



***Kyklioacalles alcornocalensis* sp.n. from Spain (Cádiz)
(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 Cádiz province, southern Spain. This species is distinguished from the related species *Kyklioacalles teter* (Boheman 1844) from Sicily (Italy). The genetic p-distance is given and the new species is included in a molecular phylogeny of *Kyklioacalles* using the mitochondrial COI- and 16S-gene in a Bayesian analysis.

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

Introduction

The 'Parque Natural Los Alcornocales' consists of an approx. 177,000 ha mosaic of woodland and scrub habitats in Cadiz province, southernmost Spain. Woodland is dominated by *Quercus suber*, with extensive patches of *Quercus canariensis* and smaller amounts of other oak species. The scrub vegetation is rich in woody species including *Calluna*, several *Erica* species, *Ulex*, *Cytisus* and *Genista*, as well as taller shrubs and small trees such as *Olea*, *Pistacia* and *Rhamnus*. *Alnus glutinosa*, *Frangula alnus*, *Rhododendron ponticum* subsp. *baeticum* and *Nerium oleander* are common along streams. Aspects of the fauna and flora of the area are of relictual and biogeographical interest (Tinaut 1989). During a period of sampling from 1988-2011, José L. Torres (Spain, La Línea) collected a new species of *Kyklioacalles* Stüben 1999 from Los Alcornocales, which we describe here. The species was collected as part of an ongoing project to catalogue as much as possible of the unique Coleoptera fauna of the Spanish side of the Strait of Gibraltar, with a view to highlighting species with restricted distributions and conservation requirements.

***Kyklioacalles alcornocalensis* sp.n.**

Type material

Holotype. 1♂, "Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, Zona Bacinete, N36.20780 W5.55653, 1.X.2009, leg. José Luis Torres"; coll. Curculio-Institute, D-Mönchengladbach. / **Paratypes.** 1♂, data as for holotype, coll. Stüben; 1♂, 2♀, "Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, el Tiradero, 10.III.1988, leg. Jose Luis Torres", coll. Curculio-Institute, Stüben; 1♂, "Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, Zona Bacinete, N36.20780 W5.55653, 1.VII.1991, leg. José L. Torres", coll. Stüben; 1♀, "Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, Zona Bacinete, N 36.20780 W 5.55653, 18-II-2011, leg. José Luis Torres", coll. Torres; 1♂, "Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, Zona Bacinete, N 36.20780 W 5.55653, 13-IV-2011, leg. José Luis Torres", coll. Torres. / **DNAtype.** 1♂, data as for holotype, coll. ZFMK: ZFMK-TIS-cES1001, ZFMK-DNA-JJ1001; GenBank Acc. no CO1: JN121401

Description (Fig. 1, 3, 4, 6, 10)

Length. 3.5 – 5.0 mm (without rostrum).

Head & Rostrum. Eyes rounded ovably towards front and acuminate towards underside of rostrum. Rostrum of males dark brown, reaching 3/4 length of pronotum (3.5x as long as wide between the insertion of the antennae, fig. 4), closely covered with dark scales in front of the base and finely punctuated towards apex; rostrum of females hardly longer, shiny and even more finely punctuated. The last antennal segments are slightly wider than long, but rounded and separated from the club (not like the species around *Kyklioacalles barbarus* (Lucas 1849) with continuously broadened, trapezoidal antennal segments that are not clearly separated from the club).

Pronotum. 1.20x as wide as long; widest at the end of the first third of the pronotum; regularly rounded laterally towards the fore-margin and the base; with a channel-like depression at the sides directly behind the fore-margin. In lateral view contour-line of pronotum and contour-line of the elytra do not form a uniform bend, they are clearly separated; disc of pronotum flattened, without a channel on the disc or with humps at the sides. The integument consists of dirty white, beige and – often dominating – black spots of tiny scales, which completely disguise the underground. Black spots of scales are always visible in front of the base and behind the fore-margin; there is sometimes a cross of white or beige scales on the disc of the pronotum. Pronotum with fine punctures and with a single tiny, raised and very short bristle inside the dimple; the space between these dimples always covered with small and overlapping scales.

Elytra. Cylindrical, 1.30x as long as wide; widest in or directly in front of the middle; sides of elytra rounded oval,

without "shoulders" behind the base, more acuminate-ovally rounded towards the apex. Contour-line of elytra flatter or slightly rounded behind the base in lateral view, the contour-line of the elytral slope forming an arc towards the apex. The predominantly black integument with its beige spots consists of tiny, overlapping scales so that the underground is not visible. The beige and scattered spots often contrast strongly and give the elytra a pied appearance. Always with a spot directly behind the base on the 5th and 6th interval (excluding the suture stripe), here with a small hump; the most extensive beige spots are between the apex and the middle of the elytra. Striae on the disc narrower than the intervals, at the sides of elytra as wide as the intervals; their circular punctures oblong and deep; their distances range from half the diameter of the punctures themselves to their full diameter. Intervals are arched, giving the elytra a wave-like appearance.

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 covered with predominantly beige and dark brown, oblong scales, disguising the integument.

Venter. 2nd sternite clearly shorter than 1st sternite and a little bit longer than sternite 3 and 4 together (Fig.3).

Female genital. Spermatheca, ovipositor, spiculum ventrale, see fig. 9.

Aedeagus. See fig. 6 (vs. *K. teter*, fig. 7).

Differential diagnosis (Fig. 2, 4, 7, 8, 10)

Morphological analysis. The new species is closely related to *Kyklioacalles teter* (Boheman 1844) from Italy (Sicily).

***Kyklioacalles alcornocalensis*.** 1. elytra more egg-shaped (oblong-oval), widest at or directly in front of the middle (Fig. 1); 2. pronotum strongly rounded laterally towards the fore-margin and the base, widest at the end of the first third of the pronotum (Fig. 1); 3. rostrum more slender, 3.5x as long as wide (between the insertion of the antennae) (Fig. 4); 4. punctures of the pronotum finer, not so deep, interspaces broader (their distances at least half the diameter of the punctures)

***Kyklioacalles teter*.** 1*. elytra with nearly parallel sides in front of the middle; widest directly behind the base (Fig. 2); 2*. pronotum slightly rounded in front of the base (parallel-sided), not clearly separated laterally from elytra (Fig. 2); 3*. rostrum clearly shorter, 2.8x as long as wide (Fig. 4); 4*. punctures of the pronotum coarse and deep, interspaces small (like a fine line).



Fig. 1 *Kyklioacalles alcornocalensis* – HT, habitus ♂ (dor./lat.)

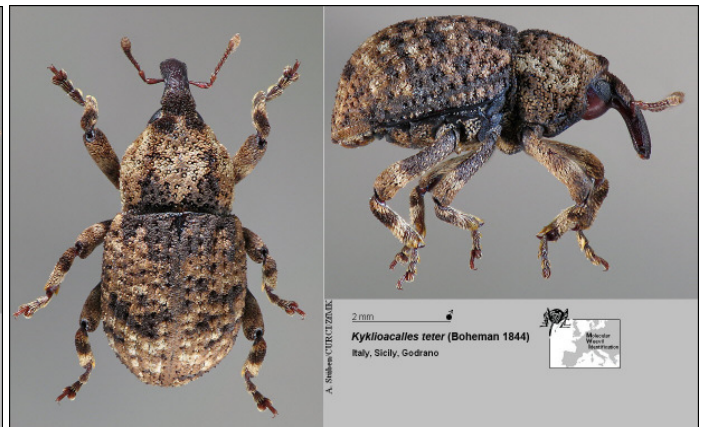


Fig. 2 *Kyklioacalles teter* (Italy: Sicily) – habitus ♂ (dor./lat.)

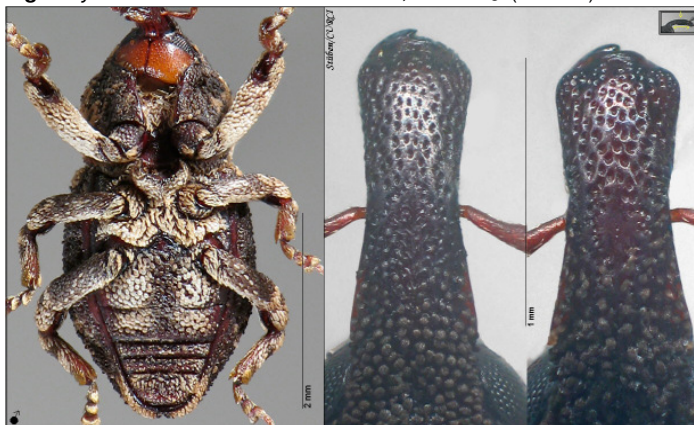


Fig. 3 *K. alcornocalensis* ♂ (ven.) Fig. 4 Rostrum ♂: *K. alcor*. vs. *K. teter*



Fig. 5 Habitat of *K. alcornocalensis* – P. N. Los Alcornocales (I.t.)

Phylogenetic analysis. Our molecular analysis is based on 28 (+ 4 "sp.") of 41 valid *Kyklioacalles* species (see catalogue: Stüben & Astrin 2010) and on 4 cryptorhynchine outgroup species, including the sister group of *Kyklioacalles* that is constituted by *Coloracalles* and *Montanacalles* (see Astrin & Stüben 2008). Collecting and vouchering

information as well as GenBank accession numbers are given in Stüben & Astrin (2010). Newly analyzed samples are presented in Appendix 1. Voucher specimens and extracted genomic DNA are deposited at the tissue and DNA bank of the ZFMK (Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany). The laboratory routine followed Astrin & Stüben (2008). Bayesian MCMC analyses were run in MrBayes ver. 3.1.2 (Ronquist & Huelsenbeck 2003) for mitochondrial COI and 16S, including only COI for the new sequences. We ran 2x 20 million generations and obtained 39.800 trees (after discarding burn-in), of which a 50%-majority rule consensus tree was built (Fig. 8). BioEdit 7.0.9 was used to calculate individual p -distances of the COI gene between *K. alcornocalensis* and related species (see map in Fig. 10).



Fig. 6 *Kyklioacalles alcornocalensis* sp.n. – HT, aedeagus (ven./lat.)

Fig. 7 *Kyklioacalles teter* – aedeagus (ven./lat.)

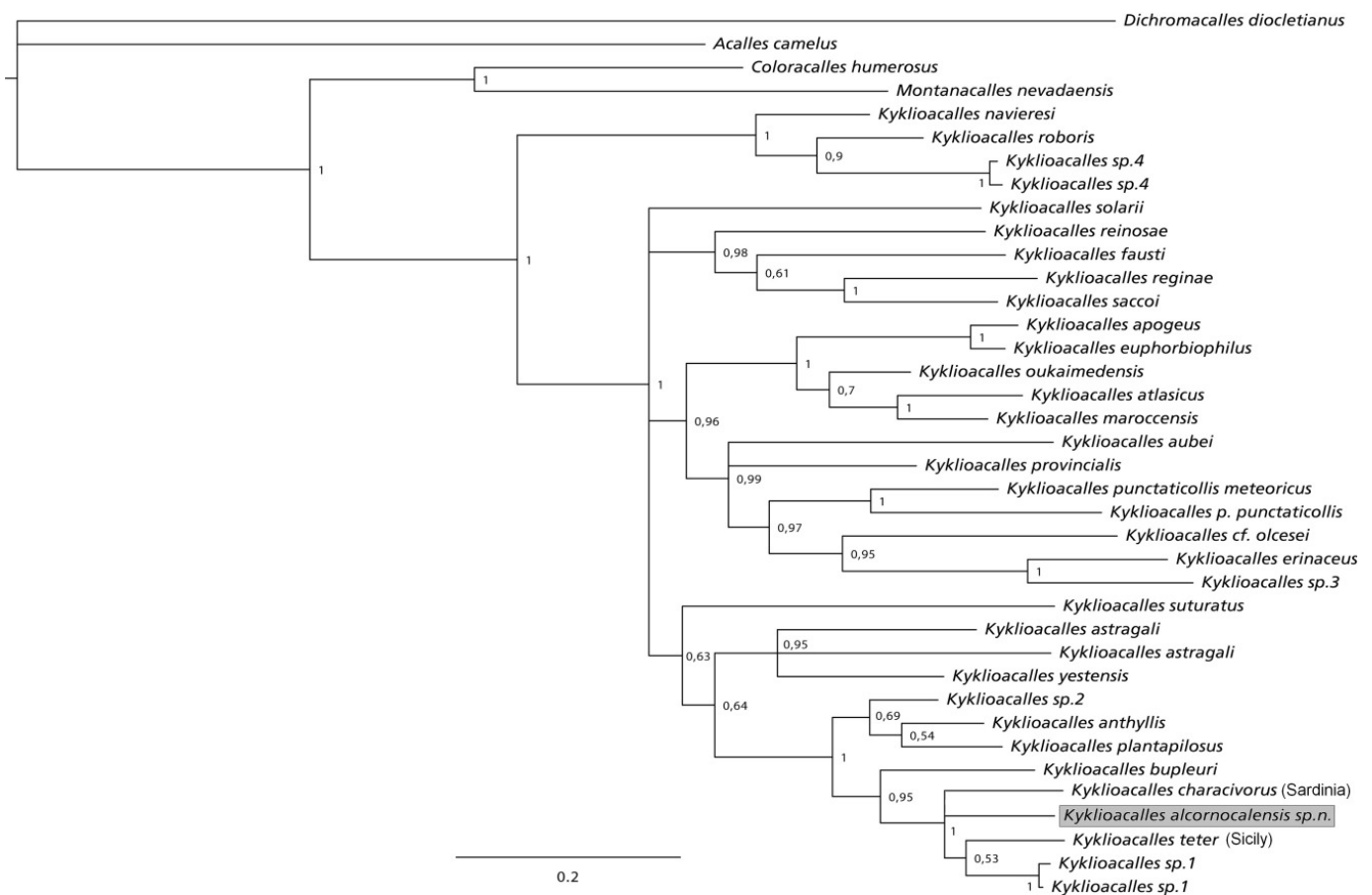


Fig. 8 Bayesian consensus tree for COI and 16S.

Etymology. The species name refers to the Parque Natural Los Alcornocales, its locus typicus (Spain: Cádiz).

Ecology. Most specimens were found sieving leaf litter of *Quercus suber* (3 ex.) or beating a variety of shrubs and trees close to a stream (4 ex.). 1 ex. was captured in a pitfall trap that had been baited with vinegar and placed close to *Olea europaea*, whilst another was found within a small, decomposing log of *Olea europaea* (Fig. 5).

Distribution. This species is so far only known from Parque Natural Los Alcornocales (Spain: Cádiz). Localities are separated by some 7-8 km (Fig. 10).

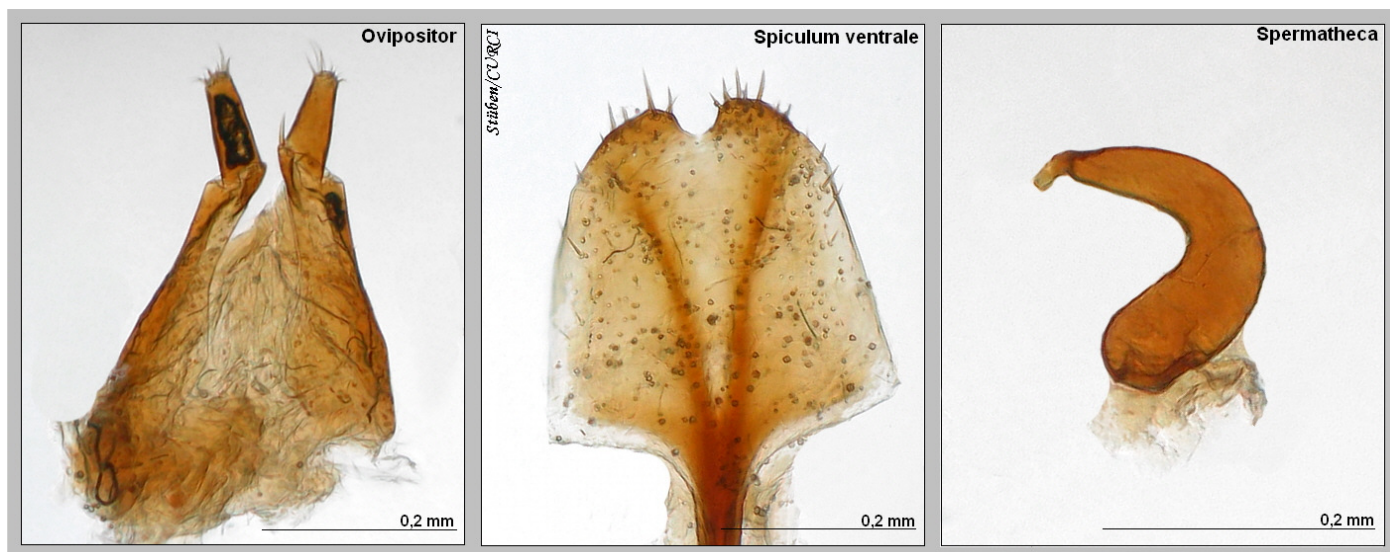


Fig. 9 *K. alcornocalensis*, ♀: Ovipositor, Spiculum ventrale, Spermatheca.

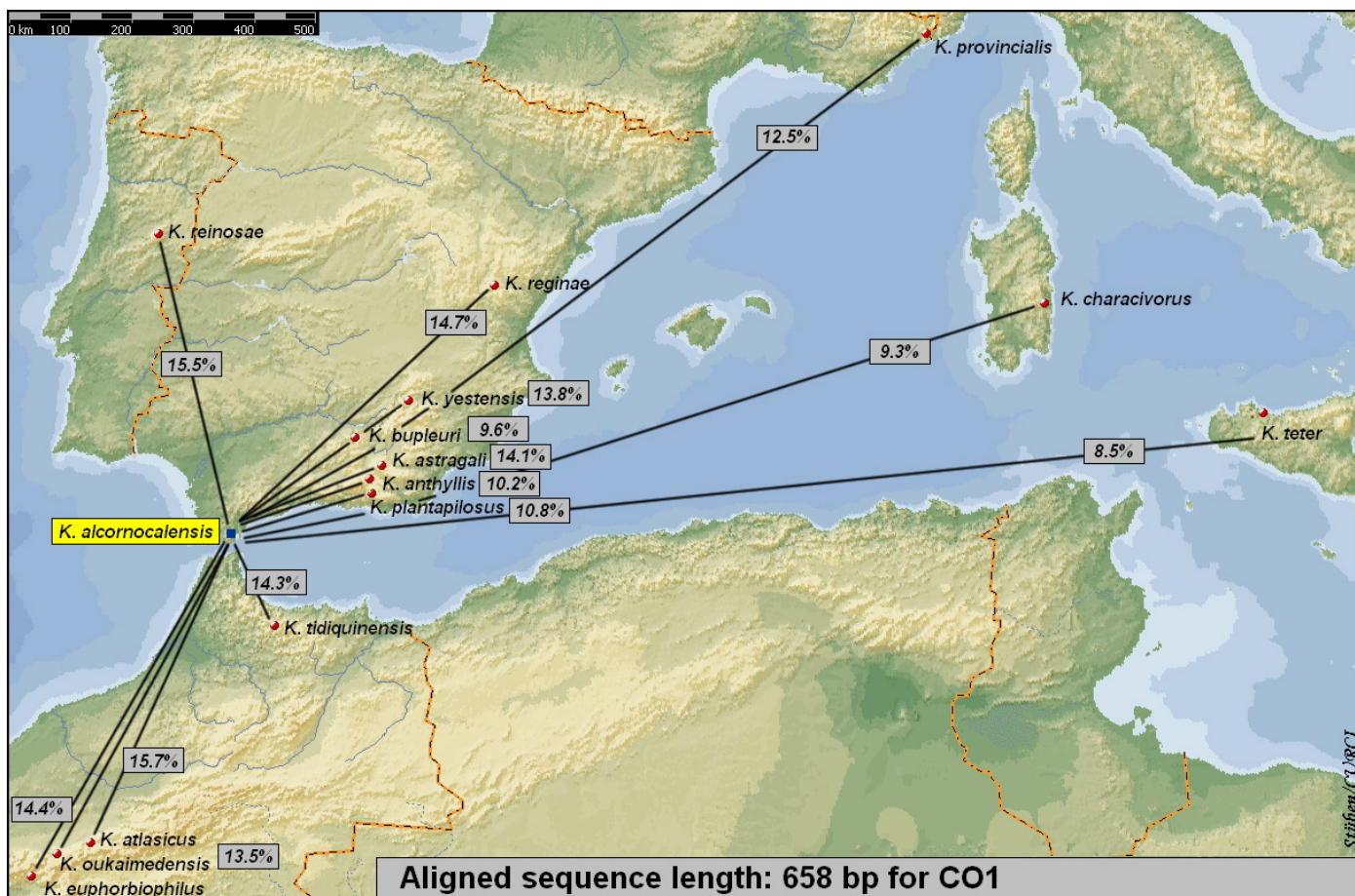


Fig. 10 Distribution of related species of *K. alcornocalensis* in the Mediterranean area with values of COI p-distance, expressed as percentage.

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Appendix 1

Taxon	Collecting data	Voucher DNA	GenBank acc CO1
<i>Kyklioacalles alcornocalensis</i> sp.n.	Spain: Cádiz, Los Barrios: Parque Natural Los Alcornocales, Zona Bacinete, N36.20780 W5.55653, 1.X.2009, leg. Torres	ZFMK-TIS-cES1001, ZFMK-DNA-JJ1001	JN121401
<i>Kyklioacalles saccoi</i> (Colonnelli 1973)	Italy: Calabria, La Sila Mts., Spezzano de la Sila, N39°19'178 E16°23'104, 16.6.2009, leg. Kratky (det. Stüben)	ZFMK-TIS-clT1051, ZFMK-DNA-JJ1051	JN121402
<i>Kyklioacalles</i> sp. 1	Spain: Prov. Málaga, S Ronda: Serranía de Ronda, Igualeja, <i>Ficus carica</i> , N36°37'33" W05°07'27", 647 m, 21.8.2010, leg. Stüben	ZFMK-TIS-cES1058, ZFMK-DNA-JJ1058	JN121403

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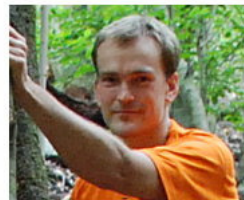
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