



Kyklioacalles flavomaculatus sp.n. from Morocco (Coleoptera: Curculionidae: Cryptorhynchinae)

by

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with 10 figures

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Abstract

A new species of the western Palearctic weevil genus *Kyklioacalles* Stüben 1999 is described from Morocco (Moyen Atlas: Jbel Bou Iblane). This species is distinguished from the related species *Kyklioacalles plantapilosus* (Stüben & Astrin 2010) from Spain. The new species is included in a molecular phylogeny of *Kyklioacalles* using the mitochondrial COI- and 16S-gene in a Bayesian analysis, and the genetic p-distances of the COI-gene to the closely related species are given in a map.

Key words. Curculionidae, Cryptorhynchinae, *Kyklioacalles*, new species, taxonomy, molecular phylogeny, morphology, Morocco.

Introduction

The first two specimens of the new *Kyklioacalles* species was generously handed over by Roman Borovec (Czech Rep.: Smidary) to the author in 2009. Together with Lutz Behne (Germany: Müncheberg) the author collected some more specimens and larvae on their research trip to Morocco (Moyen Atlas: Jbel Bou Iblane) from the host plant *Bupleurum* sp. in May 2011.

Kyklioacalles flavomaculatus sp.n.

Type material

Holotype. 1♂, "Maroc, Moyen Atlas, N Imouzzar-des-Marmoucha, Jbel Bou Iblane: Tizi-Bou-Zabel, 33°38'44"N 04°09'18"W, 2275 m, 21.05.2011, *Bupleurum*, leg. Stüben (44)"; coll. Curculio-Institute, D-Mönchengladbach. / **Paratypes.** 13♂, 13♀, data as for holotype, coll. Stüben, coll. Behne, coll. Curculio-Institute; 1♂, 1♀ same locality, 11.5.2009, leg. and coll. Borovec; 1♂, "Maroc, Moyen Atlas, N Imouzzar-des-Marmoucha, Jbel Bou Iblane: below Tizi-Bou-Zabel, 33°38'15"N 04°09'13"W, 2056 m, 21.05.2011, *Bupleurum*, leg. Stüben (45)", coll. Stüben.

DNA type. (16S): 1♂, same locality as holotype, leg. Borovec, coll. ZFMK: Vouchers: ZFMK-TIS-cMO954, ZFMK-DNA-JJ0917 / GenBank: 16S: GU981566; **(COI):** 1 larva, data as for holotype, coll. ZFMK: Vouchers: ZFMK-TIS-2D100440241, ZFMK-DNA-100438129 / GenBank: COI: JQ975013

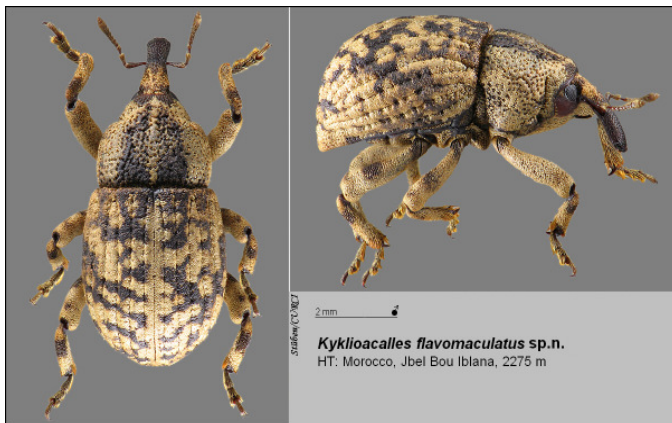


Fig. 1 *Kyklioacalles flavomaculatus*: HT, habitus ♂ (dor./lat.)

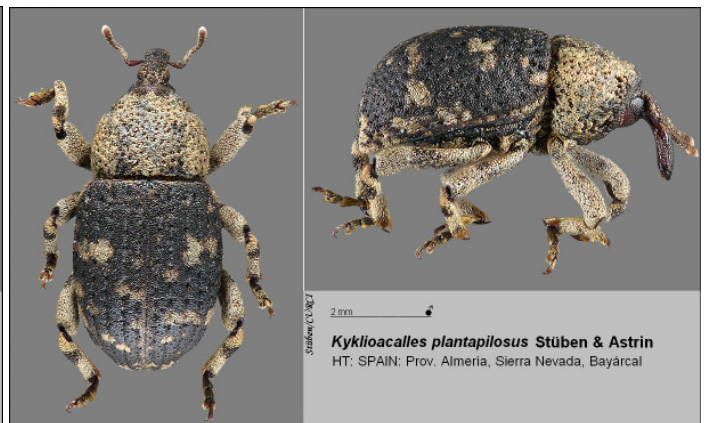


Fig. 2 *Kyklioacalles plantapilosus* (Spain): HT, habitus ♂ (dor./lat.)

Description (Fig. 1, 3, 4, 6, 8)

Length. 3.4 – 7.0 mm (without rostrum).

Head & Rostrum. The small eyes ovally rounded towards front and acuminate towards underside of rostrum. Rostrum of males yellow-brown, reaching 3/4 length of pronotum (3.64x as long as wide between the insertion of the antennae, fig. 4), closely covered with fawn scales in front of the base, strongly and densely punctuated towards apex; rostrum of females clearly longer, slender, shiny and even more finely punctuated. The last, continuously broadened, laterally rounded "trapezoidal" funicles separated from the club.

Pronotum. 1,19x - 1,23x as wide as long; widest at the end of the second fifth of the pronotum; rounded laterally towards the fore-margin more strongly than towards the base; with a channel-like depression at the sides directly behind the fore-margin. In lateral view contour-line of pronotum and of the elytra forms a uniform bend; disc of pronotum weakly arched, flat behind fore-margin, without a channel on the disc or humps at the sides. The integument consists of dirty white, beige and – sometimes in the middle and in front of the base – dark brown spots of tiny scales, which completely disguise the underground. Dark brown spots of scales are always visible behind the fore-margin. Pronotum with numerous fine punctures and with a single tiny, raised and very short bristle inside the dimple; the space between these dimples can be covered with shiny and overlapping scales or the dimples bang together and form a row.

Elytra. Long-ovally rounded; 1,19x - 1,29x as long as wide; widest in the middle (slightly egg-shaped); sides of elytra rounded, without "shoulders" behind the base, short-ovally rounded towards the apex. Contour-line of elytra forms a more or less regular arc of circle. The shiny and predominantly yellow-brown integument with its black or dark brown spots consists of tiny, overlapping scales so that the underground is not visible. The buff and black spots often contrast strongly and give the elytra a speckled appearance. Striae on the disc and at the sides of elytra are many times narrower than intervals (they look like small chinks, if they are shrouded by scales). The elongated punctures are not deep and hardly broader than the striae. Intervals flat or a little bit arched behind the base, here - on the 2nd and 4th interval - with flat humps; all intervals with some tiny, raised and very short bristles.

Legs. Short; the marginal front femora reach fore-margin of the eyes, the hind femora clearly ending in front of the elytral apex. They are densely covered with predominantly yellow-brown scales and some dark brown spots. The very long brushes of hairs under the tarsus of forelegs are characteristic and remarkable for the male of this species.

Venter. 2nd sternite shorter than 1st sternite, but longer than sternite 3 and 4 together (Fig.3).

Female genital. Spermatheca, ovipositor, spiculum ventrale, see fig. 8.

Aedeagus/endophallus. See fig. 6 (vs. *K. plantapilosus*, fig. 7).



Fig. 3 *K. flavomac.* HT, ♂ (ven.) Fig. 4 Rostrum: *K. flavomac.* vs. *K. plantapil.* Fig. 5 Jbel Bou Iblane: Habitat, larva and host plant of *K. flavomac.*



Fig. 6 *K. flavomaculatus* sp.n. HT: Morocco, Jbel Bou Iblana, 2275 m Fig. 7 *K. plantapilosus* Stüben & Astrin HT, Spain: Prov. Almería, Sierra Nevada Fig. 8 *K. flavomaculatus*: Female genitalia

Differential diagnosis (Fig. 2, 4, 7, 9-10)

Morphological analysis. The new species is closely related to *Kyklioacalles plantapilosus* Stüben & Astrin 2010 from Spain (Sierra Nevada).

***Kyklioacalles flavomaculatus*.** 1. the predominantly yellow-brown (speckled) elytra long-ovally rounded; contour-line of elytra forms a more or less regular arc of circle in lateral view (Fig. 1); 2. striae of elytra are many times narrower than intervals, their punctures elongated and hardly broader than the striae; 3. rostrum of male more slender, 3.64x as long as wide (between the insertion of the antennae) and deeply and densely punctuated towards the apex (Fig. 4); 4. medianlobus of the aedeagus rounded (Fig. 6).

***Kyklioacalles plantapilosus*.** 1*. the predominantly black elytra with slightly rounded or – in the middle section – with more or less parallel sides; contour-line of elytra flatter behind the base in lateral view (Fig. 2); 2*. striae at the sides of elytra as wide as intervals, their deep and circular punctures broader than the striae; 3*. rostrum of male clearly shorter, 3.31x as long as wide, and finely and sparsely punctuated towards the apex (Fig. 4); 4*. medianlobus of the aedeagus tapered (Fig. 7).

***Kyklioacalles bupleuri* Stüben 2004** (Tunisia, Spain) – from the same host plant *Bupleurum* sp. – always has a white pronotum and the rostrum is clearly shorter, densely and coarsely punctuated (Stüben 2004: 73).

***Kyklioacalles anthyllis* Stüben 2004** – from the Sierra Nevada and the host plant *Erinacea anthyllis* – has a yellow-brown fascia directly behind the base of elytra and a tapered aedeagus (Stüben 2004: 65).

Molecular phylogenetic analysis. Our molecular analysis is based on 29 (+ 3 "sp.") of 42 valid *Kyklioacalles* species and on 4 cryptorhynchine outgroup species (see catalogue in: Stüben & Astrin 2010). Collecting and vouchering information as well as GenBank accession numbers are given in Stüben & Astrin (2010; K. sp.2) and Stüben, Torres & Astrin (2011). Newly analyzed samples are presented in Appendix 1. COI-Sequence and 16S sequence from *K. flavomaculatus* derived from two different specimens from the same location and were used as concatenated sequence for analysis. Voucher specimens and extracted genomic DNA are deposited at the tissue and DNA bank of the ZFMK (Bonn, Germany). The laboratory routine followed Astrin & Stüben (2008), except there were no positions excluded in 16S sequence, because positional homology between sequences could be kept between closely related species. Bayesian MCMC analyses were run in MrBayes ver. 3.1.2 (Ronquist & Huelsenbeck 2003) for mitochondrial COI and 16S. We ran 2x 60 million generations and obtained 59990 trees (after discarding burn-in), of which a 50%-majority rule consensus tree was built (Fig. 9). BioEdit 7.0.9 was used to calculate individual *p*-distances of the COI gene between *K. flavomaculatus* and related species (see map in Fig. 10).

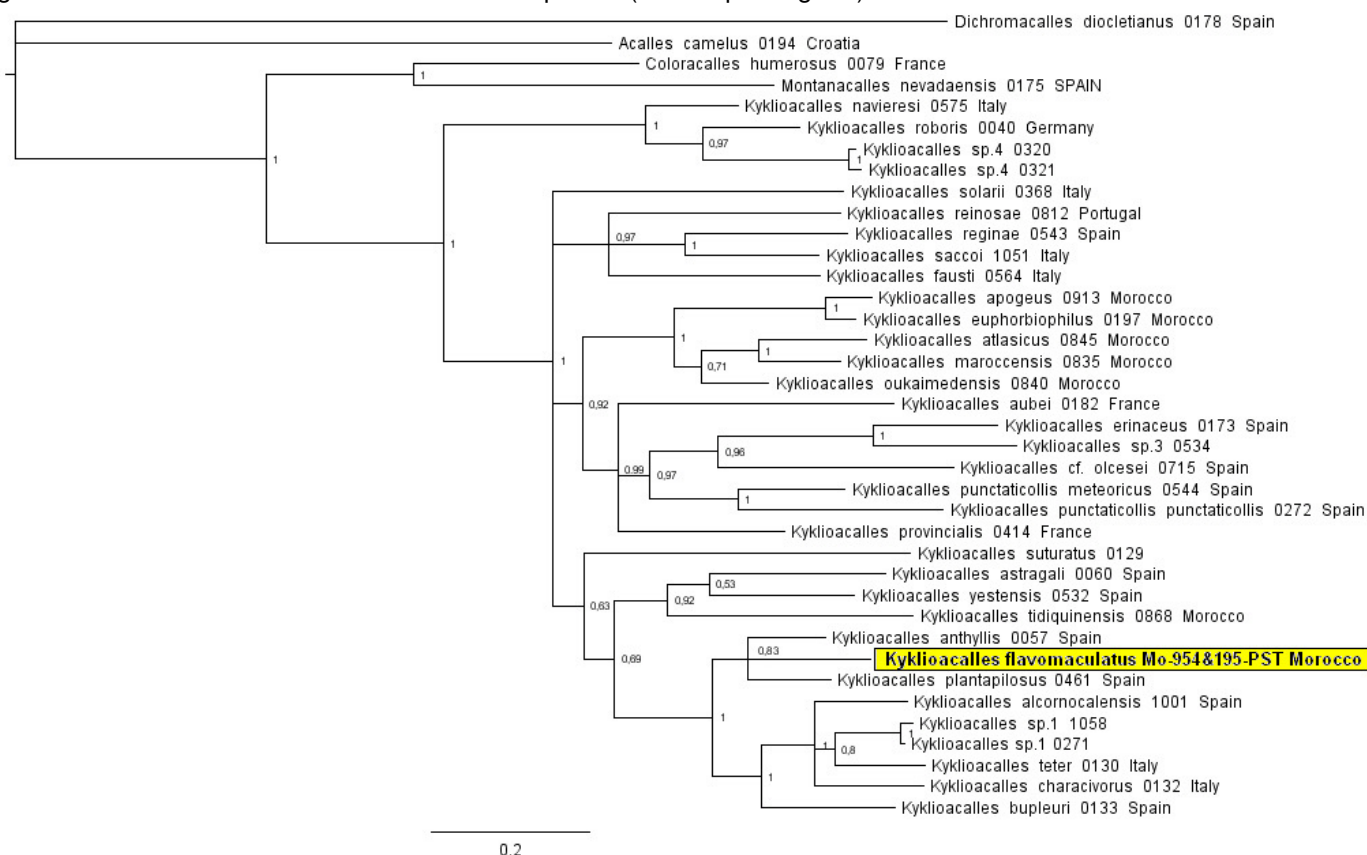


Fig. 9 Species of the genus *Kyklioacalles*: Bayesian consensus tree for COI and 16S.

Etymology. The species name refers to the conspicuously yellow-brown speckled elytra.

Ecology. Specimens and larvae were found sieving the detritus and dead stems of *Bupleurum* sp.

Distribution. This species is so far only known from the Middle Atlas (Jbel Bou Iblane) 2000 m a.s.l. (Fig. 10).

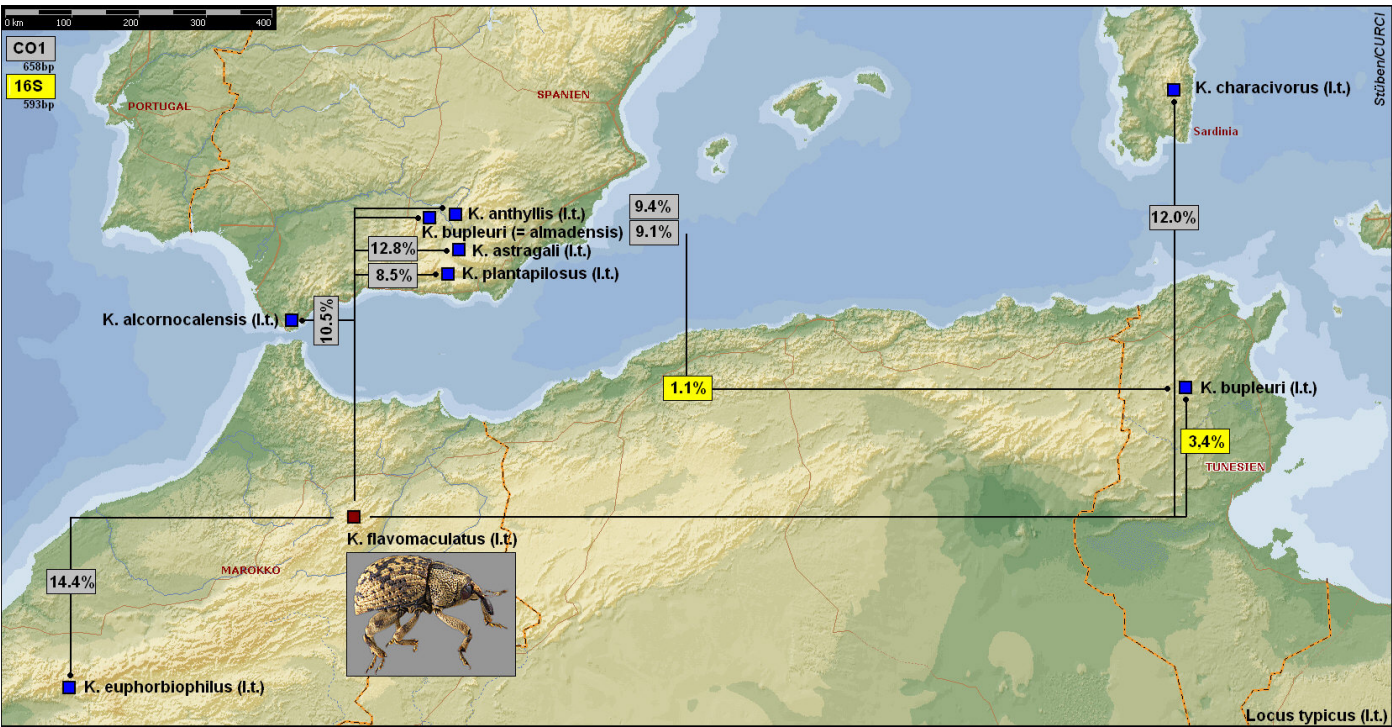


Fig. 10 Distribution of related species of *K. flavomaculatus* in the Mediterranean area with values of COI (+16S) p-distance.

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Appendix 1

Taxon	Collecting data	Voucher DNA	GenBank acc CO1 + 16S
<i>Kyklioacalles flavomaculatus</i> <i>Mo-954-ibl</i>	MOROCCO: Middle Atlas, Jbel bou Iblane; N33°38'44" W4°09'18", 2279m, 11.5.2009, leg. Borovec	ZFMK-TIS-cMO954, ZFMK-DNA-JJ0917	16S: GU981566
<i>Kyklioacalles flavomaculatus</i> <i>195-PST_44MO2011</i>	MOROCCO: Moyen Atlas, N Imouzzer-des-Marmoucha, Jbel Bou Iblane: Tizi-Bou-Zabel N33°38'44", W4°09'18", 2275 m, larva from <i>Bupleurum</i> spec, 21.05.2011, leg. Stüben	ZFMK-TIS-2D100440241 ZFMK-DNA-100438129	COI: JQ975013

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