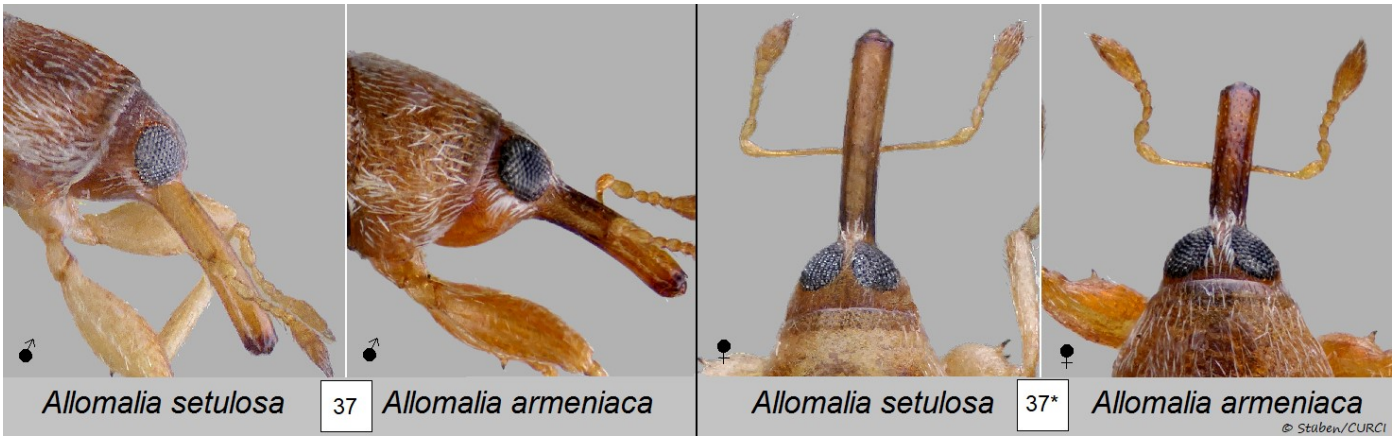


36 Rostrum of males at least 6x longer than wide between the antennal insertions, that of females even >8x longer than wide. Apex of aedeagus flatly "cut-off" (the entire median lobus wider, shorter). Length: 1.8 - 2.1 mm. L.t.: Italy, Calabria. Distribution: **E:** BU CR FR GR (Korfu) HU IT SP (Balearics) UK **N:** AG EG LB MO TU **A**: AB CY GG IS KZ SA SY UZ.

[Fig. 23] ..... *Allomalia quadrivirgata* (A. Costa, 1863)

36* Rostrum of males at most **5.1x** longer than wide between the antennal insertions, that of females only **6x** longer than wide. Apex of aedeagus arrow-like elongated (the entire median lobus narrower, longer). Length: 1.8 – 2.2 mm. L.t.: Greece: Crete. Distribution: **E:** GR (mainland, Aegean Islands)

[Fig. 24] ..... *Allomalia sexpunctata* (Kiesenwetter, 1864)



37 Elytra shorter (see Fig. 34*, left); rostrum of males at least as long as pronotum and head together, rostrum of females even longer; with 2 strong teeth on the fore femora (main tooth is curved dagger-like). Median lobe of aedeagus in lateral view with an elongated, hooked tip. Length: 1.1 - 1.9 mm. L.t.: Algeria: Sétif. Distribution: **E:** ST **N:** AG EG LB MO TU **A:** CY IS LE QA SI YE (Socotra) **AFR.**

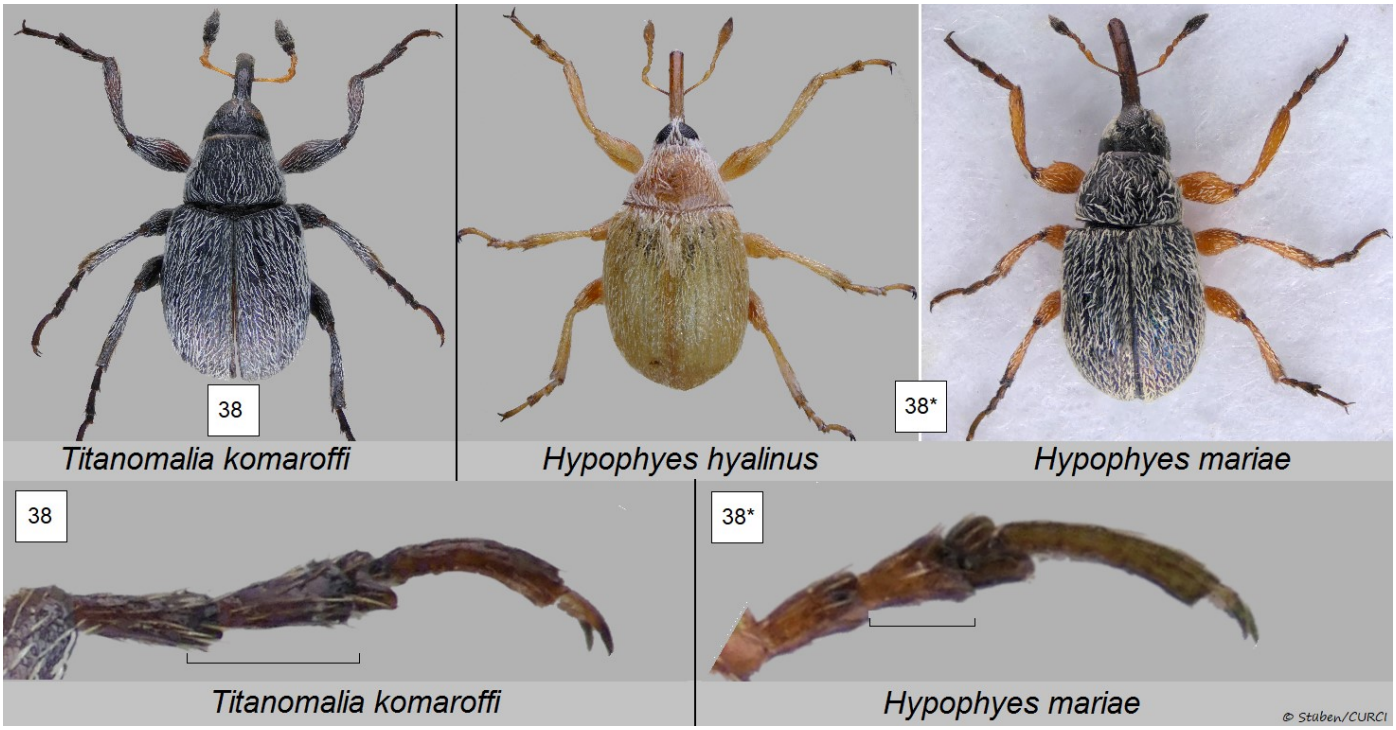
[Fig. 22]..... *Allomalia setulosa* (Tournier, 1868)
= *Corimalia discreta* Voss, 1964 **syn. nov.**

The examination of the extensive type material of *Corimalia discreta* from Egypt (Faras West, north of Wadi Halfa) in the Vienna Museum left no doubt that this is a younger synonym of *Allomalia setulosa*. All these specimens belong to the genus *Allomalia*! This was also confirmed by Karel Schön (Czech Rep.), who also studied the types (habitus and aedeagus).

37* Elytra more elongat; rostrum conspicuously short, about the same length in both sexes and distinctly shorter than pronotum and head together; with only one short, fine denticle on the fore femora. Median lobe of aedeagus in lateral view with a simple, rounded tip. Size: 1.6 - 1.8 mm. L.t.: Turkey: Süleymanli near Kahramanmaras. Distribution: **A:** TU (Eastern Turkey).

[Fig. 25]..... *Allomalia armeniaca* Stüben & Schön, 2023

Aedeagus symmetrical



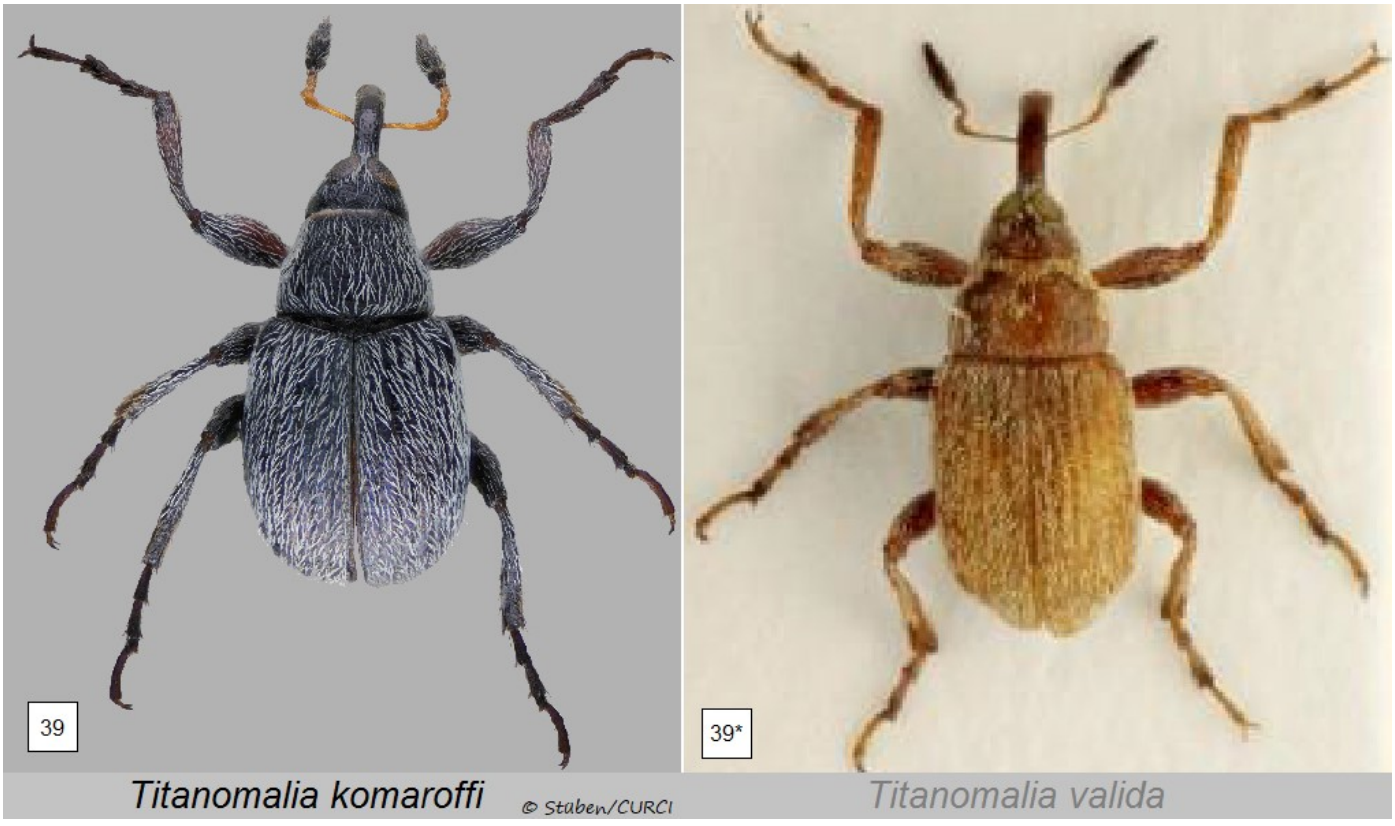
38 Body (incl. femora and tibiae) black to brown-red. With conspicuously long and narrow fore tarsi; these as long as, or longer than, the fore tibia: 2nd fore tarsomere slender, at least 2.5 times longer than wide.

Titanomalia **Alonso-Zarazaga 39**

38* Body yellow to brown; if head, pronotum and elytra black, then at least legs yellow-red (see *Hypophyes mariae*). 2nd fore tarsomere shorter, at most 1.5x longer than wide.

Hypophyes **Reitter 40**

Genus: ***Titanomalia***



39 Smaller species: 2.2 – 2.5 mm. Body black, with dense woolly hairs; fore femora clearly toothed; L.t. Dagestan: Derbent on *Tamarix laxa* Willd. L.t.: Dagestan: Derbend. Distribution: **E**: ST **A**: AB.

[Fig. 26] ……. *Titanomalia komaroffi* (Faust, 1877)

39* Larger species: 3 – 4 mm. Body brown-red, sparsely hairy, fore femora not toothed; L.t. Tajikistan: Kuljab, Ak-Sou Valley (Jachsu Valley). Distribution: **A**: TD KZ.

…… *Titanomalia valida* (Formánek & Melichar, 1916)

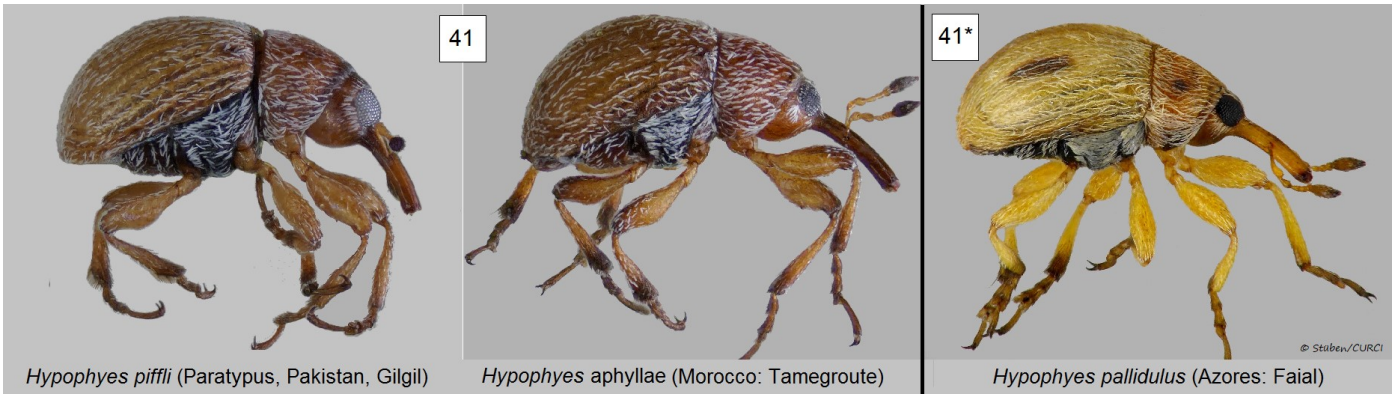
Genus: ***Hypophyes***

40 Elytra, pronotum, head and antennal club black; legs, rostrum and antennal flagellum lightened to yellow-red (see Fig. 38*, right). Length: 1.11 - 1.51 mm. L.t. Iran: Semnan. Distribution: **A:** IN.

[Fig. 27] ..... *Hypophyes mariae* Košťál, 2017

40 Body not black, but (light) yellow, yellow-brown or dark brown.

…… 41



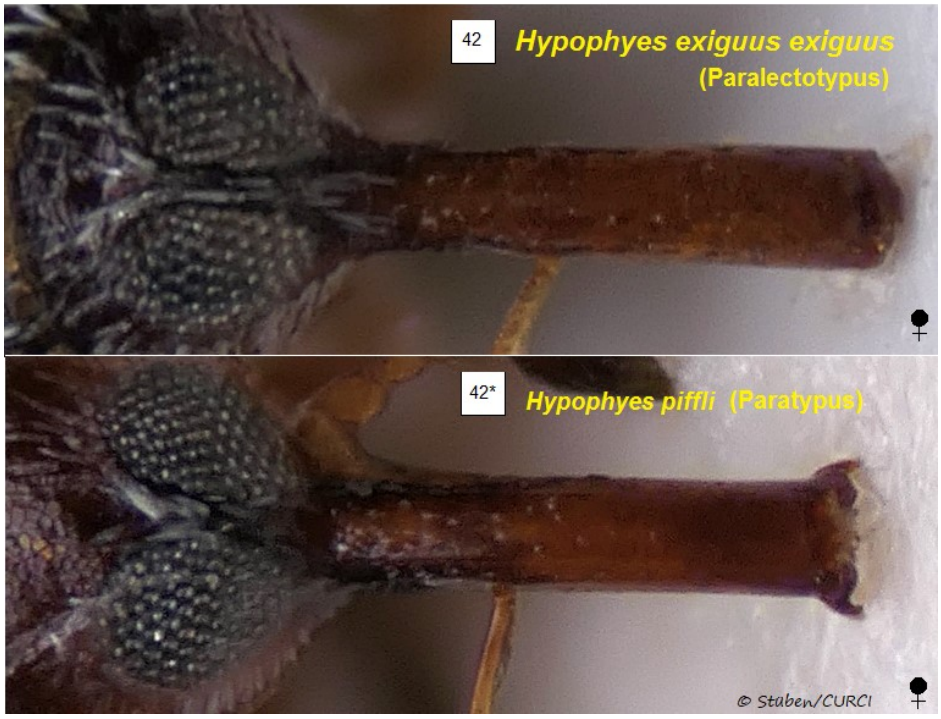
Hypophyes piffli (Paratypus, Pakistan, Gilgil) | *Hypophyes* aphyllae (Morocco: Tamegroute) | *Hypophyes pallidulus* (Azores: Faial)

41 Dark brown species. (*H. aphyllae*, occasionally also with lightened integument, is considered twice.)

…… 42

41* Light yellow and yellow-brown species.

…… 44

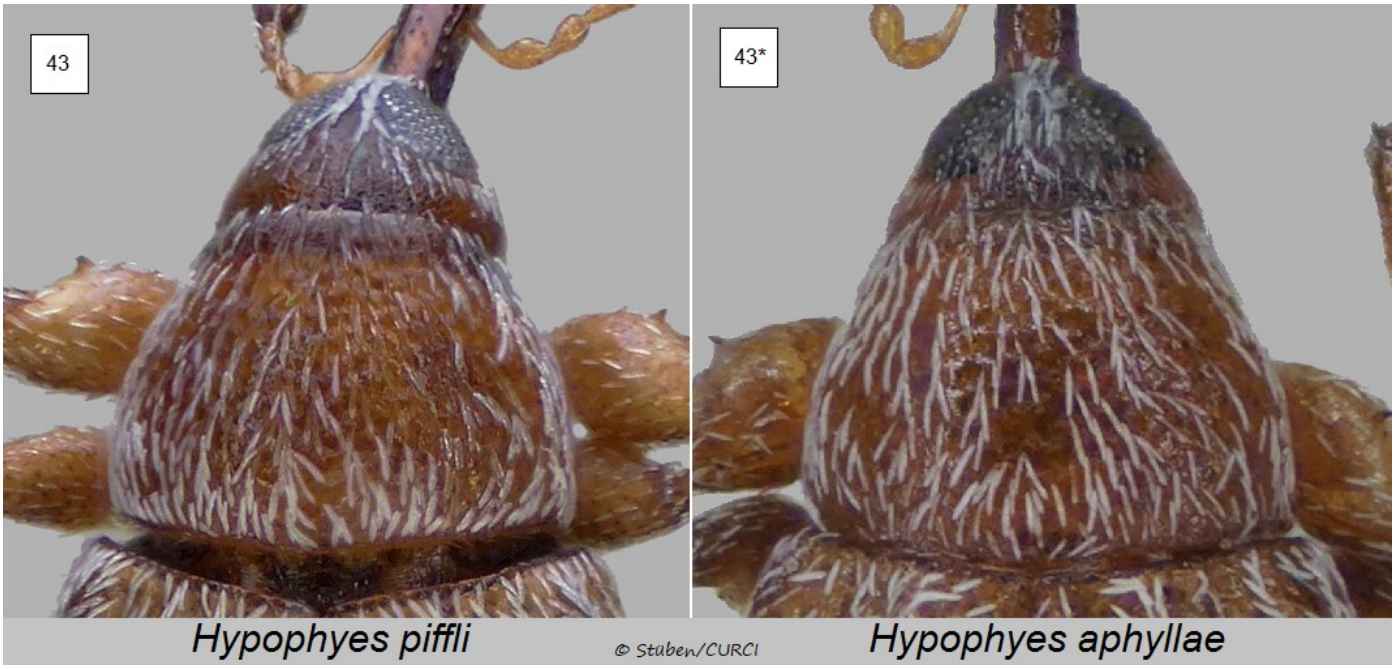


42 Rostrum slender (especially near the base), also appears to be slightly longer; the rostrum of females almost as long as pronotum and head together. Length: 0.9 - 1.1 mm. L.t.: "Etsine River, in central Mongolia". Distribution: **A:** MO.
Nanophyes exiguus Faust, 1890:**Designation of a lectotype** by Stüben: 1 ♂ „Mongol. cent …“ (Handwriting) / „exiguus Faust“ (Handwriting), coll. Senckenberg, Museum of Zoology (Dresden), here also 1 ♀ as paralectotype. See also the images of the lectotype and paralectotype (habitus) with the original labels in our catalogue: Stüben & Schön 2024.

[Fig. 40] ..... *Hypophyes exiguus exiguus* (Faust,1890)

42* Rostrum shorter, stouter and parallel-sided; also that of the females hardly longer than the pronotum. Nevertheless, even this distinction remains **marginal** (especially since the aedeagi do not show any differences in all three species). [Conclusion: The two following species could therefore each be a younger synonym of *Hypophyes exiguus exiguus*. Only molecular studies will be able to prove this with certainty and, if necessary, only after that will one be able to start looking for species-specific characteristics].

…… 43



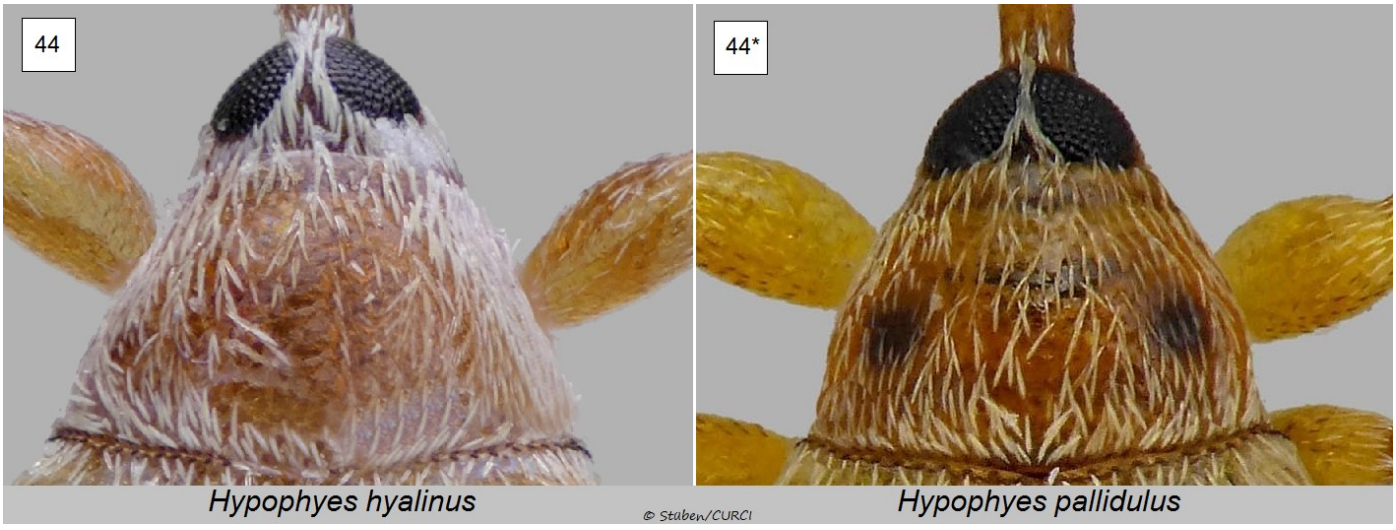
43 Pronotum more rounded laterally, widest further in front of the base. Length: (0.9) 1.2 - 1.3mm. L.t. Pakistan: Gilgit. Distribution: **A:** PA.

[Fig. 41] ..... *Hypophyes piffli* (Voss, 1964)

43* Pronotum rather trapezoidal; widest just before the base. Length: 1.2-1.7 mm. L.t. Algeria (Central Sahara): Hoggar Mts., In-Iker. Distribution: **N:** AG, MO, EG **A:** AB CY IQ QA SI TM TR UZ.

[Fig. 28] ..... *Hypophyes aphyllae* (Peyerimhoff, 1929)

Yellow Species



44 Pronotum longer and trapezoidal, with nearly straight sides.

..... 45

44* Pronontum shorter, with convex sides on posterior half.

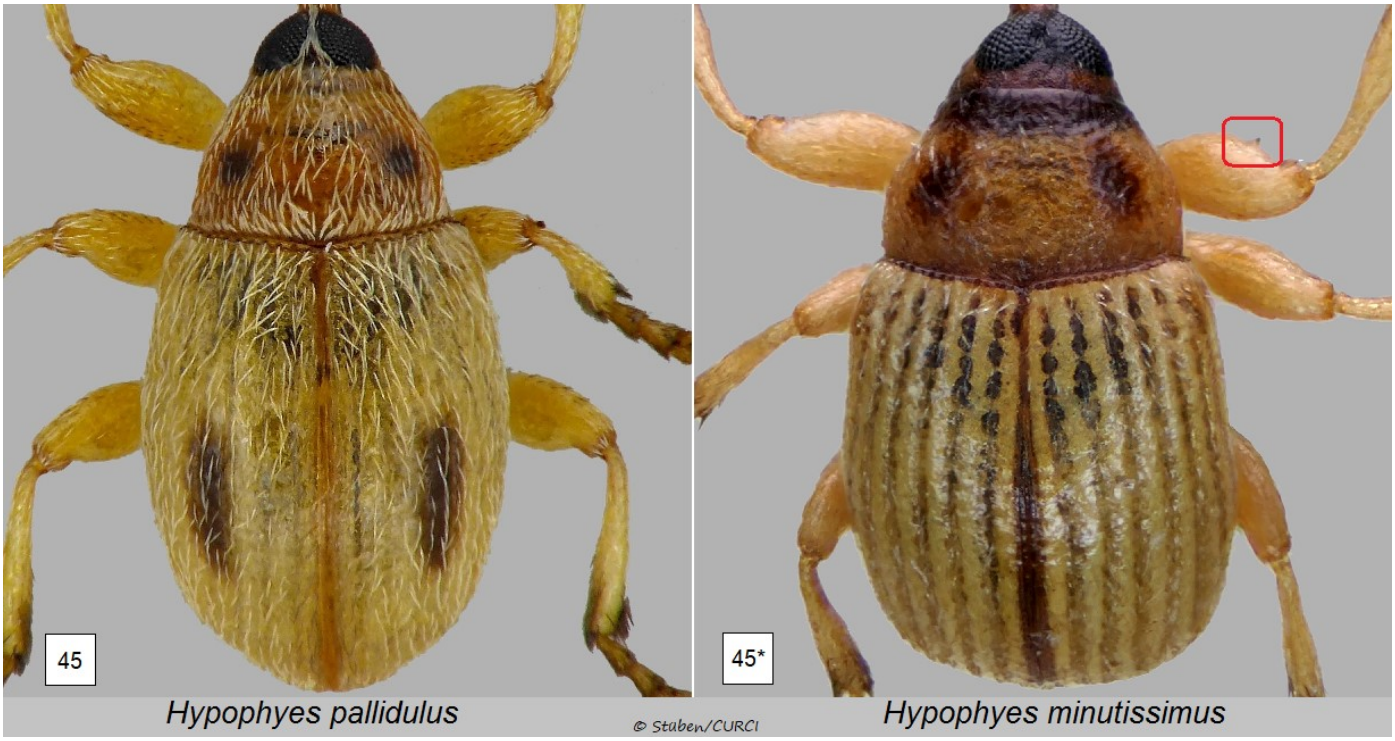
..... 46

45 The species is longer and more densely hairy, especially on the sides of the pronotum, around the eyes and on the episternae (Fig. 44); the trapezoidal pronotum with straight sides; median lobus of the aedeagus with a separate, small tip (Fig. 33*, right). Length: 1.5 - 1.8 mm. L.T. Mongolia: near Bulgan. Distribution: **E:** ST **A:** KZ UZ MG WS.

[Fig. 29] ..... *Hypophyes hyalinus* (Zherikhin, 1972)

45* Hair shorter, less dense (Fig. 43*); the trapezoidal pronotum is slightly convex immediately in front of the base; median lobus of the aedeagus simply tapers to a point without a set-off tip. (*H. aphyllae* is often confused with the very similar, but smaller, often clearly light yellow species *H. minutissimus*. However, it differs from this species - apart from the tapezoidal (never laterally rounded) pronotum (compare with Fig. 46*) - by the longer elytra, the longer rostrum of the females, fore femora with a larger denticle and the slimmer, clearly more pointed aedeagus (ventral view, see Fig. 33*). Length: 1.2-1.7 mm. L.t. Algeria (Central Sahara): Hoggar Mts., In-Iker. Distribution: **N:** AG, MO, EG **A:** AB CY IQ QA SI TM TR UZ.

[Fig. 28] ..... *Hypophyes aphyllae* (Peyerimhoff, 1929)



46 Fore femora without denticles; elytra often somewhat more elongate (almost always with two distinct longitudinal ridges on the 3rd and 4th interval behind the middle). Punctures of the striae do not extend to the intervals; sides of the pronotum slightly convex. Length: 1.0 - 1.65 mm. L.t.: <not specified>. Distribution: **E:** FR IT PT SP SZ **N:** AG TU.

[Fig. 30] ..... *Hypophyes pallidulus* (Gravenhorst, 1807)

46* Fore femora with 1 tiny denticle; elytra shorter, stockier, (occasionally with a few dark spots); striae with a deep and broad puncturation encroaching on the intervals; pronotum cushion-shaped, sides strongly convex. (Like this species, the very similar, but significantly larger species *H. aphyllae,* has also a denticle of the fore femora. However, the latter species differs in other characteristics, see under guide number 45*). Length: 0.9 - 1.4 mm. L.t. Algeria: Sétif. Distribution: **E:** SP ST "Caucasus" **N:** AG EG LB TU **A:** AF CY IQ SI TR TM **AFR**

[Fig. 31.1] ..... *Hypophyes minutissimus* (Tournier, 1868)

Acknowledgement

My great thanks go first of all to Karel Schön (Czech Republic), who not only provided the material he identified on numerous Corimaliini species, but also subjected the key to a critical examination. However, morphological studies have become unthinkable nowadays without a 'molecular cover', which remains in the background and is still waiting to be published. Therefore, my special thanks go to Eva Kleibusch (Senckenberg, Deutsches Entomologisches Institut, Müncheberg) and Andre Schütte (Zoologisches Forschungsmuseum Alexander Koenig, Bonn) for the sequence analyses. However, neither would be possible without the support of the CURCULIO Institute. And last but not least, I thank Adrian Fowles (Wales) for some suggestions and the linguistic corrections to the key.

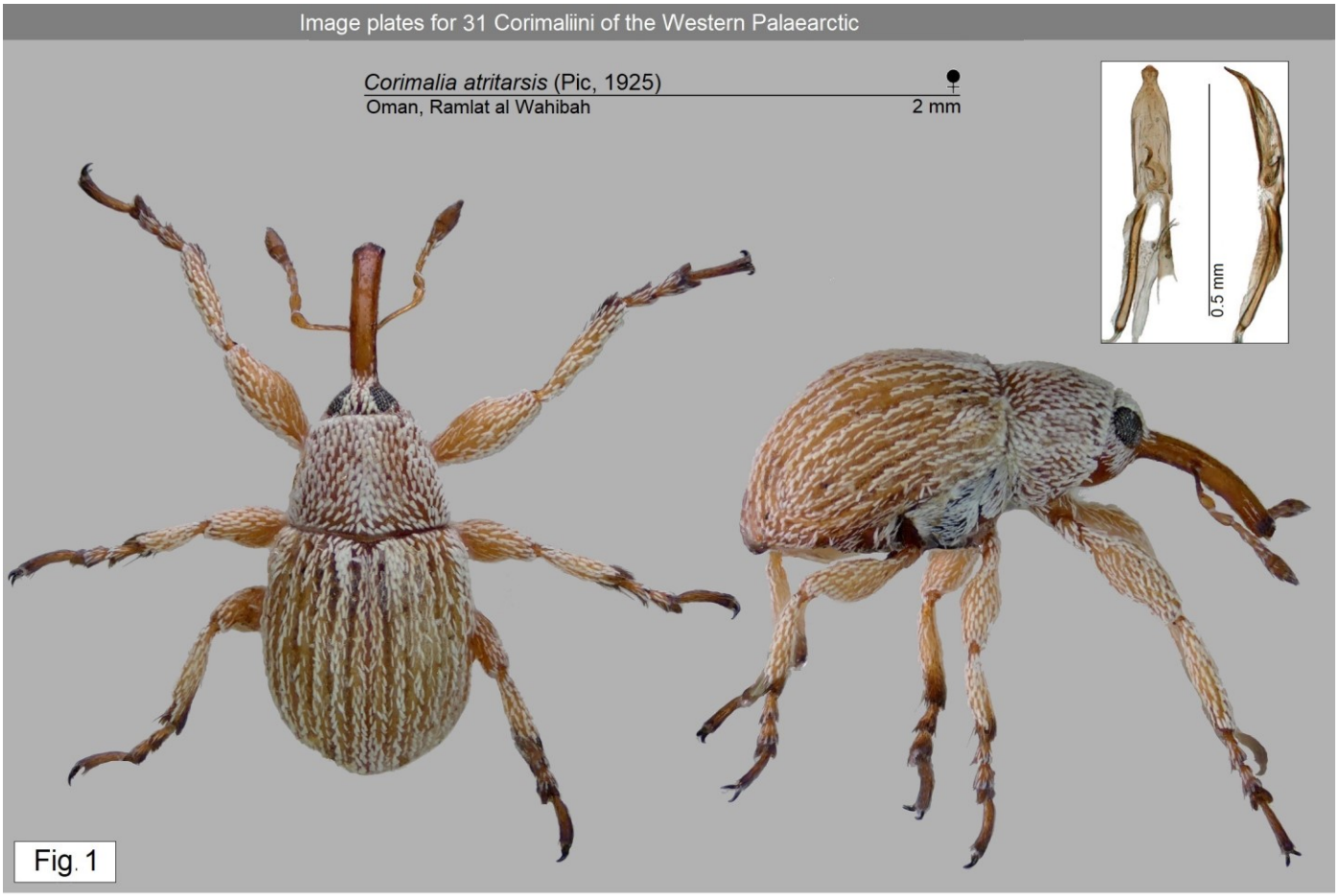
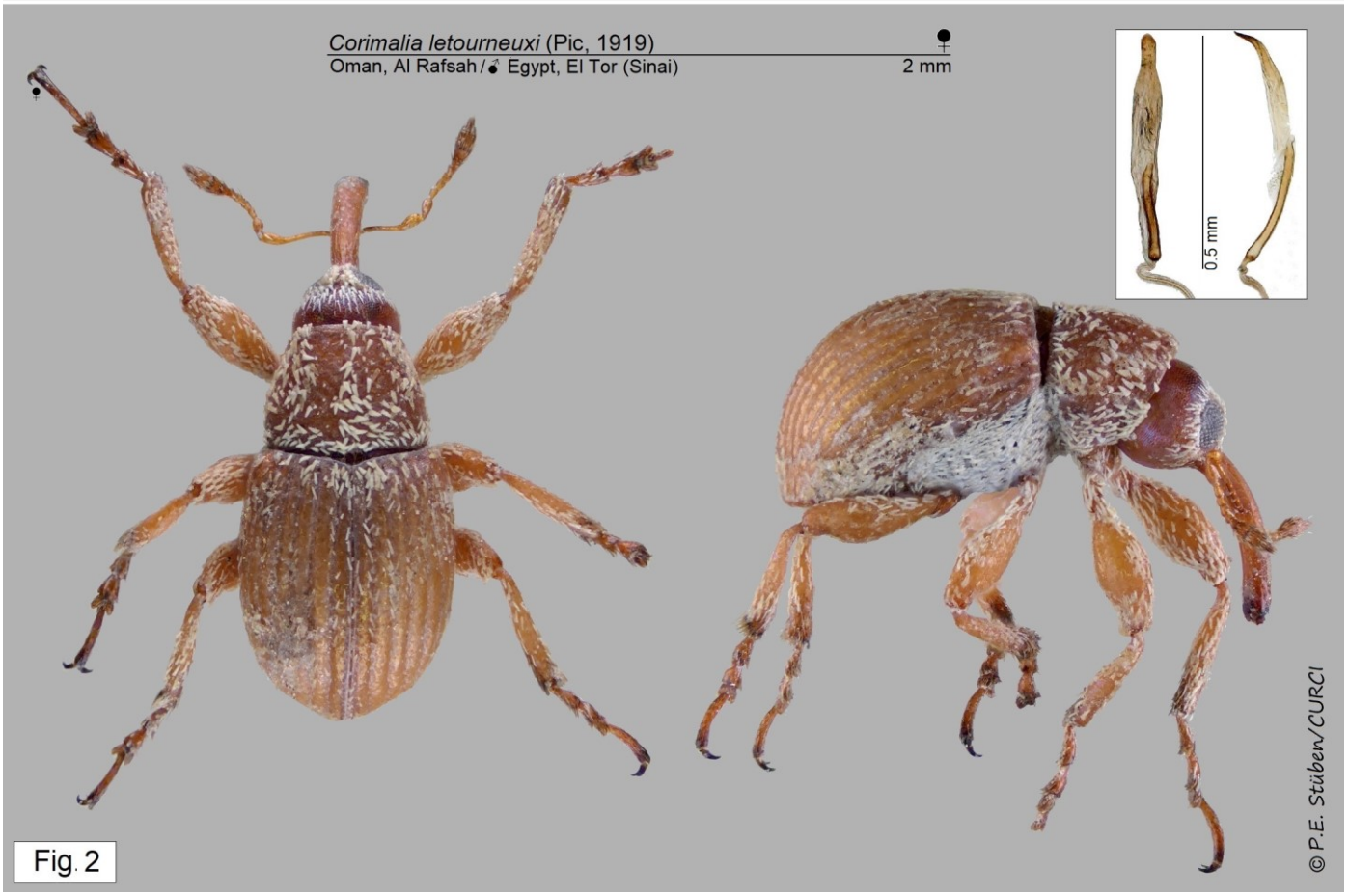


Image plates for 31 Corimaliini of the Western Palaearctic
Corimalia atritarsis (Pic, 1925) ♀
Oman, Ramlat al Wahibah
2 mm
0.5 mm
Fig. 1


Corimalia letourneuxi (Pic, 1919) ♀
Oman, Al Rafsah / ♂ Egypt, El Tor (Sinai)
2 mm
0.5 mm
Fig. 2
© P.E. Stüben/CURCI

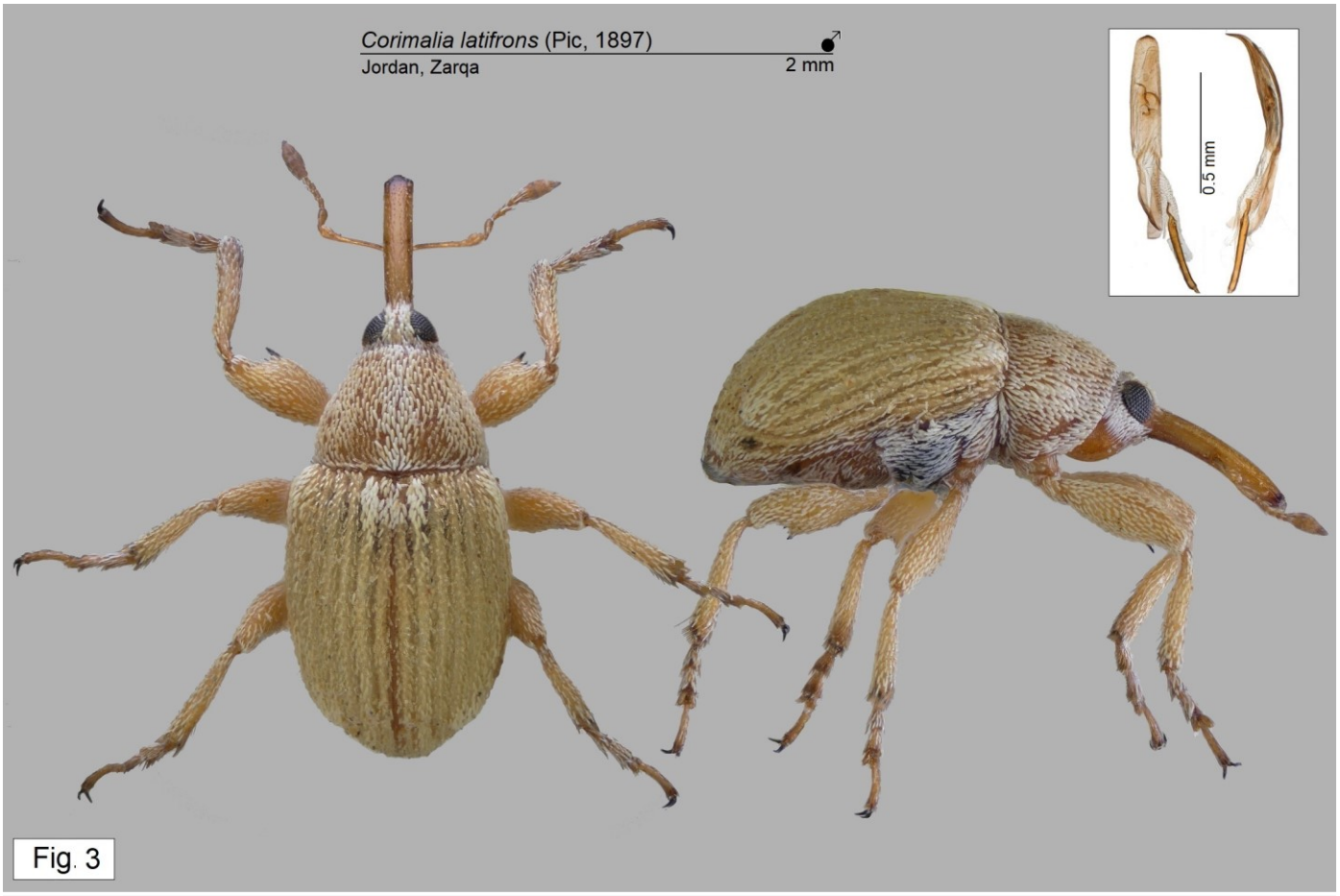

Corimalia latifrons (Pic, 1897) ♂
Jordan, Zarqa
2 mm
0.5 mm

Fig. 3

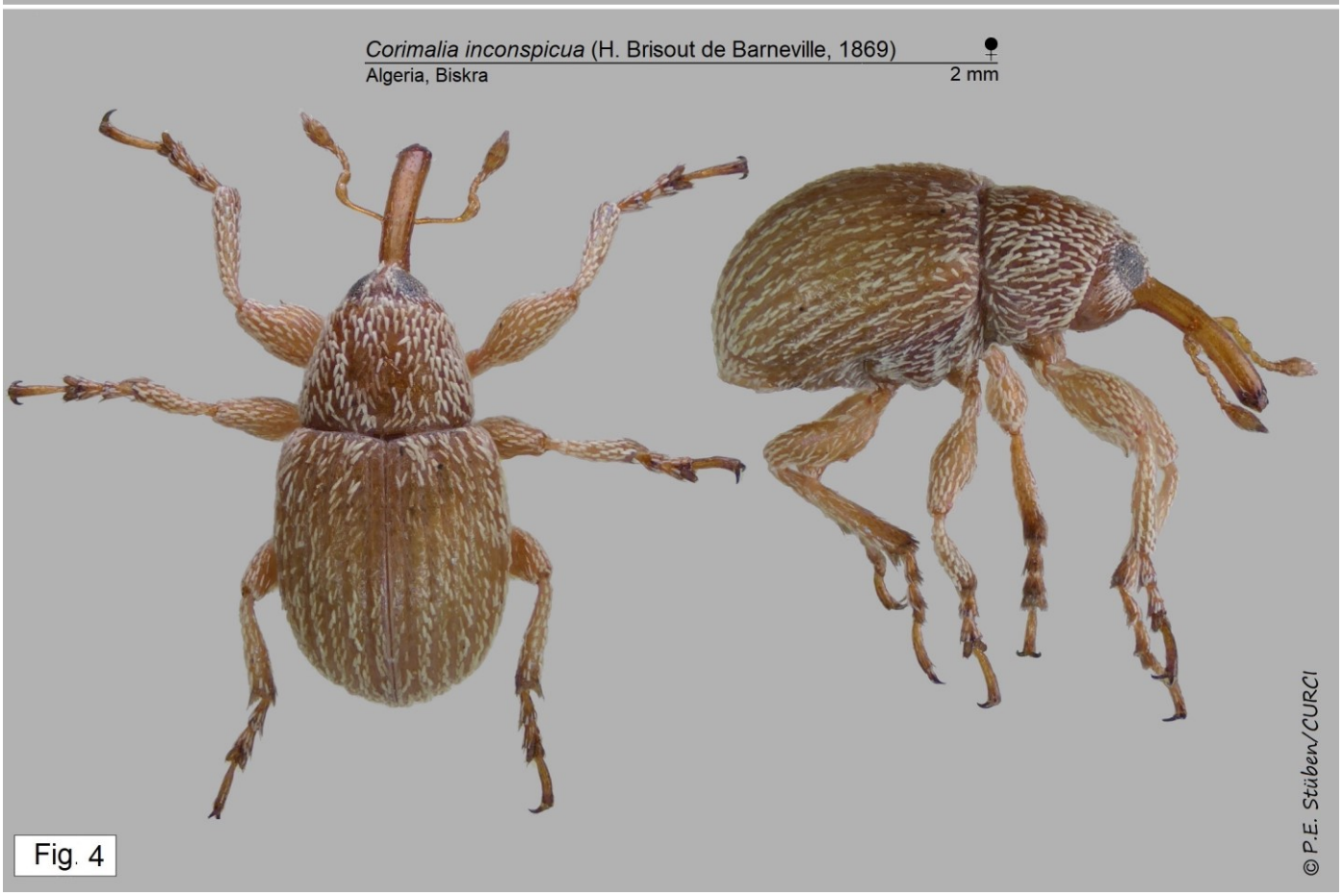

Corimalia inconspicua (H. Brisout de Barneville, 1869) ♀
Algeria, Biskra
2 mm
© P.E. Stüben/CURCI

Fig. 4


Corimalia schatzmayri (Giordani-Soika, 1937) ♀
Canary Islands, Fuerteventura
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.5A

Fig.5B

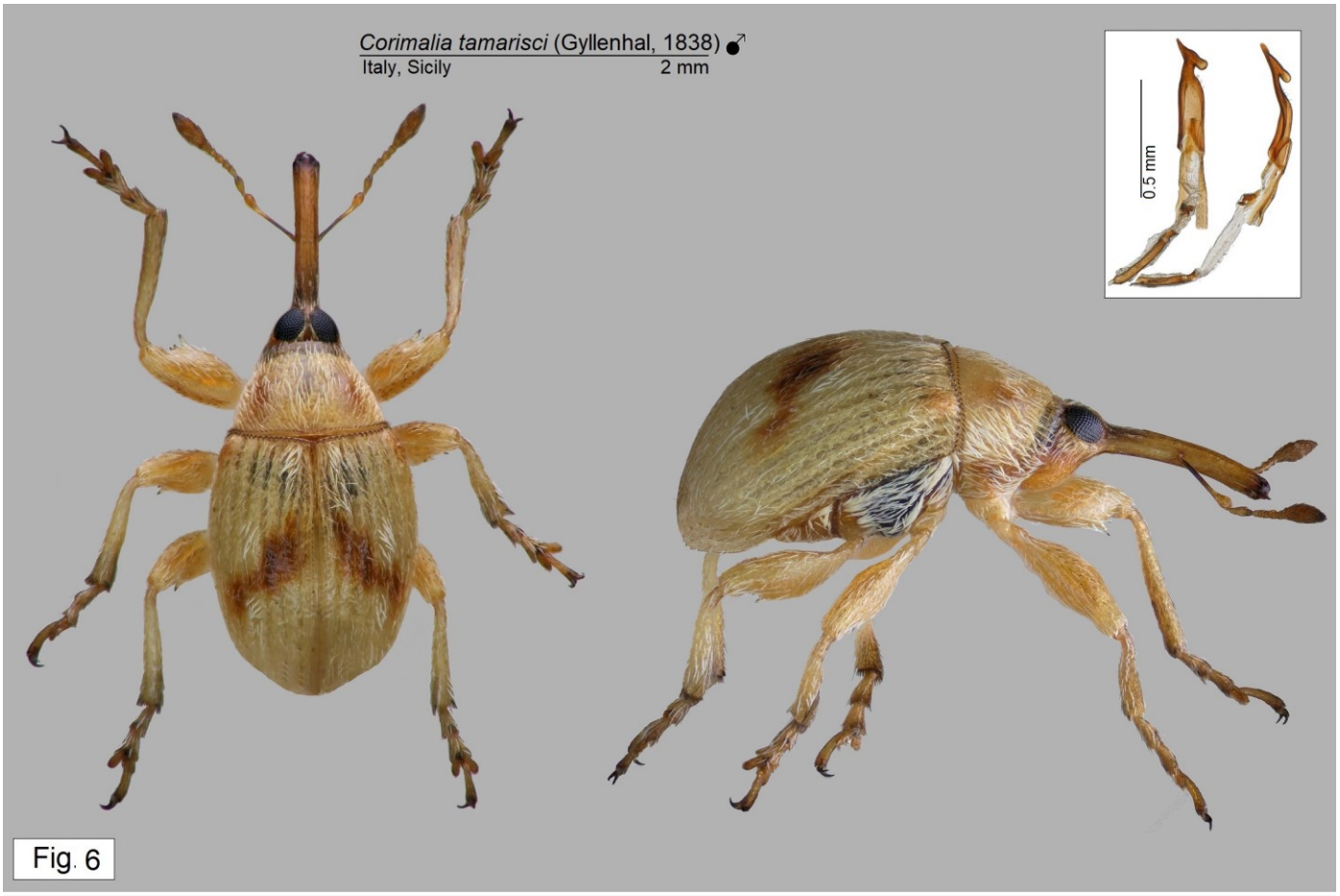

Corimalia tamarisci (Gyllenhal, 1838) ♂
Italy, Sicily
2 mm
0.5 mm

Fig. 6


Corimalia torretassoi Giordani-Soika, 1937 ♂
Israel, Ma'agan Mikha'él
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig. 7

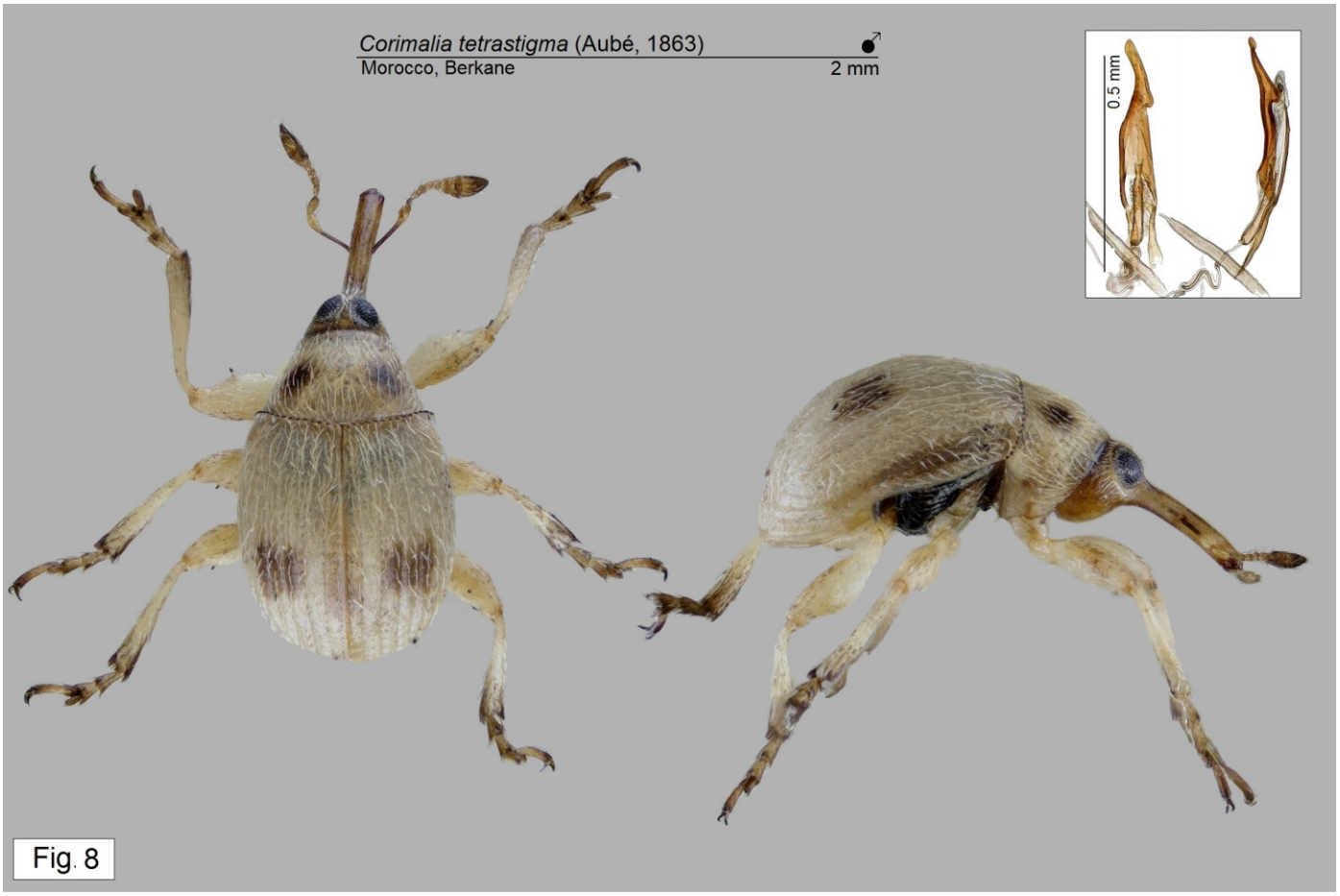

Corimalia tetrastigma (Aubé, 1863) ♂
Morocco, Berkane
2 mm
0.5 mm

Fig. 8

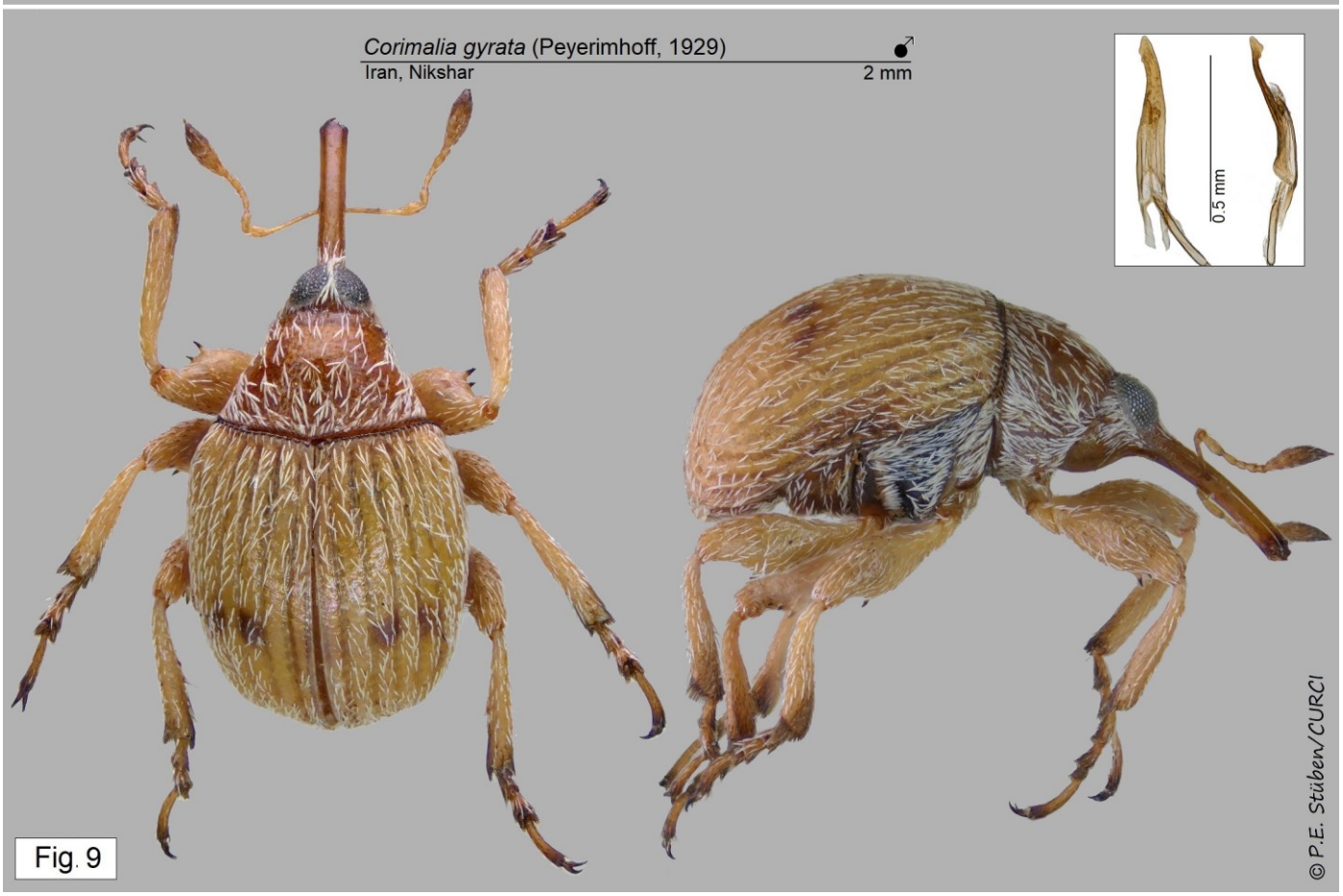

Corimalia gyrata (Peyerimhoff, 1929) ♂
Iran, Nikshar
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig. 9


Corimalia strejceki (Schön & Skuhrovec, 2016) ♀
Russia, Kislowodsk 2 mm
0.5 mm

Fig.10

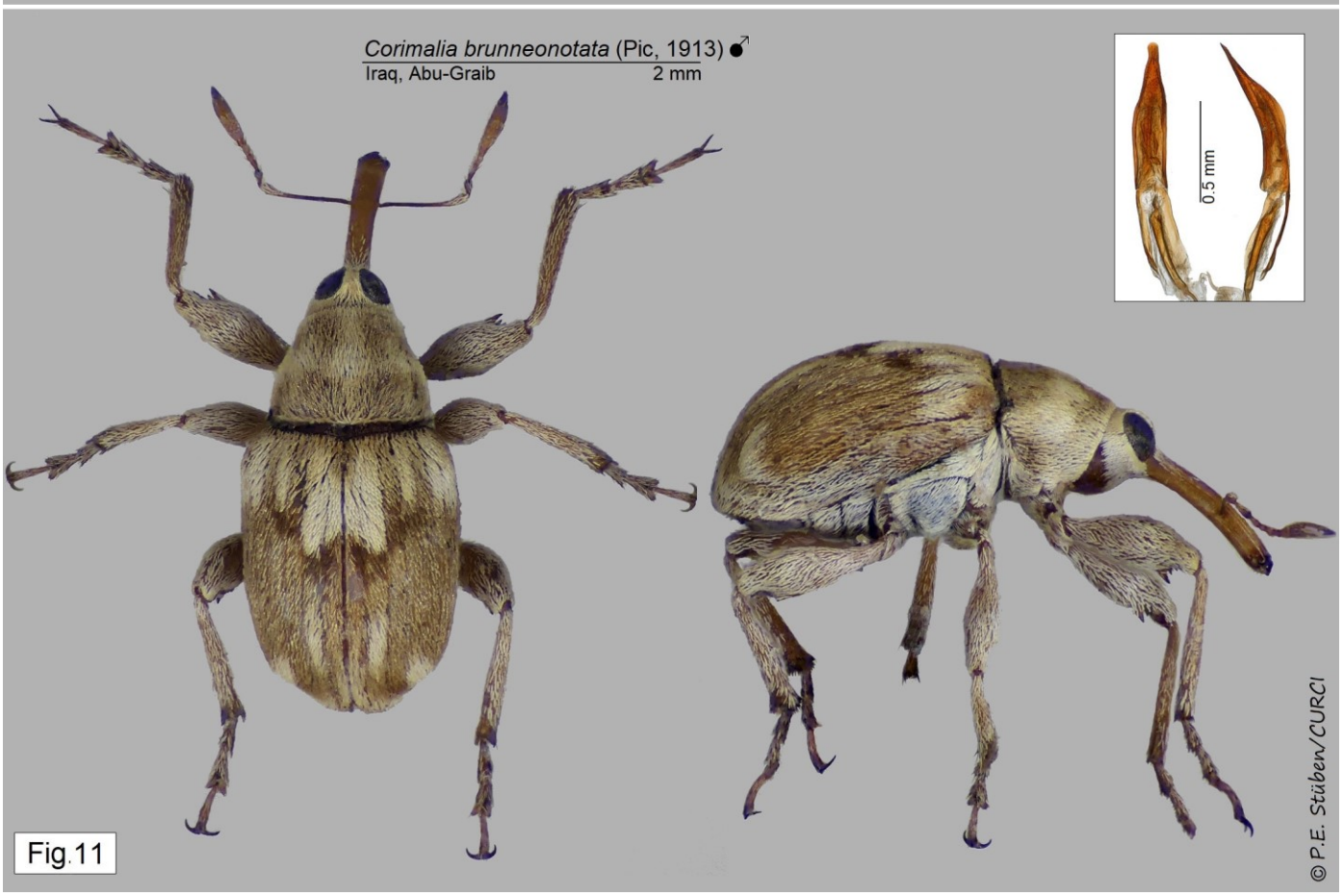

Corimalia brunneonotata (Pic, 1913) ♂
Iraq, Abu-Graib 2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.11

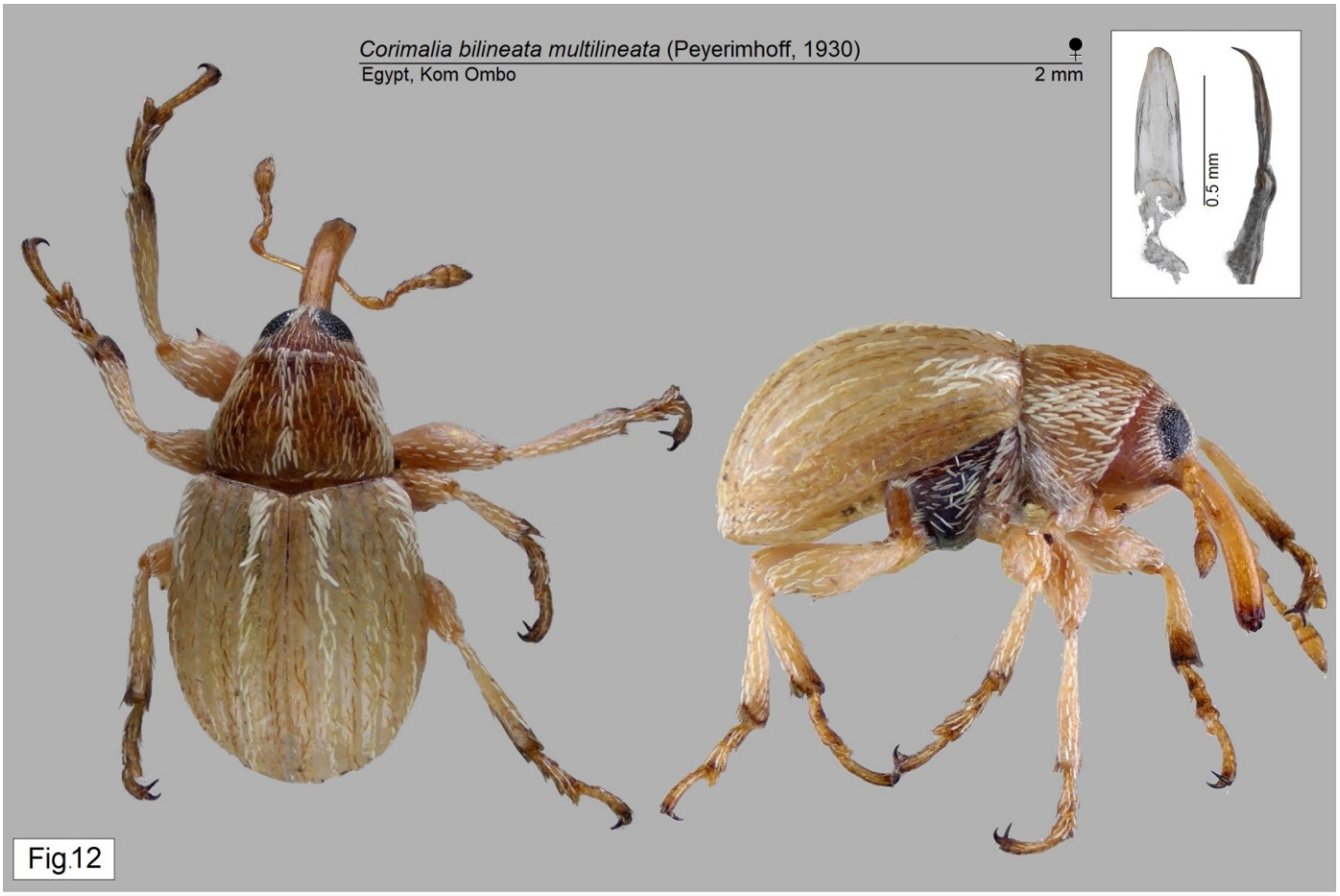

Corimalia bilineata multilineata (Peyerimhoff, 1930)
Egypt, Kom Ombo
♀
2 mm
0.5 mm

Fig.12

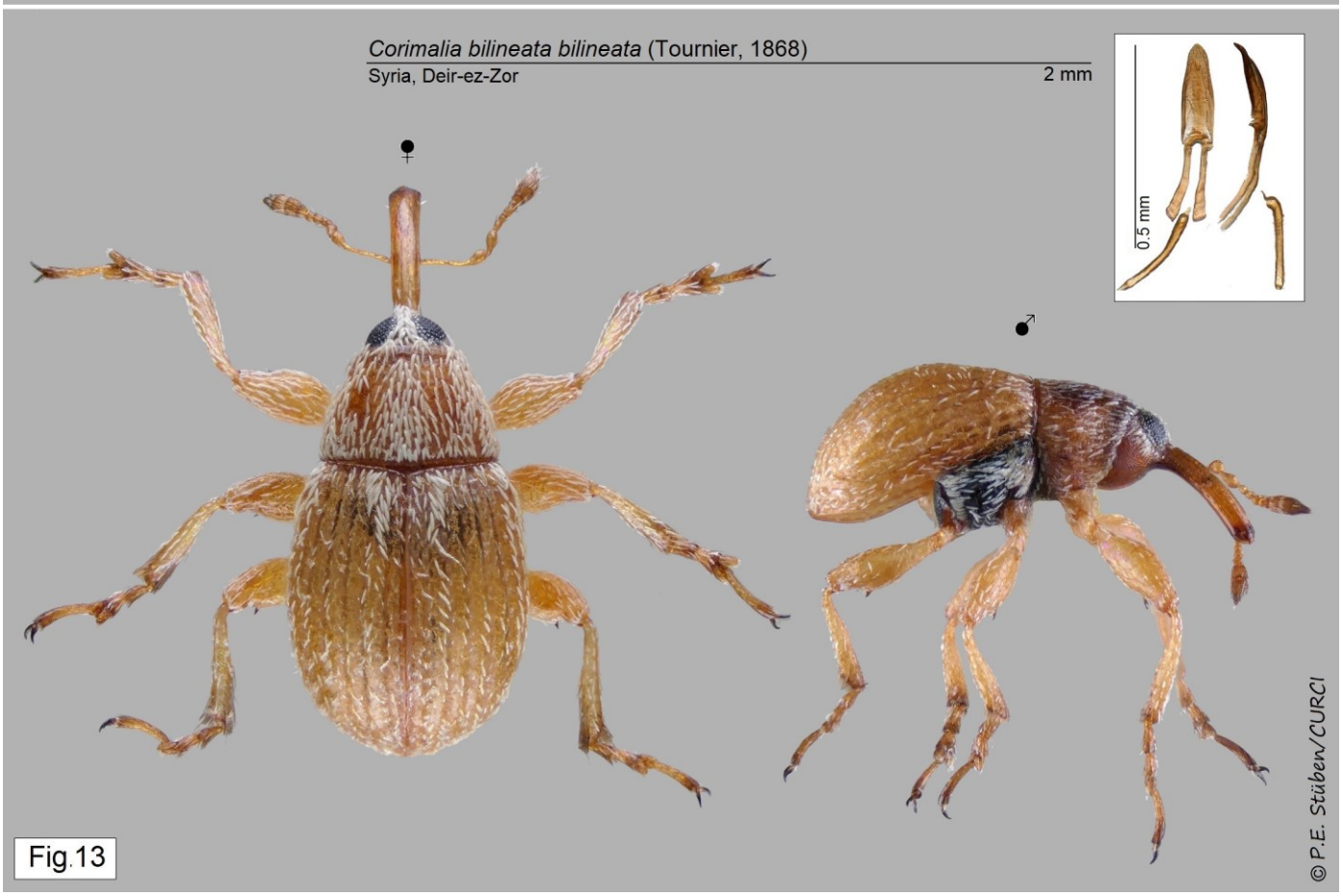

Corimalia bilineata bilineata (Tournier, 1868)
Syria, Deir-ez-Zor
2 mm
0.5 mm
♀
♂
© P.E. Stüben/CURCI

Fig.13

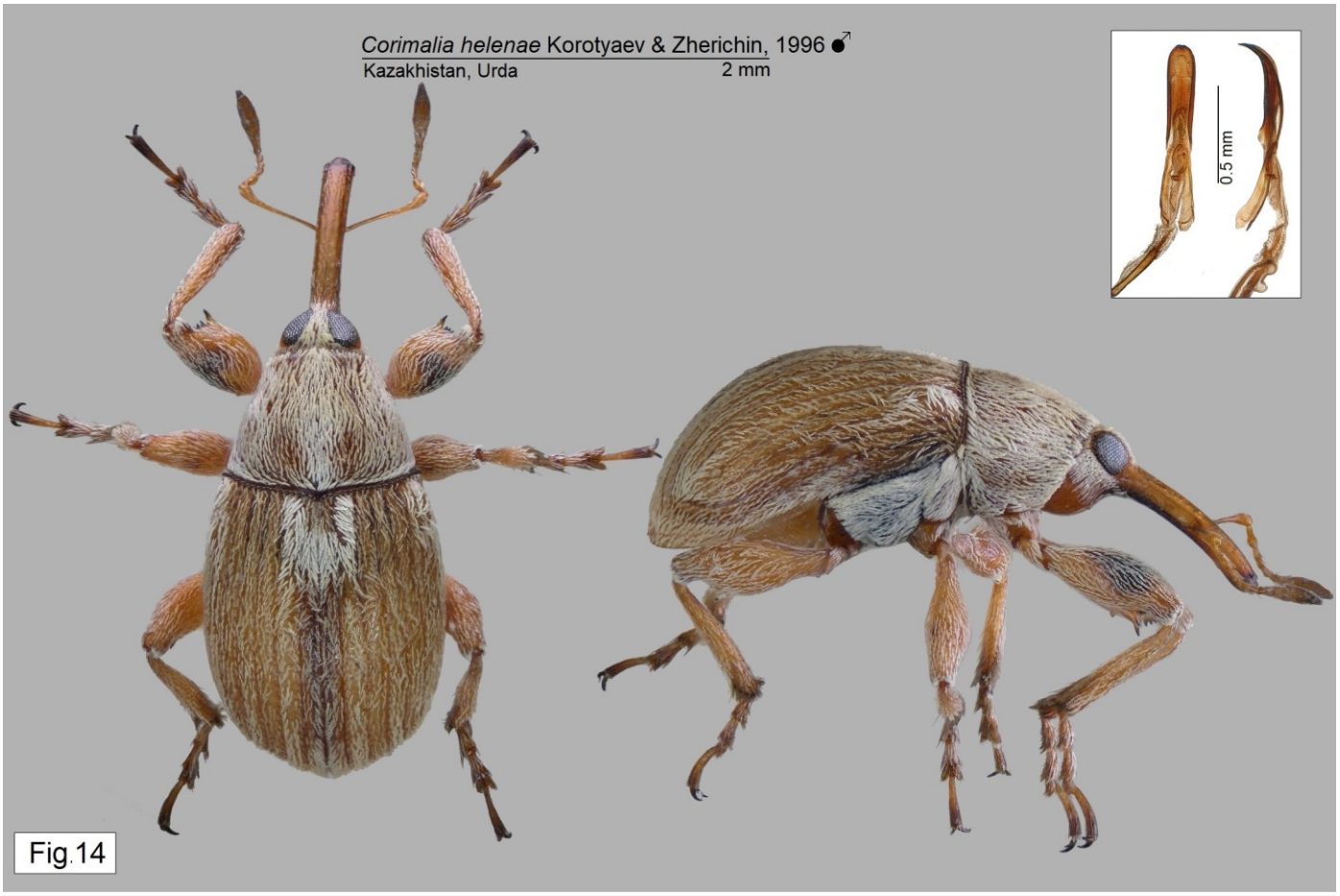

Corimalia helenae Korotyaev & Zherichin, 1996 ♂
Kazakhistan, Urda
2 mm
0.5 mm

Fig.14

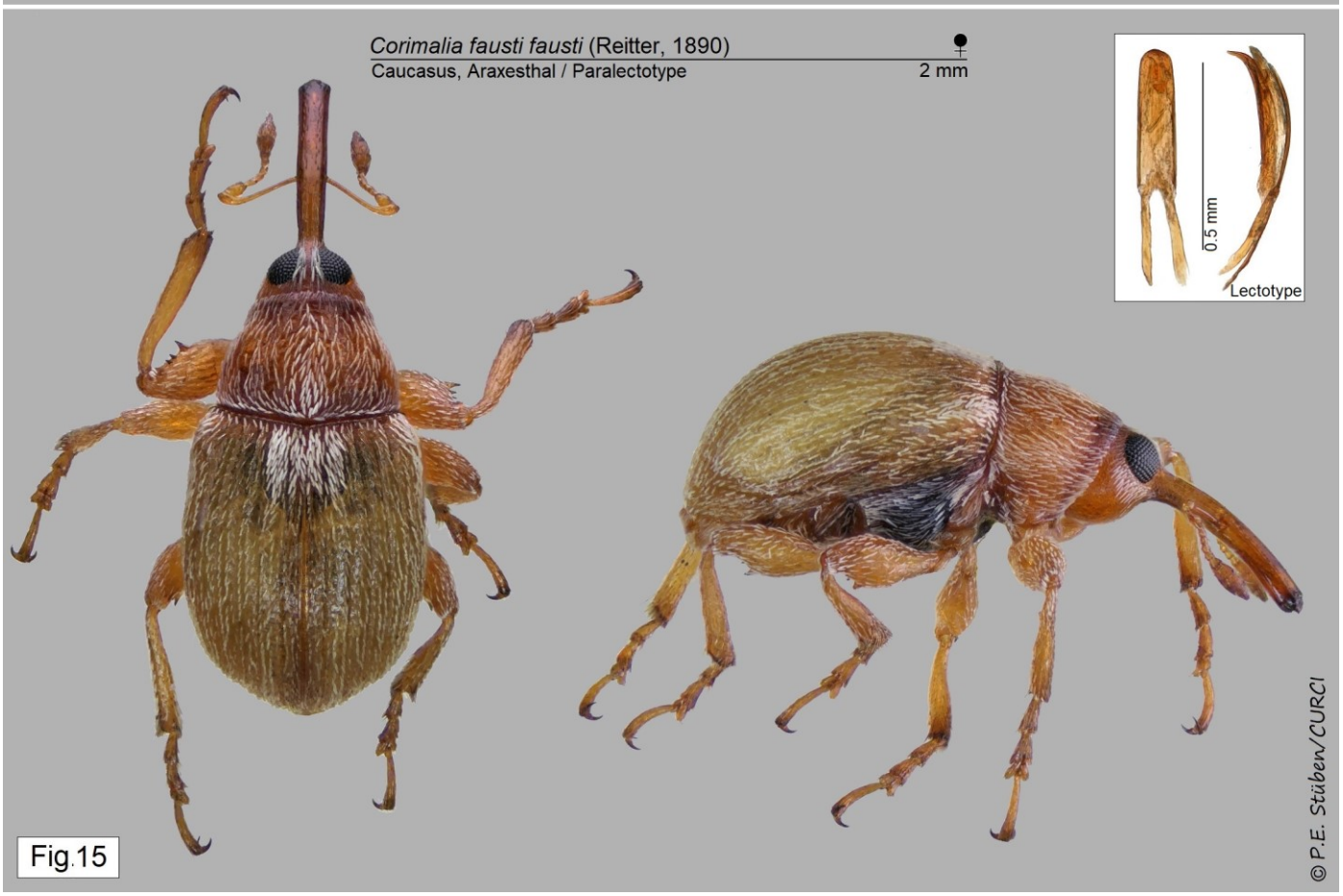

Corimalia fausti fausti (Reitter, 1890) ♀
Caucasus, Araxesthal / Paralectotype
2 mm
0.5 mm
Lectotype
© P.E. Stüben/CURCI

Fig.15

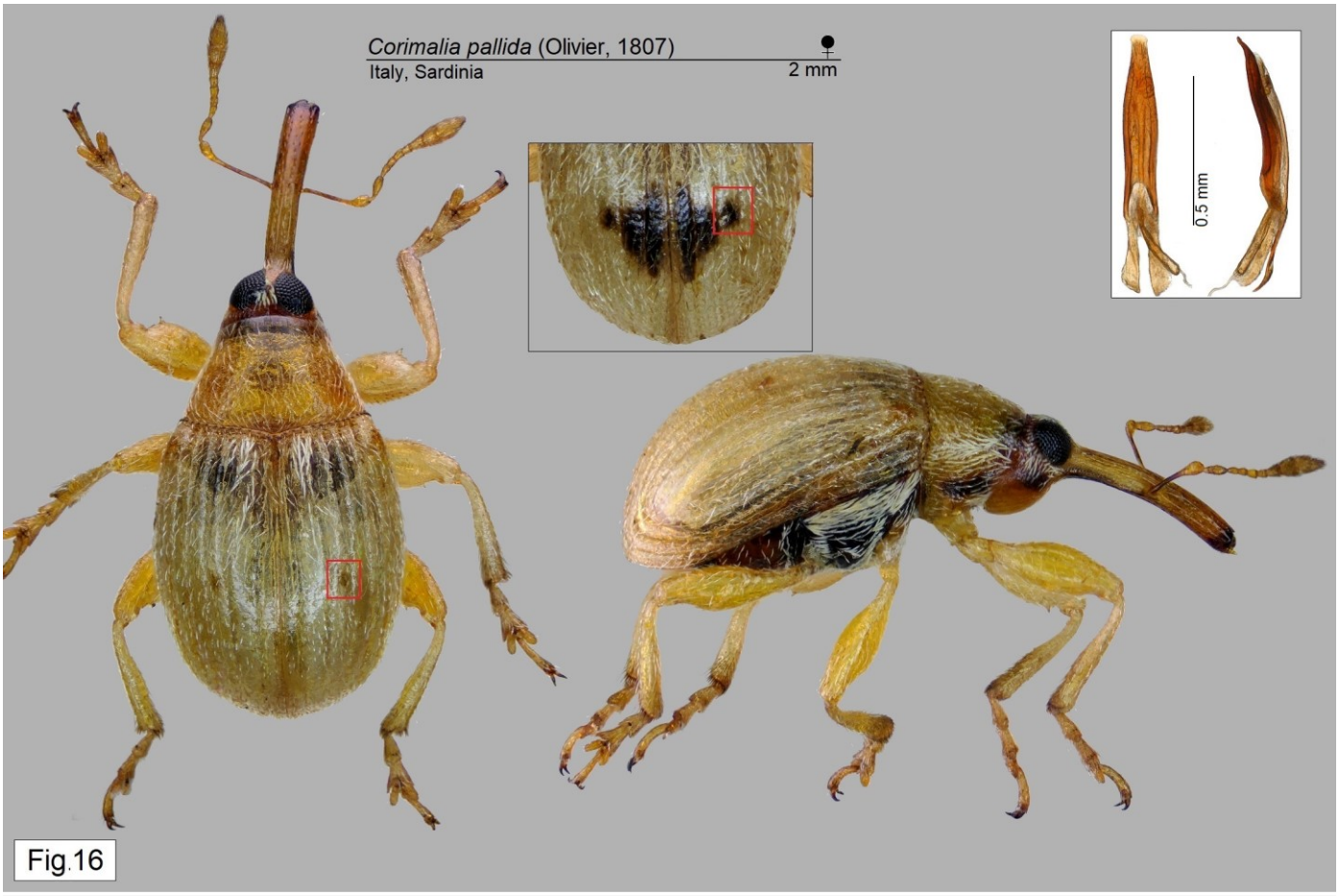

Corimalia pallida (Olivier, 1807)
Italy, Sardinia
2 mm
0.5 mm

Fig.16


Corimalia obscuripes (Pic, 1913)
Tadzikistan, Duschanbe
2 mm
0.5 mm

Fig.17

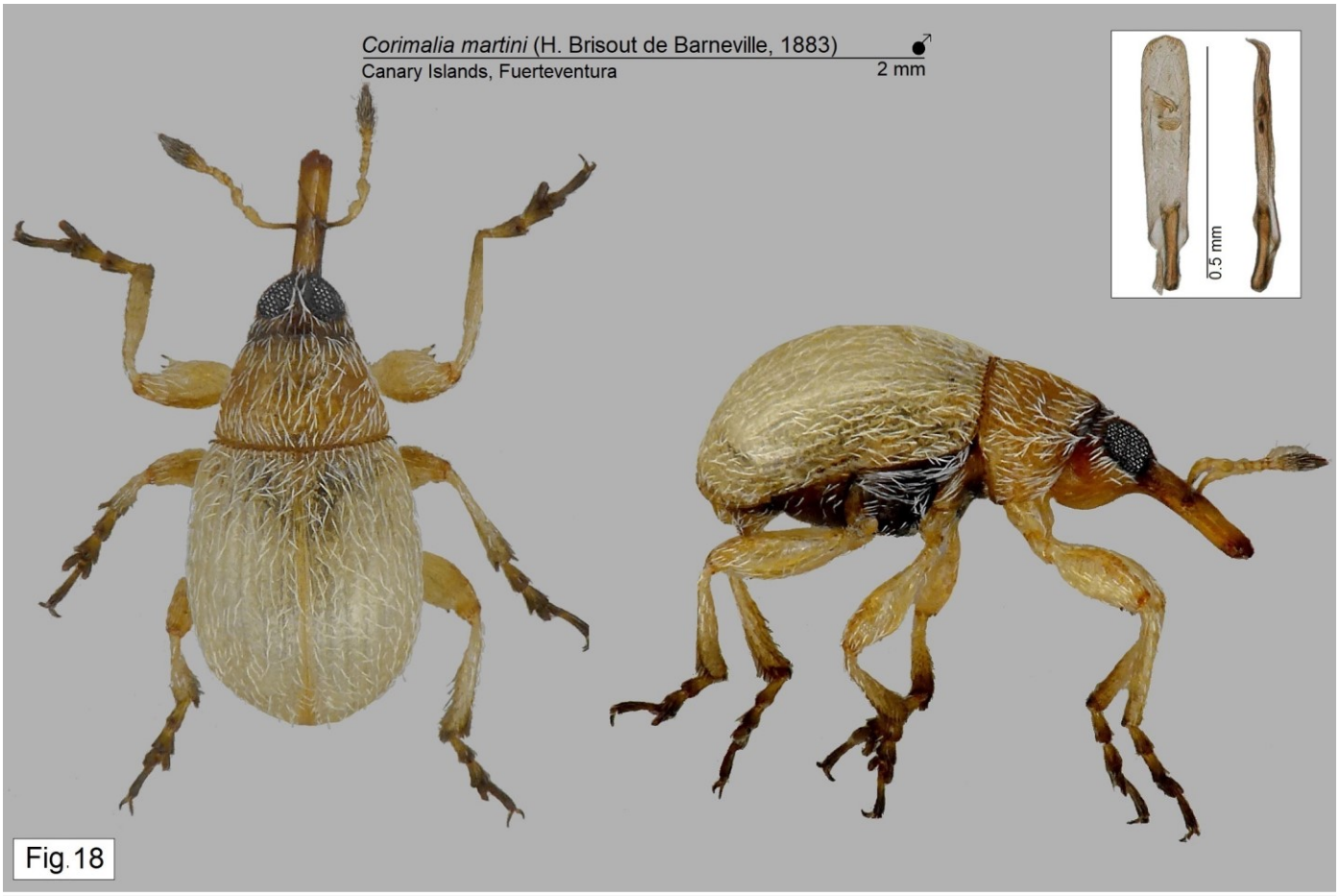

Corimalia martini (H. Brisout de Barneville, 1883) ♂
Canary Islands, Fuerteventura
2 mm
0.5 mm

Fig.18

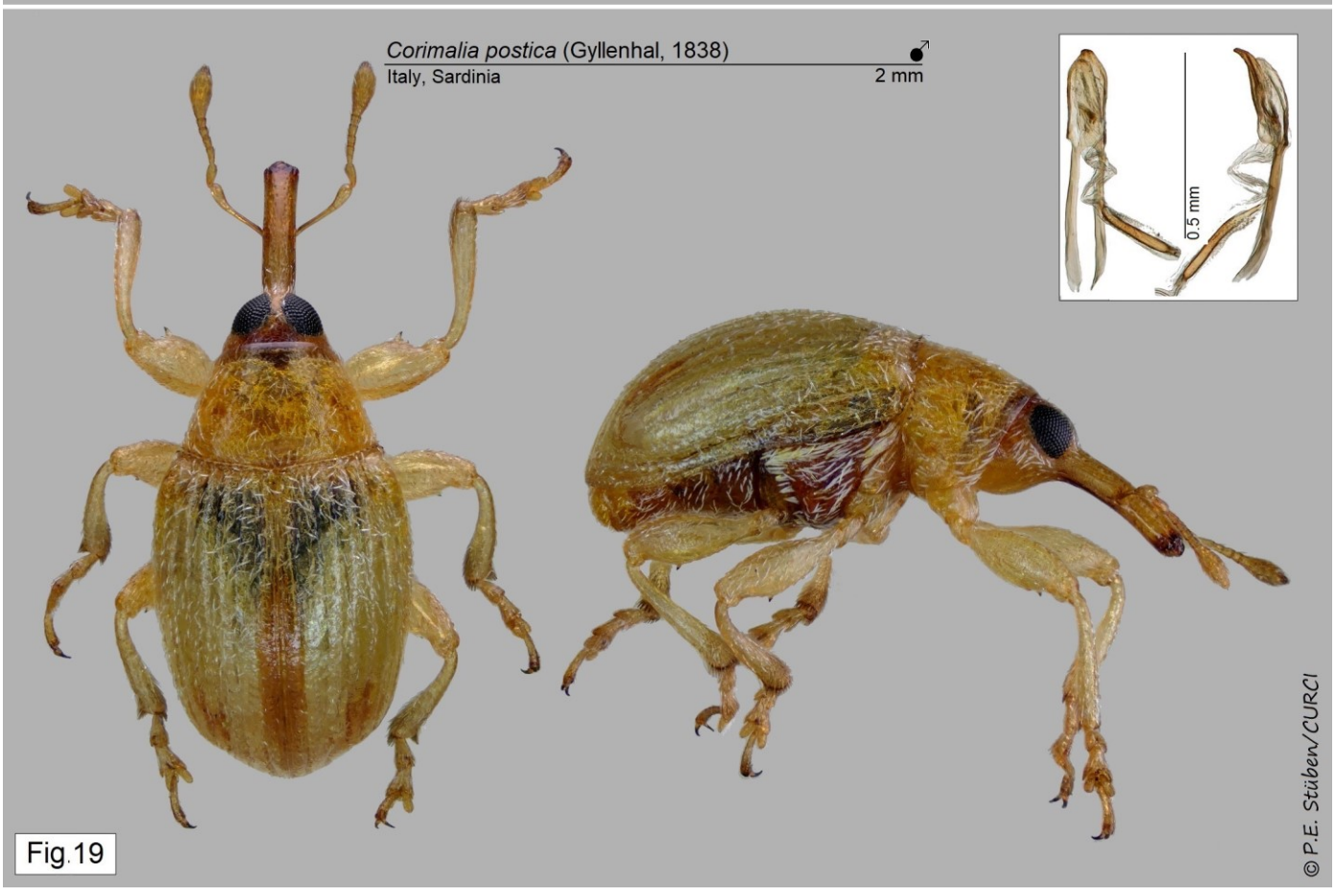

Corimalia postica (Gyllenhal, 1838) ♂
Italy, Sardinia
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.19

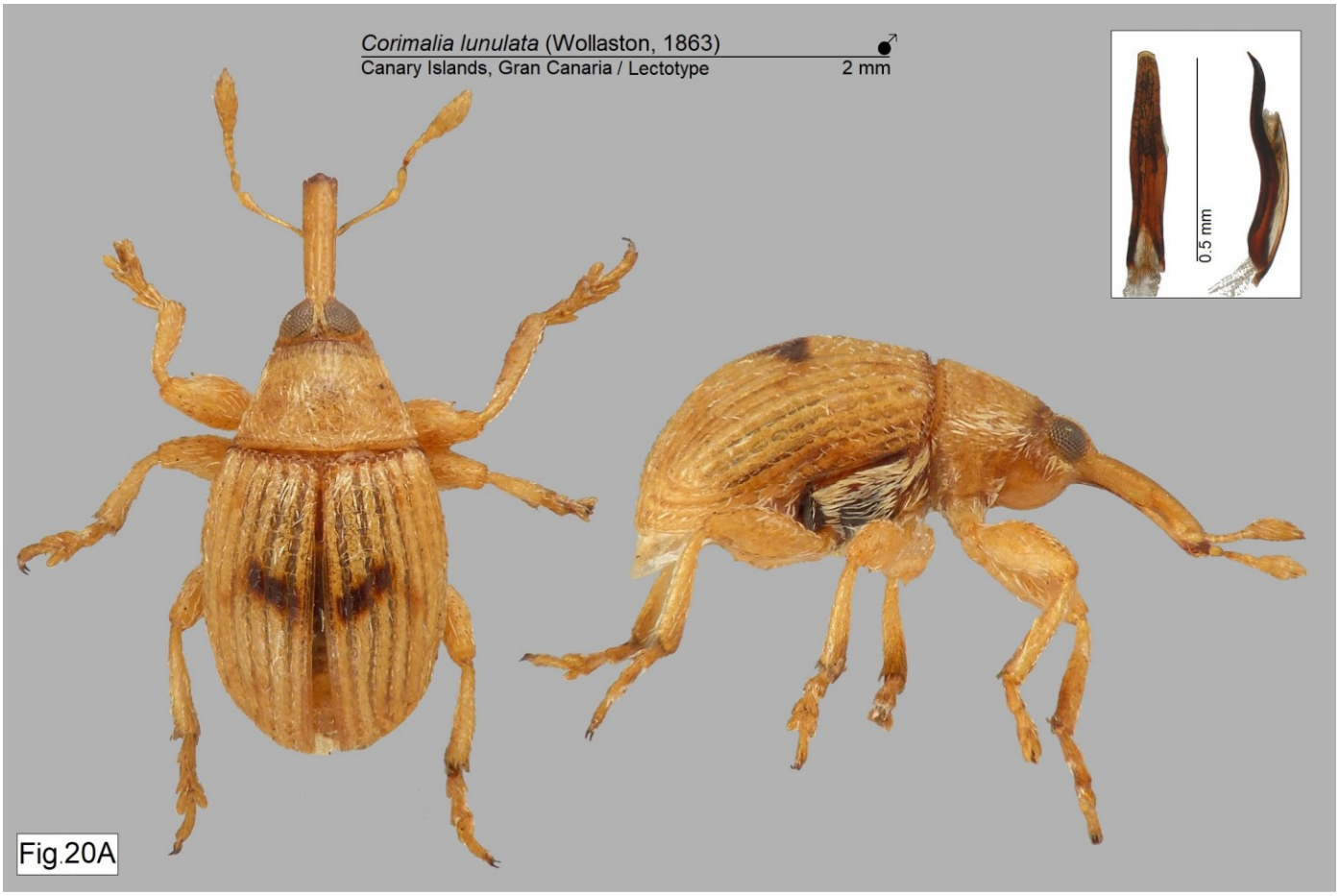


Fig.20A

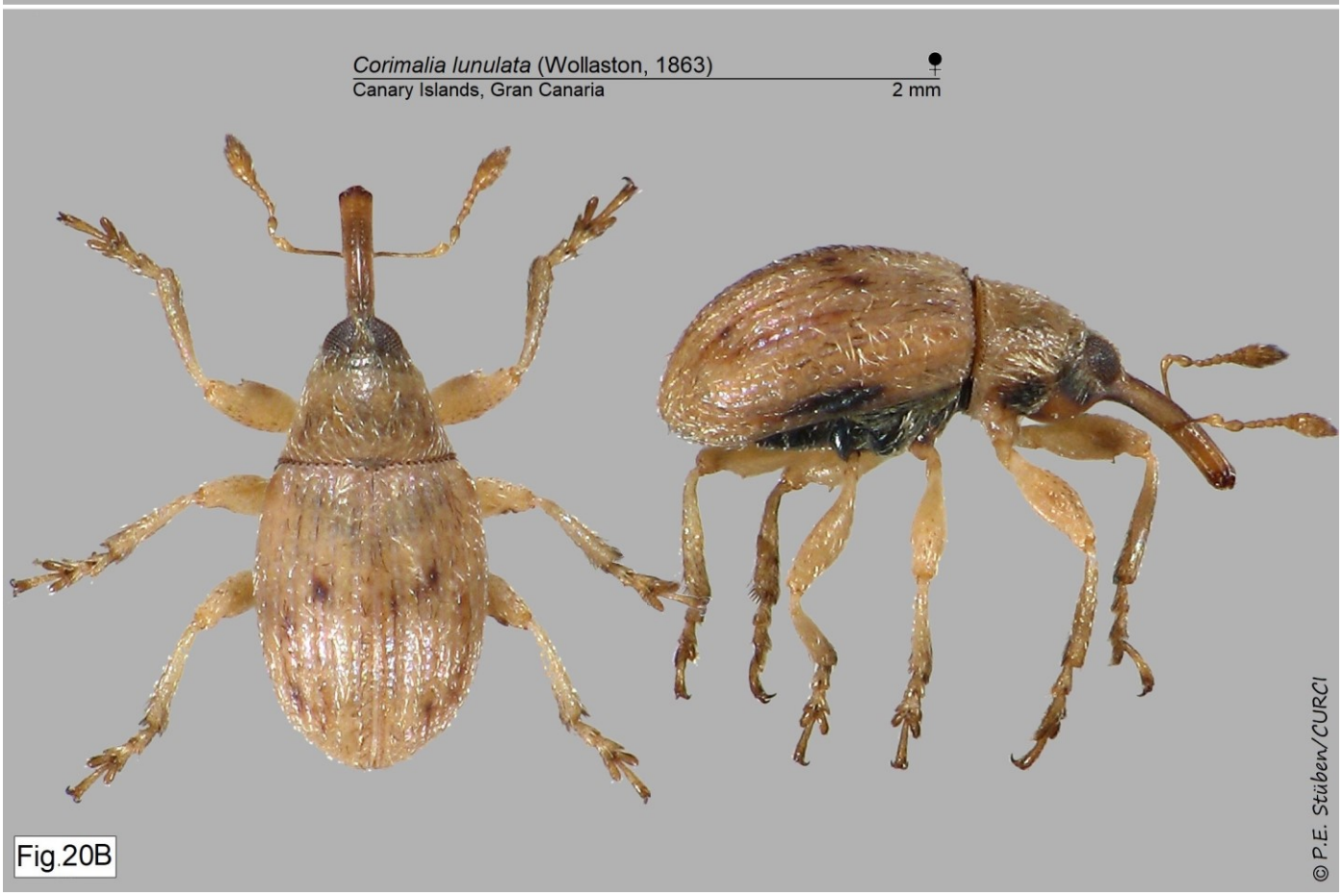


Fig.20B


♀ Lectotype
"Syria"
Allomalia gemmaria (Faust, 1887)
Iraq, Baghdad
♂
2 mm
0.5 mm

Fig. 21

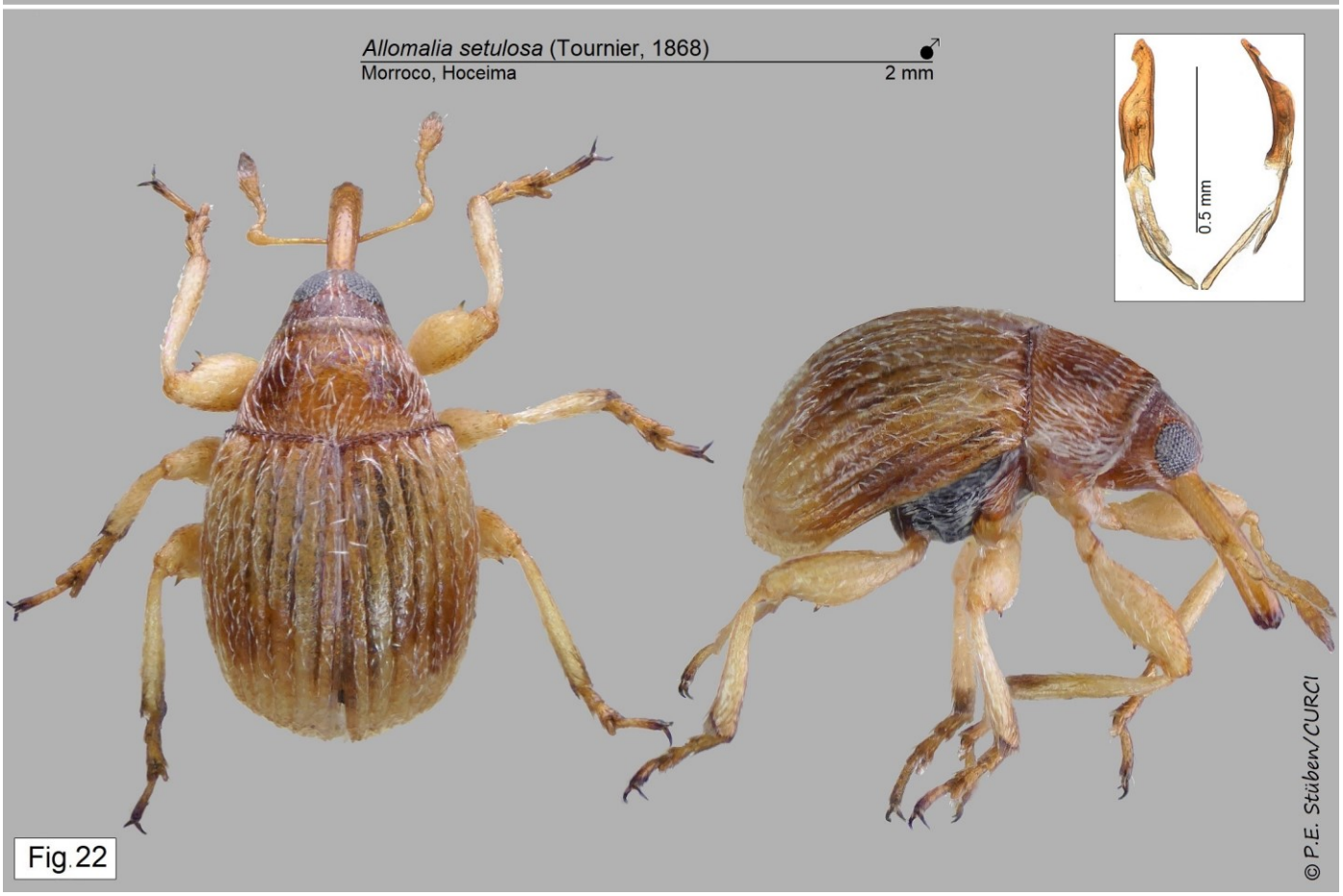

Allomalia setulosa (Tournier, 1868)
Morroco, Hoceima
♂
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig. 22


Allomalia quadrivirgata (A. Costa, 1863) ♂
Italy, Sicily
2 mm
0.5 mm

Fig.23

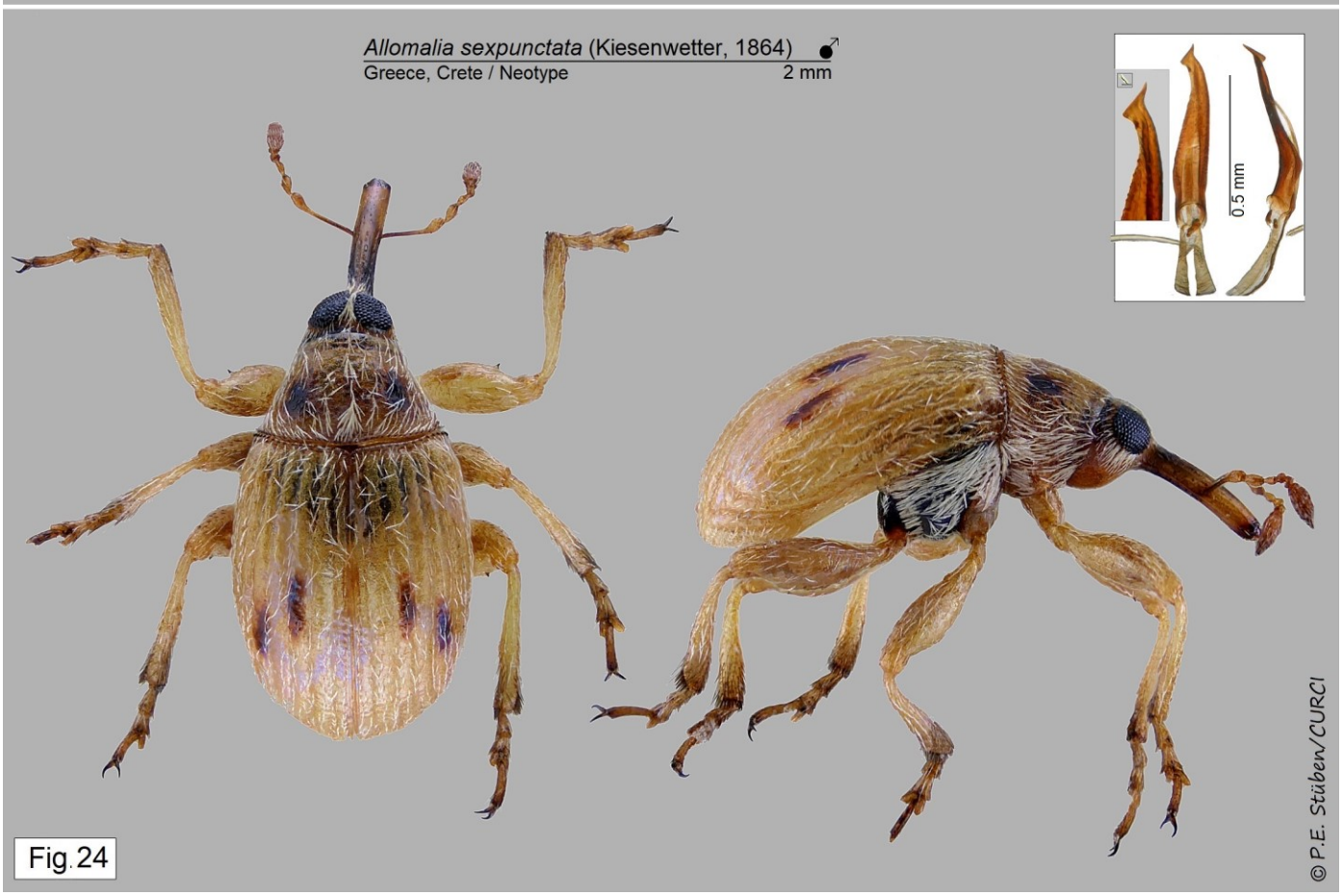

Allomalia sexpunctata (Kiesenwetter, 1864) ♂
Greece, Crete / Neotype
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.24


Allomalia armeniaca Stüben & Schön 2023
Turkey, Süleymanli / Holotype
♂
2 mm
0.5 mm

Fig.25

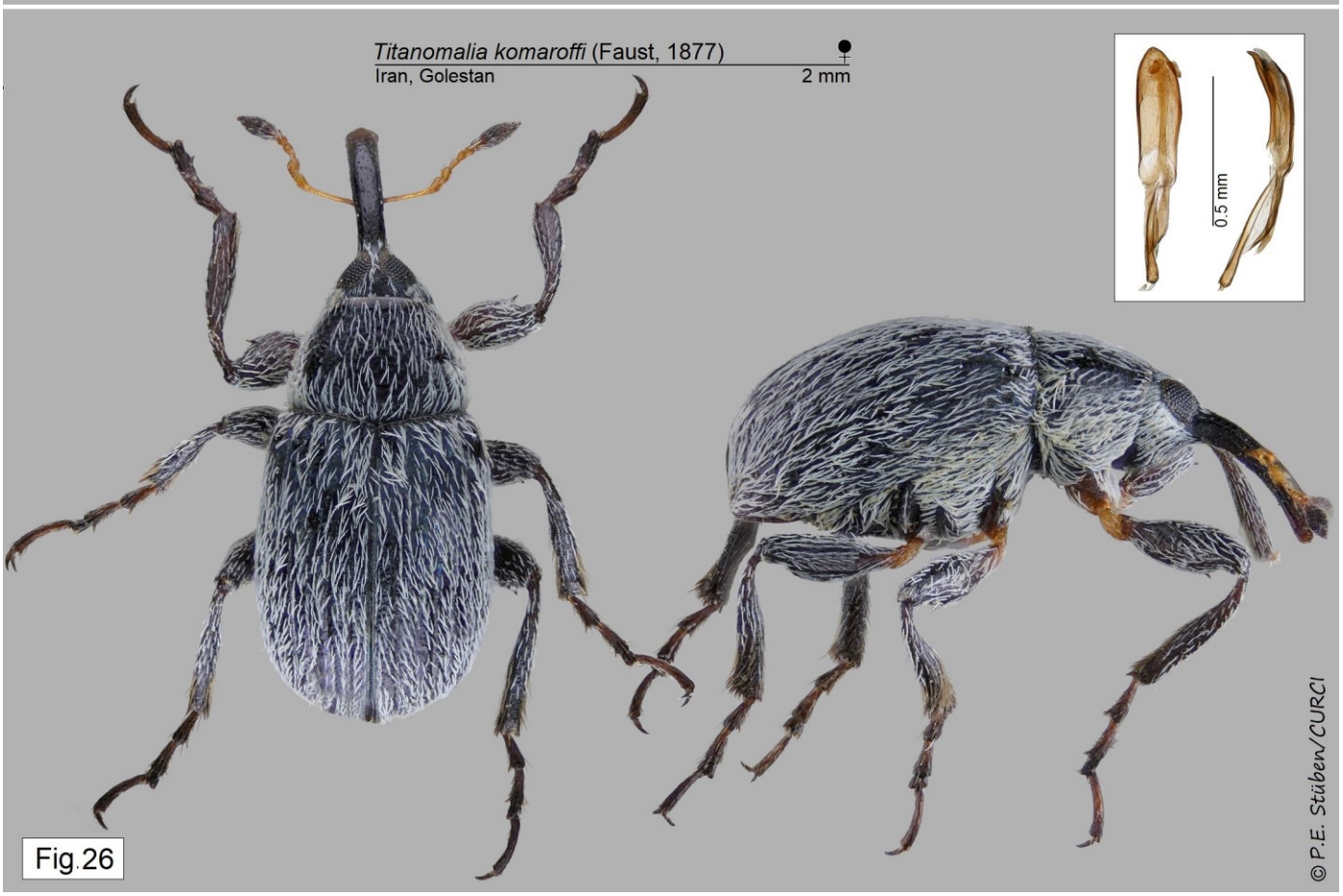

Titanomalia komaroffi (Faust, 1877)
Iran, Golestan
♀
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.26

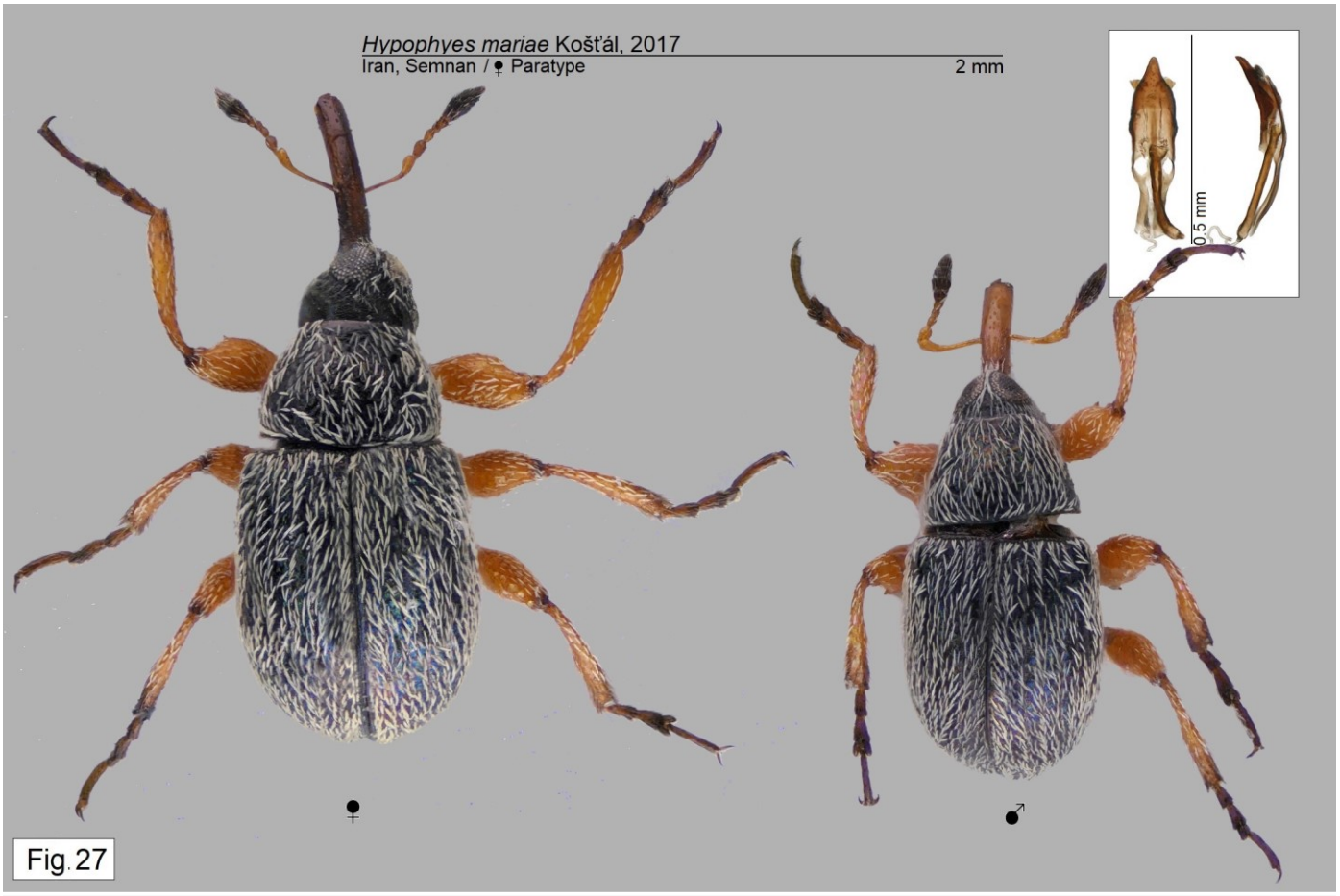

Hypophyes mariae Košťál, 2017
Iran, Semnan / ♀ Paratype
2 mm
0.5 mm
♀
♂

Fig. 27

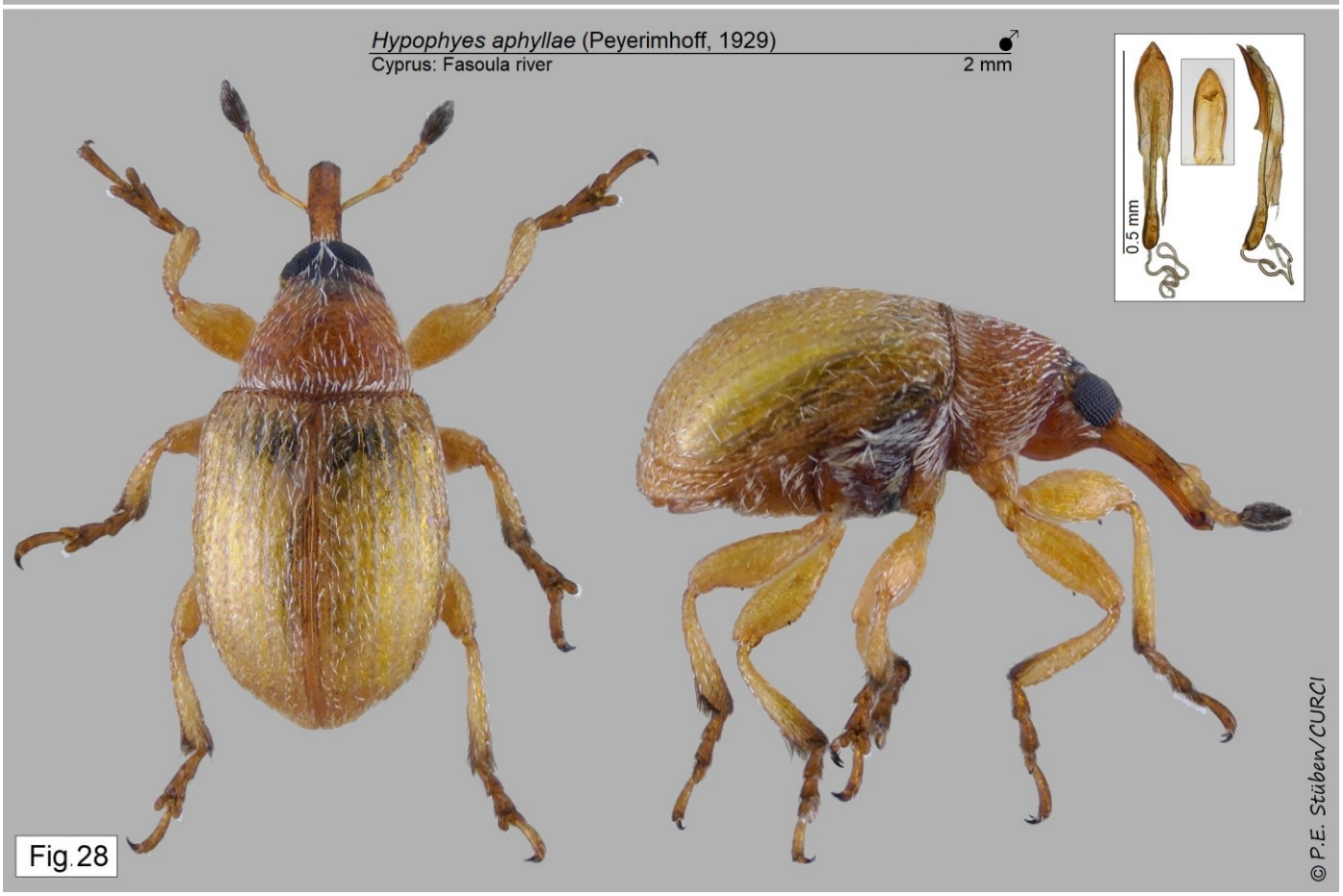

Hypophyes aphyllae (Peyerimhoff, 1929) ♂
Cyprus: Fasoula river
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig. 28

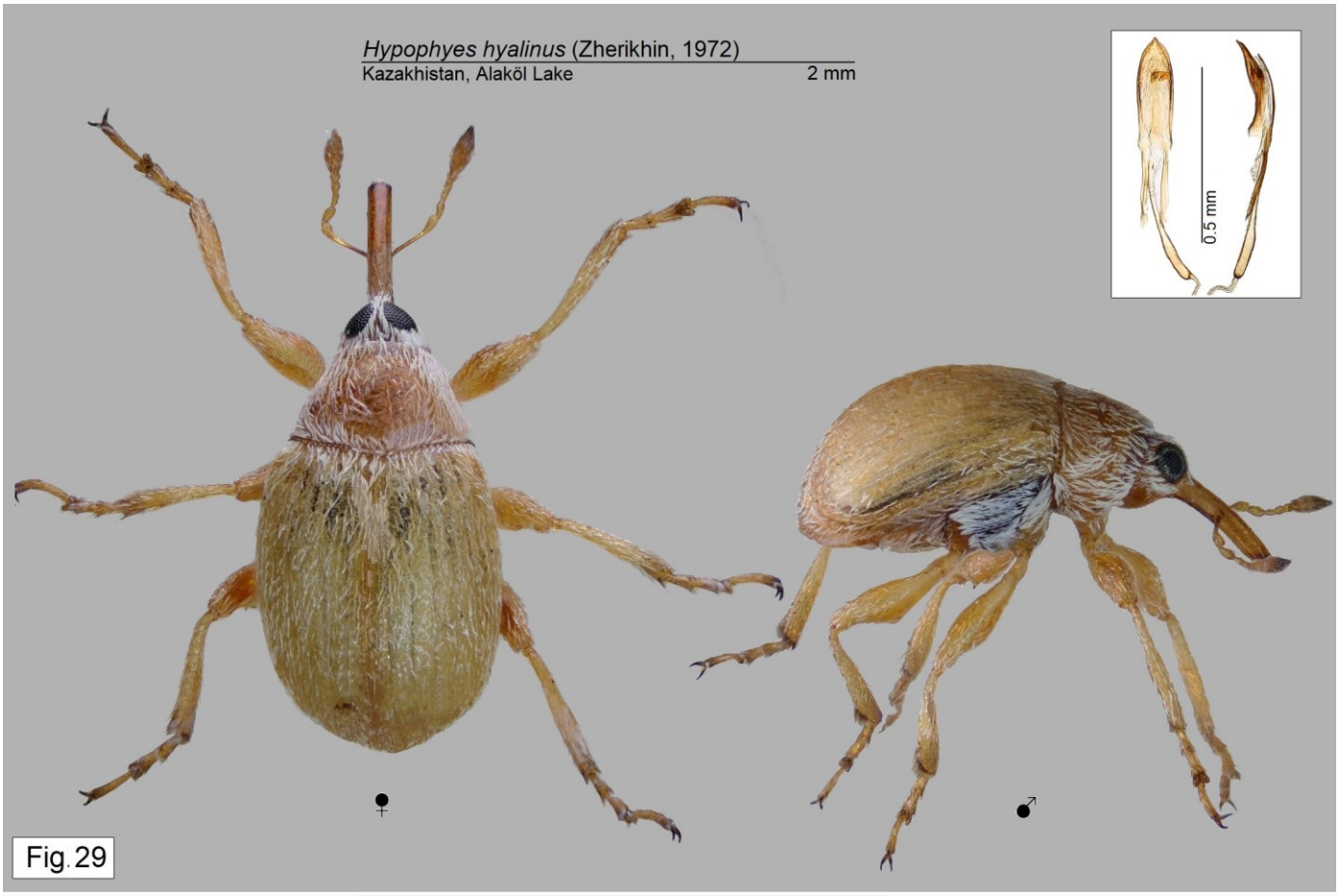
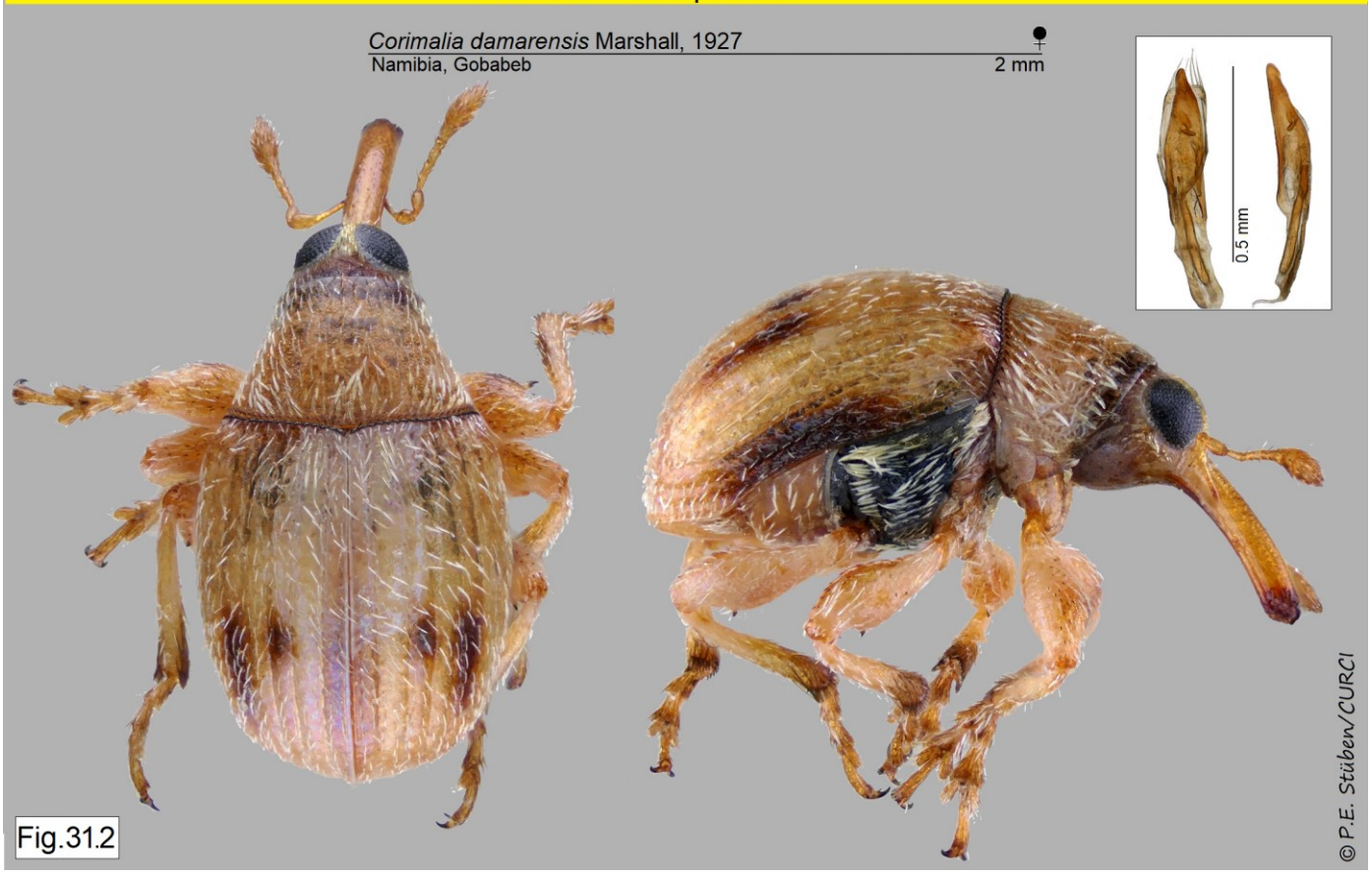

Hypophyes hyalinus (Zherikhin, 1972)
Kazakhistan, Alaköl Lake
2 mm
0.5 mm
♀
♂

Fig. 29


Hypophyes pallidulus (Gravenhorst, 1807) ♂
Azores
2 mm
0.5 mm
© P.E. Stüben

Fig. 30

Namibia: Svakop River



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Appendix

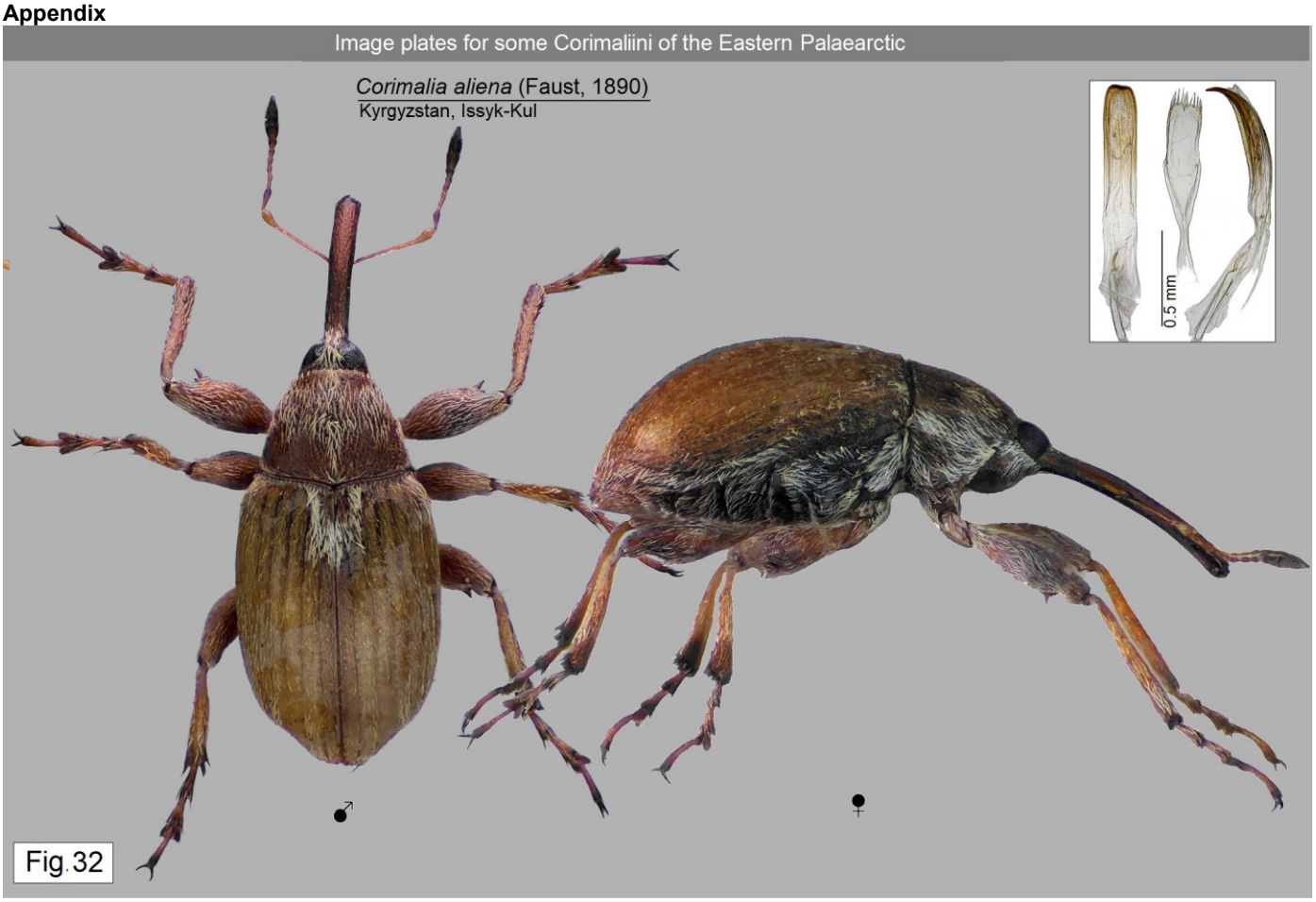
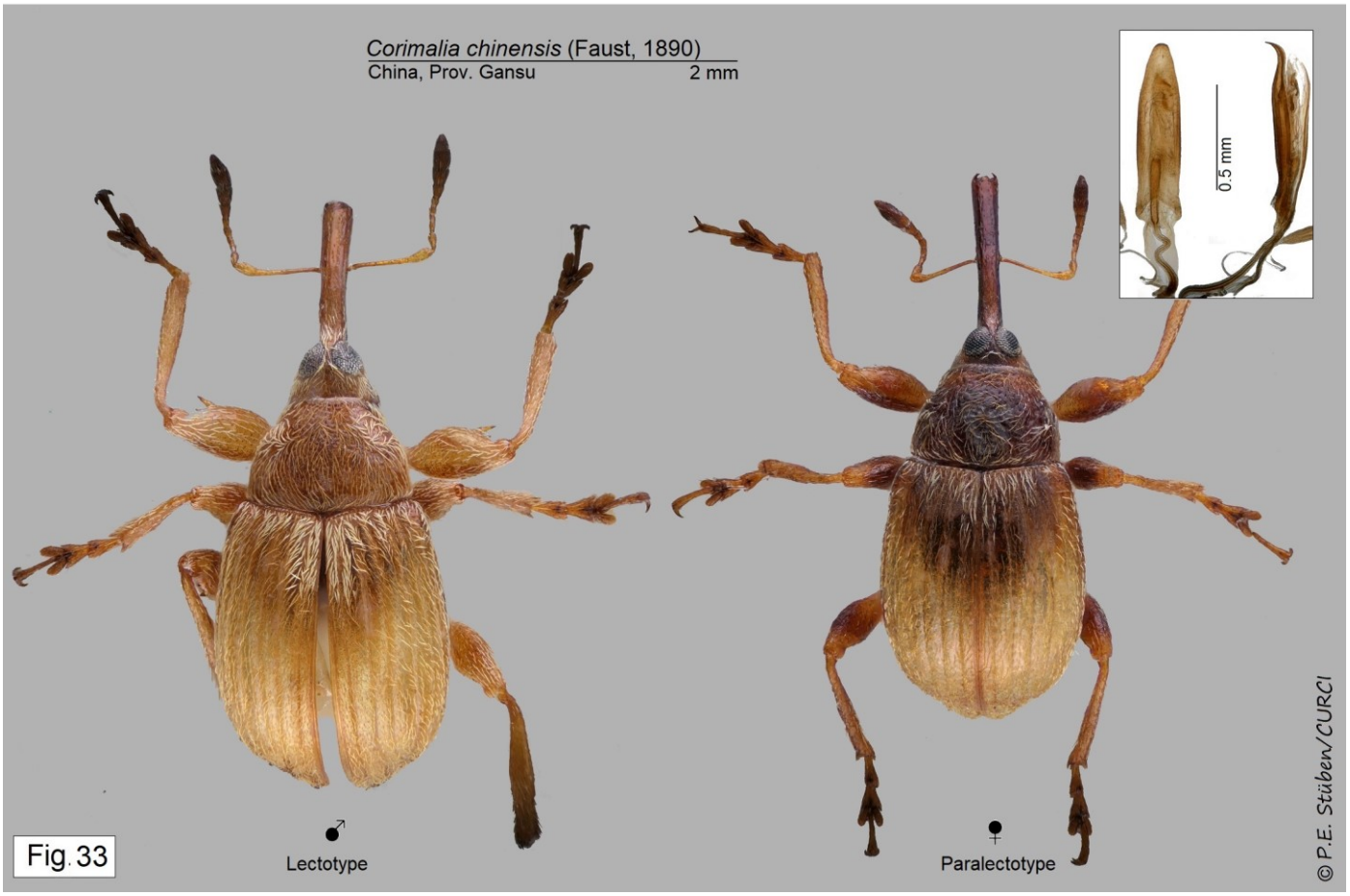


Image plates for some Corimaliini of the Eastern Palaearctic
Corimalia aliena (Faust, 1890)
Kyrgyzstan, Issyk-Kul
0.5 mm
♂
♀
Fig. 32


Corimalia chinensis (Faust, 1890)
China, Prov. Gansu
2 mm
0.5 mm
♂
Lectotype
♀
Paralectotype
Fig. 33
© P.E. Stüben/CURCI

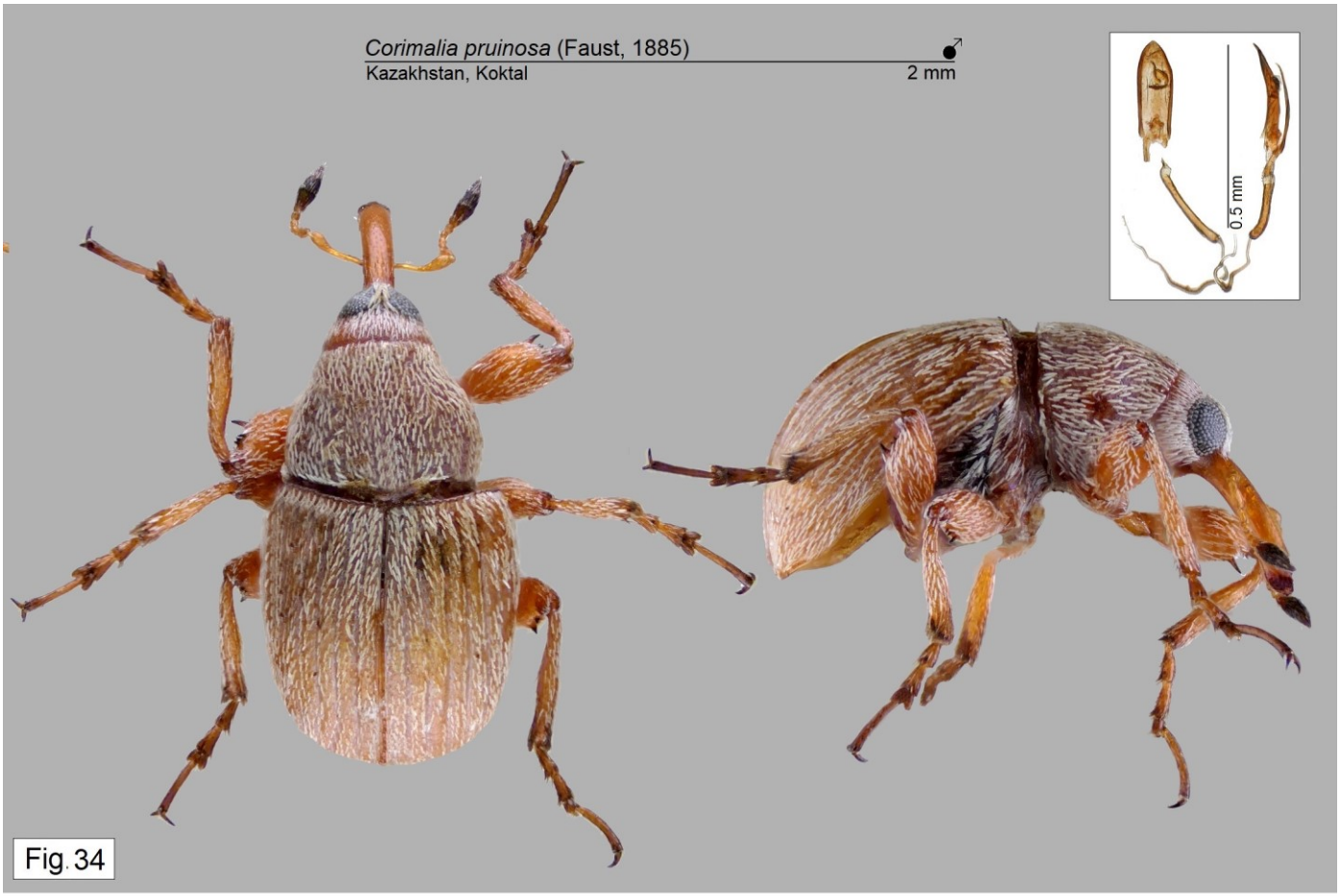

Corimalia pruinosa (Faust, 1885)
Kazakhstan, Koktal
♂
2 mm
0.5 mm

Fig. 34


Corimalia fausti orientalis Zherichin, 1972
Kazakhstan, Lake Balkhash
2 mm
0.5 mm
♂
♀
© P.E. Stüben/CURCI

Fig. 35

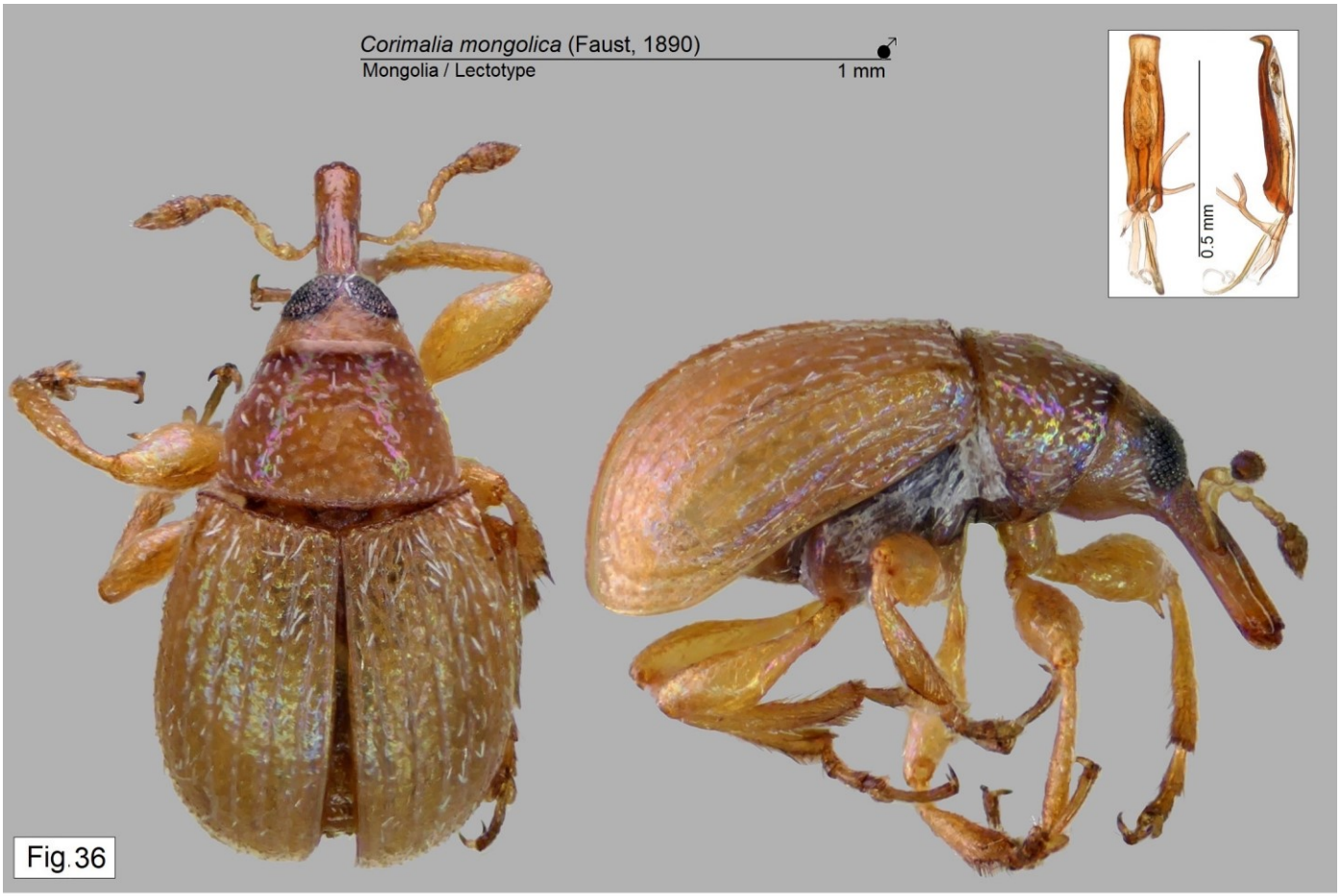

Corimalia mongolica (Faust, 1890) ♂
Mongolia / Lectotype
1 mm
0.5 mm

Fig. 36


Corimalia pilosella Voss, 1960 ♀
Afghanistan, Chorband Valley / Holotype
2 mm
Holotypus
J. Klapperich
„Ghorbandtal
1900 m, 26.8.52
O-Afghanistan
© P.E. Stüben/CURCI

Fig. 37

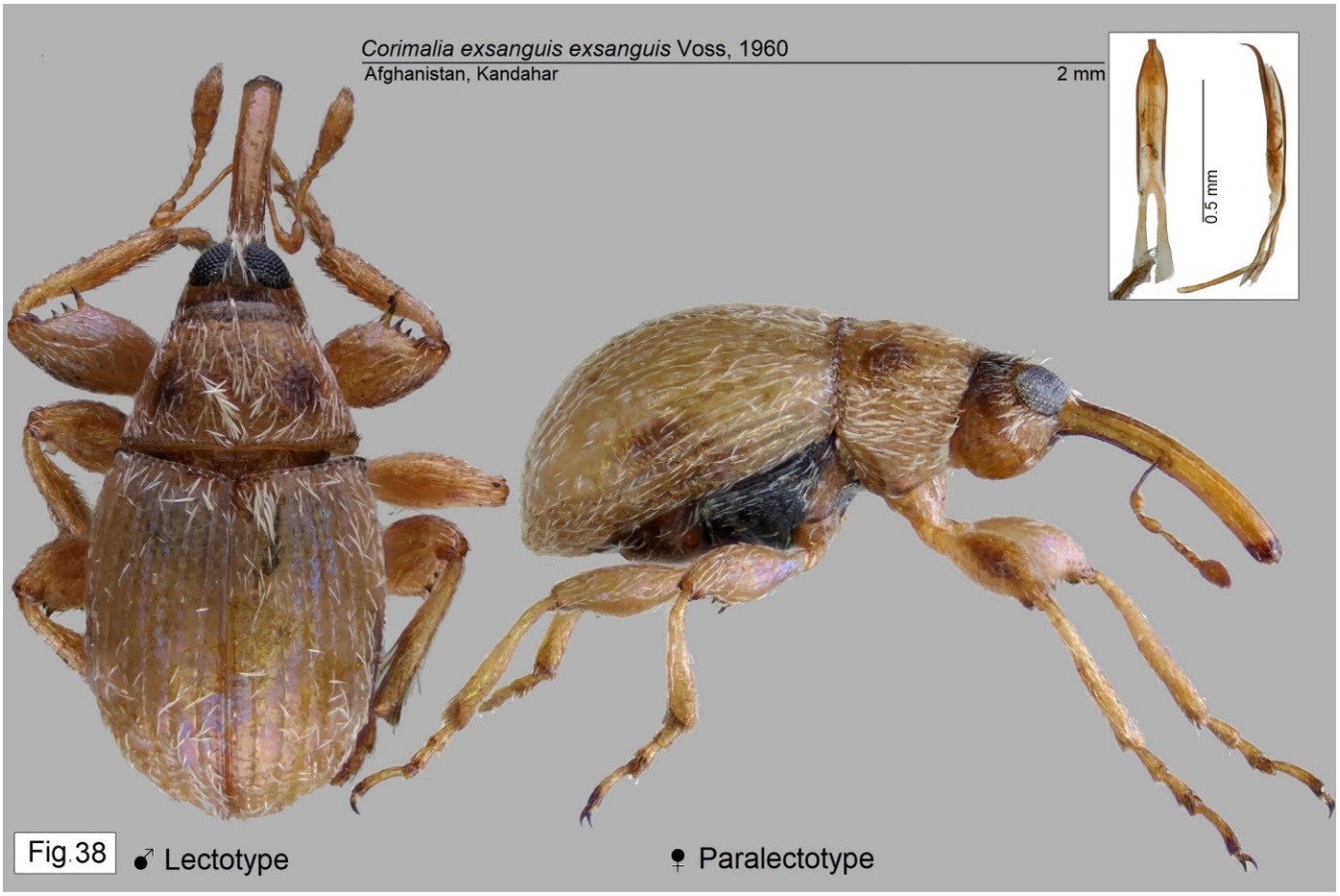

Corimalia exsanguis exsanguis Voss, 1960
Afghanistan, Kandahar
2 mm
0.5 mm
♂ Lectotype
♀ Paralectotype

Fig.38

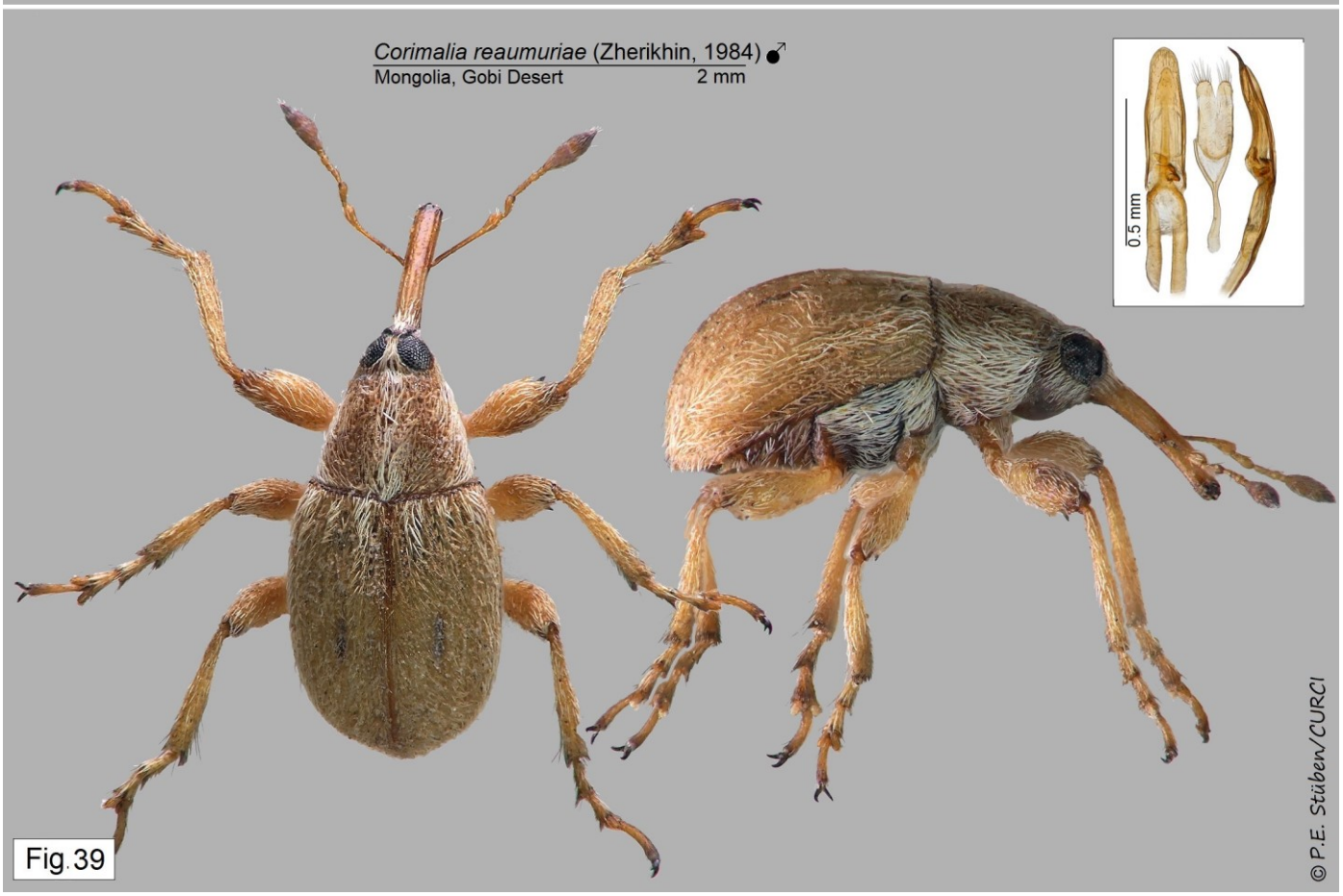

Corimalia reaumuriae (Zherikhin, 1984) ♂
Mongolia, Gobi Desert
2 mm
0.5 mm
© P.E. Stüben/CURCI

Fig.39


Hypophyes exiguus exiguus (Faust,1890)
Mongolia (Etsine River)
2 mm
♂ Lectotype
♀ Paralectotype

Fig.40

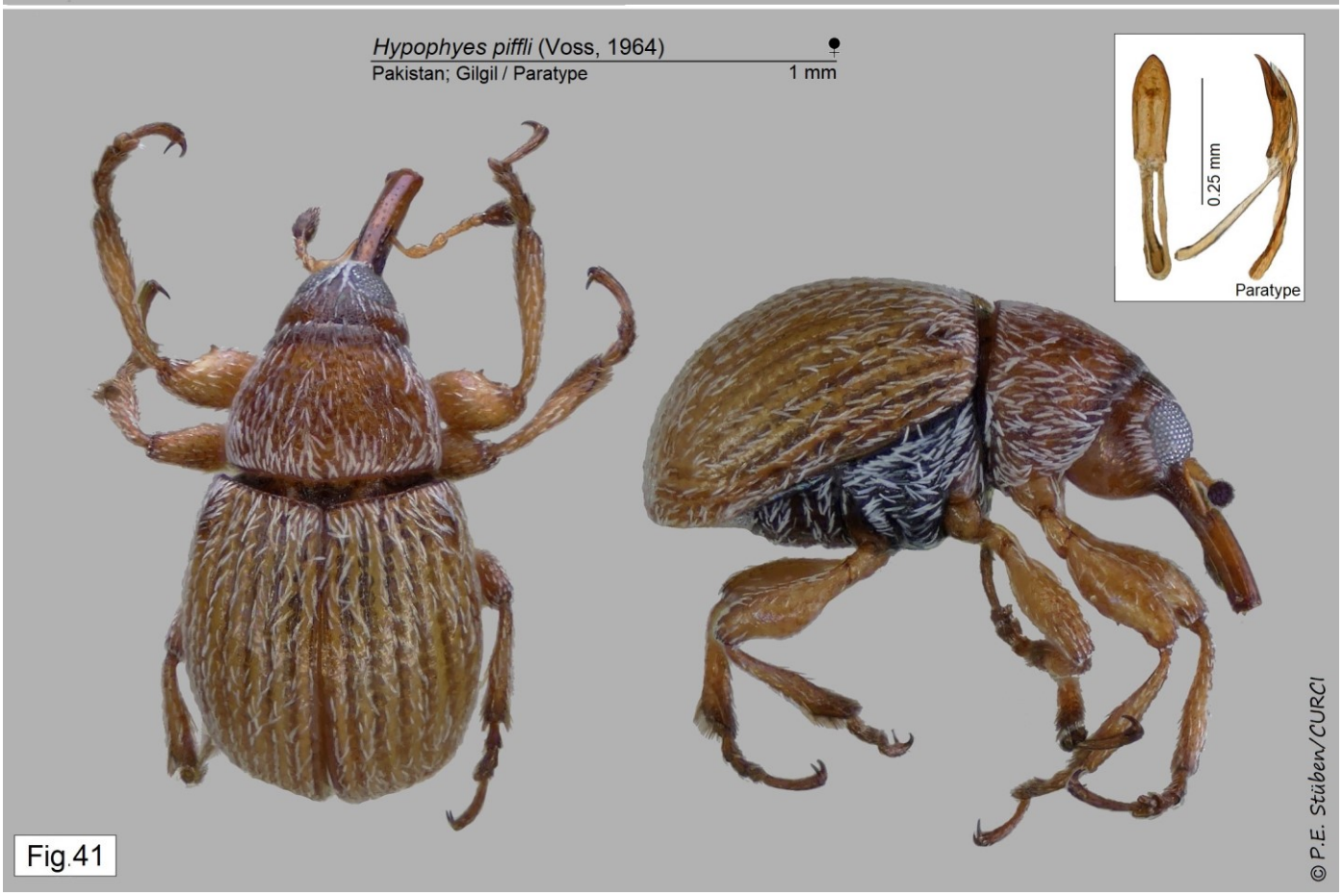

Hypophyes piffli (Voss, 1964) ♀
Pakistan; Gilgil / Paratype
1 mm
0.25 mm
Paratype
© P.E. Stüben/CURCI

Fig.41