



A new Cryptorhynchinae (Coleoptera: Curculionidae) species from southern Italy belonging to the *Kyklioacalles aubei* complex

by
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Abstract. In an integrative taxonomic study based on both, molecular and morphological evidence, *Kyklioacalles italomeridionalis* sp.n. from southern Italy is described and distinguished from other species within the *Kyklioacalles aubei* complex. For three species from this complex, an mtCO1 Neighbor Joining tree, a distance matrix, and an initial distribution map are presented. Future studies will be required to describe further adjacent species or subspecies from this complex. An appendix contains the original mtCO1 sequences (658 bp), which have not yet been published anywhere else.

Keywords. Integrative taxonomy, morphology, mtCO1, barcoding, Neighbor Joining tree, distance matrix, Western Palearctic, Europe, Italy.

Nomenclatural act.

Kyklioacalles italomeridionalis Stüben sp.n.

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Introduction

Based on morphological and molecular samples, collections, and studies, I had long been aware that there must be another species in southern Italy belonging to the widely distributed, Western Palearctic *Kyklioacalles aubei* complex. After further excursions in June 2025 to Campania, Basilicata, and Calabria, this impression was confirmed, and we concluded that we were dealing with a clearly separable additional species in the Mediterranean region. Also in 2025, we separated the species *Kyklioacalles ocellus* Stüben & Astrin, which is widespread in the Caucasus, from the *K. aubei* complex (Stüben 2018, Stüben et al. 2025), and according to my current knowledge (see Fig. 4 below), we can expect to find further species or subspecies (e.g., from Sicily).

It was therefore necessary to re-examine the lectotype and paralectotypes from the Swedish Museum of Natural History (Stockholm) that I had already designated in 2003. And since I already had extensive material from numerous locations following my own travels to the locus typicus in eastern France's 'Gallia orientalis' (see Stüben 2026), a preliminary distribution pattern of the three species could be undertaken, although comprehensive or even definitive delineations are not yet possible (see Fig. 5). This must be left to later faunistic studies, taking into account any further taxa from the aforementioned *K. aubei* complex. We are still completely in the dark about the few specimens from Bulgaria, the mountain forests of the Turkish Black Sea coast, and - far to the west - the Pyrenees.

Kyklioacalles italomeridionalis sp. n.

(Fig. 1-3, 5, 6)

Type material (see also appendix 1 and 2)

Holotype: ♂, I. Basilicata, near Castelgrande, 40°47'19"N 15°26'44"E, 864 m, mixed forest, 02.06.2025, sifting, leg. Stüben (FO45), DNA (mtCO1): 4366-PST (sequence see Appendix 1), coll. Senckenberg, Deutsches Entomologisches Institut (SDEI) // **Paratypes:** 1♀, I., Campania, Cilento, 2km N San Mauro Cilento, 40°14'19.75" N15°3'22.83"E, 28.5.2025, 858m, sifting, *Quercus*, leg. Stüben

(36), coll. SDEI / 1♂, I., Campania, Cilento, 3km S Laurino, 25.5.2025, 40°18'53.76"N 15°19'44.99"E, 707m, *Fagus*, leg. Stüben (25), DNA (mtCO1): 4356-PST (sequence see Appendix 1), coll. Stüben / 1♂, I., Campania, Cilento, 1km S Laurino, 27.5.2025, 40°19'29.57" N15°19'57.18"E, 603m, sifting, *Castanea*, leg. Stüben (31), DNA (mtCO1): 4358-PST (sequence see Appendix 1), coll. Stüben / 1♂, I., Campania, Monti Picentini, 4 km E Acerno, N40°44'17" E15°5'43", 831m, *Fagus*, 3.7.2008, leg. Stüben (11), coll. Stüben / 1♂, I., Campania, Cilento, 12 km NE Vallo d. Lucania: N Rofrano, N40°17'06" E15°23'07", 1201 m, *Fagus*, 1.7.2008, leg. Stüben (8), coll. Stüben / 1♂, I., Campania, Cilento, 17 km W Vallo d. Lucania: Monte d. Stella, N40°14'15" E15°03'52", 1123 m, *Quercus*, *Castanea*, 2.7.2008, leg. Stüben (9), coll. Stüben / 2♂, I., Campania, Cilento, 6 km SE Vallo d. Lucania: Monte Sacro (Gelbison), N40°12'41" E15°19'42", 1544m, *Fagus*, 31.6.2008, leg. Stüben (2), DNA (mtCO1): I-624-aub (GenBank: GU987969), coll. ZFMK / 1♂, I., Campania, Cilento, 5 km S Vallo d. Lucania: near S. Biase, N40°11'26" E15°16'29", 562 m, *Quercus ilex*, 31.6.2008, leg. Stüben (4), coll. Stüben / 1♀, Campania, Cilento, Monte Bulgheria, 800m, 20.4.1992, leg. Gardini, coll. SDEI / 2♂, I., Basilicata, Monte Pollino, 9 km E Rotonda: Timpa d. Demonio, N39°57'31" E16°08'39", 1254 m, *Fagus*, 5.7.2008, leg. Stüben (15), coll. Stüben / 6♂, I., Basilicata, Monte Pollino, 4 km SE Rotonda: Zarafa, N39°56'33" E16°04'28", 677 m, *Quercus ilex*, 7.7.2008, leg. Stüben (17), coll. Stüben / 1♀, I., Calabria (north), Monti di Orsomarso, 4 km E Orsomarso, Fiume Argentino, N39°47'58" E 15°57'21", 111m, *Alnus*, 10.7.2008, leg. Stüben, coll. SDEI / 1♀, I., Lazio, Carpineto Romano: 2 km SE La Faggeta, mixed forest, limestone, sifting, N41°35'20" E13°05'43", 793m, 08.05.2014, leg. Stüben & Schütte (14) coll. Stüben / 1♂, I., Lazio, Amatrice, Lago Scandarello, 28.7.1993, 1000m, leg. E. Colonnelli, coll. Natural History Museum, London.

No paratypes:

1 ex., I., Sicily, Monte Soro, 1830 m, sifting, *Fagus*, 5.2.2008, leg. Kapp, DNA (mtCO1): I-826-aub (GenBank: GU988092), coll. ZFMK / 1♀, I., Sicily, Messina, Nebrodi NP, Monte Soro, 37°55'28"N 14°39'57"E, 1563m, 20.04.2014, sifting, leg. Krátky, DNA (mtCO1): 2022-JKR (sequence see Appendix 1), coll. Stüben / 9♂, 8♀, I., Sicily, Monte Soro, 10 km NW Cesarò, P.N. del Nebrodi, 37°55'35"N 14°40'8"E, 1600m, 19.10.2002, *Fagus*, leg. Behne (19), coll. SDEI / 3♂, I., Calabria, P.N. dell'Aspromonte, 7 km SE Gambarie, 1600m, 38°6'46"N 15°52'00"E, *Fagus*, 22.10.2002, leg. Stüben & Behne (FO32), coll. Stüben & SDEI / 1♂, I., Udine, Friuli, Venezia Giulia, Sella Nevea (border with Slovenia), 46°23'55"N 13°30'18"E, 1031m, *Fagus*, 30.06.2016, sifting, leg. Stüben, DNA (mtCO1): 2896-PST (see Fig. 6 and the question mark on the map in Fig. 5; sequence see Appendix 1), coll. Stüben.

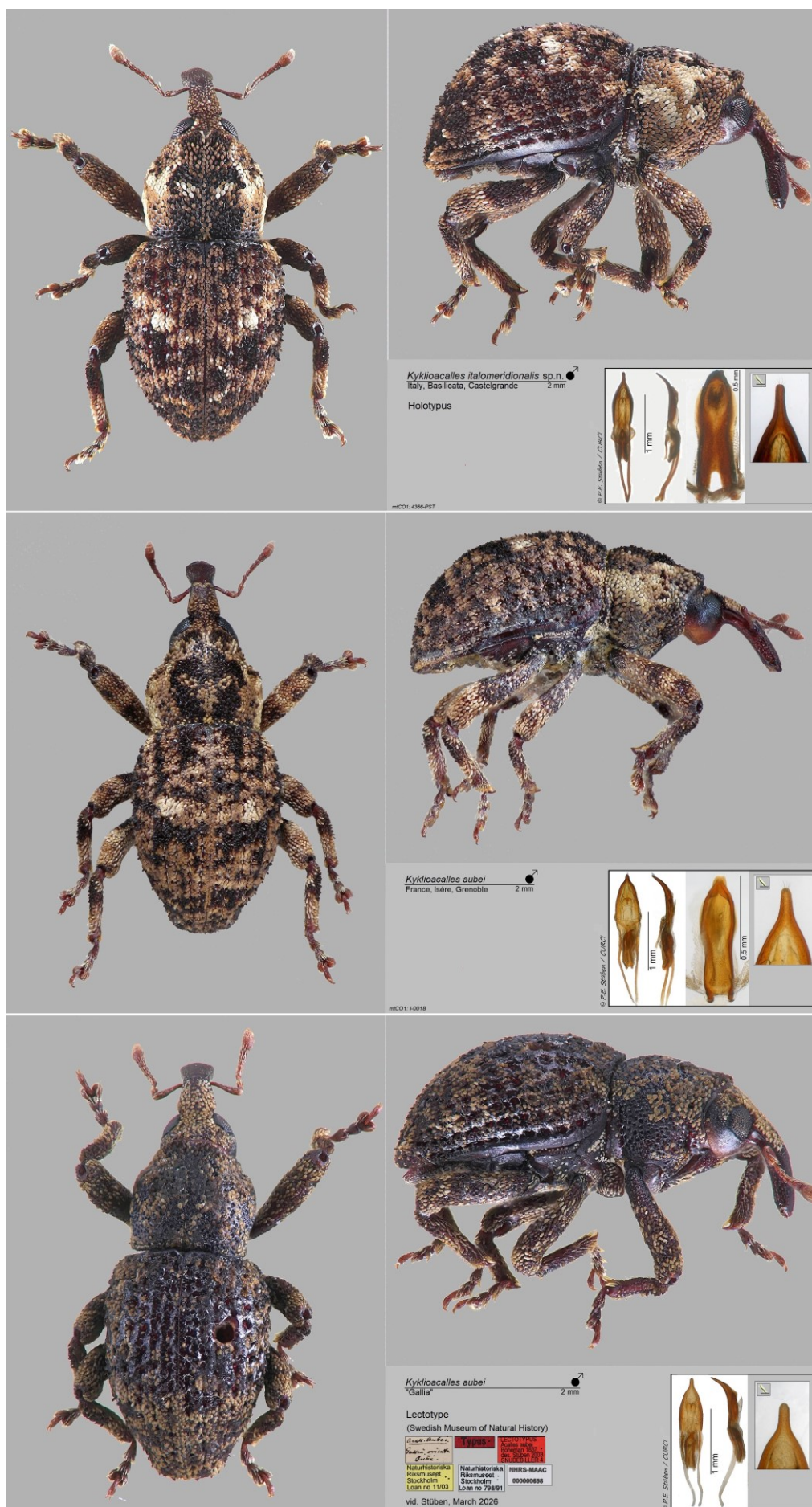


Fig. 1. Habitus and aedeagus in comparison of the sister species *Kykloacalles italomeridionalis* sp.n. and *K. aubei* (Boheman, 1837).

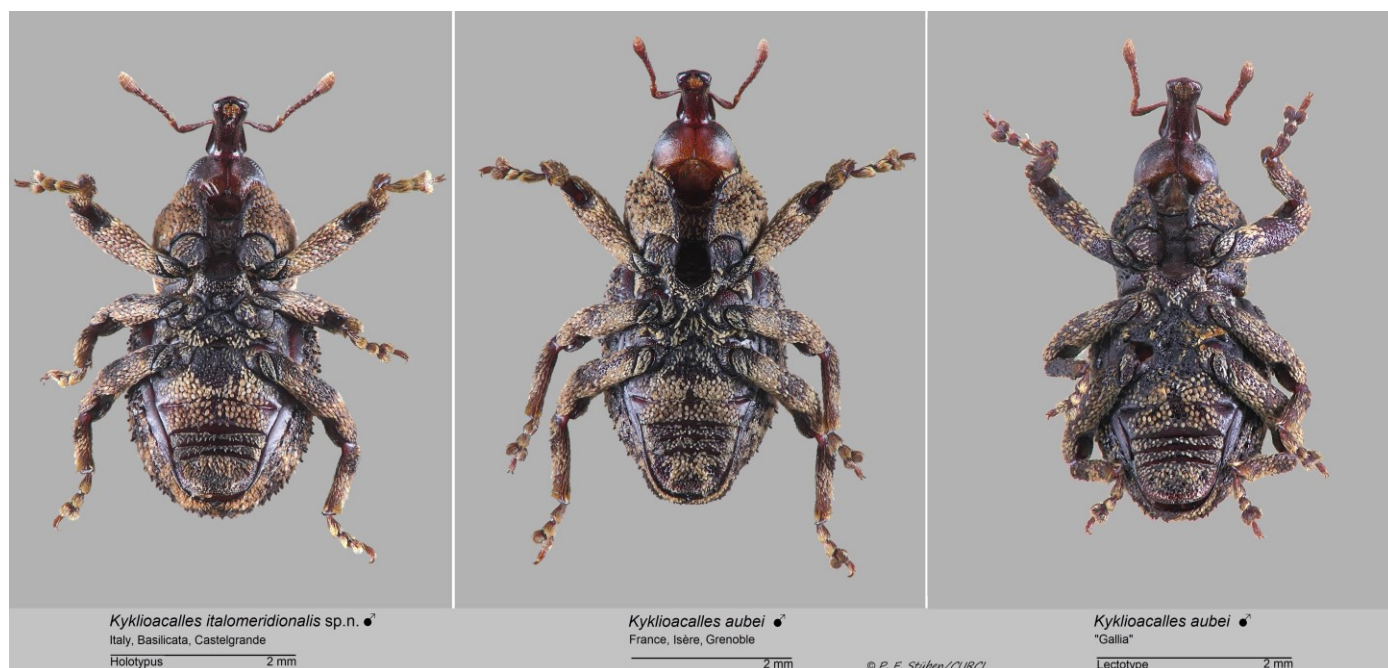


Fig. 2. Ventral view of the sister taxa *Kyklioacalles italomeridionalis* sp.n. and *K. aubei*.

Length. 3.4 – 4.5 mm (without rostrum)

Head & rostrum. The eyes, rounded at the top and tapering to a point at the bottom, are clearly visible as stripes when viewed from above; the forehead between them narrower than the base of the rostrum; rostrum of males dark brown, matt and 3.75x longer than the width between the antennal insertions; the upper half is densely punctured and lightly scaled, while the lower half is shiny and less densely punctured; rostrum of females overall more brilliant, slightly narrower, more than 4x longer than wide between the antennal insertions, with a predominantly finer and less dense puncture; antennae lighter, brown; scape slightly longer than rostrum width, club short-oval, the first two long, increasingly wider antennomeres about the same length, the 5 following antennomeres only slightly longer than wide.

Pronotum. 1.1x wider than long; widest in the centre, tapering almost straight towards the base, initially clearly rounded towards the front edge margin, then with a slight lateral constriction; disc with a wide groove, particularly pronounced from the base to the center; the short oval to weakly teardrop-shaped and only slightly raised scales are dark brown on the disc with a few scattered white scales, towards the sides with contrasting white and light brown scale patches; scales are at least two times larger than on the elytra; pronotum base as well as base of the elytra straight.

Elytra. Short oval, 1.15x longer than wide; widest point often immediately behind the base or well before the middle; ratio of length of elytra to length of pronotum 1.7x–1.8x; elytra broadly rounded to oval towards the apex (not almost straight 'cut off' as in *Kyklioacalles aubei* (Fig. 1); striae on the elytral disc between the first three, very broad interstriae initially narrow, then increasingly stronger and wider punctured towards the sides; interstriae convex; the entire surface of the elytra appears strongly fissured; two conspicuous white, large eyespots in the centre of each half of the elytra, otherwise with large, irregularly delimited light brown and dark brown spots consisting of tiny, predominantly round, only slightly raised scales and widely spaced white, upright short scales.

Legs. Front femora reach the center of the eyes, the hind femora reach the last, 5. abdominal segment; dense with beige and dark brown, long-oval scales; inside of the tibiae towards the apex covered with long hair-thin setae.

Underside. With a deep rostrum channel whose mesosternal receptaculum is semicircular and terminates anterior to the middle coxae; the first two sternites with large, round to short-oval and appressed scales that do not overlap; finer, elongated, and sparser scales on the three following sternites. 1st abdominal sternite about the same length as

2nd to 4th combined, sternites 3 and 4 together as long as the 3rd sternite (Fig. 2).

Aedeagus. Tip of median lobe ventrally very long and narrow, bottle-neck-like (typical for this *Kyklioacalles* group around *K. aubei*); median lobe also distinctly oval-shaped (narrowing) towards the base and widest in the middle; endophallus with a strong indentation at the base.

Female genitalia. See Fig. 3 (1. spiculum ventrale, 2. ovipositor and 3. 7./8. tergite).

Integrative differential diagnosis

Three syntypes (coll. Schoenherr) of the comparative species *Acalles aubei* Boheman, 1837 from the 'Swedish Museum of Natural History' (Stockholm) were already available to the author in 2003. He designated two males as lectotype and paralectotype from 'Gallia orientalis' and a further female as paralectotype from the locality 'Ban[n]at Hungariae' (Stüben et al. 2003). Finally, *Acalles aubei* was transferred to the genus *Kyklioacalles* on the basis of the internal sac structure of the aedeagus and initial molecular classifications (Astrin & Stüben 2008). It was previously assumed that the species could be sifted from the branch litter of various deciduous trees, especially *Castanea sativa*, in the mountains of south-eastern Central Europe, primarily the Alps and the French Alpine foothills. The morphological differences are now becoming clearly apparent, as more extensive material from southern Italy (especially from Campania, Basilicata and the north of Calabria) is available:

- The elytra of *Kyklioacalles italomeridionalis* are shorter, 1.1x – 1.2x longer than wide and widest clearly in front of the middle or immediately behind the base (in contrast to the elongated-oval elytra of *K. aubei*, which are 1.3x to 1.4x longer than wide and have their greatest width at or immediately before the middle).
- Ratio of length of elytra to length of pronotum: 1.7x–1.8x (compared to 1.9x–2.1x in *K. aubei*).
- Apex of the elytra are nearly oval-shaped (in contrast to the straight, 'cut-off' apices of *K. aubei*).
- Elytres more arched; elytral vertex line is approximately semicircular when viewed laterally (versus elytra much more strongly flattened towards the apex in *K. aubei*).
- Tip of the aedeagus very long and narrow; median lobe distinctly oval-shaped (narrowing towards the base) and widest in the middle (unlike *K. aubei*, where the tip is shorter and the median lobe is only slightly rounded and tapered towards the wider base).
- Endophallus with a deep basal indentation (in contrast to the relatively flat indented base in *K. aubei*).

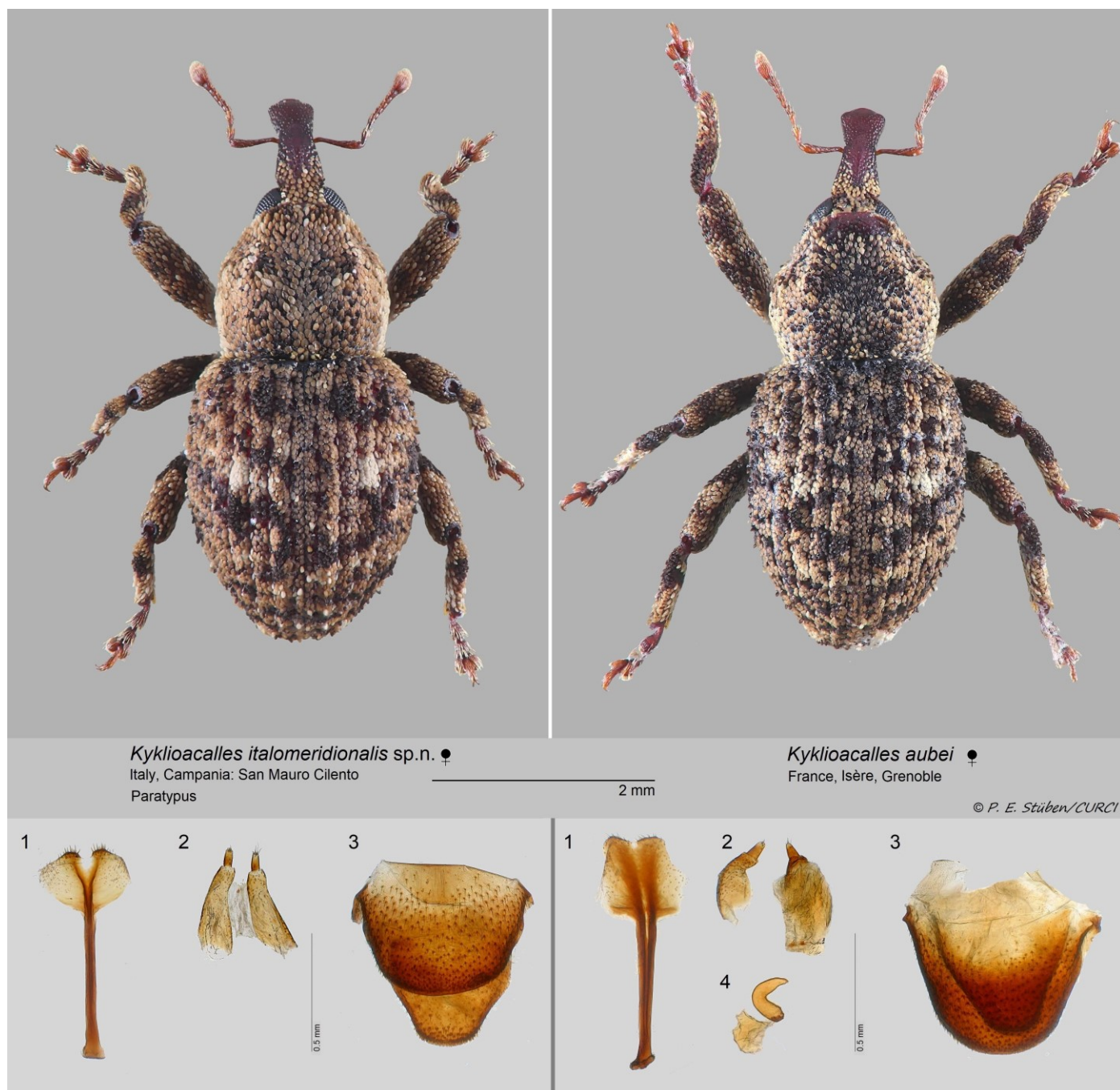


Fig. 3. Females in comparison of *Kyklioacalles italomeridionalis* sp.n. with *K. aubei*. Habitus (dorsally) and genitalia (1. spiculum ventrale, 2. ovipositor, 3. 7/8. tergite, 4. spermatheca).

The only remaining comparison is with the species *K. ocellus* Stüben & Astrin, 2025 from the Caucasus, which was recently separated from *K. aubei* (see Fig. 4). However, the elytra, which are also quite short, are almost parallel-sided up to the middle, the rostrum is significantly shorter in both sexes, and the endophallus lacks the deep basal notch found in the new species.

Based on the now more extensive material available for sequencing of the sister species from southern Italy and eastern France as well as the Alps, we now have an even more precise picture: The p-distances for the mitochondrial part gene (658 bp) are between 5.2% and 6.0% (see Fig. 6 and distance matrix). In contrast, the p-distances of the mtCO1 portion of the new species compared to the species *K. ocellus* described from the Caucasus are already >7%. Both are within the expected range for new species of the subfamily Cryptorhynchinae (Schütte et al. 2023).

At this point we would like to point out that in addition to the Central and Eastern European nominate form of *Kyklioacalles aubei*, there is another southern Italian and Sicilian clade that differs significantly in molecular terms with regard to the mtCO1 gene. However, we do not want to speak of cryptic species yet, as the morphological studies have not been completed.

Note. In this context, I would like to explicitly point out that I do not currently include the populations from Sicily and the south of Calabria (Aspromonte) among the paratypes of the new species, which I assume may belong to a new subspecies of *Kyklioacalles italomeridionalis* (for now designated as var. *siciliensis*). The specimen from north-eastern Italy near the Slovenian border (Sella Nevea) is also almost certainly not part of the nominotypical taxon.



Fig. 4. Habitus and aedeagus of *Kyklioacalles ocellus* Stüben & Astrin, 2025 from the Caucasus.



Fig. 5. Top right: Attempt at a preliminary distribution map of the three species known so far from the *Kyklioacalles aubei* complex. Bottom left: *Quercus* forest with the new species *K. italomeridionalis* from Cilento (Campania).

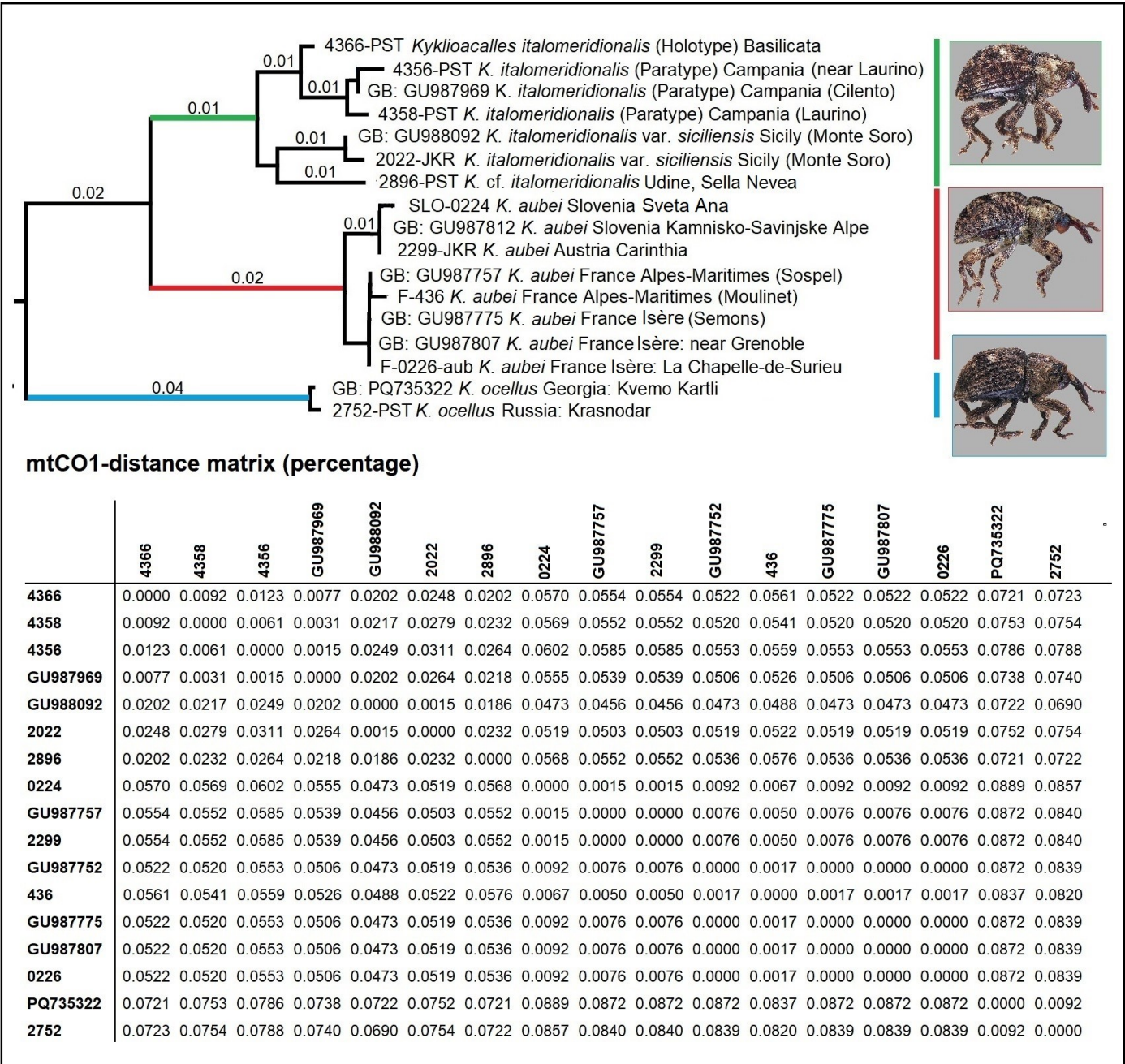


Fig. 6. Neighbour Joining Tree (Jukes-Cantor, corrected) and CO1 distance matrix for three related species from the former *Kykliocalles aubei* complex.

Distribution. I discovered this new species in Central and Southern Italy (Lazio, Campania, Basilicata and the north of Calabria) and it also appears to occur in Sicily and southern Calabria (Aspromonte) in a different population or subspecies (Fig. 5). At this point, I cannot say to what extent the new species extends beyond the province of Lazio into Emilia-Romagna or even further north to Udine, Slovenia and Croatia (Istria). This must be investigated through further faunistic studies. But perhaps we can already hint at this much: At present, it appears that there may indeed be a contact zone between the two sister taxa *Kykliocalles aubei* (identified by me in the Kamniško-Savinjske Alps of

Slovenia) and a population very closely related to the new species *K. italomeridionalis* near Sella Nevea, where I found it in the border region between Italy and Slovenia.

Derivatio nominis and bionomics. The species epithet '*italomeridionalis*' (lat.) refers to the occurrence and locus typicus (Campania, Cilento) of the species in southern Italy, where it can very often be sifted from the detritus of mixed forests, especially from the leaves and twigs of *Quercus* and *Castanea* (Fig. 5).

Acknowledgments

My thanks go to Eva Kleibusch from the Senckenberg, Deutsches Entomologisches Institut (SDEI) for the CO1 sequence analyses, as well as to Mandy Schröter (SDEI) for the very conscientious and extensive compilation of the museum material of the *Kykliocalles aubei* complex.

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Appendix 1

mtCO1 sequences (658 bp)

(In addition to some sequences that were published in GenBank many years ago, there are further mtCO1 sequences here that have not yet been published. As in previous years, there are no plans to store the sequences separately or transfer them to biobanks or gene banks outside this integrative taxonomic context, as their provision and availability has not always been guaranteed in recent years (e.g. during the shutdown in the USA).

>4366-PST *K. italomeridionalis* (see holotype)

TACTTTATATTTTATTTTGGTTCTTGATCAGGAATAATTGGAACATCTTTAAGAATATTAATCCGAACGAATTAGGAAATCCTGGGACATTAATTGGTAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGAGGATTTGGCAACTGATTAATCCCTTTAATACTAGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTCTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGATGAAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCTATTGATTAGCTATCTTTAGACTACATATAGCAGGAATTTCCCTCTATCTTAGGTGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATCACAATACTTCTAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGAGACCCTATTCTTTATCAACACCTATT

>4358-PST *K. italomeridionalis* (see paratype)

TACTTTATATTTTATTTTGGTTCTTGATCAGGAATAATTGGAACATCTTTAAGAATATTAATCCGAACGAATTAGGAAATCCTGGGACATTAATTGGTAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGAGGATTTGGCAACTGATTAATCCCTTTAATACTAGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTCTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGATGAAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCTATTGATTAGCTATCTTTAGACTACATATAGCAGGAATTTCCCTCTATCTTAGGTGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATCACAATACTTCTAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGAGACCCTATTCTTTATCAGCACCTATT

>4356-PST *K. italomeridionalis* (see paratype)

TACTCTATATTTTATTTTGGTTCTTGATCAGGAATAATTGGAACATCTTTAAGAATATTAATCCGAACGAATTAGGAAATCCTGGGACATTAATTGGTAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGAGGATTTGGCAACTGATTAATCCCTTTAATACTAGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTCTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGATGAAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCAATTGATTAGCTATCTTTAGACTACATATAGCAGGAATTTCCCTCTATCTTAGGTGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATCACAATACTTCTAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGAGACCCTATTCTTTATCAGCACCTATT

>2022-JKR *K. italomeridionalis* var. *siciliensis* (see no-paratype)

TACTTTATATTTTATTTTGGTTCTTGATCAGGAATAATTGGAACATCTTTAAGAATATTAATCCGAACGAATTAGGAAATCCTGGGACATTAATTGGTAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGGGATTTGGCAACTGATTAATCCCTTTAATACTCGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTCTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGATGAAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCAATTGATTAGCTATCTTTAGACTACATATAGCAGGAATTTCCCTCTATCTTAGGAGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATTACAATACTTCTAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGATCCCATCTTTATCAACACCTATT

>2896-PST *K. cf. italomeridionalis* (see no-paratype)

TACTTTATATTTTATTTTGGTTCTTGATCAGGAATAATTGGAACCTCTTTAAGAATATTAATCCGAACGAATTAGGAAATCCCGGGACATTAATTGGTAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGGGATTTGGCAACTGATTAATCCCTTTAATACTCGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTTTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGCTGAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCAATTGATTAGCTATCTTTAGACTACATATAGCAGGACTTTCCCTCTATCTTAGGAGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATTACAATACTTCTAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGAGACCCTATTCTTTATCAACACCTATT

>0224 *K. aubei*, Slovenia, Sveta Ana, Sv. Ana env., 20 km NE of Maribor, forest with *Fagus* and *Quercus*, 05.08.2006, leg. Stejskal

TACTTTATATTTTATTTTGGTTCTTGATCAGGATAGTTGGGACATCTCTAAGAATATTAATCCGAACGAATTAGGAAACCTGGAACATTAATTGGCAATGACCAAATTTATAACTCAATTGTTACTGCTCATGCTTTTCATTATAATTTCTTTATAGTAATAACCAATTATAATTGGGGATTTGGCAACTGATTAATCCCTTTAATACTCGGAGCCCCAGATATAGCATTTCCTCCGATTAATAATATAAGATTTTGACTTCTACCTCCTTCATTAATTCTCCTTTTAATAAGAAGAATCATTGATAAAGGAGCTGGAACAGGATGAAACAGTTTACCTCCTTTATCAGCTAATATTGCTCATGAAGGAATTTCAATTGATTAGCTATCTTTAGACTACATATAGCAGGACTTTCCCTCTATCTTAGGAGCCATTAATTATTTTCAACTATTATTAATATACGCCCATAGGTATAAAATTAGACCAAAATACCATTATTTATCTGAGCAGTTAAAATTACTGCTATTCTTCTCTCTTTCCCTTCTGTACTTGCAGGAGCTATTACAATACTTTTAAACAGACCGAAATATCAATACCTCATTCTTTGATCCTGCAGGAGGGGGAGACCCTATTCTTTATCAACACCTATT

