

# ***CONORHYNCHUS RELICTUS*, A REMARKABLE NEW WEEVIL SPECIES FROM SOUTHERN MOROCCO (COLEOPTERA: CURCULIONIDAE: LIXINAE)**

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## **ABSTRACT**

***Conorhynchus relictus*, a remarkable new weevil species from Southern Morocco (Coleoptera: Curculionidae: Lixinae).**

*Conorhynchus relictus* sp. n. is described. It is characterized by the large size (20 mm), the nearly flat pronotum with smooth surface, the wide elytra with maximum width behind middle of length. The new species seems to be closely related to species from Central Asia: remarks on this peculiar distribution pattern are added. Notes on nomenclature and taxonomy of the genus are also given.

**Key words:** Coleoptera, Curculionidae, *Conorhynchus*, Morocco, nomenclature, systematics, biogeography.

## **INTRODUCTION**

During entomological researches in Southern Morocco by the author and Dr. Enzo Colonnelli (Rome), the latter collected a dead specimen of a Lixinae (tribe Cleonini) weevil, belonging to a new species. Although based on this single damaged specimen, the new species is here described for its extraordinary biogeographical and faunistic interest (see remarks).

***Conorhynchus relictus* sp. n.**

Type locality: Southern Morocco, Sebket Oum Dba, 27°27'25"N 13°03'35"W  
Holotype ♀. Southern Morocco, 40 km N Laayoune, Sebket Oum Dba, 27°27'25"N 13°03'35"W, Colonnelli legit 30.I.2002 (Coll. Meregalli, Turin).

The specimen was found dead, evidently killed by a spider (holes of chelicerae on left episternum and remnants of web on the whole body). It lacks antennae and middle and hind left legs.

Diagnosis

A large *Conorhynchus* morphologically close to *C. schrenki* (Gebler, 1845) and *C. excavatus* (Zoubkal, 1833) from Central Asia, characterized by the large

size, the nearly flat pronotum with smooth surface, the wide elytra with maximum width behind middle of length.

#### Description

Length without rostrum 20.2 mm. Rostrum: length from anterior margin of eye to apex 2.45 mm; width at base 3.05 mm; width at apex beyond scrobe 2.25 mm. Frons: width between eyes 2.35 mm. Prothorax: length 6.60 mm; width at base 5.60 mm; width at expansion before apex 5.35 mm; width at apex 4.85 mm. Elytra: length 12.90 mm; maximum width 7.80 mm.

Body very large, oblong, slightly convex, integument blackish. (Vestiture missing).

Rostrum short, broader than long, weakly conical, slightly flattened at middle of length, distinctly sinuate in lateral view; whole length of upper margin of scrobe visible from above; surface smooth, lacking punctures or granules; median keel distinct, very narrow, scarcely raised, reaching apex, slightly curved in lateral view. Scrobes narrow, directed towards underside of rostrum, upper margin regularly curved, base distant from eyes. (Antennae missing). Vertex between eyes narrower than rostrum at base, approximately as wide as rostrum at apex; surface smooth, unpunctured; eyes oblong, lower apex acute.

Prothorax cylindrical, maximum width at base, sides nearly parallel, very slightly concave near middle of length, weakly expanded and then immediately constricted near apex. Basal margin regularly rounded; apical margin moderately lobed above head; ocular lobes rounded; sides flattened, compressed near base, with a narrow vertical groove behind apex, corresponding to the constriction seen from above. Surface smooth, with small scattered punctures more frequent towards apex and base, missing from disc; median keel distinct for the whole length, scarcely raised, broadened at middle. Prosternum with a wide prominent lamina near sides of pronotum. Metathoracic wings absent. Scutellum triangular.

Elytra oblong, as wide as prothorax at base, shoulders not prominent, sides distinctly widened, maximum width after middle of length. Suture apparently firmly locked. Intervals flat, even and odd intervals isomorphic; striae very narrow, not impressed, with a row of closely set minute punctures.

Legs slender, femora weakly thickened; tibiae rectilinear, inner side minutely denticulate. (Tarsi missing).

Ventrites: first segment as long as second; segments 3-5 shorter than segments 1 and 2; surface minutely granulate.

#### Etymology

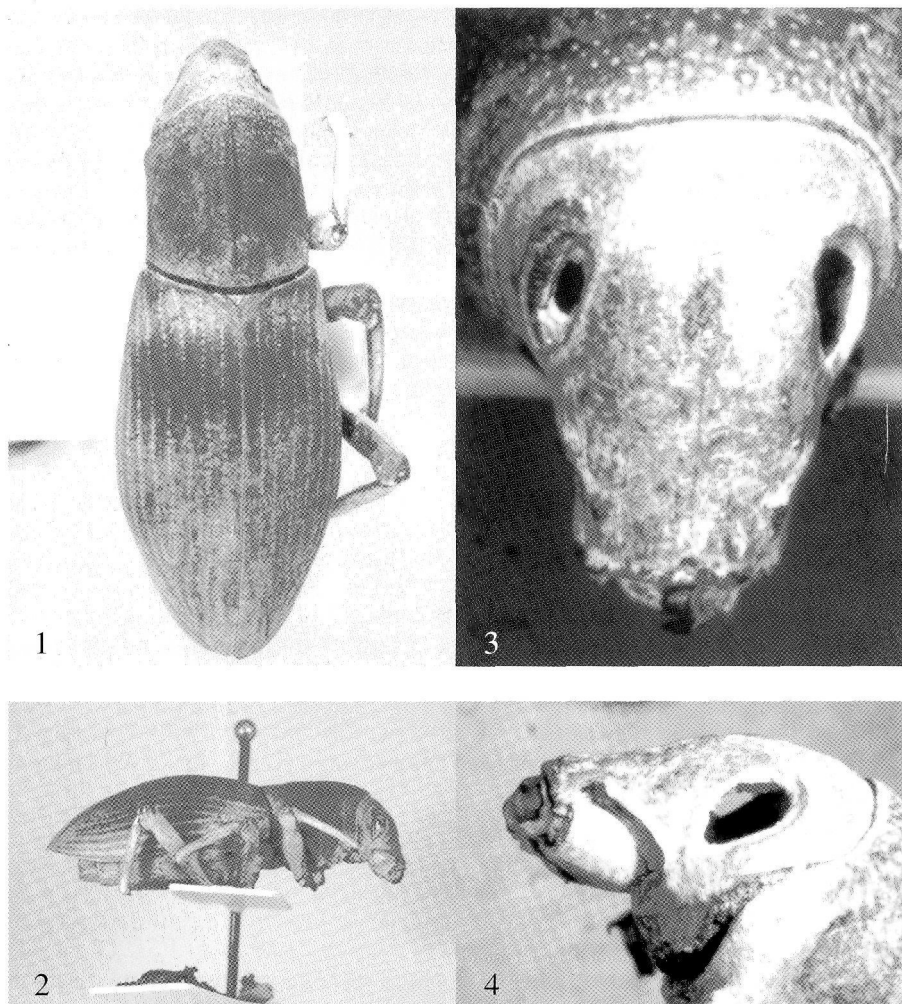
*C. relictus* represents an apparently isolated remnant of very ancient faunas (see remarks): hence the specific epithet.

#### Ecology

The dead specimen was found on a shrubby area of a few square km near the margin of a Sebkhet (salty depression), on relatively sandy soil. Local flora comprised shrubs of *Tamarix* sp. and several bushes of *Chenopodiaceae*, among which genera *Arthrocnemon* and *Salicornia*. Although following an entire year of nearly complete dryness, the habitat conditions were still quite good, with most plants in at least acceptable growing conditions.

#### Distribution

This species seems to be more or less strictly localized in Southwestern Morocco. The habitat, a relatively densely vegetated sebkhet, is in fact nowadays restricted to small isolated coastal spots in southern Morocco.



Figs. 1-4: *Conorhynchus relictus* n. sp., holotype: Body (1, 2); rostrum (3, 4).

## REMARKS

### Nomenclature

The genus *Conorhynchus* Motschulsky, 1860 was instituted for species from Central Asia (MOTSCHULSKY, 1860). Type species, by original designation, is *Cleonus bartelsi* Fåhræus, 1842 (= *Cleonus conirostris* Gebler, 1830). CHEVROLAT (1873) added other species to *Conorhynchus* and named several other genera, without designation of the type species. This originated various nomenclatural problems. The genera which influence *Conorhynchus* are: genus *Temnorhinus* Chevrolat, 1873, characterized by the conical rostrum and named for *T. pilosus* Chevrolat, 1873 (an uncertain name), *T. kirghisicus* Chevrolat, 1873

(spelled *kirguisicus* at page 43 and *kirghisicus* at page 104), *T. rufulus* Chevrolat, 1873 (= *Cleonus brevirrostris* Gyllenhal, 1834), *T. saucerottei* Chevrolat, 1873 (= *Cleonus brevirrostris* Gyllenhal, 1834), *T. albofimbriatus* Chevrolat, 1873 (an uncertain name), *T. aegyptius* Chevrolat, 1873 (= *Cleonus brevirrostris* Gyllenhal, 1834); genus *Pycnodactylus* Chevrolat, 1873, named for *P. fuscoirroratus* Chevrolat, 1873 (= *Cleonus tomentosus* Fähræus, 1842); genus *Stephanophorus* Chevrolat, 1873 (non Strickland, 1841), to which *Cleonus gebleri* Fähræus, 1842 was doubtfully included. CHEVROLAT also added a catalogue (1873: 99-113) where he listed all the species known to him under the respective genera. Unfortunately, several misplacements occurred. In particular, *Lixus mimosae* Olivier, 1807 was included in *Temnorhinus*, although its characters are referable to *Stephanophorus*, and *Lixus pacificus* Olivier, 1807 (= *Curculio hololeucus* Pallas, 1781) was included in *Pycnodactylus* rather than in *Conorhynchus*, where CHEVROLAT correctly listed *C. hololeucus*. Type species were subsequently designated by RYE (1875), who selected *Lixus mimosae* as type species of *Temnorhinus* and *Lixus pacificus* as type species of *Pycnodactylus*. These designations are valid (ICZN art. 69), although they evidently do not match Chevrolat's original concepts of these genera. Following RYE (1875), the name *Temnorhinus* Chevrolat applies to the species which show the characters indicated by Chevrolat under *Stephanophorus* and the name *Pycnodactylus* is a synonym of *Conorhynchus* Motschulsky. In other words, all the 14 species listed by CHEVROLAT (1873: 104) under *Temnorhinus*, excepted *T. mimosae*, should be excluded from this genus, and the same applies to the species listed under *Pycnodactylus*, only applicable to *P. pacificus* (= *Curculio hololeucus*). All authors from 1875 to 1999 (countless citations, not reported here) in all taxonomical, systematic and faunistic works, as well as in all the check-lists, none excluded, ignored Rye's designations, and continued to use the names according to the main Chevrolat's concept. ALONSO-ZARAZAGA & LYAL (1999) resurrected Rye's typifications, and nomenclature of these genera of Cleonini was rearranged accordingly.

## Taxonomy

In the following taxonomical remarks the genus-rank names are given as appeared in the original publications, regardless to the present nomenclature, in order to avoid any misinterpretation of the authors' concepts. FAUST (1904) considered *Temnorhinus* a subgenus of *Conorhynchus*, based on the form of scales on elytra (round and entire in *Conorhynchus*, elliptical, hair-like or with toothed apex in *Temnorhinus*) and the ratio between diameter of middle coxae and metasternum. Following FAUST (1904), the two taxa became clearly defined and his interpretation was accepted by many authors (cf. PEYERIMHOFF, 1907, 1927). FAUST (1904) also transferred *hololeucus* from *Conorhynchus*, where it was placed in CHEVROLAT (1873) to subgenus *Temnorhinus*. REITTER (1913) raised again *Temnorhinus* at genus level, based on the form of segment 2 of hind tarsi, slender in *Conorhynchus* and triangular, as long as wide in *Temnorhinus*. CSIKI (1934) used the genus *Cleonus* Schönherr, 1826 for the whole tribe Cleonini Schönherr, 1826, and listed *Conorhynchus* and *Temnorhinus* as independent subgenera. Some misplacements occurred, originated by Faust's and Reitter's different opinions: for example, *Conorhynchus (Temnorhinus) seurati* Peyerimhoff, 1927 was included by CSIKI (1934) in *Conorhynchus*, rather than in *Temnorhinus*. VOSS, 1960 observed that the differentiating traits between *Conorhynchus* and *Temnorhinus* (sic!) are quite subtle, so that some species, for example *Temnorhinus heros* Suvorov, 1909, could be placed in one or the other genus, depending on the characters considered.

Thus, he instituted *Temnorhynchus* subgenus *Pseudotemnorhynchus* Voss, 1960 for the species of *Temnorhynchus* with scarcely developed shoulders, with *T. inustulatus* Voss, 1960 as the type species. This subgenus was anyway heterogeneous, as it included species with oblong entire scales (*T. heros*) together with species with slender, toothed scales (*T. inustulatus*). Basing on VOSS (1960) *Pseudotemnorhynchus* should probably include the other large species with scarcely developed shoulders of the *T. elongatus* group, relatively similar to *T. heros*: according to TER-MINASIAN (1988), *T. elongatus* (Gebler, 1845), from Southern Kazakhstan and nearby countries; *T. nasutus* (Hochhuth, 1847) from Armenia; and *T. oryx* Reitter, 1897, from Eastern Kazakhstan, Mongolia and Western China. ANDERSON (1987) considered *Temnorhynchus* a synonym of *Conorhynchus*, without justifying his opinion, while TER-MINASIAN (1988) maintained the two genera distinct and indicated *Lixus conicirostris* Olivier, 1807 as type species of *Temnorhynchus*. ALONSO-ZARAZAGA & LYAL (1999) rearranged nomenclature according to RYE's (1875) typifications and listed *Conorhynchus* with *Conorhynchus*, *Pycnodactylus* and *Pseudotemnorhynchus* as subgenera. *Temnorhynchus*, as seen above, is the name for the species included by all authors in *Stephanophorus* Chevrolat, 1873 (not *Stephanophorus* Strickland, 1841).

Indeed, all species in genus *Conorhynchus* as defined in ALONSO-ZARAZAGA & LYAL (1999) seem to form a monophyletic unit so that their attribution to a single genus is justified. Several groups of related species can be distinguished, and the inclusion of these groups in taxa at subgenus rank might help in recognizing monophyletic lines within the genus. However, the composition of the subgenera in the present concept does not reflect natural taxa. In particular, the large, apterous species of subg. *Conorhynchus* characterized by broadened elytra, with maximum width at or behind the middle of length, form a self-standing group, already recognized by FAUST (1904). TER-MINASIAN (1988) listed the following species for this group: *C. arduus* Faust, 1904, from Mongolia; *C. excavatus* (Zoubkal, 1833), from W Kazakhstan (Lake Inder; Caspian Sea); *C. globifrons* Faust, 1904, from "Ganshun" (Western China, Kansu-Shan, South of the Gobi desert); and *C. schrenki* (Gebler, 1845) from Eastern Kazakhstan (Lake Balkhas), including here also *C. acentatus* Faust 1904, from Uzbekistan, Kyrgyzstan and Tadjikistan. All these entities are apparently very rare or localized, and very scarce material is present in the collections. This complex may be nearer to the species of the *C. heros* group within subgenus *Pycnodactylus* than to the other species of subgenus *Conorhynchus*. Further unresolved questions regard the systematic position of *C. hololeucus* (the type species of *Pycnodactylus*). This species was listed in *Conorhynchus* by CHEVROLAT (1873) and transferred to *Conorhynchus* subg. *Temnorhynchus* by FAUST (1904). This interpretation was followed by all subsequent authors; however, *C. hololeucus* occupies a morphological intermediate position, and for several aspects approaches more the species of subg. *Conorhynchus* than the majority of those of subg. *Pycnodactylus*. Also relationships of *C. arabs* (Olivier, 1807) are not fully clear. Thus, use of subgenera as presently defined in *Conorhynchus* is not justified and it is preferable to adopt informal infrageneric ranks if needed.

**Synonymies** (only relevant works are listed)

*Conorhynchus* Motschulsky, 1860

*Conorhynchus* Motschulsky, 1860: 540

Type species: *Cleonus bartelsi* Fähræus, 1842 (= *Cleonus conirostris* Gebler, 1830), original designation

- Conorhynchus* Motschulsky: Chevrolat, 1873: 45, 104
- Pycnodactylus* Chevrolat, 1873 (pro parte): 105
- Pycnodactylus* Chevrolat (pro parte): Rye, 1875: 301 (type species: *Lixus pacificus* Olivier, 1807 [= *Curculio hololeucus* Pallas, 1781], subsequent designation)
- Conorhynchus* subg. *Conorhynchus* Motschulsky: Faust, 1904: 189, 213, 277
- Conorhynchus* Motschulsky: Reitter, 1913: 35
- Cleonus* subg. *Conorhynchus* Motschulsky: Csiki, 1934: 15
- Conorhynchus* Motschulsky: Ter-Minasian, 1988: 14, 21
- Conorhynchus* subg. *Conorhynchus* Motschulsky: Alonso-Zarazaga & Lyal, 1999: 191
- Temnorhinus* Chevrolat, 1873: 41 (no type species designated)
- Temnorhinus* Chevrolat (pro parte): Chevrolat, 1873: 104
- Conorhynchus* subg. *Temnorhinus* Chevrolat (pro parte, not as type): Faust, 1904: 189, 215, 278
- Temnorhinus* Chevrolat (pro parte, not as type): Reitter, 1913: 36
- Cleonus* subg. *Temnorhinus* Chevrolat (pro parte, not as type): Csiki, 1934: 16
- Temnorhinus* Chevrolat (pro parte, not as type): Ter-Minasian, 1988: 15, 30
- Conorhynchus* subg. *Pycnodactylus* Chevrolat (pro parte, as type): Alonso-Zarazaga & Lyal, 1999: 191 (= *Temnorhinus* Chevrolat, 1873 [pro parte, not as type] sensu Faust, 1904 [pro parte])
- Temnorrhinus* subg. *Pseudotemnorrhinus* Voss, 1960: 239
- Type species: *Temnorrhinus inustulatus* Voss, 1960
- Conorhynchus* subg. *Pseudotemnorrhinus* Voss: Alonso-Zarazaga & Lyal, 1999: 191
- Pycnodactylopsi*** subg. *Louwia* Alonso-Zarazaga & Lyal, 1999
- Pycnodactylus* Chevrolat, 1873: 50 (no type species designated)
- Pycnodactylus* Chevrolat (pro parte): Chevrolat, 1873: 105
- Pycnodactylus* Chevrolat (pro parte, not as type): Faust, 1904: 187, 202, 270 (at page 202 cited as subgenus of *Neocleonus* Chevrolat, 1873)
- Pycnodactylus* Chevrolat (pro parte, not as type): Reitter, 1913: 42
- Cleonus* subg. *Pycnodactylus* Chevrolat (pro parte, not as type): Csiki, 1934: 44
- Pycnodactylopsi* subg. *Louwia* Alonso-Zarazaga & Lyal, 1999: 192 (type species: *Cleonus tomentosus* Fähræus, 1842)
- Temnorhinus*** Chevrolat, 1873
- Temnorhinus* Chevrolat (pro parte): Chevrolat, 1873: 104
- Stephanophorus* Chevrolat, 1873 (not Strickland, 1841): 39
- Stephanophorus* Chevrolat (pro parte) (not Strickland, 1841): Chevrolat, 1873: 103
- Temnorhinus* Chevrolat (pro parte): Rye, 1875: 301 (type species: *Lixus mimosae* Olivier, 1807, subsequent designation)
- Stephanophorus* Chevrolat (pro parte, not as type) (not Strickland, 1841): Faust, 1904: 184, 274
- Bothynoderes* sensu Motschulsky, 1860 (sub *Bothynoderus*) (not Schönherr, 1823): Reitter, 1905: 193
- Stephanophorus* Chevrolat (pro parte, not as type) (not Strickland, 1841): Reitter, 1913: 39
- Cleonus* subg. *Stephanophorus* Chevrolat (pro parte, not as type) (not Strickland, 1841): Csiki, 1934: 35
- Stephanophorus* Chevrolat (pro parte, not as type) (not Strickland, 1841): Ter-Minasian, 1988: 21, 199
- Temnorhinus* Chevrolat (pro parte, as type): Alonso-Zarazaga & Lyal, 1999: 193

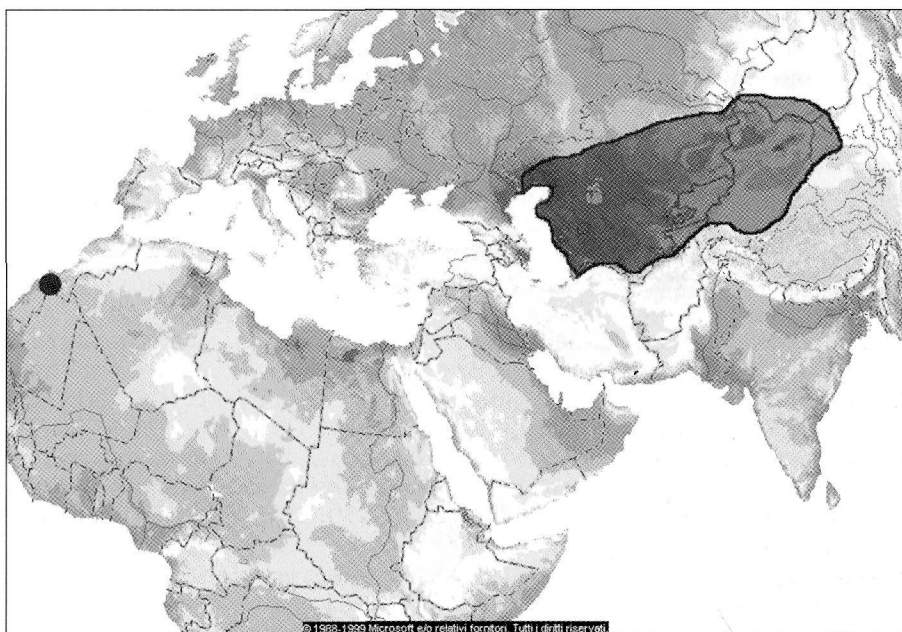


Fig. 5: Distribution of the *C. excavatus* group. Central Asian species (shaded); *C. relictus* sp. n. (dot).

### Biogeography

Morphological characters of *C. relictus* sp. n., namely, large size, form of rostrum, cylindrical prothorax, oblong elytra with broadened sides indicate that the new species should be attributed to the *C. excavatus* group. This is really remarkable, considering that all the hitherto known taxa of this group are peculiar to the Central Asian steppes, with no geographical intermediate being known (Fig. 5). Ecology is important to understand this peculiar distribution pattern. All available data on genus *Conorhynchus* indicate that these weevils colonize dry halophilous steppes and are associated to Chenopodiaceae (PEYERIMHOFF, 1927; HOFFMANN, 1950; TERMINASIAN, 1988; personal observations on various species). Dryland vegetation communities started developing in the middle-latitudes of the northern hemisphere during Oligocene (AXELROD & RAVEN, 1978; WALTER & BOX, 1983) and expanded during Middle and Late Miocene (TALLIS, 1991), when they occupied vast regions (OLSON, 1985). These desert and semidesert habitats, well represented both in Africa (AXELROD & RAVEN, 1978) and Central Asia (SONG *et al.*, 1979), formed a continuous, relatively homogeneous, saharo-sindic stripe (SCHMIDA, 1983), of great biogeographical importance (LA GRECA, 1993). The semidesert steppes, still relatively expanded in northern Africa during Middle Holocene (SCHULZ *et al.*, 1999), are now mainly present as isolated patches of vegetation in salty depressions, separated by wide extensions of nearly bare desert. Basing on chorology of the known species it can be hypothesized that the ancestors of the *C. excavatus* group, adapted to Chenopodiaceae-rich habitats, differentiated into two lines. One of these spread in Northern Africa and is now represented by *C. relictus*; the other line gave rise to the colonization of the Central Asian steppes, where a

secondary process of speciation occurred. The fragmentation of the present distribution of these wingless weevils, in accordance with the palaeogeological and palaeoecological models cited above, is suggestive of an ancient, possibly Miocenic differentiation. Basing on known data, most species seem to be very localized, likely as a consequence of stenotopy and limited mobility; hence, the presence of other undescribed entities in intermediate areas between Morocco and Central Asia cannot be excluded, or these may have disappeared in more or less recent times. Significantly, no apterous *Conorhynchus* has been recorded from circum-Mediterranean halophilous habitats, which are only colonized by winged species of the genus, mainly belonging to the widely spread, relatively eurytopic, *C. conicirostris* group. Similarities in this distribution pattern are found for other Curculionoidea linked to Chenopodiaceae. Among Cleonini, the apterous genus *Eurycleonus* Bedel, 1907, systematically related to *Epexochus* Reitter, 1913 from Central Asia, is known from northern African and Sinai deserts (MEREGALLI, 2000), whilst winged species of genus *Asproparthenis* Gozis, 1886 (*Bothynoderes* s. auct.; non Schönherr, 1823), related to Asian groups, colonize halophilous habitats in the whole Mediterranean region. Primary halophilous habitats in this area reached their peak during the Messinian salinity crisis (HSU, 1972; BENSON, 1976) and nearly completely disappeared in Pliocene after the opening of the Straits of Gibraltar, with subsequent inundation of the Mediterranean basin, and the modification of climate towards sub-tropical, warmer and more humid, conditions (BLASCO ZUMETA, 1993; SUC, 1984; MACKENZIE, 1999). Hence, it seems that the phyletic lines of these apterous Cleonini spread in northern Africa before Messinian, remaining isolated in refuge habitats during the late Tertiary and Quaternary geological and climatic vicissitudes. The limited mobility and stenotopy prevented them from recolonizing the more recent, Pleistocenic circum-Mediterranean halophilous steppes (SUC, 1984), where only winged species are found.

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