

## New or little known *Laemostenus* species from southern Spain and Morocco (Coleoptera: Carabidae: Sphodrini)

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### Abstract

Two new *Laemostenus* (*sensu lato*) species are described from southern Spain and Morocco.

*Laemostenus* (*Actenipus*) *mateui* Casale & Comas, **n. sp.** is described from southwestern Spain (type locality: Almería, Enix, Sierra de Gádor: Cueva Llano de la Montés cave). It is a very peculiar, isolated species not related to other *Actenipus* species known so far from the Iberian Peninsula. In particular, the new taxon is characterised by the peculiar combination of the following features: dorsal surface black-bluish, moderately shiny; body very elongate and slender; head elongate, temples parallel-sided; pronotum narrow, longer than wide; elytra convex, with deep, punctate striae; legs very long, tarsal claws with traces of reduced teeth in the basal third; median lobe of aedeagus with apex thickened, prominent on the dorsal side, widened in dorsal aspect. This new species, sampled in an area entomologically well known and apparently not related to other *Laemostenus* species of close areas, is very isolated geographically in southern Iberian Peninsula, and highly interesting from the biogeographical point of view.

*Laemostenus* (*Ceuthobthene*) *aurouxi* Casale & Comas, **n. sp.** is described from southwestern Morocco (type locality: E Agadir, Tagoudicht-Asdif, Kef Thaleb cave), close to the epigeal species *L. (C.) berberus* Mateu, 1975, from which is distinguished by the smaller size, the less elongate body, and the median lobe of aedeagus more elongate, less inflated in the middle, and with apex wider, not asymmetrically and more prominent at sides in dorsal aspect.

New records of interesting or little known *Laemostenus* species are also provided. Amongst them, particularly interesting are two new subterranean localities of *L. (Ceuthobthene) kolbi* (Coiffait, 1972), previously known from the holotype specimen only, from a cave in the Rif massif.

**Key words:** Coleoptera, Carabidae, Sphodrini, *Laemostenus*, new species, Spain, Morocco.

### Resumen

#### **Especies nuevas o poco conocidas de *Laemostenus* del sur de España y Marruecos (Coleoptera: Carabidae: Sphodrini)**

Se describen dos nuevas especies de *Laemostenus* (*sensu lato*) del sur de España y Marruecos.

*Laemostenus* (*Actenipus*) *mateui* Casale & Comas, **n. sp.** se describe del suroeste de España (localidad tipo: Almería, Enix, Sierra de Gádor: Cueva Llano de la Montés). Se trata de una especie muy peculiar, aislada, y no relacionada con otras especies de *Actenipus* conocidas hasta el momento de la Península Ibérica. En particular, el nuevo taxón se caracteriza por la peculiar combinación de las siguientes características: superficie dorsal de color negro azulado, moderadamente brillante; cuerpo muy alargado y esbelto; cabeza alargada y mejillas de lados paralelos; pronoto estrecho, más largo que ancho; élitros convexos, con estrías profundas y punteadas; patas muy largas, uñas tarsales con huellas de pequeños dientes en el tercio basal; lóbulo medio del eedeago con el ápice engrosado y saliente en la parte dorsal, ensanchado en visión dorsal. Esta nueva especie, que se encuentra en una zona entomológicamente bien conocida y aparentemente no está relacionada con otras especies de *Laemostenus* de zonas cercanas, queda geográficamente aislada en el sur de la Península Ibérica y es muy interesante desde el punto de vista biogeográfico.

*Laemostenus (Ceuthobtenes) aurouxi* Casale & Comas, **n. sp.** se describe del suroeste de Marruecos (localidad tipo: E Agadir, Tagoudicht-Asdif, cueva Kef Thaleb), próxima a la especie epígea *L. (C.) berberus* Mateu, 1975, de la cual se distingue por el tamaño más pequeño, el cuerpo menos alargado y el lóbulo medio del edeago más alargado, menos ensanchado en el centro y con el ápice más amplio, de forma asimétrica y más prominente en los lados de su cara dorsal.

También se proporcionan nuevos registros de especies de *Laemostenus* interesantes o poco conocidas. Entre ellos, son particularmente interesantes dos nuevas localidades subterráneas de *L. (Ceuthobtenes) kolbi* (Coiffait, 1972), solo conocido anteriormente por el holotipo, de una cueva en el macizo del Rif.

**Palabras clave:** Coleoptera, Carabidae, Sphodrina, *Laemostenus*, especies nuevas, España, Marruecos.

## Laburpena

### *Laemostenus* espezie berri edo ez oso ezagunak Espainiaren hegoaldean eta Marokon (Coleoptera: Carabidae: Sphodrini)

*Laemostenus (sensu lato)* generoko bi espezie berri deskribatzen dira, Espainiaren hegoalde eta Marokokoak.

*Laemostenus (Actenipus) mateui* Casale & Comas, **n. sp.** deskribatzen da, Espainiaren hegomendebaldekoa (tipolekua: Almería, Enix, Sierra de Gádor: Cueva Llano de la Montés leizea). Oso espezie berezia da, isolatua, eta orain arte ezagututako *Actenipus* espezieekin ez-erlazionatua. Hain zuzen, ondoko ezaugarrien konbinazioak bereizten du taxoi berria: gainaldeko azalera beltz-undinska, pixka bat distiratsua; gorputz oso luzea eta liraina; burua luzea eta masailen albo paraleloekin; pronoto estua, bere zabalera baino luzeagoa; elitro konbexuak, ildaska sakon eta punteatuekin; hanka oso luzeak, tartsoen unguis lehenengo herenean hortz txikien aztarnekin; edeagoren erdiko lobuluaren muturra loditua eta irtena alde dortsalean, zabaldua gainaldetik ikusita. Espezie berri hau, zonalde entomologikoki aski ezagun batean aurkitu dena, eta zonalde hurbiletako *Laemostenus* espezieekin ustez erlaziorik ez duena, geografikoki isolatuta dago Iberiar Penintsularen hegoaldean, ikuspuntu biogeografikotik oso interesgarria suertatuz.

*Laemostenus (Ceuthobtenes) aurouxi* Casale & Comas, **n. sp.** deskribatzen da, Marokoren hegomendebaldekoa (tipolekua: E Agadir, Tagoudicht-Asdif, Kef Thaleb leizea). *L. (C.) berberus* Mateu, 1975 espezie epigeotik hurbila izanik, honengandik bereizten da tamaina txikiagoatik, gorputz ez hain luzeagatik eta edeagoaren ezaugarriengatik: erdiko lobulu luzeagoa, erdialdean ez hain zabaldua eta mutur handiagoarekin, forma asimetrikoarekin eta irtenagoa bere alde dortsalaren alboetan.

Beste *Laemostenus* espezie interesgarri edo ez oso ezagun batzuen zenbait aipu berri ere aurkezten dira. Bestek beste, *L. (Ceuthobtenes) kolbi*ren (Coiffait, 1972) lurpeko bi lekune berri bereziki interesgarriak suertatzen dira, espezie horren holotipoa baino ez baitzen ezaguna lehendik, Rif mendiguneko leize batekoa hain zuzen.

**Gako-hitzak:** Coleoptera, Carabidae, Sphodrina, *Laemostenus*, espezie berriak, Espainia, Maroko.

## Introduction

Carabid beetles of the subtribe Sphodrina (in particular, species of the genus *Laemostenus* Bonelli, 1810; in the widest sense, and of different subgenera) include many representatives in the Iberian Peninsula (Casale, 2003; Serrano, 2003) and in western Maghreb (Antoine, 1957, 1961; De Miré Bruneau, 1958; Mateu, 1975), and most of them have been treated and illustrated by Casale (1988). Nevertheless, although the carabid fauna of the Betico-Rifean area seems to be well known, large areas have not been adequately investigated so far. For instance, subsequently to the monograph of Casale (1988), further new specialised subterranean *Laemostenus (Antisphodrus)* species have

been described from southern Iberian Peninsula in the last years (Mateu, 1990, 1996; Fernandez Cortés, 1995).

It is however highly surprising (being the subterranean fauna of the Iberian-Lusitanian region as a whole one of the richest and best known in Europe (Sendra *et al.*, 2011) ) the discovery of a new, isolated and peculiar *Laemostenus* species in a well known and easily accessible cave near Almería. A female individual of this species was sent by J. Mateu to the senior author of this contribution (A.C.) about ten years ago, labelled: «*Laemostenus* subg.? n. sp., J. Mateu det., paratipo». Male individuals lacking, the description was delayed, and apparently forgotten. Very recently only, J.C. was able to obtain some male and female individuals of the

original series, sampled in 2000, in the type locality near Almeria (Cueva Llano de la Montés, Sierra de Gádor). Therefore, only now we have the opportunity to complete the description and to discuss the taxonomic position of the new taxon.

Furthermore, we will describe and illustrate a new, interesting *Laemostenus* (*Ceuthosthenes*) species sampled in a cave of southwestern Morocco, close to *Laemostenus* (*Ceuthosthenes*) *berberus* Mateu, 1975, and will provide new records of different species sampled in not yet cited localities. These are the results of several biospeleological investigations («Projecte Atlas») carried out by one of the authors (J.C.) in several areas of Morocco, and started in 2001 by Florentino Fadrique of the «Secció d'Investigacions Espeleològiques, Barcelona». In the following years, with the cooperations of Lluís Auroux of the same group, Francesc Alfambra of the «Grup d'Espeleologia de Badalona», Carles Fontgivell of the «Secció d'Espeleologia del Centre d'Estudis Riudomencs Arnau de Palomar», with occasional support by local speleologists and the «Associació Catalana de Bioespeleologia (BIOSP)».

## Material and methods

Male and female genitalia were dissected and examined in DMHF (Dimethyl Hidantoina Formaldehid) or dried, before their definitive inclusion on labels attached to the respective specimens. Line drawings were made using a camera lucida attached to stereoscopic microscopes Wild M-3 or Wild M-5.

Photographs were obtained by cameras Nikon D70 (*L. mateui*) and Nikon COOLPIX L20 V1.0 (*L. aurouxi*).

### Acronyms:

TL: body Total Length, from the anterior margin of clypeus to the apex of elytra, measured along the suture.

L: overall Length, from apex of mandibles to apex of elytra, measured along the suture.

PL/PW: ratio Length of Pronotum, as linear distance from the anterior to the basal margin, measured along the midline / maximum Width of Pronotum, as greatest transverse distance.

EL/EW: ratio Length of Elytra, as linear distance from the basal ridge to the apex, measured along the suture / maximum Width of Elytra.

### Collections:

CCa	Achille Casale collection, Torino (Italy).
CCo	Jordi Comas collection, Barcelona (Spain).
CMA	Joaquin Mateu collection, Museo regionale di Scienze Naturali, Torino (Italy).
MNHN	Muséum National d'Histoire Naturelle, Entomologie, Paris.
MCNB	Museu de Ciències Naturals de Barcelona.

### Taxonomic treatment and morphological terms:

The genus *Laemostenus* is treated in the widest sense of Casale (1988), in which the limits of subgenera and species groups are clear in some cases, but not yet defined in other cases.

The median lobe of aedeagus is synonym of phallus of some authors.

## Results

### Genus *Laemostenus* Bonelli, 1810

#### Subgenus *Actenipus* Jeannel, 1937

#### *Laemostenus* (*Actenipus*) of the *mateui* species group

This very isolated group of *Actenipus* is here proposed for the only, peculiar new species *L. (A.) mateui* Casale & Comas, n. sp., from southern Spain (Almeria, Enix, Sierra de Gádor), and is mostly characterized by the peculiar combination of the features stressed in the description of the new species (see below).

#### *Laemostenus* (*Actenipus*) *mateui* Casale & Comas, n. sp. (Figs. 1-2)

#### Diagnosis:

A medium sized (TL: 15.0–15.5 mm; L: 16.5–17.0 mm) *Laemostenus* (*Actenipus*) species, sharing the main morphological features of representatives of the subgenus *Actenipus* (in the sense of Casale, 1988), but markedly characterised and isolated by the peculiar combination of the following features: dorsal surface black, mod-

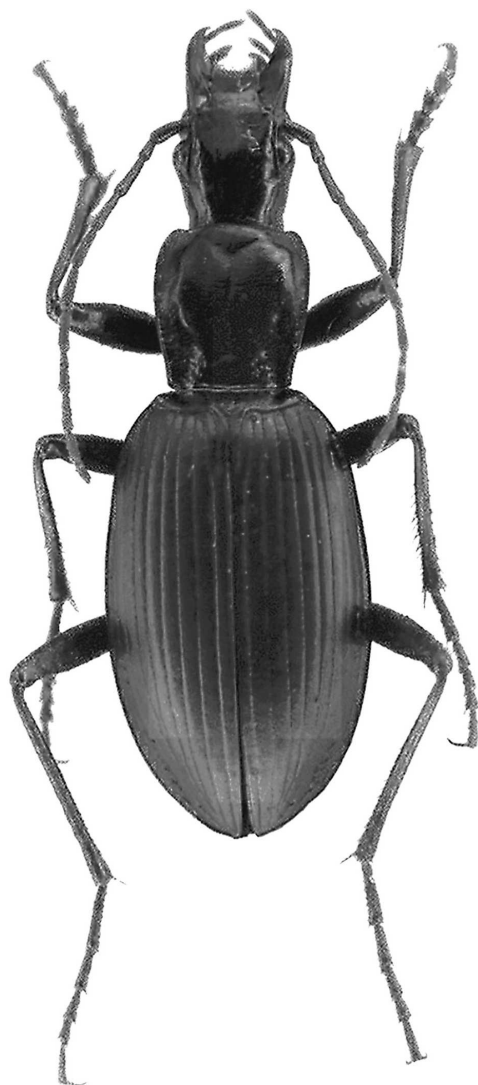


FIGURE 1. *Laemostenus (Actenipus) mateui* Casale & Comas, n. sp.: Male paratype, habitus (Photo: P. Marcia).

erately shiny, with slight bluish reflection on elytra; body very elongate, convex and slender; head elongate, temples parallel-sided; pronotum narrow, longer than wide; mesosternum unarmed in front of mesocoxae; elytra convex, with deep, punctate striae; legs very long, tarsal claws with traces of reduced teeth in the basal third; median lobe of aedeagus with apex thickened, prominent on the dorsal side, widened in dorsal aspect.

#### Examined material:

HOLOTYPE ♂, labelled: «Cueva Llano de la Montés, Sierra de Gádor, T.M. Enix, Almería (España), D. Ortega – J.G. Mayoral leg. 29.X.2000» (CMA); paratypes: 2 ♂♂, 3 ♀♀, same data as holotype (CCa, CCo, MCNB).

#### Etymology:

It is for us an honour to dedicate this very interesting new species to our good friend Joaquin Mateu in Barcelona, for his 90<sup>th</sup> birthday. We are sure that the persons who obtained the specimens on which this description is founded will be associated with us in this dedication. Joaquin, well known specialist of carabid beetles at world level, highly contributed to the knowledge of the carabid fauna of the Iberian Peninsula and northern Africa, and several years ago identified the taxon here described as a possible new species.

#### Description:

TL: 15.0–15.5 mm; L: 16.5–17.0 mm.

Dorsal surface piceous black, moderately shiny, with marked bluish reflection at oblique light; mouth parts, antennae and legs brown reddish. Microsculpture: head and pronotum with almost vanished, transversal microlines; elytral intervals with distinct, isodiametric meshes.

*Head* very elongate; temples long, parallel-sided or slightly oblique, narrowed on the neck constriction, which is shallowly impressed; frontal impressions short, deep, with superficial oblique wrinkles; eyes small, as long as 2/3 of temples, moved in front, very slightly prominent.

*Pronotum* very elongate and narrow, longer than wide (PL/PW: 1.1), with its maximum width at the anterior fourth, its lateral sides slightly sinuate and constricted to the basolateral angles, which are obtuse; anterolateral angles rounded, slightly prominent; base straight or slightly oblique at sides, fully beaded. Disc convex, with shallow transversal wrinkles; basal impressions elongate, each with deep punctures extended to the basal area and the lateral furrows; anterolateral and basolateral setiferous punctures present.

*Mesosternum* unarmed in front of mesocoxae.

*Elytra* elongate-ovate, narrow (EL/EW: 1.50), convex. Base narrow, humeral angle rounded, humeral tooth not prominent; basal ridge incavate. Striae very deep, punctate; intervals flat or moderately convex. Chaetotaxy: basal pore present; umbilicate series with 17-18 setiferous punctures; 2 setae at apex of stria 7.

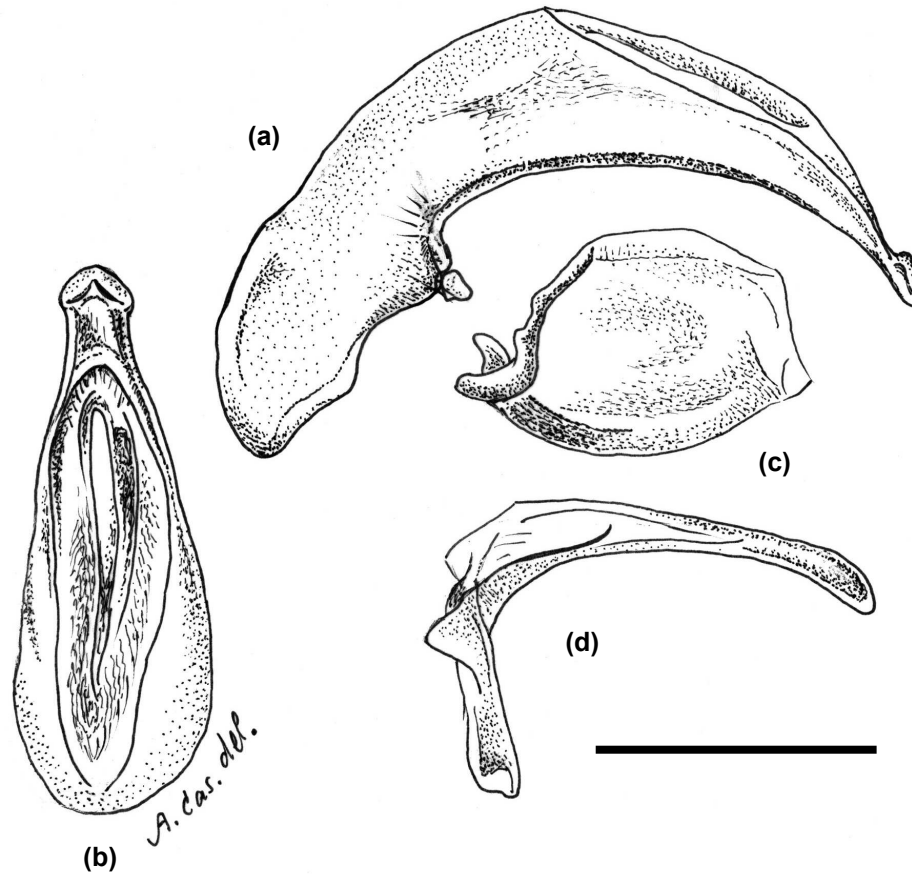


FIGURE 2. *Laemostenus (Actenipus) mateui* Casale & Comas, n. sp.: Male holotype, genitalia features: (a)-(b) Median lobe: (a) Left side; (b) Dorsal side; (c) Left paramere; (d) Right paramere (Scale bar = 1 mm) (Drawings: A. Casale).

*Legs* elongate and slender; profemora with ventral side flat, both its outer and inner sides smooth and without setae. Protibiae with a few, short setae at apex of the anterior side; mesotibiae straight in both sexes; metatibiae straight, each with apical group of very short, scarce yellow reddish setae. Tarsomeres with dorsal pubescence scarce, short, decumbent. Tarsal claws with very small, reduced in number (2-3) teeth along the basal third of the inner margin.

*Male genitalia* (Fig. 2): median lobe of aedeagus markedly curved, with apical lamina developed, with lateral margins prominent, markedly and symmetrically widened in the dorsal aspect; right paramere short, widened apically; left paramere with reduced apical membranous lobe.

*Female genitalia*: not examined.

#### Distribution and habitat:

Known so far from the type locality only: Cueva Llano de la Montés cave, Sierra de Gádor (Enix, Almeria), 450 m, UTM coordinates: 30SWF3976.

The new species was associated with another Sphodrina species, widely spread in southwestern Iberian Peninsula, *i.e.* *L. (Pristomychus) baeticus* (Rambur, 1837).

#### Remarks:

The discovery of this new, highly characterized species in a well investigated area confirms the high diversity of Sphodrina species in the southern Iberian Peninsula, and its high interest from both the taxonomic and biogeographical points of view.

Morphologically, the new species shares the main

features of representatives of the subgenus *Actenipus* of *Laemostenus* in the sense of Casale (1988). However, for both external features and morphological characters of male genitalia, it seems to be markedly isolated from the westernmost species of the subgenus, i.e. *L. (A.) oblongus* (Dejean, 1828), widely spread in southwestern France, Pyrenees, and the Cantabrian chain. On the contrary, its aedeagus shows many similarities to those of the Apennine species *L. (A.) acutangulus* (Schaufuss, 1862), and the Corso-Sardinian species *L. (A.) carinatus* (Chaudoir, 1859).

This is not all: its male genitalia and general habitus are rather similar to those of some Moroccan *Ceuthosthenes* species, in particular *berberus* Mateu, 1975 and *aurouxi* n. sp. (see below). If a phylogenetic analysis shows in the future that these similarities are true synapomorphic features, and not mere characters of convergence, the hypothesis proposed by Casale (1988: 584) that *Ceuthosthenes* and *Actenipus* should be putative adelphotaxa in Maghreb and Europe, respectively, could be confirmed.

Highly interesting is also the geographical position of the type locality of the new taxon, a mountain massif close to Almeria. In fact, this area, owing to the occurrence of several endemic, isolated subterranean taxa of carabid beetles (such as pterostichines of the genus *Tinautius* Mateu, 1997, and *Dabyat mirabilis* Mateu, 2002, the only promecognathine species of the Palaearctic Region (see Mateu, 1997, 2001; Mateu and Bellés, 2003; Ribera *et al.*, 2005, 2010)) confirms, with the description of this new species, its conservative rule of relic taxa of ancient origin in the southwestern Iberian Peninsula.

#### Subgenus *Ceuthosthenes* Antoine, 1954

##### *Laemostenus (Ceuthosthenes) kolbi* (Coiffait, 1972)

###### Examined material:

Besides the male holotype (MNHN) (see Casale, 1988), we had the opportunity to examine additional material from the following localities: Morocco: Ez Zerkar, Tetuan, Kef Mizou, 12-VII-2007, Auroux-Comas-Fadrique leg. (12 ♂♂♀♀); Afertane, Oued Lou, Ghar Knadel, 12-VII-2007, Auroux-Comas-Fadrique leg. (13 ♂♂♀♀) (CCo, CCa).

###### Redescription:

This interesting species was known so far from the male holotype and from the type locality only, the Jebel El Ouad cave, South Tetouan (Coiffait, 1972; Casale, 1988). The examination of individuals from the localities cited above allows us to better evaluate the variability of this species.

The general morphological features are mostly corresponding to those of the male holotype:

L: 13.0–16.5 mm (15.0 in male holotype). Colour dark piceous brown or dark reddish brown; elytral disc darkened; palpomeres, antennae and legs brown reddish. Dorsal surface dull. Microsculpture: head and pronotum with distinct transversal microlines; elytral intervals with very distinct, deep isodiametric meshes.

*Head* elongate; genae long, slightly oblique, constricted on the neck; eyes small, as long as 2/3 of genae, slightly prominent.

*Pronotum* elongate-cordiform (PL/PW: 1), its lateral sides deeply sinuate in the posterior third; base truncate or slightly oblique at sides, beaded at sides only. Basolateral angles rectangular, or acute and prominent outside.

*Elytra* elongate-ovate, depressed; elytral striae deep, smooth; intervals slightly convex. Umbilicate series with 21–23 setiferous punctures; 2 setae at apex of stria 7.

*Legs* elongate but robust. Protibiae with dense, developed pubescence on the apical third of the anterior side. Tarsomeres with dorsal pubescence dense, short, strigose; tarsomeres 1–3 markedly widened in males. Tarsal claws smooth on the inner margin.

*Male genitalia* as in Casale (1988: figs. 864–865).

###### Remarks:

In spite of the fact that it is only known from caves, this species shows only moderate adaptive features to the subterranean environment (slight depigmentation and moderately reduced eyes).

##### *Laemostenus (Ceuthosthenes) berberus* Mateu, 1975

###### Examined material:

Besides the type material (CMa), and the additional specimens cited by Casale (1988), we had the opportunity to examine a male individual of this taxon from «Morocco, Ant. Atlas, Jibel Imzi m 650 Addar 29° 45' 01" N 09° 15' 28" W, 2.V.2000 M. Meregalli» (CCa).

***Laemostenus (Ceuthosthenes) aurouxi* Casale & Comas, n. sp.** (Figs. 3-4)

**Diagnosis:**

A medium sized (in male holotype: TL: 14.0 mm; L: 14.6 mm; MW: 5.0 mm) *Laemostenus (Ceuthosthenes)* species mostly characterised by the elongate, slender body; the piceous black dorsal colour with very slight violet reflection on elytra; the small, elongate head with small eyes, shorter than genae and moved in front; the elongate-cordiform pronotum with basal margin oblique at sides and deep punctuations on basal foveae; the elytral striae deep and elytral intervals very convex; the inner side of tarsal claws smooth; and the median lobe of aedeagus elongate, markedly widened at apex in dorsal aspect. For the combination of these several peculiar features, this new taxon is close to *L. (C.) berberus* Mateu, 1975, from which is distinct for the smaller size (17–20 mm in *L. berberus*), the less elongate body, and the different shape of the median lobe of aedeagus, which in *L. berberus* is stouter, more inflated in the middle, and with apical lamina asymmetrically widened and toothed on the right side in dorsal aspect (see Mateu, 1975: fig. 2; Casale, 1988: figs. 859-862).

**Examined material:**

HOLOTYPE ♂, labelled: «Tagoudicht-Asdif (Marroc), Kef Thaleb 23-VII-2006 Auroux-Comas-Fadrique leg» (CCo).

**Etymology:**

Dedicated to Lluís Auroux, active speleologist and companion of one of the authors (J.C.) in explorations of caves in Morocco, and in the discovery of the new taxon here described.

**Description:**

TL: 14.0 mm; L: 14.6 mm (male holotype).

Dorsal surface piceous black, shiny; elytra with slight violet reflection at oblique light; antennae, legs and palpomeres dark brownish. Microsculpture: head and pronotum with almost vanished, transversal micro-lines; elytral intervals with distinct, isodiametric meshes.

*Head* elongate, small; genae oblique, abruptly constricted on the neck constriction, which is shallowly impressed; frontal impressions very shallow, with superficial oblique wrinkles; eyes small, as long as 2/3 of temples, moved in front, very slightly prominent.

*Pronotum* elongate-cordiform (PL/PW: 1), with its



**FIGURE 3.** *Laemostenus (Ceuthosthenes) aurouxi* Casale & Comas, n. sp.: Male holotype, habitus (Photo: J. Comas).

maximum width at the anterior third, its lateral sides sinuate in the posterior fourth and constricted to the basolateral angles, which are obtuse; anterolateral angles rounded, slightly prominent; base slightly concave in the middle, oblique at sides, fully beaded. Disc depressed, with shallow transversal wrinkles; basal impressions elongate, each with large, deep wrinkles and punctures extended to the basal area and the lateral furrows; anterolateral and basolateral setiferous punctures present.

*Mesosternum* unarmed in front of mesocoxae.

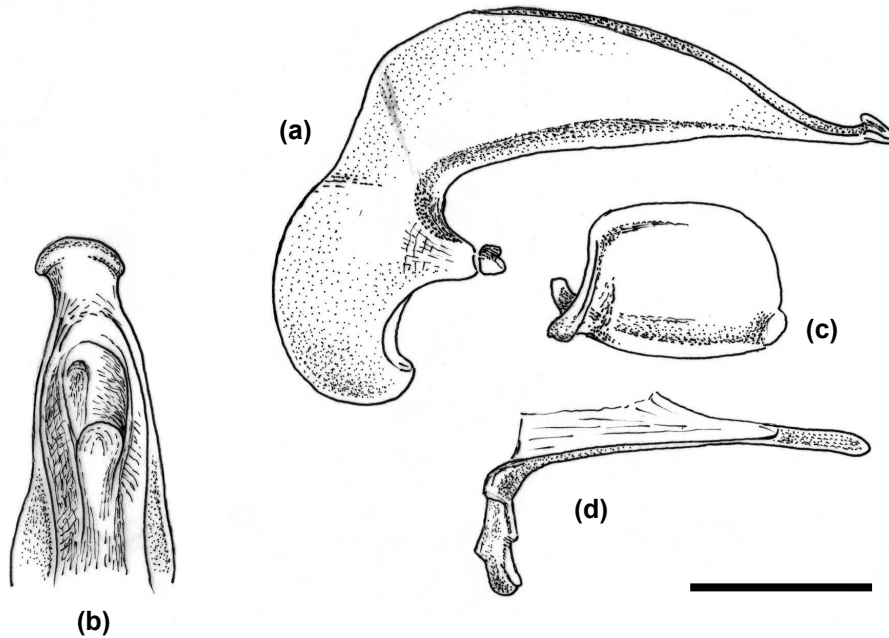


FIGURE 4. *Laemostenus (Centhosthenes) auronxi* Casale & Comas, n. sp.: Male holotype, genitalia features: (a)-(b) Median lobe: (a) Left side; (b) Dorsal side; (c) Left paramere; (d) Right paramere (Scale bar = 1 mm) (Drawings: A. Casale).

*Elytra* elongate-ovate, narrow (EL/EW: 1.7), moderately convex and with marked sutural depression, extended to intervals 1-3. Base narrow, humeral angle rounded, humeral tooth not prominent; basal ridge incavate. Striae very deep, shallowly punctuate; intervals very convex. Chaetotaxy: basal pore present; umbilicate series with 16 setiferous punctures; 2 setae at apex of stria 7.

*Legs* elongate but robust; profemora with ventral side flat, both its outer and inner sides smooth and without setae. Protibiae with short but evident pubescence on the apical third of the anterior side; mesotibiae almost straight; metatibiae straight, each with deep longitudinal wrinkles. Tarsomeres with dorsal pubescence dense, short, strigose; tarsal claws smooth on the inner margin.

*Male genitalia* (male holotype) (Fig. 4): median lobe of aedeagus large-sized, abruptly curved in the proximal third; apical lamina very developed, with lateral margins prominent, toothed, markedly and symmetrically widened in the dorsal aspect; right paramere elongate and narrow, rounded apically; left

paramere with very reduced apical membranous lobe.

*Female genitalia*: unknown.

#### Distribution and habitat:

An apparently troglomorphic species, known so far only from the male holotype sampled in the type locality: Morocco, Asdif, Tagoudicht, Kef Thaleb cave, 1734 m, coordinates N 30° 21' 43,3" W 07° 30'02,1". This cave, located in the Tazenakhte region, north to Jibel Siroua, is an active subterranean system in the Palaeozoic limestone of South Atlas, about -90 m deep and 220 m long (see AA.VV., 1981: 213, fig. 104).

#### Remarks:

For its morphological features, *L. (C.) auronxi* n. sp. is closely related to *L. (C.) berberus*, an epigeic species of the region of Agadir (southwestern Morocco). Of the latter it appears as the subterranean, geographically isolated adelphotaxon in a desert area located at 90 km E to Agadir. Both species form a homogeneous group of *Centhosthenes* species, markedly distinct and isolated from all other representatives of the subgenus.



Subgenus *Pristonychus* Dejean, 1828*Laemostenus (Pristonychus) cadilhaci* (Antoine, 1951)**Examined material:**

Besides the type material (MNHN) and long series of individuals sampled in the type locality (Azilal, caves near Aid M'Hammed [CCa, CCo, MNHN]), we had the opportunity to examine additional material from the following localities: Morocco: Tadmart, Tagelft, Ifri Tadmart, 12-VII-2005, Auroux-Comas-Fadrique leg. (9 ♂♂♀♀, CCa, CCo); Marrakesh, Jebel Oukaimeden, 2700-2900 m, 21/28.V.2003, P.F. Cavazzuti leg. (11 ♂♂♀♀) (CCa).

The individuals sampled in High Atlas, near Marrakesh, confirm the occurrence of this species in that area at high altitude, already reported by Antoine (1957).

*Laemostenus (Pristonychus) algerinus* (Gory, 1833) (*sensu lato*)**Examined material:**

Northeastern Morocco: Oujda, Saidia (Kalab leg., CCa); Bab bou Idir, Kef (Ifri) Izoura, 6-VII-2007, Auroux-Comas-Fadrique leg. (1 ♂, with immature genitalia) (CCo).

The latter is a large-sized, robust individual (L: 17.0 mm), with both mesotibiae and metatibiae markedly curved, the ventral side of profemora with 4 setae on the posterior margin and an obtuse, slightly bifid tooth on the basal half of the anterior margin. The examination of further specimens from Morocco confirms that individuals of the populations of this species, localised to the northern area of the country, are rather different from those of the rest of the Euro-Mediterranean region, as already stated by Antoine (1957), De Miré (1958), and Casale (1988). However, any hypothesis of their attribution to a distinct subspecies should need the examination of further long series of individuals from many localities.

Subgenus *Sphodroides* Schaufuss, 1865*Laemostenus (Sphodroides) atlanticus atlanticus* Escalera, 1913**Examined material:**

Morocco: Tiffert, Taguelf, Ifri N'Said, 13-VII-2005, L. Auroux leg. (1 ♂, 2 ♀♀); Taguelft, Ifri Ousgre, 9-VII-2005, Auroux-Comas-Fadrique leg. (1 ♂); Azrou, Aïn Leuh, Ifri Mkhruqa, 8-VII-2007, Auroux-Comas-Fadrique leg. (2 ♀♀) (CCo).

*Laemostenus (Sphodroides) atlanticus deserticus* (Mateu, 1975)**Examined material:**

Morocco: Tagoudicht, Asdif, Kef Thaleb, 23-VII-2006, Auroux-Comas-Fadrique leg. (15 ♂♂♀♀) (CCo).

*Laemostenus (Sphodroides) aelleni* (Antoine, 1952)**Examined material:**

Ain el Ouda, Kef Boyeme, 13-XI-2008, Fadrique-Mansouri-Alfambra leg. (7 ♂♂♀♀) (CCo).

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