Acarina 22 (2): 71–75

SUPPLEMENTARY DESCRIPTION OF *LEPTOGALUMNA* (*AEGYPTOGALUMNA*) *MASTIGOPHORA* (AL-ASSIUTY, ABDEL-HAMID, SEIF ET EL-DEEB, 1985) COMB. N. (ACARI, ORIBATIDA, GALUMNIDAE)

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ABSTRACT: The type species of the monotypic oribatid mite genus *Aegyptogalumna* Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985 (Galumnidae) is redescribed on the basis of specimens from Spain. We discuss the taxonomic status of the genus and propose to consider it a subgenus of *Leptogalumna* Balogh, 1960: *Leptogalumna* (*Aegyptogalumna*) stat. nov. Accordingly, the type species is recombined to *Leptogalumna* (*Aegyptogalumna*) *mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985) comb. n.

KEY WORDS: oribatid mites, Galumnidae, *Leptogalumna* (*Aegyptogalumna*), taxonomic status, diagnosis, supplementary description

INTRODUCTION

The genus *Aegyptogalumna* (Acari, Oribatida, Galumnidae) was proposed by Al-Assiuty, Abdel-Hamid, Seif and El-Deeb (1985) with *Aegyptogalumna mastigophora* Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985 as type species. Currently, this genus is monotypic, with the single species distributed in Egypt and Spain (Subías 2004, updated 2014). Later, Mahunka and Akrami (2001) described *Pilogalumna saboorii* Mahunka et Akrami, 2001 based on specimens from Iran, but Subías (2004) considered it a junior subjective synonym of *A. mastigophora* (see *Remark* section).

As discussed below, *Aegyptogalumna* is morphologically very similar to *Leptogalumna* Balogh, 1960 and one of our objectives is propose a more conservative ranking as a subgenus of the latter and to provide new diagnoses of *Leptogalumna* and its subgenera. The original descriptions of *A. mastigophora* and *P. saboorii* are incomplete in that they lack detailed measurement and information about leg setation and the gnathosoma. Therefore, our second goal is to redescribe and illustrate *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985) comb. n. based on new material from Spain.

MATERIAL AND METHODS

Six specimens (five females and one male) of *L.* (*A.*) *mastigophora* with the following collection data were studied: Spain, Mérida, Badajóz Province, 35°55′N, 06°20′E, cereal meadow, soil from depth, 27.II.2013, collected by J.P. Zaballos and S. Pérez.

Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. The body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate. Notogastral width refers to the maximum width in dorsal aspect. Lengths of body setae were measured in lateral aspect. All body measurements are presented in micrometers. Formulas for leg setation are given in parentheses according to the sequence trochanter–femur–genu–tibia–tarsus (famulus included). Formulas for leg solenidia are given in square brackets according to the sequence genu–tibia–tarsus. General terminology used in this paper follows that of F. Grandjean (summarized by Norton and Behan-Pelletier 2009). Drawings were made with a drawing tube using the Carl Zeiss transmission light microscope "Axioskop-2 Plus". Images were obtained by the AxioCam ICc3 camera using the Carl Zeiss transmission light microscope "Axio Lab.A1".

SUPPLEMENTARY DESCRIPTION

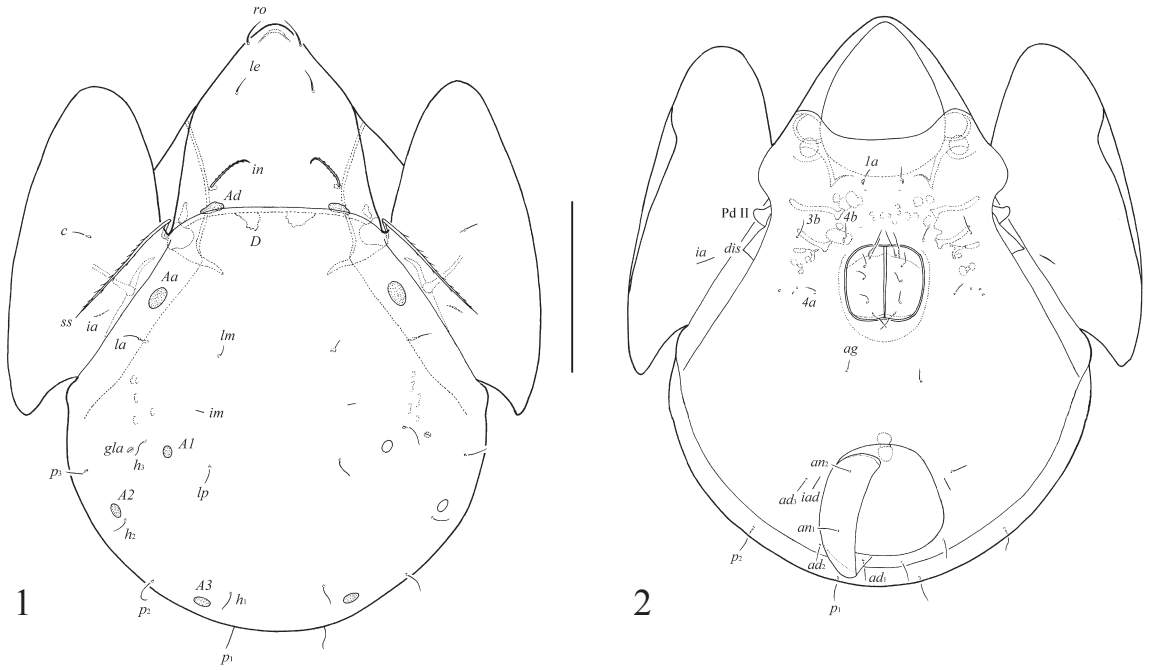
Leptogalumna (*Aegyptogalumna*) *mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985) comb. n.

Figs 1–11

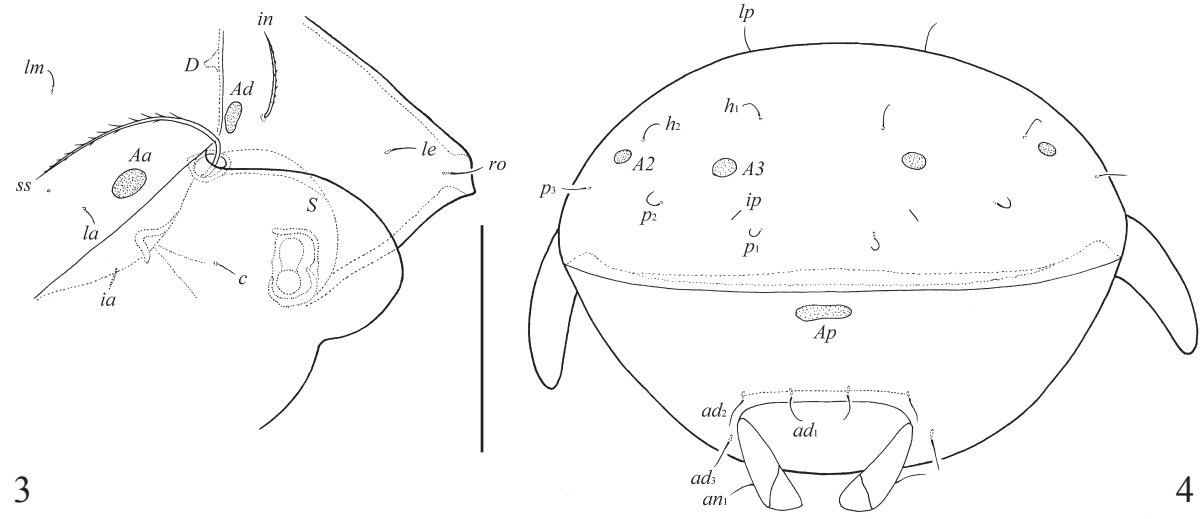
Measurements. Based on six specimens (five females, one male): body length 340–385; maximum notogastral width 225–258.

Integument (Fig. 11). Color light brown, surface smooth. Pteromorphs with slightly visible radiating wrinkles.

Prodorsum (Figs 1, 3, 10). Rostrum rounded. Sublamellar line (*S*) strong. Rostral (*ro*, 16–20)



Figs 1–2. *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El2-Deeb, 1985), adult: 1 — dorsal view; 2 — ventral view (gnathosoma and legs not illustrated). Scale bar 100 μm.

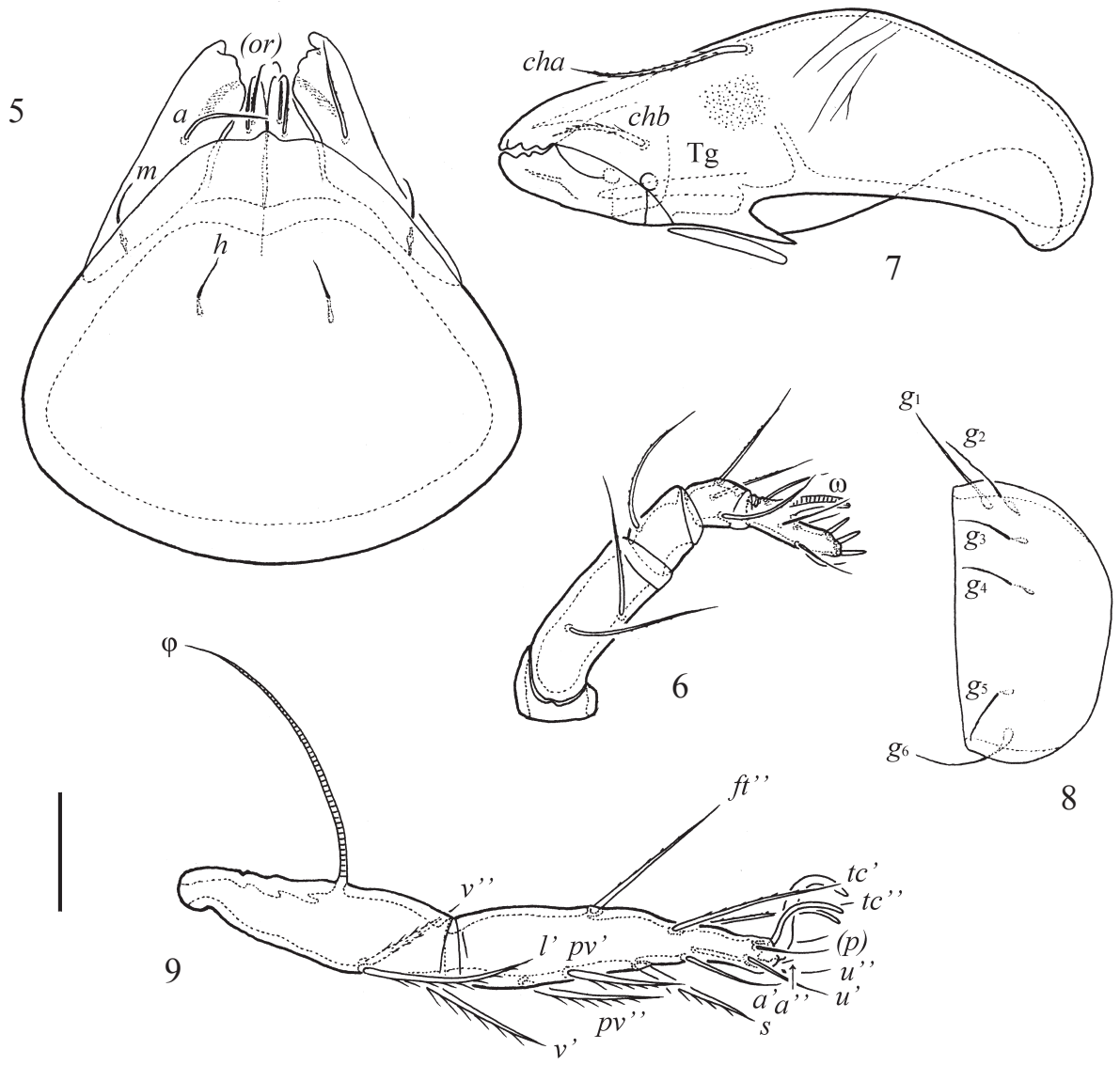


Figs 3–4. *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985), adult: 3 — dorso-lateral view of anterior part of body (gnathosoma and leg I not illustrated); 4 — posterior view. Scale bar 100 μm.

and lamellar (*le*, 10–12) setae simple, thin, smooth. Interlamellar setae (*in*, 49–53) setiform, barbed. Bothridial setae (*ss*, 90–94) setiform, thickened, ciliate bilaterally; dorsal side with numerous cilia, ventral side with rare cilia. Exobothridial setae absent without vestige. Porose areas *Ad* oval (12–20 × 6–8).

Notogaster (Figs 1, 3, 4, 11). Anterior notogastral margin developed, almost straight transversally. Dorsophragmata (*D*) of short, wide. Notogastral setae represented by 10 pairs of thin, smooth setae (10–16), usually with short attenuate tip. Four pairs of porose areas well visible, with distinct margins: *Aa* oval, longitudinally oriented (16–20 × 10–12), *A1* rounded (6–10), *A2* rounded (8–10) or oval (8–10 × 6–8), *A3* rounded (10–12) or oval (10–12 × 6–8). Setae *la* inserted posteriorly to *Aa*. Median pore absent. All lyrifissures distinct; *im* located between *la* and *lp*. Opisthonotal gland openings (*gla*) located laterally to *A1* and h_3.

Gnathosoma (Figs 5–7). Morphology of subcapitulum, palps and chelicerae typical for Galumnidae (for example, Engelbrecht 1972; Er-



Figs 5–9. *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985), adult: 5 — subcapitulum, ventral view; 6 — palp; 7 — chelicera; 8 — genital plate, left; 9 — tarsus and tibia of leg IV, left, antiaxial view. Scale bar 20 μm.

milov et al. 2010; Ermilov and Anichkin 2014). Subcapitulum longer than wide (86–90 × 80–82). Subcapitular setae setiform, slightly barbed; *a* (20–24) longer than *m* (16–18) and *h* (12–16). Two pairs of adoral setae (*or*, 12–16) setiform, hook-like distally, barbed. Palps (73–82) with setation 0–2–1–3–9(+ω). Solenidion attached to eupathidium, both located on dorsal tubercle. Chelicerae (102–110) with two setiform, barbed setae; *cha* (32–36) longer than *chb* (20–24). Trägårdh's organ (Tg) long, tapered.

Epimeral and lateral podosomal regions (Fig. 2). Apodemes 1, 2, sejugal and 3 well visible. Four pairs of simple, thin, smooth epimeral setae observed; setal formula: 1–0–1–2. Setae *3c* (36–45) longer than *1a*, *4a* and *4b* (12–14). Pedotecta II (Pd II) scale-like, rounded anteriorly in ventral view. Discidia (*dis*) triangular, distally pointed. Circumpedal carinae indistinct.

Anogenital region (Figs 2, 4, 8). Six pairs of genital (g_1, 16–20; g_2–g_6, 12–18), one pair of aggenital (*ag*, 12–14), two pairs of anal (an_1, an_2, 12–16) and three pairs of adanal (ad_1–ad_3, 12–16) setae simple, thin, smooth. Anterior edge of genital plate with two setae, rarely with one (all setae inserted in one row on genital plate in this case). Adanal lyrifissures (*iad*) in paraanal or weakly inverse apoanal positions. Adanal setae ad_3 inserted laterally to *iad*. Postanal porose area elongate oval, transversally oriented (24–32 × 6–8).

Legs (Fig. 9). Morphology of leg segments, setae and solenidia typical for Galumnidae (for

Figs 10–11. *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985), adult, microscope images: 10 — bothridial seta; 11 — antero-medial part of pteromorph. Scale bar 20 μm.

Table 1.
Leg setation and solenidia of *Leptogalumna (Aegyptogalumna) mastigophora* (Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985)

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	*v′*	*d, (l), bv″*	*(l), v′*, σ	*(l), (v)*, φ_1, φ_2	*(ft), (tc), (it), (p), (u), (a), s, (pv), v′, (pl), l″*, ε, ω_1, ω_2
II	*v′*	*d, (l), bv″*	*(l), v′*, σ	*(l), (v)*, φ	*(ft), (tc), (it), (p), (u), (a), s, (pv)*, ω_1, ω_2
III	*v′*	*d, ev′*	*l′*, σ	*l′, (v)*, φ	*(ft), (tc), (it), (p), (u), (a), s, (pv)*
IV	*v′*	*d, ev′*	*d, l′*	*l′, (v)*, φ	*ft″, (tc), (p), (u), (a), s, (pv)*

Roman letters refer to normal setae (ε to famulus), Greek letters to solenidia. Single prime (′) marks setae on anterior and double prime (″) setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

example, Engelbrecht 1972; Ermilov et al. 2010; Ermilov and Anichkin 2014). Claws smooth on dorsal side. Formulas of leg setation and solenidia: I (1–4–3–4–20) [1–2–2], II (1–4–3–4–15) [1–1–2], III (1–2–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Solenidion φ on tibia IV inserted in the middle part.

Remarks. The specimens of *L.* (*A.*) *mastigophora* from Spain are similar in general appearance to those from Egypt according to the original description (Al-Assiuty et al. 1985) and to those from Iran according to the description of *P. saboorii* (Mahunka and Akrami 2001). However, the Iranian specimens are slightly larger than Spanish and Egyptian specimens (372–395 × 263–270 versus 340–385 × 225–258 and 340 × 244, accordingly).

REMARKS

Mahunka and Akrami (2001) described *P. saboorii* Mahunka et Akrami, 2001 and included it in the genus *Pilogalumna* Grandjean, 1956. However, this species has distinct sublamellar lines (versus sublamellar lines absent in *Pilogalumna*-species). Hence, its inclusion into *Pilogalumna* was not correctly. All morphological characters of *P. saboorii* testify it should be placed into to *Leptogalumna* (*Aegyptogalumna*) (see diagnoses for genus and subgenus below).

We did not study the type material of *P. saboorii*, however the data of publications (Al-Assiuty et al. 1985; Mahunka and Akrami 2001) and our redescription of *L.* (*A.*) *mastigophora* allow making clear comparison between both species. Based on these data, we have not found any differences between *P. saboori* and *L.* (*A.*) *mastigophora*, therefore we support Subías's opinion (2004, updated 2013), who considered the former species a junior subjective synonym of the latter species.

Aegyptogalumna is morphologically very similar to the genus *Leptogalumna*, but differs from the latter by having three claws on all legs versus one claw (in *Leptogalumna*). The number of claws on legs can vary within genera in Brachypylina, therefore use of this character as a generic or subgeneric character is problematic. However, among Galumnidae, the number of claws demonstrates stability in genera/subgenera, therefore, in our opinion, it can be used as a subgeneric character. For example: *Galumna* (*Bigalumna*) Mahunka et Mahunka-Papp, 2009 (see Mahunka and Ma-

hunka-Papp 2009) has two claws compared to the three in other members of the nominate subgenus *Galumna* Heyden, 1826. *Neoctenogalumna* (*Paractenogalumna*) Ermilov, Starý, Sandmann, Marian et Maraun, 2013 has one claw compared to three in the nominate subgenus *Neoctenogalumna* Ermilov, Starý, Sandmann, Marian et Maraun, 2013 (see Ermilov et al. 2013).

Hence, following the logic of the above examples, we propose to include *Aegyptogalumna* as a subgenus of *Leptogalumna*. The result is in the following taxonomic proposals: *Leptogalumna* (*Aegyptogalumna*) stat. n., *Leptogalumna* (*Aegyptogalumna*) *mastigophora* comb. n.

Genus *Leptogalumna* Balogh, 1960

Type species: *Leptogalumna ciliata* Balogh, 1960

New diagnosis (based on data from Balogh 1960; Balogh and Balogh 1992). Body elongated to oval; lamellar lines absent; sublamellar lines present, curving backwards; bothridial setae setiform, long, densely ciliate; anterior notogastral margin complete, transversally straight; dorsophragmata short and wide or long and elongated; 10 pairs of short, thin notogastral setae developed, pteromorphs with one seta; notogaster with four pairs of porose areas, *Aa* represented by one pair; median pore absent; adanal lyrifissures located near anal aperture, in paraanal or inverse apoanal position; leg tarsi with one or three claws; sexual dimorphism absent.

Subgenus *Leptogalumna* (*Leptogalumna*) Balogh, 1960

Type species: *Leptogalumna ciliata* Balogh, 1960

Diagnosis. Body elongated (length 2 times as wide, approximately); dorsophragmata long, elongated and parallel; leg tarsi with one claw.

Subgenus *Leptogalumna* (*Aegyptogalumna*) Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985

Type species: *Aegyptogalumna mastigophora* Al-Assiuty, Abdel-Hamid, Seif et El-Deeb, 1985

Diagnosis. Body oval (length 1.5 times as wide, approximately); dorsophragmata short and wide; leg tarsi with three claws.

ACKNOWLEDGEMENTS

We gratefully acknowledge Prof. Dr. Roy A. Norton (State University of New York, College of Environmental Science and Forestry, Syracuse, USA) for many valuable suggestions.

REFERENCES

Al-Assiuty, A.I.M., Abdel-Hamid, M.E., Seif, A.I.M. and El-Deeb, S.I.K. (1985). Revision of the family Galumnidae Jacot, 1925 (Acari: Oribatei) of Egypt with further studies. *Journal of Egyptian Society of Parasitology*, 15 (1): 273–287.

Balogh, J. 1960. Oribates (Acari) nouveaux d'Angola et du Congo Belge (2ème série). *Companhia de Diamantes de Angola, Lisboa*, 51: 15–40.

Engelbrecht, C.M. 1972. Galumnids from South Africa (Galumnidae, Oribatei). *Acarologia*, 14 (1): 109–140.

Ermilov, S.G. and Anichkin, A.E. 2014. Taxonomic study of oribatid mites (Acari, Oribatida) of Bi Dup – Nui Ba National Park (southern Vietnam). *Zootaxa*, 3834 (1): 1–86.

Ermilov, S.G., Sidorchuk, E.A. and Rybalov, L.B. 2010. A new species of the genus *Pergalumna* (Acari: Oribatida: Galumnidae) collected in moss on trees from Ethiopia. *Systematic and Applied Acarology*, 15 (3): 244–250.

Ermilov, S.G., Starý, J., Sandmann, D., Marian, F. and Maraun, M. 2013. New taxa and new records of oribatid mites of the family Galumnidae (Acari: Oribatida) from Ecuador. *Zootaxa*, 3700 (2): 259–270.

Mahunka, S. and Akrami, M.A. 2001. Galumnatid mites from Iran (Acari: Oribatida). *Annales Historico-Naturales Musei Nationalis Hungarici*, 93: 231–237.

Mahunka, S. and Mahunka-Papp, L. 2009. Further taxonomical and faunistical studies on oribatids of Kenya (Acari: Oribatida). *Opuscula Zoologica Budapest*, 40 (1): 47–62.

Norton, R.A. and Behan-Pelletier, V.M. 2009. Oribatida. Chapter 15. *In*: G.W. Krantz and D.E. Walter (eds.). A Manual of Acarology. Texas Tech University Press, Lubbock: 430–564.

Subías, L.S. 2004. Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes: Oribatida) del mundo (excepto fósiles). *Graellsia*, 60 (número extraordinario): 3–305. Online versions accessed in May 2013 (570 pp.) and February 2014 (577 pp.); http://www.ucm.es/info/zoo/Artropodos/Catalogo.pdf