A taxonomic catalogue of the Dyspnoi Hansen and Sørensen, 1904 (Arachnida: Opiliones)

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TAXONOMIC CATALOGUE OF THE DYSPNOI
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Abstract

An update of the systematics and determination key of the Opiliones suborder Dyspnoida is provided. The included catalogue represents the first comprehensive species and synonymy listing since Roewer (1923). It summarises all taxonomic changes to date and attempts to be a sound basis against the exponential growing number of online errors, for which examples are given. Species taxonomy features most obvious changes within the Nemastomatidae. The number of species in the collective genus Nemastoma is reduced from 96 (Hallan 2005) to its sensu stricto definition of 7, and the excluded names are transferred to other genera or considered as nomina dubia, predominantly in Paranemastoma. The systematics of the superfamily Ischyropsalidoidea is discussed and family-level diagnoses are renewed to support taxonomical changes: The morphological heterogeneity in the Sabaconidae is resolved by reverting the family to its original monogenic state. Taracus and Hesperonemastoma are separated as Taracidae fam. n., and Crosbycus is tentatively transferred to this assembly. The remaining genera of Ceratolasmatidae, Acuclavella and Ceratolasma, are included as subfamily Ceratolasmatinae in the Ischyropsalididae and Ischyropsalis is assigned subfamily status, respectively. Other nomenclatural acts are restricted to species-group level with the following synonymies established: Sabacon jonesi Goodnight & Goodnight, 1942 syn. n. (seavicolenus (Packard, 1884)), Dicranolasma diomedaeum Kulczyński, 1907 syn. n. (hiritum Loman, 1894), Mitostoma (Mitostoma) sketi Hadži, 1973a syn. n. (schrysmelus (Hermann, 1804)), Mitostoma asturisticum Roewer, 1951 syn. n. (zypyraeum (Simon, 1879a)), Nemastoma formosum Roewer, 1951 syn. n. (=Nemastomella bacillifera bacillifera (Simon, 1879a)), Nemastoma reimoseri Roewer, 1951 syn. n. (=Paranemastoma bicuspidatum (C.L. Koch, 1835)), Nemastoma tunetanum Roewer, 1951 syn. n. (=Paranemastoma bureschi (Roewer, 1926)), Phlaliangium flavimanum C.L. Koch, 1835 syn. n. (=Paranemastoma quadririspunctatum (Perty, 1833)), Crosbycus graeaceus Giltay, 1932 syn. n. (=Paranemastoma simplex (Giltay, 1932)), Nemastoma bimaculatum Roewer 1951 syn. n. (=Paranemastoma tianiacum (Roewer, 1914)), Trogulocratus tunetanus Roewer, 1950 syn. n. (=Calathocratus africanus (Lucas, 1849)), Troglus albericus Sörenszen, 1873 syn. n. (=Calathocratus sinususus (Sörenszen, 1873)), Metopoecia exarata Simon, 1879a syn. n. (=Troglus aquaticus Simion, 1879a), Troglus galasensis Avram, 1971 syn. n. (=Troglus nepaeformis (Scopoli, 1763)) and Troglus roveri Avram, 1971 syn. n. (=Troglus nepaeformis (Scopoli, 1763)). Paranemastoma wernerl (Kulczyński, 1903) is elevated from subspecies to species. Ischyropsalis luteipes Simon, 1872b is proposed as nomen protectum, taking precedence over Lhernia spinipes Lucas 1866 nomen oblitum. The same accounts for Anelasmocephalus cambridgei (Westwood, 1874) nomen protectum, taking precedence over Trogulus violaceus Gervais, 1844 nomen oblitum, Trogulus clesianicus Avram, 1971 nomen protectum over Trogulus asperatus C.L. Koch, 1839a nomen oblitum, as well as Trogulus martensis Chenini, 1983 nomen protectum over Trogulus tuberculatus Canestrini, 1874 nomen oblitum. New combinations, all from Nemastoma, are Histriscostoma anatolicum (Roewer, 1962), Medistoma globaluliferum (L. Koch, 1867), Nemastomella hankiewiczii (Kulczyński, 1909), Nemastomella maarebensense (Simon, 1913), Nemastomella monchiqunense (Kraus, 1961) and Paranemastoma simplex (Giltay, 1932); from Mitostoma: Nemastomella armatissima (Roewer, 1962). Revived combinations are Nemastomella cristinae (Rambla, 1969) (from Nemastoma) and Nemastomella sexmucronata (Simon, 1911) (from Nemastoma). The following Nemastoma are transferred to Paranemastoma but suggested as nomina dubia: aeginum (Roewer, 1951), amuelleri (Roewer, 1951), bolei (Hadži, 1973a), caporiaccii (Roewer, 1951), carnelutti (Hadži, 1973a), ferkeri (Roewer, 1951), gigas monteneigrinus (Nosek, 1904), gostivarens (Hadži, 1973a), ikarium (Roewer, 1951), quadririspunctatum ios (Roewer, 1951), kaestneri (Roewer, 1951), longipalpatum (Roewer, 1951), macedonicum (Hadži, 1973a), multisignatum (Hadži, 1973a), nigrum (Hadži, 1973a), perfgium (Roewer, 1951), santorinum (Roewer, 1951), senussium (Roewer, 1951), sketi (Hadži, 1973a), spinosulum (L. Koch, 1869). Further suggested nomina dubia are Trogulus coreiforms C.L. Koch, 1839a, Trogulus lygaeiformis C.L. Koch, 1839a and Trogulus templetonii Westwood, 1833. 

Key words: Troguloidea, Ischyropsalidoidea, Ceratolasmatae, Ischyropsalidinae, Taracidae fam. n., cyber-taxonomy, cyber-plagiarism, systematics, taxonomy

Introduction

When searching for taxonomic-systematic online resources on Opiliones one quickly discovers an extensive list managed by Joel Hallan (2005; the 'Hallan list') providing taxonomic and systematic information on many groups of animals. Its contribution to Opiliones is comprehensive, and the Hallan list is presently the only available digital entity, which gives most taxonomic names together with relevant taxonomic and additional information. Even with errors introduced, additional taxa described and systematics partly changed, these issues are recognisable for taxonomic experts, to whom the Hallan list serves as a good template. The main issue are other internet sites featuring taxonomy and systematics, approaching Hallan list information uncritically, multiplying initial errors and preserving outdated synonymies. Locating and correcting these errors throughout the Internet has already become a rather futile effort.
As an example, the Hallan list combined the genus *Centetostoma* Kratochvíl, 1958 with an incorrect authorship (*Centetostoma* Kratochvíl & Miller, 1958). A Google search in February 2011 retrieved 214 hits for “*Centetostoma* Kratochvíl & Miller, 1958” while the correct combination “*Centetostoma* Kratochvíl, 1958” had almost no hits, although being the only combination mentioned in all taxonomic-systematic literature investigated. The error likely originated from the misinterpretation of a preface article by Kratochvíl and Miller, followed by the description of *Centetostoma* by Kratochvíl alone (Martens pers. com.). Originating from the Hallan list, this example makes it obvious that most other online lists did not consult original taxonomic information but simply copied the source. The error seems to multiply further as the false authorship retrieved 346 hits only a year later (14 Feb. 2012) and 564 on 30 June 2012, but with the correct authorship having a higher number of hits, likely due to the available *Centetostoma* revision by Martens (2011). The whole matter appears almost absurd, as the genus *Centetostoma* and its species have never played an important role in systematics or in other scientific fields, not even in faunistics, while apparently receiving considerable online attention. Unfortunately, this is not a single incidence. Kratochvíl (1958) is the author of several valid genera, all given the same erroneous authorship in the Hallan list and subsequently having multiplied in the same manner. Other errors comprise insufficient incorporation of published synonymies, e.g. from important reference works as Martens (1978) for Nemastomatidae, influencing many open-source references, as e.g. Wikipedia.

Tracking other errors originating from the Hallan list suggests that a large proportion of taxonomic information on Opiliones online 1) is copied from the Hallan list without re-checking the taxonomy, 2) is not curated or worked through, subsequently, 3) results from a strong desire to compile and exhibit large, comprehensively looking lists for Internet projects, many of which do not cite the original source. This cyber-plagiarism is deleterious for taxonomic science, as the multiplying errors invite “Google hit” majority opinions, rather than considering peer-reviewed taxonomic-systematic publications. As these lists do and will aid as anchor points for scientific and community projects, the many known problems and criticisms of approaches neglecting taxonomy apply (Smith et al. 2011). Updating the Dyspnoi section of the Hallan list will follow the publication of this catalogue and may solve some of these problems. Providing a peer-reviewed publication as a template to update and correct any of the erroneous databases appears the most effective solution and is the aim of the presented taxonomic catalogue.

Aside the aforementioned rather formal problems, Opiliones is a group still in need of major revisions from suborder (e.g. Giribet et al. 2010, Hedin et al. 2012) to species level. For the suborder Dyspnoi a comprehensive overview is given by Gruber (2007), yet a summarizing approach listing all species is missing since Roewer (1923). Giribet et al. (2010) changed the systematics of the superfamily Ischyropsalidoidea, but some aspects, not only the placement of several genera, remained unclear. Diagnoses of groups within this superfamily presently do not provide distinguishing characters and lack support from molecular genetics used for their emendation. Revisiting all available information, including recent molecular genetic results, Ischyropsalidoidea is reorganised and characters supporting this systematics are discussed. Male genital morphology, accepted as key character in most other groups of Opiliones (see Schönhofe & Martens 2012) but neglected in the most recent emendations, is re-evaluated.

Having been studied for over two centuries, the Dyspnoi still exhibit many problems with species delineation and assignment. Many species have not been treated since their original description, and generic concepts have changed suggesting transfer of these species from their original placement (e.g. *Nemastoma* C.L. Koch, 1836b; Gruber & Martens 1968). This catalogue takes a pragmatic approach, to assign as many species as possible to a more reasonable systematic position or treat them otherwise. Being only a snapshot in time, this revision aims to provide a comprehensive starting point for future ventures, and highlights and comments on taxonomic and systematic issues of many taxa.

**Material and methods**

All taxon names associated with the Dyspnoi were tracked manually by following citations to the original description. 2,950 references were scanned or downloaded from acknowledged sources and from many single online providers not explicitly mentioned. If unavailable in the original pdf, text was made accessible with Adobe Acrobat Pro 9.3.1. This searchable database allowed data-mining and located even difficult records.
Taxonomic and systematic information was assessed as follows: 1) a list of all available species epithets associated with the Dyspnoi and generic names contained in the Dyspnoi was compiled; 2) the original descriptions were investigated; 3) perception of taxa over time was checked, including synonymies, alternative placements, and descriptions; 4) the last revising author’s opinion was generally accepted; 5) if disagreement or unreasonable placements were found, correction upon available descriptions, and partly original material was attempted; 6) authors were followed if they suggested but not formally established more reasonable placements of species, e.g. when removing species from Nemastoma sensu stricto; 7) unrecognisable taxa, based on questionable descriptions and not further discussed, are treated as nomina dubia, excluding them from the species count, e.g. see Paranemastoma Redikorzew, 1936 and further comments on Roewer; 8) the Index of Organism Names (ION; http://www.organismnames.com) was searched, using all generic names to check for species names; obvious spelling errors were neglected.

The catalogue style follows a hierarchical and then alphabetical order. All taxa considered as valid are given in bold. Subgenera are mentioned in parentheses (e.g. Mitostoma (Carinostoma) Kratochvíl, 1958) to highlight historical taxonomic interpretations, but are currently not considered of importance in the Dyspnoi. Citations provided are limited to those of taxonomic-systematic relevance, e.g. original descriptions, synonymies, taxonomic transfers, alternative spellings, redescriptions and discussions of the taxon status. Mere faunistic citations, reiterative listings and misidentifications are omitted. Type genera of families and type species of genera are given by their original assignment and spelling, and their fixation is stated. Etymologies for all genera are provided. Citations and synonymies are arranged in chronological order of first appearance. If not unambiguously perceivable from this order, remarks outline taxonomic issues and list additional information. Taxon authors are always indicated by separating their name with a comma from the year of description. Others are treated as citations without a comma and are additionally separated by “—” from the species epithet or the species author. For author names of Cyrillic origin, transcribed into the Latin alphabet, the predominant spelling was selected (e.g. Mcheidze; alternative Mkheidze; Ljovuschkin; alternative Lyovushkin). The locus typicus (loc. typ.) is given for every species. Hierarchical order of administrative and/or geographic units using English names is preferred, and primary historical locality names are stated for clarification only. Cardinal directions are abbreviated. Type depositories are omitted; locality information better helps to explain associated taxonomic problems. Information about the types of spurious species is given in the remarks. Abbreviated type depositories are: BMNH - The Natural History Museum, London, UK; MNHN - Muséum national d’Histoire naturelle, Paris, France; NHMW - Naturhistorisches Museum, Vienna, Austria; SMF - Senckenberg Naturmuseum, Frankfurt am Main, Germany. Other abbreviations used are: compr. - comprising; redescr. - redescription. References in the catalogue aim to pinpoint page numbers of exact taxonomic statements, but in few cases page ranges are given or page numbers are omitted if not available. Fossil species were not considered.

To provide an additional online source, results will be available and frequently updated at the Tree of Life (ToL) project (Schönhofer & Hedin 2012). ToL will also feature phylogenetic information gathered when compiling this catalogue. Furthermore, a new version of the Biology Catalog managed by Joel Hallan will soon integrate the updated information on the Dyspnoi (http://pipedev.tamu.edu/Biocat/About/Introduction.aspx).

C.F. Roewer has been the most prolific harvestmen expert in terms of describing new species. However, his glory fades when having to deal with his often intangible mess of made-up species, invented species characters and false type localities. His inability to look through the growing maze partly caused him to misidentify his own species, describing them anew or assigning false type localities even where this would not have been necessary in order to describe new “geographic” species. Helversen and Martens (1972) and Novak and Gruber (2000) provided detailed criticism of Roewer’s works. Especially Roewer’s later works (1950, 1951) described numerous species upon variable characters such as spination and colour patterns, recognised as variable by many subsequent authors. This is perceivable from the extensive synonymy lists of many species, e.g. in Ischyropsalis C.L. Koch, 1839 and Paranemastoma. Collective groups of Roewer’s 1951 Nemastoma species are therefore treated as nomina dubia (see Paranemastoma). Remarks throughout this revision highlight other issues associated with Roewer, whose information is generally to be treated with caution.
Results and discussion

Species and genera counts and changes compared to previous approaches

Although new species and genera have been described since Pinto-da-Rocha et al. (2007) and the last update of the Hallan list (03.07.2005), the number of Dyspnoi species as recognised here (286) decreases by 13–14% (Hallan list: 323; Pinto-da-Rocha et al. 2007: 327). This substantial difference stems from acknowledging already published synonymies and defining many Nemastoma as nomina dubia within Paranemastoma. The Hallan list included 96 species in Nemastoma (including revalidated subgenera) while the actual species count as specified for the genus is only 7 (Gruber & Martens 1968). In Ischyropsalis the species count drops from 35 (Hallan list) to 22. The number of genera increased from 32 (Hallan list) to 38 in Pinto-da-Rocha et al. (2007), likely for over-counting Nemastomatidae genera, and is reported here as slightly lower (36). Changes in the grouping of genera are due to additions in the Nemastomatidae, new synonymies in the Trogulidae and re-establishment of genera in the Ortholasmatinae. The Hallan list also recognised the otherwise long abandoned superfAMILY Nemastomatoidea and listed six genera of Nemastomatidae as incertae sedis (Pinto-da-Rocha et al. 2007 listed them as Nemastomatinae incertae sedis). According to the definition by Martens (1978), summarising all West Palearctic genera within one subfamily, these have to be assigned to the Nemastomatinae, which is supported by phylogenetic data and morphology (Schönhofer & Martens 2012).

Higher taxonomic classification within the Dyspnoi

Following the taxonomic overview provided by Gruber (2007) the Dyspnoi are accepted to include the superfamilies Troguloidea and Ischyropsalidoidea. The Troguloidea comprise the families Dicranolasmatidae, Nemastomatidae, Nipponopsalididae and Trogulidae, with the Nipponopsalididae in an unresolved, but likely basal position (Giribet et al. 2010). Schönhofer and Martens (2010a) suggested unifying Dicranolasmatidae and Trogulidae based on molecular relationship and morphological traits, which remains a matter of taxonomic convenience. All genera within the Troguloidea can be clearly assigned to a respective family and systematic questions concern mainly relationships of genera within the families (Trogulidae: Schönhofer & Martens 2010a; Nemastomatidae: Schönhofer & Martens 2012) and the composition of several genera within the Nemastomatidae.

The situation is different in the second superfamily Ischyropsalidoidea, where the placement of the clear-cut genera in families is uncertain. Currently three families, Ceratolasmatidae, Ischyropsalididae and Sabaconidae, are recognised. Problems arise as the latest emendations and diagnoses provided no clear understanding of two of these families. In particular, the following issues concerning the Ischyropsalidoidea need to be considered:

1) The family Ceratolasmatidae was originally diagnosed upon external structures of legs and scutum to encompass its highly divergent genera (Shear 1986). Its composition has since changed, with Hesperonemastoma Gruber, 1970 having been transferred to Sabaconidae (Giribet et al. 2010) but retaining its proposed sister Crosbycus Roewer, 1914 (Shear 1986) in Ceratolasmatidae for which an updated diagnosis is necessary.

2) The emended diagnosis of Sabaconidae by Giribet et al. (2010) listed differences between the included genera, but no unambiguous diagnostic characters for the family. Molecular support, the main argument to retain Taracus Simon, 1879b and Hesperonemastoma close to Sabacon Simon, 1879a, was weak (Giribet et al. 2010) and Sabaconidae requires redefinition.

3) Shear (1986) downgraded the complex genital morphology of Sabacon as genus-specific to include Taracus within Sabaconidae. He rejected Martens (1976, 1983) and Martens et al. (1981) suggesting a monotypic family Sabaconidae.

4) Genital characters were disregarded for the classification of Ischyropsalidoidea, while metapeltidial sensory cones (with sensory capabilities assumed for one species in Sabacon: Juberthie et al. 1981) were assigned high significance without knowing their phylogenetic value (Shear 1986, Giribet et al. 2010).

Studies featuring molecular genetics will help draw a clearer systematic picture of Ischyropsalidoidea (Richart & Hedin in press, Schönhofer et al. 2013b). Acuclavella Shear, 1986 is most closely related to Ceratolasma Goodnight & Goodnight, 1942, which is also obvious in the morphological similarity of both genera, and both are next relatives to Ischyropsalis (Richart & Hedin in press). The composition of the complex sternal region, sharing
isolated coxal endites II to IV and a large labium (Martens 1969, Gruber 1978, Shear 1986), and the peculiar penial morphology with a glans formed by two separate sclerotised areas only joined close to the stylus, support a close relationship of all three genera. Divergence estimates show that the split between Ischyropsalis and Ceratolasma is considerably younger than in other clades in Ischyropsalidoidea (Schönhofer et al. 2013b), and all evidence suggests including Acuclavella and Ceratolasma in Ischyropsalididae. Maintaining a subfamily Ceratolasmatae for Acuclavella and Ceratolasma is proposed, here. It parallels a systematic and geographic situation that is roughly similar to the mainly European and Western North American distributed subfamilies within the Nemastomatidae.

The remaining Ischyropsalidoidea genera share palps with peculiar bottle-brush hairs (a plesiomorphic character) and have reduced (only on leg II) or missing coxapophyses. While uniting them in Sabaconidae accords with the weak molecular support (Giribet et al. 2010), the phylogenetic level of the two main Sabaconidae clades is much higher than in the Ischyropsalididae as proposed here (Schönhofer et al. 2013b). This coincides with the wide range of morphological characters outlined in the emended family diagnosis of Sabaconidae (Giribet et al. 2010). Recompiling and extending this diagnosis sensu Giribet et al. (2010) revealed no flaws by these authors and retrieved the same variable characters. However, this lack of shared morphological characters and weak molecular support does not add confidence to accept Sabaconidae in its present composition.

**FIGURE 1.** Cladogram summarising the classification and systematics of the Dyspnoi to genus level, incorporating hypotheses of this study, Giribet et al. 2010, Richart and Hedin in press, Shear 1986 and Schönhofer and Martens 2010a, 2012. The tree is a compilation and not based on a phylogenetic reconstruction. All genera are listed on the right, with corresponding species numbers in parentheses; family level lineages are indicated by bold branches.

Regarding the first of the two sabaconid clades, comprising only Sabacon, a simple generic rank has to be rejected. Sabacon is highly diversified, and its primary lineages are comparably older than most other genera within the superfamily and within the Dyspnoi (Schönhofer et al. 2013b). Its wide Holarctic distribution and a
wealth of functional penis modifications reflects this divergence. Penis modifications in other Dysnoi, e.g. the Nemastomatidae, are characters perceived to outline separate generic levels (Schönhofer & Martens 2012). In the future it is likely that Sabacon will be split into several genera that should be enclosed in a taxon of family level. Highly distinct male genitals with a bent and deeply split penial base and a muscle concentrated at the base, and positioned outside the sclerotised truncus (Martens 1983), peculiar inflated palps with specialised tarsi, and the lack of coxapophyses (Gruber 2007, Tsurusaki & Song 1993, Thaler 1976), serve as distinct characters, justifying a taxonomic status clearly isolated within Ischyropsalidoidea and higher than the generic level (Gruber 1970, Martens et al. 1981, Martens 1983).

Consequently, the genera Taracus and Hesperonemastoma require evaluation if being recognisable as a distinct and separable unit. The two genera share a straight and generally short and massive penial truncus filled with a large muscle that is completely enclosed within the truncus, normal, uninflated palps and coxapophyses on coxae II (Gruber 2007). These characters also apply to Crosbycus (Gruber 2007), considered close to Hesperonemastoma in the original composition of Ceratolasmatidae (Shear 1986), but that is clearly different from the remaining Ceratolasmatidae. Molecular evidence strongly supports a grouping of Hesperonemastoma with Taracus (Schultz & Regier 2001; Giribet et al. 2002, 2010), while the placement of Crosbycus needs confirmation.

Restricting Sabaconidae to Sabacon and treating Hesperonemastoma and Taracus as a separate taxonomic unit provides a convincing number of diagnostic characters to accept both as well-defined entities which is in accordance with strong molecular support. Sabaconidae is thus restored to its original monogeneric state, and a new family Taracidae, based on the oldest taxon Taracus, is here proposed. Taracidae fam. n. further includes Hesperonemastoma sensu Giribet et al. (2010) and, tentatively, Crosbycus. Considering these clades as subfamilies within a higher taxon Sabaconidae resulted in the same problem of being unable to diagnose such a family.

Full diagnoses of all new or emended family level taxa in the Ischyropsalidoidea are given in the taxonomic section, followed by listing the genera and species included. A systematic overview, featuring a summary of all phylogenetic results and hypotheses presently available for the Dysnoi, is given in Fig. 1.

**Key to the higher groups within the Dysnoi**

The latest determination key for the higher groups within the Dysnoi (Giribet 2007) needs to be presented in more detail and corrected, partly for disregarding the morphological diversity of the keyed taxa, partly due to newly described species (especially Hesperonemastoma smilax Shear, 2010b). The following also needs to be taken into account:

1) the number of metapeltidial sensory cones (spines on 2nd prosomal tergite) in Ischyropsalis can be as low as two (e.g. in I. hellwigii (Panzer, 1794)), which does not key to the genus;

2) a reflexed tarsus of the palp is not a static condition in Sabacon, as in both living and preserved animals the tarsus is at different angles to the tibia, some not different from other Dysnoi;

3) soil crypsis is not a reliable character to identify Dicranolasmatidae and Trogulidae, because animals (adults) need to reach a certain age to acquire the soil cover (and sometimes they do not; often lacking in juveniles); it is also a feature of some Nemastomatinae (Vestiferum Martens, 2006) and Ortholasmatinae;

4) thin and elongated palps of identical shape are present in both Crosbycus and some Hesperonemastoma species.

The following key is remodelled and intended to feature external characters in adult animals. A key for identification to Trogulidae genera is given in Schönhofer (2009: 168, erroneously including Dicranolasma Sørensen, 1873). For a key to Ortholasmatinae see Shear (2010a: 16). For Nemastomatidae, a key based on external characters is difficult to establish and was therefore not attempted. Soil incrusted animals may require cleaning with a soft paintbrush to see relevant features.

---

1 Ventral opisthosomal sclerites with a median suture .......................................................... Trogulidae
- Ventral opisthosomal sclerites without a median suture ....................................................... 2

2 Chelicerae conspicuous and protruding, as long as and often much longer than body, body length in most cases clearly above 1 mm ................................................................. 3
- Chelicerae of moderate size, significantly shorter than body, if different, body length around 1 mm (troglomorph species) . . 5
Two or more spines on 2nd thoracic tergite; no diaphanous teeth in central part of cutting edges of chelae; Europe
- One or no spines on 2nd thoracic tergite; diaphanous teeth in central part of cutting edges of chelae; North America and Eastern Asia
- No spine on 2nd thoracic segment; diaphanous teeth mostly restricted to central part of chelae; sometimes present in basal part; Japan and Korea
- A single prominent spine on 2nd thoracic segment; diaphanous teeth in central and distal third of chelae; North America and Far Eastern Russia

Elaborate prosomal structures forming a basket-like cover over the chelicerae; if missing, dorsal ornamentation with extensive intersecting spines.
- If structures covering chelicerae present, then these simple and spine-like; if dorsal ornamentation present, then this never consisting of extensive intersecting spines.

Dorsal side of body covered with reticulate ornamentation; eyes close together on an eye mound; if present, then structures covering chelicerae originating from eye mound; America and Asia
- Dorsal side of body covered with spines and tubercles; eyes widely separated and in the middle of each of two long processes anteriorly protruding from prosoma; Western Palearctic

Dorsal side of body covered with club-shaped hairs (can be missing in males of some Paramnestoma: then dorseum smooth and black; respective species with prominent spines and/or golden colour pattern)
- Palps with bottlebrush-shaped hairs or without modified hairs.

Walking legs with dense cover of long, partly curly hairs, palps as long as shortest walking legs, body size below 1 mm
- Walking legs without dense cover of hairs, hairs not curly, palps always shorter than walking legs, body length at least 1 mm

Palps set with normal sensory setae and appressed microtrichia; palps conspicuous, either very long or with inflated distal segments.
- Palps set with normal sensory setae and appressed microtrichia; palps of normal proportion, neither very long nor with inflated distal segments.

Integument soft; pro- and opisthosoma never fused into a scutum magnum; distal segments of palps massive and inflated in most species.
- Integument sclerotised; pro- and opisthosoma fused into a scutum magnum; distal segments of palps not massive or inflated.

Frontal margin of prosoma with two horns lateral of eye mound, colouration grey to brown
- Frontal margin of prosoma without horns, colouration black.

Taxonomic catalogue

Suborder Dyspnoi Hansen & Sørensen, 1904

Dyspnoi Hansen & Sørensen, 1904: 81 (as tribus in Palpatores);—Roewer 1923: 3; Šilhavý 1961: 265–266 (as suborder); Martens 1969: 184 (as cohors); Shear 1974: 68 (as superfamily); Gruber 1974a: 258 (as superfamily); Shultz 1998: 259 (as clade combining superfamilies).

Remarks. The initial composition of the Dyspnoi included Ischyropsalidoidea, Nemastomatoidae and Troguloidae (Hansen & Sørensen 1904: 81). Later, Roewer (1923: 3) added his new family Acropsopilionidae. It was excluded from Dyspnoi, united with Caddidae, and the resulting group elevated to superfamily rank as Caddoidea Banks, 1893 by Shear (1974: 68), which was supported by Gruber (1974a: 258). This resulted in classifying Caddoidea, Eupnoi and Dyspnoi as independent superfamilies, making it necessary to replace the latter two names by Phalangiidea and Trogulidea, respectively (Shear 1974: 68). Shultz (1998: 259) transferred Caddoidea to Phalangiidea, restoring the suborder classification in Dyspnoi and Eupnoi, revalidating these names.

Superfamily Ischyropsalidoidea Simon, 1879a

Family Ischyropsalididae Simon, 1879a


Diagnosis. Dyspnai of the superfamily Ischyropsalidoidea with a western Palearctic and western Nearctic distribution. Defined by peculiarities of glans penis morphology, composition of the sternal region, and supported by molecular phylogenetic evidence. Palps without bottlebrush-shaped hairs, distal articles with dense cover of microtrichia, claw rudiment present. Chelicerae of moderate size, enlarged in Ischyropsalis. Except for few cave-species in Ischyropsalis males with glandular fields on the dorsal cheliceral segment, these partly associated with apophyses. Truncus penis simple, filled up to two thirds with a single muscle; muscular tendon short; base of truncus divided into two short root-like structures.

Glans penis simple and conical, separated into two sclerotised areas: dorsally the continuously sclerotised portion of the truncus and ventrally an isolated sclerotised plate set with uniform spines of variable length; both sclerotised portions gradually tapering into and joined at the long stylus. Stylus simple, long and tapering, either bent at the base (Ischyropsalis) or set with indistinct hook-like structures. Ovipositor short and stout, without large papillae, opening cleft of vagina bordered by a seam of microspinules, medium-sized setae on apical part only, arranged into rows and clusters. Frontal margin of opisthosoma without a median furrow. Coxae II to IV with sternal apophyses, labium large. Two or more bump- or spine-like metapeltidial structures present, the median ones largest.

Subfamily Ceratolasmatinae Shear, 1986


Ceratolasmatinae; new rank, new composition (compr. Acuclavella, Ceratolasma).

Diagnosis. Dyspnai of the family Ischyropsalididae with a narrow western Nearctic distribution (USA: N-California, Washington, Idaho). Defined by peculiarities of male genital morphology and morphological similarities concerning palps, armature of dorsum and tuber oculorum, supported by molecular phylogenetic evidence. Palps short and stout, tibia and tarsus similar to each other and almost equal in length. Chelicerae of moderate size; males with large glandular fields dorso-medially on basal cheliceral segments, glands associated with rather unspecialised but in most species large, plateau-like apophyses exposing the glandular fields to dorsal and dorso-caudal side. Truncus penis as described for Ischyropsalididae but generally slender; glans penis simple and conical, rarely inflated, with a long, narrow, sclerotised ventral plate, gradually tapering into a long stylus being simple, straight, but slightly contorted in few species and set with indistinct, hook-like structures. Ventral plate irregularly set with small uniform spines, pronounced and structured setation otherwise lacking. Tuber oculorum set with a long blunt spine. Dorsal armature with blunt tubercles and partially varying numbers of large paired cones or spines on opisthosoma. Two bump-like enlarged metapeltidial structures present.

Genus Acuclavella Shear, 1986 (4 species)

Acuclavella Shear, 1986: 13; type species Acuclavella cosmetoides Shear, 1986 by original designation.

Etymology. Gender feminine; Latin neologism for “acute little spines” referring to the dorsal armament of the body.

merickeli Shear, 1986: 20; loc. typ.: USA, Idaho, Idaho Co., 20 mi ESE Lowell, Meadow Creek.

quattuor Shear, 1986: 22; loc. typ.: USA, Idaho, Idaho Co., 10 mi E Slate Creek.

shoshone Shear, 1986: 18; loc. typ.: USA, Idaho, Shoshone Co., Hobo Cedar Grove.

Genus Ceratolasma Goodnight & Goodnight, 1942 (1 species)

Ceratolasma Goodnight & Goodnight, 1942: 3; type species Ceratolasma tricantha Goodnight & Goodnight, 1942 by monotypy and original designation.

Etymology. Gender neuter; Greek, combination of “keratos” (genitive of “keras” = horn) for the horn-like processes, and „elasma“ (plate), referring to similar prosomal structures in other genera of Dyspnoi, as e.g. Dicranolasma, Ortholasma or Dendrolasma.

tricantha Goodnight & Goodnight, 1942: 3; loc. typ.: USA, Oregon, near Forest Grove, Clear Creek;—Gruber 1978 (redescr.).

Subfamily Ischyropsalidinae Simon, 1879a

Ischyropsalididae Simon, 1879a (see there).
Ischyropsalidinae; new rank (compr. Ischyropsalis).

Diagnosis. Dyspnoi of the family Ischyropsalididae with a western Palearctic distribution. Defined by peculiarities of male genital morphology and enlarged chelicerae with glandular fields situated distally on the basal segment in males of most species. Palps long and thin, elongated to enable interaction with the chelicerae. Chelicerae massive and enlarged, longer than the body; in most species glandular fields of males associated with knob-like apophyses exposing the field to dorsal and/or distal side. Truncus penis as described for Ischyropsalidiae; glans penis usually simple and conical, but inflated and distinct from the truncus in many species; the sclerotised ventral plate mostly short, from roughly rhombic to deeply bi-lobed at the base; sclerotised area of glans with several defined regions exhibiting dense fields of mostly very thick, long and backward-pointing hairs; glans gradually tapering into a long stylus, the latter simple and pointed, bent at the base but without contortion or additional structures. Tuber ocularum without spine. Dorsal armature mostly lacking, dorsum smooth, often glossy, in few species opisthosomal areas raised to low, pointed bumps. Two or many spine-like metapeltidial structures, arranged in a transversal row.

Genus Ischyropsalis C.L. Koch, 1839b (22 species, 4 subspecies)


Remarks. Establishment of the present-day taxonomy and validating species-specific characters in Ischyropsalis have been mainly facilitated by the thorough revision of Martens (1969). Having been unable to borrow many types from the Iberian Peninsula, part of his work remained hypothetical for that local fauna, which was later
corrected by Dresco (e.g. 1970, 1972), Luque (1991, 1992) and Prieto (1990a, 1990b). Of the 42 species described or emended by Roewer (1914, 1916, 1923, 1950, 1953a) only two remain valid. Species delineation and discovery of new species in northern Spain are still in progress (L. Labrada and C. Prieto, pers. comm.).

**Etymology.** Gender feminine; from Greek “ischyros” (robust, strong) and “psalis” (scissor), referring to the enlarged chelicerae.

*Ischyropsalis adamii* Canestrini, 1873; loc. typ.: Italian Peninsula, Golfo de Squillace.

Ischyropsalis adamii Canestrini, 1873: 50;—Martens 1969: 205 (redescr.). **Remarks.** Martens (1969: 205) reported Roewer’s (1950: 33) lectotype of *adamii* (SMF RI/976) as invalid and SMF data indicate that the lectotype locality could be “Como”, suggesting that the lectotype belongs to *I. carli*. A lectotype designation is only necessary if the species definition is questionable (ICZN 75), which is currently not the case.


*Ischyropsalis apuana*—Roewer 1950: 36.

*Ischyropsalis apuanus nanus* Dresco, 1968b: 751; **syn. n.:** Dresco (1968b) described this subspecies, while Martens (1969) synonymised *I. apuana* likely without knowing about *namus*.

*Ischyropsalis cantabrica* Luque & Labrada, 2012: 28; loc. typ.: Spain, Cantabria, Alfoz de Lloredo, Oreña Rogeria Cave.

*Ischyropsalis carli* Lessert, 1905; loc. typ.: Switzerland, Graubünden. **Remarks.** Schuls-Fettan (today Scuol-Ftan), the first of three localities listed by Lessert (1905) and separated from the others by a distance of 40 km, is to be favoured as explicit type locality.


*Ischyropsalis dentipalpis* Canestrini, 1872; loc. typ.: Italy, Aosta Valley, Gressoney-St. Jean.


*Ischyropsalis gigantea* Dresco, 1968a: 308; loc. typ.: Spain, Santander, Cueva la Cañuela.

*Ischyropsalis hadzii* Roewer, 1950; loc. typ.: Slovenia, Mokritz Mountain, Ziavka Cave.

*Ischyropsalis hadzii* Roewer, 1950: 52;—Martens 1969: 242 (redescr.). **Remarks.** Originally described as *Phalangium cancroides* Schmidt, 1851: 61 Roewer (1950) assumed the name preoccupied (Müller 1776: 192) and changed it to *hadzii*. Müller (1776) might have referred to *Acarus cancroides* Linnaeus, 1758: 616 (transferred to *Phalangium* by Linnaeus 1767: 1028), now recognised as a pseudoscorpion. Meanwhile, the name *hadzii* is in frequent use and established, and should not be altered. Roewer (1923: 683; also Hadži 1954: 141) questioned a specimen labelled “*Ischyropsalis cavernosum* Schmidt” (Krain, Zoological Institute University of Vienna) being the type of *cancroides*, which was not verified.

*Ischyropsalis hellwigii* (Panzer, 1794); loc. typ.: Germany, Elm Mountain (Elem) near Destedt, Braunschweig (reconstructed by Martens 1969). **Remarks.** Changes to the original spelling “*hellwigii*” are prohibited (ICZN 33.4).

*Phalangium hellwigii* Panzer, 1794: 18.

*Ischyropsalis hellwigii*—C.L. Koch 1839b: 24.

hellwigii lucantei Simon, 1879a; loc. typ.: France, Dép. Hautes-Pyrénées, Grotte de Bétharram.
Ischyropsalis superba—Simon 1881a: 130; Roewer 1914: 117.

hispanica Roewer, 1953a; loc. typ.: Spain, Sierra de Ancares, Cabana vella.
Ischyropsalis hispanica Roewer, 1953a: 208;—Prieto 1990a: 319 (redescr.).
Ischyropsalis hispanum—Roewer 1953a: 208 (misspelling).

kollari C.L. Koch, 1839b; loc. typ.: Austria, Salzburg, Gastein.
Ischyropsalis kollari C.L. Koch, 1839b: 24—C.L. Koch 1840: 19 (description).

lithoclasica Schönhofer & Martens, 2010b: 9; loc. typ.: Italy, Bergamo, Stalle del Möschel.

luteipes Simon, 1872b; nomen protectum; loc. typ.: France, Ariège, Massat, grotte de Le Quère.
Lhermia spinipes Lucas 1866: 44; nomen oblitum; Simon 1872b: 484. Remarks. Reviewing Lucas’ (1866) description, Lhermia spinipes is presented in a sparse description, in a comparison with other harvestmen and with a distinct type locality. Simon’s (1872b) decision to treat the name as a nomen nudum and to provide the new name, Ischyropsalis luteipes, is questionable, especially as he seems to have understood Lhermia spinipes and I. luteipes to be conspecific. However, it is proposed to maintain the use of luteipes (ICZN 23.9.1; nomen protectum) because spinipes (nomen oblitum) has not been used as a valid name after 1899 (ICZN 23.9.1.1) and luteipes has been used in at least 60 works between 1962 and 2012 (ICZN 23.9.1.2).
Ischyropsalis luteipes Simon, 1872b: 484 (replacement name).
**Remarks.** Dresco (1966: 598, 1970: 1205) defined three different forms or ecological races (*intermedia*, *longipes*, *brevipes*). Nothing is said about how to unambiguously recognise these forms, and they are of no nomenclatural relevance (ICZN 15.2).

**magdalenae** Simon, 1881a; loc. typ.: Spain, Galmádes, Cueva de la Magdalena.  
*Ischyropsalis madalenae*—Roewer 1914: 118 (misspelling).

**manicata** L. Koch, 1869; loc. typ.: Romania (“Siebenbürgen”; not further specified).  
*Ischyropsalis manicata* L. Koch, 1869: 164.

*Ischyropsalis ianotai* / *ianotae* Wajgel 1874: 36 (alternative spellings).  
**Remarks.** Wajgel (1874) mentioned the name *ianotae* in *Ischyropsalis*, and Rafalski (1961: 15, then spelled *ianotai*) recognised it as a nomen nudum.

*Ischyropsalis manicatus*—Lebert 1875 (incorrect ending).


**Remarks.** Martens (1969) states 1865 as the publication date which is related to a typo on his personal copy. Later authors have adopted this error.

*Ischyropsalis muellneri* Hamann, 1898; loc. typ.: Slovenia, Častitljiva Cave.  
*Ischyropsalis mulleri*—Hansen & Sørensen 1904: 5 (misspelling).


*Ischyropsalis muellneri*—Martens 1965: 144; Martens 1969: 246 (redescr.).

*Ischyropsalis navarrensis* Roewer, 1950; loc. typ.: Spain, Navarra.  
**Remarks.** Prieto (1990b) specified *nicaea* and *turki* as synonyms for having false type localities.  
*Ischyropsalis navarrensis* Roewer, 1950: 44.  

*Ischyropsalis nodifera* Simon, 1879a; loc. typ.: France, Basses-Pyrénées, St. Jean de Luz.  
*Ischyropsalis nodifera* Simon, 1879a: 270;—Luque 1991: 28 (see Remarks on *petiginosa*).  
*Ischyropsalis sharpi* Simon, 1879c: 129;—syn. Simon 1881a: 128 (see Remarks on *petiginosa*).  

*Ischyropsalis petiginosa* Simon, 1913; loc. typ.: Spain, Oviedo, Pimiango, Première grotte de Mazaculos.  
*Ischyropsalis peptiginosa*—Mello-Leitao 1936: 12 (misspelling).  
**Remarks.** Luque (1991) confirmed and redescribed *nodifera* and *petiginosa*, but did not unravel Martens’ synonymies (1969: 222; *petiginosa* and *sharpi* in syn. of *nodifera*). A revision of these *Ischyropsalis* species needs to comment on the validity of *petiginosa* and *sharpi*.  

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**TAXONOMIC CATALOGUE OF THE DYSPNOI**  
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**pyrenaea pyrenaea** Simon, 1872b; loc. typ.: France, Ariège, Moulis, grotte de l’Estelas.


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**pyrenaea alpinula** Martens, 1978: 224; loc. typ.: Italy, Crissolo, Grotta di Rio Martino.

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**ravasinii** Hadži, 1942: 11; loc. typ.: Italy, Cansiglio, Bus del Pal.

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**robusta** Simon, 1872a; loc. typ.: Spain, Tras-os-Montes, Serra de Gerêz.


*Ischyropsalis robusta*—Simon 1879a: 276.


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**strandi** Kratochvíl, 1936; loc. typ.: Italy, Monte Baldo, Malgre Prato Cave.


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**Family Sabaconidae** Dresco, 1970


**Diagnosis.** Dyspnioi of the superfamily Ischyropsalidoidea with a disjunct Holarctic distribution. Defined by peculiarities of male genital morphology, molecular phylogenetic evidence and the peculiar shape and functionality of palps. Palps densely set with bottlebrush-shaped hairs, inflated in all parts, most pronounced in females and juveniles; tarsus freely movable to dorsal and ventral side. Chelicerae small to moderate in size, in many species males with glandular fields on dorsal side of proximal cheliceral segment, often associated with large apophyses. Truncus penis of complex shape, with a deeply split base drawn out in two long roots, forming an upside-down Y-structure with the two basal branches bent towards the truncus. A single muscle situated outside the truncus and mounted between the truncus roots, connected with the distal part of the penis by a long tendon running through the truncus. Further characters of truncus, glans and stylus very variable, but penial stylus generally very long, if not modified. Ventral region poorly sclerotised, generally smooth and glossy without armature or microstructure. Labium absent, coxae without coxal apophyses. Frontal margin of opisthosoma with a median furrow. Two metapeltidial sensory cones.

**Genus Sabacon** Simon, 1879a (35 species, 4 subspecies)

*Sabacon* Simon, 1879a: 266; type species *Sabacon paradoxus* Simon, 1879a by monotypy.


*Tomicomerus* Pavesi, 1899: 533; type species *Tomicomerus bryantii* Banks, 1898 by monotypy;—syn. Shear 1986: 5 (see also Remarks on *bryantii*).

*Parasabacon* Hansen & Sørensen, 1904: 83; type species *Nemastoma crassipalpis* L. Koch, 1879 by monotypy;—syn. Roewer 1914: 123.

**Remarks.** Roewer (1914) and subsequent authors treated *Sabacon* as neuter in gender, while Gruber (2003) clarified it to be masculine, but did not list species names with corrected ending. In a list of species from France
and Spain, Prieto (2008) stated that Gruber had corrected the endings. Additional mandatory changes made for the first time according to Gruber are indicated by “new ending”.

**Etymology.** Gender masculine; from Greek “Sabákon” (Egyptian king). For details see (Gruber 2003).

*aikiyoshiensis* Suzuki, 1963; loc. typ.: Japan, Yamaguchi Pref., Miné-shi, Ōmine-machi, Satoyamase, Satoyamase-no-ana Cave.

*Sabacon aikiyoshiensis* Suzuki, 1963: 156


*Sabacon altomontanus*—Prieto 2008: 51.

*astoriensis* Shear, 1975: 24; loc. typ.: USA, Oregon, Clatsop Co., Fort Stevens State Park.

*briggsi* Shear, 1975: 26; loc. typ.: USA, California, Marin Co., Bolinas Ridge.

*bryantii* (Banks, 1898); loc. typ.: USA, Alaska, Mt. St. Elias, Malaspina Glacier. **Remarks.** Changes to the original spelling “*bryantii*” are prohibited (ICZN 33.4). The generic placement of *bryantii* remains to be investigated. It appears to have morphological traits of both *Sabacon* and *Taracus*, but new material is needed for further investigation (Shear 1975, 1986).

*Phlegmacera bryantii* Banks, 1898: 16.

*Tomicomerus bryantii*—Roewer 1914: 127.


*Tomicomerus bryanti*—Shear 1975: 26 (incorrect subsequent spelling).

*Sabacon bryanti*—Shear 1986: 5.

*cavicolens* (Packard, 1884); loc. typ.: USA, Kentucky, Carter Co., Bat Cave.

*Phlegmacera cavicolens* Packard, 1884: 203.

*Phlegmacera cavicolensis*—Banks 1894b: 52; Banks 1901: 677 (misspellings).


*Sabacon jonesi* Goodnight & Goodnight, 1942: 1; **syn. n.** **Remarks.** Shear (1975: 8) tentatively placed *jonesi* close to *cavicolens* which is accepted and the synonymy formally established here.


*Sabacon cavicolens*—Shear 1975: 13.


*crassipalpis* (L. Koch, 1879); loc. typ.: Siberia, Tunguska, 4 mi S om Podsk (see also Martens 1989: 370).

*Nemastoma crassipalpis* L. Koch, 1879: 111.

*Sabacon crassipalpis*—Roewer 1914: 125; Martens 1989: 370 (redescr.); Chemeris & Logunov 2000: 207 (redescr.).

*dentipalpis* Suzuki, 1949; loc. typ.: Japan, Kyoto suburbs, vicinity of Kibuné Shrine.

*Sabacon dentipalpe* Suzuki, 1949: 8; **new ending.**

*dhaulagiri* Martens, 1972: 314; loc. typ.: Nepal, Thakkola, ascend to Dapa-Col.

*distinctus* Suzuki, 1974a; loc. typ.: Japan, Kumamoto Pref., Kamimashiki-gun, Yabé-cho, Fusé-dô Cave.

*Sabacon distinctum* Suzuki, 1974a: 105; **new ending.**
franzi Roewer, 1953a: 208; loc. typ.: Spain, Sierra de Ancares.

gonggashan Tsurusaki & Song, 1993: 158; loc. typ.: China, Sichuan Prov., Kangding, W slope of Mount Gong-ga-
shan.


iriei Suzuki, 1974a: 103; loc. typ.: Japan, Kumamoto Pref., Yatsushiro-gun, Izumi-son, Ochiai, Yayama-daké-no-
tateana.


ishizuchi Suzuki, 1974a: 100; loc. typ.: Japan, Ehime Pref., Mount Ishizuchi.

makinoi makinoi Suzuki, 1949; loc. typ.: Japan, Hokkaido, Nopporo.
   Sabacon makinoi Suzuki, 1949: 15.


martensi Tsurusaki & Song, 1993: 155; loc. typ.: China, Sichuan Prov., Kangding, W slope of Mount Gong-ga-
shan.

mitchelli Crosby & Bishop, 1924; loc. typ.: USA, North Carolina, Yancey Co., Mt. Mitchell.
   Sabacon mitchelli Crosby & Bishop, 1924: 23;—Shear 1975: 17 (redescr.).

occidentalis (Banks, 1894b); loc. typ.: USA, Washington, Olympia.
   Phlegmacera occidentalis Banks, 1894b: 51.
   Sabacon occidentalis—Shear 1975: 19 (redescr.).

okadai Suzuki, 1941: 16; loc. typ.: China, Manchukuo, Moukden.

palpogranulatus Martens, 1972; loc. typ.: Nepal, Khumbu, Lughla.
   Sabacon palpogranulatum Martens, 1972: 319; new ending.

paradoxus Simon, 1879a; loc. typ.: France, Dép. Herault, caves.

pasonianus Luque, 1991; loc. typ.: Spain, Cantabria, Alto Asón-Miera.
   Remarks. The different spellings in Luque (1992) are listed in the errata of the same paper and probably
reflect no flaw by the author.

   Gruber (in Prieto 2008: 51) considered the species epithet a noun in apposition and therefore did not alter the
ending (IUCN 31.2.1).
**pygmaeus** Miyosi, 1942a; loc. typ.: Japan, Ehime Pref., Saraga-Miné Mountains.

_Sabacon pygmaeum_ Miyosi, 1942a: 165; **new ending.**

**relictus** Marten, 1972; loc. typ.: Nepal, Kathmandu Valley, Mount Phulchoki.

_Sabacon relictum_ Marten, 1972: 320; **new ending.**

**satoikioi** Miyosi, 1942b; loc. typ.: Japan, Ehime Pref., Saraga-Miné Mountains.

_Sabacon sato-ikioi_ Miyosi, 1942b: 49.

_Sabacon satoikioi_ —Suzuki 1974a: 100.

**sergeidedicus** Martens, 1989; loc. typ.: Siberia, Altai Mountains, Cherga, Artybash, Teletskoye Lake.

_Sabacon sergeidedicum_ Martens, 1989: 372; —Chemeris & Logunov 2000: 210 (redescr.); **new ending.**

**sheari** Cokendolpher, 1984: 989; loc. typ.: USA, Oregon, Benton Co., Marys Peak.


**siskiyou** Shear, 1975: 22; loc. typ.: USA, California, Siskiyou Co., 3mi N McCloud.


**viscayanus** Martens, 1983; loc. typ.: France, SW Lourdes, Val d’Ouzon, N. Ferrières.


_Sabacon viscayanum viscayanum_ —Dresco 1955: 42; Rambla (1967: 10).

**viscayanus ramblaianus** Martens, 1983; loc. typ.: France, SW Lourdes, Val d’Ouzon, N. Ferrières.

_Sabacon viscayanum ramblaianus_ Martens, 1983: 278.

_Sabacon viscayanum ramblaianus_ —Prieto 2008: 51.

**Family Taracidae fam. n.**

Compr. _Crosbycus_ (tentatively), _Hesperonemastoma, Taracus_; type genus _Taracus_ Simon, 1879b.

**Diagnosis.** Dyspnoi of the superfamily Ischyropsalidoidea with predominantly Nearctic distribution; _Crosbycus_ and one _Taracus_ species in eastern Asia. Palps elongated, slender and segments not markedly inflated (except for species of _Hesperonemastoma_ where males exhibit glandular structures in the palpal femur), set with bottlebrush-shaped hairs, tarsus movable to ventral side only. Chelicerae comparatively large to very large, segments elongated, pincer equipped with mainly diaphanous teeth and few coarse teeth, these predominantly in basal third. Glandular field on first cheliceral segment absent. Truncus penis simple and straight, filled for two thirds with a single muscle; muscular tendon short; base of truncus divided into two broad, root-like structures in line with truncus; truncus base partly opening to a wide cavity (_Hesperonemastoma_) but never exposing the muscle like in _Sabacon_. Glans penis simple and conical, without marked constriction towards truncus, mostly forming a uniformly sclerotised capsule set with uniform spines, tapering into the stylus. Stylus usually simple, relatively short, often bent to the side and sometimes with species-specific modifications (some elaborate, clasper-like mechanisms in _Taracus_). Ventral region moderately to strongly sclerotised. Coxae II with coxal apophyses; labium small. Frontal margin of opisthosoma with (_Taracus_) or without a median furrow. One prominent spine-like metapeltidial structures or none.
Crosbycus is here considered to belong to the Taracididae as it partly matches the given diagnosis, especially the similar structure of the penis and the presence of bottlebrush-shaped hairs on slender palps support this placement (Gruber 2007, Shear 1975). As character reduction in the minute Crosbycus is likely, its placement is tentative and should be verified by molecular evidence. Tomicomerus bryantii, here retained in its current placement in the genus Sabacon, shows affinities to Taracididae as well, yet material for a comprehensive re-investigation is lacking.

Genus Crosbycus Roewer, 1914 (1 species)

Crosbycus Roewer, 1914: 168; type species Nemastoma dasycnemum Crosby, 1911 by monotypy.

Etymology. Gender masculine; in honour of C.R. Crosby, who described the type species.

dasycnemus (Crosby, 1911); loc. typ.: USA, Columbia State, Hinkson Creek. Remarks. The amphi-pacific populations of Crosbycus dasycnemus require investigation for specific distinction.

Nemastoma dasycnemum Crosby, 1911: 20.

Crosbycus dasycnemus—Roewer 1914: 168.

Crosbycus considered as invalid: Gruber and Martens (1968) investigated most of the types of nominal Crosbycus species or revisited original literature, concluding that most of them belong to Nemastoma or other genera of Nemastomatidae, and thereby excluded Crosbycus from the European fauna. If discernible, names are assigned to distinct taxa in the Nemastomatidae. Non-assignable names are listed here. All three of these “species” were described by Roewer in 1951, one from Pentelikon and likely artificially assigned to this locality. This nominal species had not been considered for description before 1951, although Roewer claimed to have collected at this locality in 1927 and immediately described material from that expedition (see also Helversen & Martens 1972: Ischyropsalis pentelica Roewer 1950 is I. carli). Shear (2008: 67) assumed that the type locality of Crosbycus goodnighti is incorrect.

Crosbycus goodnightorum—Shear 2008: 67 (incorrect subsequent spelling).

Genus Hesperonemastoma Gruber, 1970 (5 species)


Etymology. Gender neuter, from Greek “hesperos” (western) combined with “Nemastoma“, referring to the Western distribution and the similarity to Nemastoma.

kepharti (Crosby & Bishop, 1924); loc. typ.: USA, North Carolina, Buncombe Co., Mt. Pisgah, South Hominy Creek.

Nemastoma kepharti Crosby & Bishop, 1924: 24.

modestum (Banks, 1894b); loc. typ.: USA, California and Washington (indifferent).

Nemastoma modesta Banks, 1894b: 52.
Nemastoma modestum—Roewer 1923: 677.
Hesperonemastoma modestum—Gruber 1970: 140.
packardi Roewer, 1914; loc. typ.: USA, Utah, E Lake Point, Clinton’s Cave.
Nemastoma troglodytes Packard, 1877: 160.
Nemastoma packardi Roewer, 1914: 163 (replacement name).
Hesperonemastoma packardi—Gruber 1970: 142; Shear 2010b: 106.

Remarks. Roewer (1914: 163) applied the new name packardi, because he found that Nemastoma troglodytes is preoccupied by Leiobunum troglodytes Wankel, 1861, a species that Roewer also considered to belong in Nemastoma. While today these two would be placed in different genera, the replacement name is valid, being established before 1961 and in use (ICZN 59.3). Shear (2010b: 107) stated that H. packardi as redescribed by Gruber (1970) may represent a new species.

pallidimaculosum (Goodnight & Goodnight, 1945); loc. typ.: USA, Alabama, Marshall Co., S Oleander, Rock House Cave.

Genus Taracus Simon, 1879b (8 species)

Taracus Simon, 1879b: 74; type species Taracus packardi Simon, 1879b by monotypy:—Roewer 1950: 52.

Remarks. Many species descriptions lack explicit type localities and are partly based on juvenile specimens. A revision is overdue and in progress (Shear pers. comm.).

Etymology. Gender masculine; from Greek “Tarakus”, an Egyptian king (Gruber 2003).

birsteini Ljovuschkin, 1971: 127; loc. typ.: Far East Russia, southern Primorsky Krai, Belii Dvorets Cave.
Remarks. A redescription was erroneously published under Nipponopsalis coreana (Chemeris 2000: 47).

heitschi Goodnight & Goodnight, 1942: 1; loc. typ.: USA, eastern Oregon.

malkini Goodnight & Goodnight, 1945: 242; loc. typ.: USA, California, Shasta Co., Lassen NP, Manzanita Lake.

nigripes Goodnight & Goodnight, 1943: 647; loc. typ.: USA, Colorado, Mineral Co., Wolf Creek Pass.

packardi Simon, 1879b: 74; loc. typ.: USA, Colorado.

pallipes Banks, 1894c: 161; loc. typ.: USA, Washington. Remarks. From 1914: 123 on Roewer states “Olympia” as type locality and added “Mt. Shasta” in 1923: 694, both likely errors. Banks (1894c: 161) mentioned only Washington State as locus typicus, while acknowledging T. Kincaid from Olympia to have sent him the material (Banks 1894c: 160). The label of the paratype in the Roewer collection (SMF RII/984) may not be reliable and should be checked against Banks’ original label.

silvestrii Roewer, 1929: 10; loc. typ.: USA, Oregon, Josephine Co., Oregon Cave. Remarks. Frequently cited as 1930, the valid publication date is 06.Aug.1929.

spinosus Banks, 1894b; loc. typ.: USA, California. Remarks. Roewer (1914: 121) states “Southern California” without having seen material; probably an error.
Taracus spinosa Banks, 1894b: 51.
Taracus spinosus—Roewer 1914: 121.
Superfamily Troguloidea Sundevall, 1833

Trogulides Sundevall, 1833: 35 (defined as one of three families in Opiliones); type genus Trogulus Latreille, 1802 as inferable from the stem of the family name (ICZN 11.7.1.1).


Family Dicranolasmatidæ Simon, 1879a

Dicranolasmatinæ Simon, 1879a: 290 (compr. Dicranolasma, Amopaum); type genus Dicranolasma Sørensen, 1873 as inferable from the stem of the family name (ICZN 11.7.1.1);—Šilhavý, 1967: 176 (compr. Dicranolasmata, genera of the Ortholasmatinæ established later).

Dicranolasmidæ—Pocock 1902: 509 (contains only Dicranolasma); Gruber 1974b: 34.

Genus Dicranolasma Sørensen, 1873 (16 species)

Dicranolasma Sørensen, 1873: 516; type species Opilio scaber Herbst, 1799 by subsequent designation (Martens 1978: 152);—Gruber 1974b: 34.

Amopaum Sørensen, 1873: 517; type species Amopaum spinipalpe Sørensen, 1873 by monotypy;—syn. Dahl 1903: 282.

Dicranolasma—Goodnight & Goodnight 1944: 3 (misspelling).

Remarks. Sørensen (1873: 516) assigned scabrum as type species for Dicranolasma, while he used a specimen of opilionoides for the morphological delineation of his genus. Thorell recognised additional species, also D. opilionoides, but confirmed the type species as scabrum (1876: 467). Later, Šilhavý (1956a) cited opilionoides as type, but without reference to ICZN 70.3.2 or further explanation, not qualifying this act as correcting the type species to the species used for the genus definition (ICZN 70.3). Martens (1978: 152; in reference to J. Gruber) suggested to use the original species scabrum sensu Herbst (1799) as type, which is in agreement with ICZN 70.3.1., and should be followed. Martens (1978) stabilised the situation further by redefining scabrum, giving a thorough description and specifying its type locality.

Etymology. Gender neuter; Greek from “di” (two) “kranion” (head) and “elasma” (plate), referring to the bifurcate head cap carrying the eyes and appearing like a split head.

apuanum Marcellino, 1971: 368; loc. typ.: Italy, Alpi Apuane, Pizzo Baldozzana.
cristatum Thorell, 1876; Italy, Florence.

Dicranolasma cristatum Thorell, 1876: 506;—Martens 1978: 160 (redescr.).
hirtum Loman, 1894: loc. typ.: Sumatra (erroneous; see Remarks).

Dicranolasma diomedaeum Kulczyński, 1907: 583; syn. n. by J. Gruber (see Remarks).

Remarks. According to J. Gruber (pers. comm.) D. diomedæum has to be considered as a junior synonym of D. hirtum, and this nomenclatural act is here attributed to him. While the type locality of D. hirtum (Sumatra) is obviously an error, Gruber suggested considering “Southern Italy” as the real type locality. A narrower definition is proposed here, using the type locality of D. diomedæum (Italy, Tremiti Islands, S. Domino) for D. hirtum. Chemini (1995: 4) probably learned from Gruber about the synonymy and listed only D. hirtum.
hoberlandti Šilhavý, 1956b: 32; loc. typ.: Turkey, East Taurus, Suluhan.

kurdistanum Stařega, 1970: 475; loc. typ.: Iraq, Kurdistan, Erbil, Salahaddin.

mladeni Karaman, 1990: 144; loc. typ.: Montenegro, Manastir Morača.

opilionoides (L. Koch, 1867); loc. typ.: Greece, Corfu.

Trogulus opilionoides L. Koch, 1867: 883.


pauper Dahl, 1903; loc. typ.: Italy, NW of Lake Garda.

Dicranolasma pauper Dahl, 1903: 290;—Martens 1978: 161 (redescr.).

ponticum Gruber, 1998: 513; loc. typ.: Turkey, Vilayet Ordu, ca. 5 km NE Ulubey.


scabrum (Herbst, 1799); loc. typ.: Hungary. Remarks. Martens (1978: 156) redefined the type locality to be Romania, Sibiu, which was within the borders of Hungary in 1799.

Opilio scaber Herbst, 1799: 15.

Dicranolasma scabrum—Sørensen 1873: 516; Martens 1978: 153 (redescr.).

Dicranolasma schmidti Hadži, 1928: 11;—syn. Martens 1978: 153. Remarks. Martens (1978) stated to have received information from J. Gruber that led to this synonymisation.

soerensenii Thorell, 1876; loc. typ.: France, Nice. Remarks. Changing the original spelling “soerenenii” is prohibited (ICZN 33.4).

Dicranolasma soerensenii Thorell, 1876: 505.


Dicranolasma wiehlei Kraus, 1959: 295;—syn. Martens 1978: 157. Remarks. Martens (1978) stated to have received information from J. Gruber that led to this synonymisation.

Dicranolasma soerenseni—Marcellino 1980: 325 and most subsequent authors (incorrect subsequent spelling).

thracium Stařega, 1976; loc. typ.: Bulgaria, Isval near Čirpan.


verhoeffi Dahl, 1903: 291; loc. typ.: not specified by Dahl (1903). Gruber (in Moritz 1971: 213) designated a lectotype from Southern Herzegovina, thereby fixing the type locality.

Family Nemastomatidae Simon, 1872a

Nemastomatidae Simon, 1872a: 226 (compr. Nemastoma, Ischyropsalis); type genus Nemastoma C.L. Koch, 1836b as inferable from the stem of the family name (ICZN 11.7.1.1).

Nemastomatidae Simon, 1879a: 277 (Nemastoma).

Remarks. Later definitions of Nemastomatidae mostly added the many subsequently described genera, but did not feature substantial transfers between families. These changes in the composition of the family are not further listed.
except for the following: described earlier, members of today’s Ortholasmatae were placed in Trogulidae (Banks 1894a: 11) and transferred to Nemastomatidae by Martens (1969: 185).

**Subfamily Ortholasmatae Shear & Gruber, 1983**

Ortholasmatae Shear & Gruber, 1983: 13; type genus *Ortholasma* Banks, 1894a by original designation;—Shear 2006: 192; Shear 2010a: 15.

**Remarks.** Gruber (1976) suggested organising Nemastomatidae in only two subfamilies which Martens (1978) followed, giving a new definition of Kratochvíl’s (1958) Nemastomatinae. Martens (1978) stated Ortholasmatae to be officially described by Gruber, who effected this in 1983 together with Shear. Shear and Gruber (1983) considered the names ending in “-lasma” as derived from *Dicranolasma*, therefore neuter, and changed endings of species names accordingly.

The Ortholasmatae were partly revised by Shear (2010a), who expected more undiscovered species to occur in Central America and Asia, some of them presently studied.

**Genus *Cladolasma* Suzuki, 1963 (2 species)**

*Cladolasma* Suzuki, 1963: 40; Shear 2010a: 17; type species *Cladolasma parvula* Suzuki, 1963 by monotypy and original designation.

**Remarks.** Suzuki (1974b) synonymised *Cladolasma* with *Dendrolasma* when he was able to compare adult specimens of both genera. Revising the Ortholasmatae, Shear (2010a) re-established *Cladolasma* for the Asian species.

**Etymology.** Gender neuter; Greek from “klados” (branch), referring to the multi-branched hood, and “elasma” (plate), both in reference to *Dendrolasma*.

*angka* (Schwendinger & Gruber, 1992); loc. typ.: Thailand, Chiang Mai Province, Doi Inthanon National Park.

*Dendrolasma angka* Schwendinger & Gruber, 1992: 57.
*Cladolasma angka*—Shear 2010a: 17.

*parvulum* Suzuki, 1963; loc. typ.: Japan, Shikoku, Ehime, Mt. Ishizuchi.

*Dendrolasma parvulum*—Shear & Gruber, 1983: 60.
*Cladolasma parvulum*—Shear 2010a: 17.

**Genus *Dendrolasma* Banks, 1894a (2 species)**

*Dendrolasma* Banks, 1894a: 12; type species *Dendrolasma mirabilis* Banks, 1894a by monotypy.

**Etymology.** Gender neuter; from Greek “dendron” (tree), referring to the multi-branched hood, and “elasma” (plate).

*mirabile* Banks, 1894a; loc. typ.: USA, Washington, Olympia.

*Dendrolasma mirabilis* Banks, 1894a: 12.
*Dendrolasma mirabile*—Martens 1978: 38; Shear & Gruber 1983: 51 (redescr.).

*dentipalpe* Shear & Gruber, 1983: 58; loc. typ.: USA, California, Humboldt Co., Carlotta.
**Genus *Martensolasma* Shear, 2006 (1 species)**

*Martensolasma* Shear, 2006: 192; type species *Martensolasma jocheni* Shear, 2006 by monotypy and original designation.

**Etymology.** Gender neuter; formed from “Martens” (German opilionologist) and „elasma“.

*jocheni* Shear, 2006: 193; typ. loc.: Mexico, Aguascalientes, Ciudad Aguascalientes.

**Genus *Ortholasma* Banks, 1894a (5 species)**

*Ortholasma* Banks, 1894a: 11; type species *Ortholasma rugosa* Banks, 1894a by monotypy.

**Etymology.** Gender neuter; combination of Greek “orthos” (straight), referring to the hood pointing horizontally, and “elasma” (plate).

*colossus* Shear, 2010a: 19; loc. typ.: USA, California, Tulare Co., Sequoia National Park, Bear Den Cave.

*coronadense* Cockerell, 1916; loc. typ.: USA, California, Coronado Islands, South Island.

*Ortholasma coronadense* Cockerell, 1916: 158.

*Ortholasma coronandensis*—Roewer 1923: 649.


*levipes* Shear & Gruber, 1983: 31; loc. typ.: USA, California, San Luis Obispo Co., Los Padres National Forest, La Panza, Navajo Camp.

*pictipes* Banks, 1911; loc. typ.: USA, California, Humboldt Co. (Humboldt Co. specified by Shear & Gruber 1983: 25 (redescri.)).

*Ortholasma pictipes* Banks, 1911: 417;—Shear & Gruber 1983: 25 (redescri.).

*rugosum* Banks, 1894a; loc. typ.: USA, Central California. **Remarks.** Shear and Gruber (1983: 15) restricted the type locality of *rugosum* to Central California. However, the type locality may be further specified, as they reported the syntype series of *rugosum* to include specimens of *levipes*, both known to co-occur in Sonoma County, only.

*Ortholasma rugosa* Banks, 1894a: 12; Roewer 1923: 648.

*Ortholasma rugosum*—Shear & Gruber 1983: 15 (redescri.).

**Genus *Trilasma* Goodnight & Goodnight, 1942 (9 species)**

*Trilasma* Goodnight & Goodnight, 1942: 7; type species *Trilasma bolivari* Goodnight & Goodnight, 1942 by monotypy and original designation;—Shear 2010a: 11.


**Etymology.** Gender neuter; combination of Greek “tria” (three) and „elasma“ (plate), referring to the three linear hood elements.

*bolivari* Goodnight & Goodnight, 1942; loc. typ.: Mexico, Puebla, Rio Friu.

*Trilasma bolivari* Goodnight & Goodnight, 1942: 7;—Shear 2010a: 38.

*Ortholasma bolivari*—Shear & Gruber 1983: 42 (redescri.).
**Ruaxphilos petrunkevitchou** Goodnight & Goodnight, 1945: 250;—syn. Gruber 1978: 106; Shear 2010a: 26. **Remarks.** Shear (2010a: 26) questioned the assignment of *petrunkevitchou* to *bolivari* because the localities seem very distant from each other.

**chipinquensis** Shear, 2010a: 37; loc. typ.: Mexico, Nuevo Léon, Monterrey, Chipinque Mesa.

**hidalgo** Shear, 2010a: 39; loc. typ.: Mexico, Hidalgo, Pachuco, El Chico.

**petersprousei** Shear, 2010a: 35; loc. typ.: Mexico, San Luis Potosí, S Aquismón, Hoya de las Guaguas.

**ranchonuevo** Shear, 2010a: 27; loc. typ.: Mexico, Tamaulipas, Rancho Nuevo.

**sbordonii** Šilhavý, 1973: 191; loc. typ.: Mexico, Tamaulipas, Gomez Farias, Cueva de la Perra. **Remarks.** *Trilasma sbordoni* differs in many respects from other *Trilasma* and also *Ortholasma*, as e.g. in exhibiting long, blade-like spines on a penial glans that seems inflated in comparison to the truncus (Šilhavý, 1973). Further investigation is recommended if *sbordonii* is to be treated as an independent lineage.

**tempestado** Shear, 2010a: 32; loc. typ.: Mexico, Nuevo Léon, S San Josecito, Cueva de Polvo Tempestado.

**trispinosum** Shear, 2010a: 29; loc. typ.: Mexico, Veracruz, Puerto del Aire.

**tropicum** Shear, 2010a: 41; loc. typ.: Honduras, “Las Ventas”. **Remarks.** Shear (2010a) could not locate Las Ventas in Honduras and advised to treat the geographical information with care.

**Subfamily Nemastomatinae Simon, 1872a**

Nemastomidae Simon, 1872a: 226; see Nemastomidae.

Nemastomatinae—Kratochvil 1958: 530; type genus *Nemastoma* by subsequent designation (see Remarks); Gruber 1976: 800; Martens 1978: 93 (see Nemastomatidae).


**Remarks.** The genus *Nemastoma* was redefined to contain only a small set of mainly Central European species (Gruber & Martens 1968), but up to now many other species of Nemastomatidae resided in their original placement as *Nemastoma*. Species are here pragmatically removed from *Nemastoma* sensu Gruber and Martens and assigned to other genera, while it is acknowledged that other authors were more careful in transferring species from *Nemastoma* to other genera (e.g. to *Nemastomella*; Prieto 2004).

Kratochvil (1958) investigated many of the species known in his days and established a widely accepted taxonomy. He unfortunately only provided species counts for his genera and rarely listed species names. Generic assignment is only attributed to Kratochvil when clearly perceivable.

**Genus Acromitostoma Roewer, 1951 (2 species)**


**Etymology.** Gender neuter; combination of the Greek “akros” (pointed), referring to the long, spine-like tubercle on the eye mound of the type species, combined with the genus name „mitostoma“.
**hispanum** (Roewer, 1917); loc. typ.: Spain, vicinity of Granada.

* Nemastoma hispanum Roewer, 1917: 156.
  * Carinostoma (Hispanostoma) hispanum—Kratochvıl 1958: 530.
  * Acromitostoma hispanum—Gruber 1976: 799; Rambla 1983: 22, 24 (redescr.).

**Remarks.** Gruber (1976: 799) synonymised *Carinostoma (Hispanostoma)* with *Acromitostoma* while Rambla (1983: 22) assumed he did not, yet she reconfirmed the synonymy.

**rhinoceros** (Roewer, 1917); loc. typ.: Spain, near Malaga.

  * Acromitostoma rhinocerus—Rambla 1983: 21 (misspelling, redescr.).

**Genus Carinostoma** Kratochvıl, 1958 (3 species)

*Mitostoma (Carinostoma)* Kratochvıl, 1958: 530; type species *Nemastoma carinatum* Roewer, 1914 by original designation.


**Etymology.** Gender neuter; combination of the Latin “carina” (keel), referring to the keels formed by anvil-shaped tubercles, and „stoma”, in reference to *Nemastoma*.

**carinatum** (Roewer, 1914); loc. typ.: Herzegovina, Jablanica.

* Nemastoma carinatum Roewer, 1914: 165.

**elegans** (Sørensen, 1894); loc. typ.: Hungary (not further specified).

* Nemastoma elegans Sørensen in Lendl, 1894: 29
  * Carinostoma elegans—Martens 1978: 137.

**Remarks.** Loksa (1991: 685) re-established *batorligetiense* as a subspecies, which is not followed here as the outlined characters should be considered as variants.

**ornatum** (Hadži, 1940); loc typ.: S Serbia (now Kosovo), Šar-Mountains, Kačanik.

* Nemastoma ornatum Hadži, 1940: 8.

**Remarks.** When defining *Carinostoma*, Kratochvıl (1958) listed only *carinatum* and *elegans*. One can assume that he also included *Nemastoma ornatum* in *Carinostoma* as he mentioned three species in this well-defined group. Staręga (1976) formally placed *ornatum* in *Carinostoma*.

**Genus Caucnemastoma** Martens, 2006 (2 species)


**Etymology.** Gender neuter; abbreviation of “Caucasus”, referring to the geographic origin, combined with “Nemastoma”.

**golovatchi** Martens, 2006: 180; loc. typ.: Russia, Krasnodar Prov., pasture Abago near Guzeripl.
martensi Snegovaya, 2011 (in Snegovaya & Chumachenko 2011: 118); loc. typ.: Russia, Sochi, N Khosta, Caucasian State Natural Biospheric Reserve, yew and box-tree grove.

Genus *Centetostoma* Kratochvíl, 1958 (4 species)


**Remarks.** Without providing species names, Martens (1978: 140) included *Nemastoma* of the *bacilliferum* group discussed by Dresco (1967b) and Rambla (1968) within *Centetostoma*. Stařečka (1986: 303) assigned the older available name *Nemastomella* to this assembly, gave a full list of species (1986: 304) but mentioned *centetes* as relatively isolated. Prieto (2004: 108) resolved this heterogeneity by restoring *Centetostoma* for *centetes* and Martens (2011: 38) finally redefined *Centetostoma*, including *centetes* and three species previously in *Nemastoma*.

**Etymology.** Gender neuter; combination of probably Greek “kentetes” (piercer), repeating and referencing the type species’ name (having rows of long, spine-like cones on the dorsal side) and „stoma”, in reference to *Nemastoma*.

centetes (Simon, 1881b); loc. typ.: France, Dép. Alpes-Maritimes, St. Martin Lantosque.  
*Nemastoma centetes* Simon, 1881b: 89;—Roewer 1923: 674.  


scabriculum (Simon, 1879a); loc. typ.: France, Dép. Hautes-Pyrénées, Saint-Sauveur.  
*Centetostoma scabriculum*—Martens 2011: 39 (redescr.).

ventalloi (Mello-Leitao, 1936); loc. typ.: Spain, Lleida Prov., Val d’Aran.  
*Centetostoma ventalloi*—Martens 2011: 41 (redescr.).

Genus *Giljarovia* Kratochvíl, 1958 (10 species)


**Remarks.** Kratochvíl (1958) introduced and briefly defined *Giljarovia* and *Malekia* as new genera in 1958, but gave full descriptions in 1959, which was erroneously cited as the year of description by Martens (2006). Kratochvíl (1958) summarised both genera as Giljaroviinae on the basis of their unique stridulatory mechanism. Gruber (1976) rejected the subfamily and synonymised *Malekia* with *Giljarovia*, by claiming that stridulatory organs are not relevant at genus level.

**Etymology.** Gender feminine, as inferred from the feminine ending of species described together with the genus; in honour of the Russian arachnologist M.S. Giljarov.

**redikorzevi** (Charitonov, 1946); loc. typ.: Georgia, Sataplia Cave near Kutaisi.


*Malekia redikorzevi*—Stærga 1978: 201.

*Giljarovia redikorzevi*—Martens 2006: 165 (redescr.).

**rossica** Kratochvíl, 1958; loc. typ.: Russia, Krasnodar Prov., Kotch Mt. near Gorjacij Kljuc; *Giljarovia rossica* Kratochvíl, 1958: 530;—Kratochvíl 1959: 1344; Martens 2006: 167 (redescr.).

**stridula** (Kratochvíl, 1958); loc. typ.: Russia, Krasnodar Prov., Krasnaja Poljana.


*Giljarovia stridula*—Gruber 1976: 798; Martens 2006: 151 (redescr.).

**tenebricosa** (Redikortsev, 1936); loc. typ.: Russia, Suchumi Distr., upper Tsebelda Valley.

*Nemastoma tenebricosum* Redikortsev, 1936: 34;—Stærga 1978, 204.

*Giljarovia tenebricosa*—Martens 2006: 152 (redescr.). **Remarks.** Martens (2006: 155) proposed an isolated position within the genus as this species is missing a stridulatory apparatus.

**thoracocornuta** Martens, 2006: 167; loc. typ.: Russia, Daghestan, upper Gunib.

**triangula** Martens, 2006: 156; loc. typ.: Georgia, Caucasus Major, Kazbegi.

**trianguloides** Martens, 2006: 159; loc. typ.: Russia, Krasnodar Prov., Caucasian State Reserve, Pslukh, ca. 20 km E of Krasnaya Polyana.

**turcica** Gruber, 1976: 782; loc. typ.: Turkey, Vilayet Amasya, S Amasya.

**vestita** Martens, 2006: 161; loc. typ.: Russia, Krasnodar Prov., Caucasian State Reserve, Pslukh, ca. 20 km E of Krasnaya Polyana, Mt. Kogot.

**Genus Hadzinia Šilhavý, 1966a (1 species)**

*Hadzinia Šilhavý, 1966a: 71; type species Nemastoma karamani Hadži, 1940 by monotypy and original designation.*

**Remarks.** Novak (2005: 313) erroneously gave Roewer as describing author.

**Etymology.** Gender feminine (not specified, inferred from ending; ICZN 30.2.4). In honour of the Yugoslavian zoologist J. Hadži, who described the type species.

**karamani** (Hadži, 1940); loc. typ.: SW Bosnia, Drvar, cave Resanova špilja Ledenica (clarification by Novak 2005: 313).

*Nemastoma karamani* Hadži, 1940: 2.


*Hadzinia karamani*—Šilhavý 1966a: 71 (misspelling).

**Genus Histricostoma Kratochvíl, 1958 (8 species)**


Remarks. Gruber (1976) rejected Kratochvíl’s subgenera and restricted *Histricostoma* to include *argenteolunulatum*, *dentipalpe* and *drenskii*. By including *creticum*, Martens (1978) synonymised the monotypic *Cretostoma* (see *creticum*).

Etymology. Neuter; probably derived from Latin “histrio” (actor) combined with „stoma“ in reference to *Nemastoma*. Maybe derived from “hystrix” (porcupine). The origin of this name remains uncertain.

*anatolicum* (Roewer, 1962); loc. typ.: Turkey, Western Taurus, two caves 20 km NW Dag (the small one referred to as “piccola”, the large one as “In Dag”, Turkish for “Dag Cave”). Dag is on the road from Antalya to Isparta, at the border of both provinces. Remarks. Brignoli reported details about the type locality to Gruber, who made the information available for this catalogue. *Nemastoma anatolicum* Roewer, 1962: 15.

*Histricostoma anatolicum* comb. n.: The syntype series (SMF 13903) comprises females and juveniles only. Females are very characteristic in exhibiting transverse rows of anvil-shaped tubercles and pairs of very long spines which terminate into one or two smaller spines. According to Gruber (pers. comm.) the leg microsculpture is similar to that of *H. creticum* and the presence of similar *Histricostoma* from Anatolia is confirmed. Until males are available, a tentative placement in *Histricostoma* is advised. Stareňga (1973: 132) mentioning *anatolicum* close to *Mediostoma cypricum*, which should be considered when revising these species.


*drenskii* Kratochvíl, 1958: 570; loc. typ.: Bulgaria, Rhodope Mountains, Chvojna, locality “Peštera”.


*mitovi* Snegovaya & Marusik, 2012: 61; loc. typ.: Turkey, Bursa, İnegöl, Great Oylat Cave.
**Genus **Mediostoma **Kratochvıl, 1958 (11 species)**


*Histricostoma* (Mediostoma) Kratochvıl, 1958: 54; type species *Nemastoma graecum* Roewer, 1917 by original designation (see humerale).


**Etymology.** Gender neuter; Latin “medius” (in the middle) combined with „stoma”, in reference to *Nemastoma*. The name probably refers to the position of pseudoarticulations in the middle of the leg femora. In the original composition of subgenera in *Histricostoma* (Kratochvıl 1958) it was compared to the basal-positioned pseudoarticulations in *Basostoma*.

**Etymology.**

*armatum* Martens, 2006: 189; loc. typ.: Iran, Mazandaran, S Alamdeh.

*ceratocephalum* Gruber, 1976: 790. loc. typ.: Turkey, S Anatolia, Vilayet Içel, 10 km NE Silifke. **Remarks.**

Gruber (1976: 794) discussed a placement of *ceratocephalum* in either *Giljarovia* or *Mediostoma* and decided for a tentative placement in the latter. Males of *ceratocephalum* are unavailable to confirm other generic characters.

*cypricum* (Roewer, 1951) loc. typ.: Cyprus (not further specified).


*Histricostoma (Mediostoma) cypricum*—Kratochvıl 1958: 569.


*globuliferum* (L. Koch, 1867); loc. typ.: Greece, Syros (=Syra).

*Nemastoma globuliferum* L. Koch, 1867: 893—Roewer 1923: 656.

*Mediostoma globuliferum* comb. n.: According to existing descriptions (L. Koch 1867: 893, Roewer 1923: 656) and the geographic origin of the type, this is most likely a *Mediostoma* species. The type seems lost (Roewer 1923: 656). Roewer’s re-description is based on material from Naxos. It is here tentatively transferred to *Mediostoma* to exclude it from *Nemastoma* where it certainly does not belong. A revision is necessary.

*haasi* (Roewer, 1953a); loc. typ.: Israel, Jerusalem.


*humerale* (C.L. Koch, 1839b); loc. typ.: Greece, Nauplia.

*Nemastoma humerale* C.L. Koch, 1839b: 38,—C.L. Koch 1847: 66.

*Nemastoma quadripunctatum humerale*—Roewer 1914: 148.


*Histricostoma (Mediostoma) graecum*—Kratochvıl 1958: 529


*nigrum* Martens, 2006: 190; loc. typ.: Iran, Gilan Prov., seaside of Talysch Mountains.

*pamiricum* Starega, 1986; loc. typ.: Tajikistan, West-Pamir, Vanč River Valley.

*Centetostoma pamiricum*—Starega 1978: 200 (as nomen nudum).


**Remarks.** Starega (1978: 200) mentioned the species name without giving a description) and tentatively placed it in *Centetostoma*. The intended description (cited as “Starega 1979” in Starega 1978) was postponed until 1986, objecting to the previous generic placement, as only a female was available. Snegovaya (2010: 353)
had no females to compare *pamiricum* with *Starengovia* which both occur in geographic proximity in an area with no other known members of the family.

**stussineri** (Simon, 1885a); loc. typ.: Greece, Ossa Mountains, Kokkino Vracho Cave.

*Nemastoma stussineri* Simon, 1885a: 217.  
*Histricostoma (Mediostoma) stussineri*—Kratochvíl 1958: 569.  
**Remarks.** *M. stussineri* is the largest species within *Mediostoma*, matching body size of the related genus *Pyza* and also showing some genital-morphological affinities (Gruber 1979, Mitov 2002). Its relationships should be reinvestigated.

**variabile** Martens, 2006: 185; loc. typ.: Iran, Azerbaijan, Makidi near Kaleybar.

**vitynae** (Roewer, 1927); loc. typ.: Greece, Crete, Topolia Canyon.

*Nemastoma vitynae* Roewer, 1927: 455.  
**Remarks.** Gruber (1976) stated that two of the three species of *Basostoma, topolium* and *vitynae* (excluding *funebre*), are synonymous, and referred to Martens (1966). Martens listed only *vitynae* and Gruber probably referred to his description, thus synonymy of *topolium* with *vitynae* has to be attributed to Gruber. The type localities of *topolium* (Crete) and *vitynae* (Peleponnes) are geographically isolated and warrant reinvestigation.

**Genus Mitostoma Roewer, 1951 (17 species, 3 subspecies)**

*Mitostoma (Mitostoma)—Kratochvíl 1958: 530.  
**Remarks.** *Mitostoma* stands out of the bulk of Nemastomatidae in exhibiting a very complex, three-dimensionally structured penial glans. Molecular data (Schönhofer & Martens 2010a) corroborated a placement of *Mitostoma* in a basal and isolated position to the rest of the Palearctic Nemastomatinae. However, Kratochvíl’s (1958) Mitostomatinae have not been accepted (Gruber 1976: 800), as his definition included unrelated genera. Martens (1978) synonymised many of Hadži’s (1973b) late nominal species. However, several species from the Central Balkan, rarely mentioned subsequently, appear to be valid (I. Karaman, pers. comm.) and are here treated as such. Types of Hadži are mainly lost or in bad shape (T. Novak, pers. comm.), so collecting at the type localities is necessary to redefine these species.

**Etymology.** Gender neuter; from Greek „mitos“ (thread) and „stoma“ (mouth) referring to the slender, glistening pedipalps, with regards to the etymology of *Nemastoma*.

**alpinum** (Hadži, 1931); loc. typ.: Slovenia, Triglav Massiv.  
**Remarks.** From the complex penis of this otherwise character-poor troglobiont, Fage (1946: 328) already inferred a closer relationship to *chrysomelas*, which later became the type species of *Mitostoma*. Considerable
size difference within this species warrants further investigation (Martens 1978: 149, Tedeschi & Sciaky 1997: 507).

**atticum** (Roewer, 1927); loc. typ.: Greece, Pentelikon Mountain, way up to Penteli Monastery.

*Nemastoma atticum* Roewer, 1927: 453.

*Mitostoma atticum*—Roewer 1951: 144.

**Remarks.** The type (SMF RII/239) is a female with only two remaining legs. Judging from this poor material, it seems morphologically very similar to specimens of *Mitostoma chrysomelas*. The same type locality was given by Roewer in the description of several invalid species (see *Crosbycus pentelicus*; Helversen & Martens 1972). It should be neglected if collections at this site cannot confirm the presence of similar animals.

**cancellatum** (Roewer, 1917); loc. typ.: Bosnia and Herzegovina, Sarajevo.


**carneluttii** Hadži, 1973a: 57; loc. typ.: Montenegro, Vasojević Komu. **Remarks.** Martens (pers. comm.) investigated the type in the Hadži Collection and assumed that it is close to *cancellatum*. A revision of both species is recommended.

**chrysomelas** (Hermann, 1804); loc. typ.: France, Alsace, Strasbourg.

**Remarks.** Many names have been assigned to this widespread Central European species, based on differences in the variable colouration and pattern of anvil-shaped tubercles. Most of them were synonymised by Martens (1978). He also mentioned that all *Mitostoma* described by Avram (1969, 1970) fall within the variation of *chrysomelas*, but did not list them as synonyms, having not seen the type material. They were officially synonymised by Weiss (1996: 263) based on good knowledge of the Romanian fauna. Subsequent publications (e.g. by Weiss and Babalean) did only cite *chrysomelas* for Romania. Tedeschi and Sciaky (1997: 510) considered some alpine populations of *chrysomelas* as distinct species, which remained unattended.

*Phalangium chrysomelas* Hermann, 1804: 108.

*Nemastoma chrysomelas*—C.L. Koch 1839b: 38.

*Nemastoma quadricorne* L. Koch, 1861: 142;—syn. Roewer 1914: 159. *Leiobunum troglodytes* Wankel, 1861: 257;—syn. Šilhavý 1956a: 79. **Remarks.** According to Wankel’s (1861) drawings the type is a juvenile *Mitostoma*, and according to the type locality (Czech Republic, Moravia caves) only *chrysomelas* applies (for *troglodytes* being preoccupied see also *Hesperonemastoma packardi*). Šilhavý (1956a) did not list *troglodytes* in the synonymy of *chrysomelas*.

*Nemastoma troglodytes*—Roewer 1923: 657.


*Mitostoma chrysomelas*—Roewer 1951: 142.


*Nemastoma chrisomelas*—Cîrdei 1956: 74 (misspelling).

Mitostoma (Mitostoma) sketi Hadži, 1973a: 50; syn. n.: According to Hadži’s (1973a: 51) drawings and the locality (Zlot, Serbia) this is very likely Mitostoma chrysomelas.
daccordii Tedeschi & Sciaky, 1997: 511; loc. typ.: Italy, Venetia, Monti Lessini, Cima Posta.
fabianae Tedeschi & Sciaky, 1997: 513; loc. typ.: Italy, Tuscany, Elba, N slopes of Mt. Tambora.
gracile (Redikortsev, 1936); loc. typ.: Russia, Gagari, Sochi (restricted by Staręga 1978: 202).
Nemastoma gracile Redikortsev, 1936: 39.
macedonicum Hadži, 1973a: 58; loc. typ.: Republic of Macedonia (not further specified).
olgae olgae (Šilhavý, 1939); loc. typ.: Montenegro, Risan, Golodražnica.
Nemastoma olgae olgae Šilhavý, 1939: 108 (for species), 109 (for subspecies).
Mitostoma olgae olgae—Roewer 1951: 144.
Remarks. Novak (2004) considered the subspecies decorum and kratochvili as invalid, being based on characters showing high variability. While his argumentation is reasonable, a reinvestigation might be worthwhile because these populations occur within a zone of high endemism (e.g. in Trogulus; Schönhofer & Martens 2009). For this reason, the subspecies are maintained for the time being.
olgae decorum (Šilhavý, 1939): 109; loc. typ.: Montenegro, Nikšiče, Dragova Luka.
Mitostoma olgae decorum—Roewer 1951: 144.
olgae kratochvili (Šilhavý, 1939): 109; loc. typ.: Croatia, Brac, Pučišća.
Mitostoma olgae kratochvili—Roewer 1951: 144.
olgae zorae Hadži, 1973a: 60; loc. typ.: Republic of Macedonia, Šar Planina, Karaorman Mt.
orobicum (Caporiacco, 1949); loc. typ.: Italy, Bergamo, Monte Arera.
Nemastoma orobicum Caporiacco, 1949: 121.
Remarks. The species was transferred to Mitostoma and synonymised with chrysomelas by Martens (1978), stating that J. Gruber had seen the juvenile type. Chemini (1985) redescribed and revalidated orobicum based on adult males.
patrizii Roewer, 1953b; loc. typ.: Italy, Sicily, Grotta di San Giovanni Domusnovas.
pyrenaeum (Simon, 1879a); loc. typ.: France, Ariége, Mouis, Château de la Brûlerie, Grotte d’Aubert.
Nemastoma pyrenaeum Simon, 1879a: 287.
Mitostoma asturicum Roewer, 1951: 147; syn. n.: The type locality (Spain, Asturia; Cave near Oviedo) is
doubtful as no new material from there is known (Prieto 2008). The male type was investigated (SMF RII/6210) and is very similar to specimens of *M. pyrenaenum*.

*Mitostoma pyrenaenum*—Roewer 1951: 149.

*sabbadinii* Tedeschi & Sciaky, 1997: 508; loc. typ.: Italy, Sardinia, Sassari, N slope of Mt. Limbara.

*valdemonense* Marcellino, 1974; loc. typ.: Italy, Sicily, Nebrodi, Portella di Femmina morta.


**Genus Nemaspela Šilhavý, 1966a (7 species)**


**Remarks.** Šilhavý mentioned only *Nemaspela sokolovi* in the definition of the genus, but also illustrated *abchasica* and *caeca* as *Nemaspela* (1966a: 68).

**Etymology.** Gender neuter; combination of “*Nemastoma*” and Latin “spelaeum” (cave), indicating a cave adaptation within Nemastomatidae.

*abchasica* (Ljovuschkin & Starobogatov, 1963); loc. typ.: Abchasia, Niznaja Sakuranskaia Cave.

*Burešiolla abchasica* Ljovuschkin & Starobogatov, 1963: 47.


*birsteini* Ljovuschkin, 1972; loc. typ.: Abchasia, Gudauta, Tarkiladze Caves.


*caeca* (Grese, 1911); loc. typ.: Ukraine, Crimea, unnamed cave near Skelja.

*Nemastoma caecum* Grese, 1911: 108.

*Burešiolla caecum*—Ljovuschkin & Starobogatov 1963: 43.

*Nemaspela coeca*—Šilhavý 1966a: 68 (misspelling).

*Nemaspela caeca*—Ljovuschkin 1972: 66; Chemeris 2009: 289 (redescr.).

*femorecurvata* Martens, 2006: 171; Georgia, Ratscha Mt. Range, Ambrolauri Dist., Sakishore Cave near Upper Tlugi.

*kovali* Chemeris, 2009: 293; loc. typ.: Russia, Central Caucasus, Kabardino-Balkaria, source of Belaya River, Fontanka Cave.

*sokolovi* (Ljovuschkin & Starobogatov, 1963); loc. typ.: Russia, Krasnodar Prov., Sochi, 15 km N of Khosta, Vorontsovskaya Cave.

*Burešiolla sokolovi* Ljovuschkin & Starobogatov, 1963: 47.


*taurica* (Lebedinski, 1914); loc. typ.: Ukraine, Crimea, Ajutisič Cave.


**Remarks.** Ljovuschkin (1972) mentioned *Phalangodes taurica* but excluded it from species he listed under *Nemaspela*. 
Genus Nemastoma C.L. Koch, 1836b (7 species, 4 subspecies)

Nemastoma C.L. Koch, 1836b: 70; type species Phalangium bimaculatum Fabricius, 1775 by subsequent fixation (Thorell 1876: 467) and subsequent delineation of the type species (Gruber & Martens 1968: 139).


Remarks. Nemastoma has long been the sole genus of the family, and accumulated large numbers of species. The subsequent decline of species assigned to Nemastoma is directly correlated with elaborating the systematics and taxonomy of the family. After Roewer (1951) assigned the first Nemastoma species to new genera, the original genus still comprised 107 species. Kratochvíl (1958) further elaborated the systematics, but counted 86 Nemastoma species, of which he included 23 in the subgenus Lugubrostoma, that came closest to today’s definition of Nemastoma. Gruber and Martens (1968) clarified the type species of Nemastoma (not Paranemastoma quadrupunctatum as stated by Kratochvíl 1958) and restricted the generic name to a defined number of seven species.

Etymology. Gender neuter; from Greek „nema“ (thread) and „stoma“ (mouth), likely referring to the threadlike and glistening pedipalps.

bidentatum bidentatum Roewer, 1914; loc. typ.: The locality information (Romania, Comana Vlasca) was considered erroneous, as the type series also contained triste and bidentatum sparsum, with only the latter occurring in Romania, but not bidentatum bidentatum (Gruber & Martens 1968: 143). The type locality is to be corrected, but should await a revision of the subspecies complex and use a locality within the known distribution.

Nemastoma bidentatum Roewer, 1914: 141;—Gruber & Martens 1968: 141 (redescr.).

bidentatum pluridentatum Hadži, 1973a; loc. typ.: Bosnia, Mt. Vlašić.

Nemastoma (Lugubrostoma) triste pluridentatum Hadži, 1973a: 43.


Remarks. Hadži (1973a) mentioned Stridulostoma seliskari as distinct from N. (L.) triste pluridentatum by the presence or absence of assumed stridulatory structures only. Gruber (1976: 797) therefore rejected the subgenus Stridulostoma within Nemastoma and suggested a reinvestigation of the two “species”. Later, the sole type specimen of seliskari was assumed to be a hybrid between b. bidentatum and b. sparsum (Novak & Gruber 2000: 286). Novak (2005) placed pluridentatum in the synonymy of N. bidentatum and regarded it as a valid subspecies, which is followed here. The subspecies in bidentatum are currently re-investigated.

bidentatum sparsum Gruber & Martens, 1968: 146; loc. typ.: Austria, Leitha Mountains, Sonnenberg.

bidentatum relictum Gruber & Martens, 1968: 147; loc. typ.: Austria, Salzburg, Kleinartal, Tappenkarsee.

bimaculatum (Fabricius, 1775); loc. typ.: Great Britain (not further specified).

Phalangium bimaculatum Fabricius, 1775: 440.


Nemastoma bimaculatum—C.L. Koch 1836b: 71; Meade 1855: 412; Gruber & Martens 1968: 150 (redescr.).

dentigerum Canestrini, 1873: 51; loc. typ.: Italy, Padova, Altichiero.

Nemastoma dentigerum Canestrini, 1873: 51;—Gruber & Martens 1968: 153 (redescr.).

lugubre (Müller, 1776); loc. typ.: Denmark (not further specified).

Phalangium lugubre Müller, 1776: 192.
Nemastoma lugubre—Simon 1879a: 281; Gruber & Martens 1968: 156 (redescr.).
Nemastoma lugubre striatum—Roewer 1951: 127.
Nemastoma (Lugubrostoma) lugubre—Kratochvíl 1958: 529.
Lugubrostoma lugubre—Šilhavý 1966a: 68.

schuelleri Gruber & Martens, 1968: 160; loc. typ.: Austria, Muhr, Lungau.


triste (C.L. Koch, 1835); loc. typ.: Germany, Bavaria, Regensburg.
Phalangium triste C.L. Koch, 1835: 20.
Nemastoma triste—C.L. Koch 1847: 63; Gruber & Martens 1968: 167 (redescr.).

Genus Nemastomella Mello-Leitão, 1936 (14 species, 2 subspecies)


Remarks. Staręga (1986: 303) used Nemastomella integripes as type species to make the genus name available, while he synonymised integripes with dubia in the same paper.
Prieto (2004, 2008) used a narrow and careful concept for Nemastomella, which is acknowledged but extended here, assuming the secondary loss of male cheliceral apophyses (as in cristinae, close to bacilliferum and dubium regarding genital morphology; in sexmucronata probably secondary loss because of cave adaptation) and allowing more variation in dorsal armament, to remove species from their definitely erroneous placement in Nemastoma. The species cristinae, maarebensis, monchiquensis and sexmucronata are hereby tentatively included in Nemastomella (see respective Remarks).

Etymology. Gender feminine; diminutive form of Nemastoma, using the suffix “-ella”.

armatissima (Roewer, 1962); loc. typ.: Portugal, Coimbra.
Nemastomella armatissima comb. n.: The type (SMF RII/11156) seems to be a female of Nemastomella close to spinosissima, but differs in being uniformly dark in colour, the first two areae having a row of anvil-shaped tubercles and the cones terminating in two large, fork-like spines. A full redescription has to await the collection of males, and placement and locality data require confirmation.

bacillifera bacillifera (Simon, 1879a); loc. typ.: France, Gers, Condom, La Plaigne du Mage.
Nemastoma bacilliferum Simon, 1879a: 287.
Nemastoma formosum Roewer, 1951: 134; syn. n.: After investigating the type (SMF RII/9525, France, Biarritz), this is certainly bacillifera.
Histricostoma (Mediostoma) bacilliferum—Kratochvíl 1958: 569.
Histricostoma bacillifera—Šilhavý 1966a: 69.

bacillifera carbonaria (Simon, 1907); loc. typ.: Spain, Huesca, Vio, Llobrica Cave.
Nemastoma carbonarium Simon, 1907: 553.
**Histricostoma** (*Mediostoma*) *carbonarium*—Kratochvıl 1958: 569.

*Nemastomella carbonaria*—Staręga 1986: 304.

*Nemastomella bacillifera carbonaria*—Prieto 2004: 111.

**cristinae** (Rambla, 1969); loc. typ.: Spain, Léon, Puerto de Piedrafita.


*Nemastomella cristinae*—Staręga 1986: 304.

**Remarks.** Oddly, Rambla (1969) did not mention the name of her new species throughout the written text but only in the legends of the figures. Staręga (1986) transferred the species to *Nemastomella* but Prieto (2004) placed it back in *Nemastoma* as it did not fit a number of external characters, e.g. having no cheliceral apophysis in males, and differences in granulation. External characters, as cheliceral apophyses, can get lost within a genus, as known from *Giljarovia* and *Nemaspela* (Martens 2006). The genital morphology of *cristinae* conforms with that of *bacilliferum* and *dubium*, and *cristinae* is best placed in *Nemastomella* and Staręga’s combination is hereby revived.

**dentipatellae** (Dresco, 1967b); loc. typ.: Spain, Santander, Arredondo, Cueva La Cañuela.


**dipentata** (Rambla, 1959); loc. typ.: Spain, Sierra Guadarrama, Lozoya Springs.

*Nemastoma bacilliferum dipentatum* Rambla, 1959: 79.


**dubia** (Mello-Leitao, 1936); loc. typ.: Catalogne (not further specified).


*Nemastomella dubia*—Staręga 1986: 304.

**gevia** Prieto, 2004: 114; loc. typ.: Spain, Jaén, Peal de Becerro: Complejo del Arroyo de la Rambla.

**hankiewiczi** (Kulczyński, 1909); loc. typ.: Portugal, Torres Vedras, Barro.


*Nemastomella hankiewiczii comb. n.*: Rambla (1980: 199) regarded the differences between *N. roeweri* and *N. hankiewiczii* as intraspecific variation, while Kraus (1961: 343) depicted differences in the structure of the male cheliceral apophyses that, based on current systematics, would warrant placement in different genera. The issue cannot be resolved without checking more material and meanwhile Rambla’s synonymy is retained. It is not clear what Kraus (1961) or Rambla (1980) perceived when discussing these species, but both forms show characters present in the Iberian radiation of Nemastomatidae, and a tentative placement in *Nemastomella* seems reasonable.

**iberica** (Rambla in Dresco, 1967b); loc. typ.: Spain, Sierra de Guadarrama (see Remarks).


*Nemastomella iberica*—Staręga 1986: 304; Prieto 2004: 117. **Remarks.** The species was established based on material used for a re-description of *N. bacilliferum bacilliferum* based on non-type material (Rambla 1959: 73). Dresco (1967b) recognised differences to the original *bacilliferum*, suggested the name *ibericus* and assigned Rambla as official author. Dresco specified the year of description as 1965, recited by Rambla (1967: 7), but it was not published in that year. Prieto (2004: 117) interprets the authorship of the species as “Rambla in Dresco, 1967” which is followed here. Dresco (1967) did not specify types or a type locality, but pointed solely to Rambla’s description, of which the illustrated male of the two series used for the description is to be...
preferred as lectotype (Collection Rambla, Barcelona: specimens n°335, 336). Depending on the formal lectotype selection, a more specific type locality is either Regajo del puerto de Navacerrada or Sanatorio Forest. Prieto (2004: 117) mentioned the species to be poorly characterised and advised revision.

maarebensis (Simon, 1913); loc. typ.: Algier, Ifri Maareb, near Djebel Azerou Tidjer.

_Nemastoma maarebensis_ Simon, 1913: 385.

_Nemastomella maarebensis_ comb. n.: Known from one female only, any generic association remains preliminary, while placement within _Nemastoma_ can be rejected. The type shows superficial similarity with _Nemastomella sexmucronatum_ and is therefore tentatively placed in _Nemastomella_. Delfosse (2004: 48) erroneously reported the species for France.

manicata (Simon, 1913); loc. typ.: Spain, Lérida, Llastarri, Minas dei Canal-B.

_Nemastoma manicata_ Simon, 1913: 386.

_Nemastomella manicata_—Prieto 2004: 112.

monchiquensis (Kraus, 1961); loc. typ.: Portugal: N slope Sierra de Monchique.


_Nemastomella monchiquensis_ comb. n.: According to the form of the cheliceral apophysis and the penial stylus (Rambla 1967) _monchiquense_ is clearly a member of the Iberian radiation including _Acromitostoma_, _Centetostoma_ and _Nemastomella_. However, it differs from the first two genera by the lack of characteristic penial wings, further from _Acromitostoma_ in lacking anvil-shaped tubercles, and from _Centetostoma_ in lacking large, knob-like tubercles on the dorsum and on the supracheliceral sclerites. _N. monchiquense_ is transferred to _Nemastomella_ for lacking these characters, but also for the penial glans armed with long, slender spines, for possessing rows of elongated papillae on the dorsal opisthosoma and for having a similar body size (Kraus 1961, Rambla 1967).

sexmucronata (Simon, 1911); loc. typ.: Spain, Santander, Santillana del Mar, Cueva de Altamira.

_Nemastoma sexmucronatum_ Simon, 1911: 205;—Prieto 2004: 119

_Nemastomella sexmucronata_—Staręga 1986: 304. **Remarks.** Placing _sexmucronata_ in _Nemastoma_ has to be rejected and it is tentatively reinstated in _Nemastomella_ following Staręga 1986. Still, several features of _sexmucronatum_ deviate from this genus. The penial truncus is narrowed below the glans, with deep lateral furrows, a stylus is almost absent, and large spines are missing from the glans (Prieto 2004). Dorsal spines and male cheliceral apophyses may be reduced in this cave-dwelling species, but its position in _Nemastomella_ is isolated, requiring investigation, as acknowledged by Prieto (2004).

spinosissima (Kraus, 1961); typ. loc.: Spain, Navarra, Picos de Europa, foot of Peña Vieja Mt.

_Nemastoma spinosissima_ Kraus, 1961: 345.


**Genus Paranemastoma** Redikorzev, 1936 (21 species, 5 subspecies)


_Buresiolla_ Kroatcvić, 1958: 529; type species _Nemastoma buresci_ Roewer, 1926 by original designation.

_Paranemastoma_ (Buresiolla)—Staręga 1976: 332. **Remarks.** Staręga (1976: 332) transferred the type of _Buresiolla, buresci_, to _Paranemastoma_, thus effecting synonymy with _Paranemastoma_ (ICZN 61.3.1). Preserving the subgenus was not subsequently approved (Mitov 2011).

**Remarks.** While the genus _Paranemastoma_ is nowadays accepted and well-defined upon genital morphology, its revalidation and redefinition are difficult to pinpoint. Roewer (1951: 95) and Kroatcvić (1958: 526) rejected _Paranemastoma_ as defined by Redikorzev (1936), who delineated his monotypic genus upon the presence or
absence of pseudosegmentation of the legs. Based on genital morphology, and also on large body size, Šilhavý (1966a: 70) assumed close relationship between seven Nemastoma species, including *quadripunctatum*, all later accepted as Paranemastoma. He further delineated this assembly from species which are today in the sister genera Carinostoma (*elegans*) and Histricostoma (*dentipalpe*). Mcheidze (1959: 111) re-established Paranemastoma as a subgenus for *superbum*, and Staręga (1966a: 392) placed Dromedostoma in its synonymy. Staręga did so for *superbum* only, while *quadripunctatum* and others remained in the subgenus Nemastoma. In 1968, Gruber and Martens redefined Nemastoma for a narrow ensemble of species. To reinforce this, they associated the earlier concepts of Nemastoma by Kratochvíl (1958: 529; excluding Lugubrostoma), Roewer and Šilhavý (for the latter two no explicit references were given) to conform better to Paranemastoma and its type *superbum*. While this could be regarded as redefining Paranemastoma, the concepts of Kratochvíl, Roewer and Šilhavý can hardly be seen in agreement, and Gruber and Martens (1968) gave no further definition or listed associated species. Yet, later authors have followed their proposal (see statement in Avram 1973a: 31), using mainly the conclusive concept of Šilhavý (1966a), and accepted species close to *quadripunctatum* as Paranemastoma (Helversen & Martens 1971, Dumitrescu 1972, Avram 1973a). Martens (1978: 116) redefined the genus, stating the species-count to be twenty, but did not present a list, and his bibliography for Paranemastoma and the four discussed species is unusually incomplete (e.g. not listing his own contributions: Gruber & Martens 1968, Helversen & Martens 1971). In summary, assignment of species to Paranemastoma has always been a stepwise process, adding single species or small groups of species, and a complete list of species was never published. Taxonomy represents a nightmare, having to deal with about 100 names, often based on variable external characters as spination and colouration. Informative characters for species delineation, as male genital morphology and cheliceral apophysis structures, are complex and need careful re-evaluation.

**Etymology.** Gender neuter; Greek; combination of “para” (“close to”) and “Nemastoma” indicating the close relationship perceived at the time of separation.

*ancae* Avram, 1973b; loc. typ.: Romania, Apuseni Mountains, Râcaș region (from different mines; no explicit type or type locality was specified).


*armatum* (Kulczyński, 1909); loc. typ.: Hercegovina, Domanović.

Nemastoma *armatum* Kulczyński, 1909: 468.

Nemastoma quadripunctatum *armatum*—Roewer 1923: 661.

Paranemastoma *armatum*—Novak 2005: 316 (stated revision needed).

*aurigerum aurigerum* (Roewer, 1951); loc. typ.: Bulgaria, Burgas.

Nemastoma *aurigerum* Roewer, 1951: 119.


*aurigerum ryla* (Roewer, 1951); loc. typ.: Bulgaria, Tscham Kuria, Borovec (restricted by Staręga 1976: 324).

Nemastoma *ryla* Roewer, 1951: 120.


*aurigerum joannae* Staręga, 1976: 324; loc. typ.: Bulgaria, Belasica Mt., 30 km WSW Petrič, Ključ.

*aurosum* (L. Koch, 1869); loc. typ.: Greece.

Nemastoma *aurosum* L. Koch, 1869: 165.

Nemastoma quadripunctatum *aurosum*—Roewer 1951: 661.

Paranemastoma *aurosum*—Novak 2005: 318 (stated revision needed).

bicuspidatum (C.L. Koch, 1835); loc. typ.: Austria, Salzburg, Gastein.

Phalangium bicuspidatum C.L. Koch, 1835: 16.

Nemastoma bicuspidatum—C.L. Koch 1836b: 70; Šilhavý 1956a: 124, 141 (erroneously listed as type species of Nemastoma).

Nemastoma quadripunctatum bicuspidatum—Roewer 1923: 663.

Nemastoma reimoseri Roewer, 1951: 108; syn. n.: According to size, colouration and distribution stated for reimoseri, species other than bicuspidatum can be excluded.

Paranemastoma bicuspidatum—Avram 1973a: 31; Martens 1978: 121 (redescr.).

bureschi (Roewer, 1926); loc. typ.: Bulgaria, Isker Defilé, cave above Tzerowo.

Nemastoma bureschi Roewer, 1926: 300.

Nemastoma tunetanum Roewer, 1951: 130; syn. n.: Investigation of the syntypes of N. tunetanum (SMF RII/ 241) show that these are without doubt Paranemastoma that perfectly fit the redescription of P. bureschi by Mitov (2011). N. tunetanum from “Tunisia” is another misplaced Roewer species.

Crosbycus bureschi—Roewer 1951: 152.


Paranemastoma (Buresiolla) bureschi—Staręga 1976: 332.

Paranemastoma bureschi—Karaman 1995b: 334; Mitov 2011: 303 (redescr.).

coryraeum (Roewer, 1917); loc. typ.: Greece, Corfu.

Nemastoma quadripunctatum coryraeum Roewer, 1917: 143.


filipes (Roewer, 1917); loc. typ.: Azerbaijan, Lenkoran.

Nemastoma quadripunctatum var. filipes Roewer, 1917: 144.

Nemastoma filipes—Roewer 1923: 665.

Nemastoma (Dromedostoma) filipes—Kratochvíl 1958: 538.

Paranemastoma filipes—Martens 2006: 203 (redescr.).

iranicum Martens, 2006: 204; loc. typ.: Iran, Mazandaran, 11 km E Alasht.

kalishevskyi (Roewer, 1951); loc. typ.: Georgia, Suchumi Distr., Azhazy.

Nemastoma kalishevskyi Roewer, 1951: 122.


Paranemastoma kalishevskyi—Staręga 1966a: 390.

Paranemastoma charitonovi—Staręga 1978: 204.

Paranemastoma suchumium—Staręga 1978: 205.

kochii (Nowicki, 1870); loc. typ.: High Tatras Mountains (mostly in Slovakia).

Nemastoma kochii Nowicki, 1870: 57.

Nemastoma quadripunctatum kochii—Roewer 1923: 662.


Paranemastoma kochii—Avram 1973a: 31; Martens 1978: 124 (redescr.).

longipes (Schenkel, 1947); loc. typ.: Albania, Tirana.


quadripunctatum (Perty, 1833); loc. typ.: Germany, vicinity of Munich.

Phalangium quadripunctatum Perty, 1833: 204.

Phalangium flavimanum C.L. Koch, 1835: 22; syn. n.: Judging from the description (C.L. Koch 1835) and the area it was collected from (between Bad Gastein and Triest), a Paranemastoma, already associated with quadripunctatum by Roewer (1914: 144).

Nemastoma flavimanum—C.L. Koch 1847: 64; Roewer 1914: 144.

Nemastoma quadripunctatum—Simon 1879a: 279.


Nemastoma quadripunctatum quadripunctatum—Roewer 1923: 660.


Nemastoma lessinensis—Roewer 1951: 110.


radewi (Roewer, 1926); loc. typ.: Bulgaria, Trnowo Distr., near Monastir Dranowski, Wodnata Pester Cave.

Nemastoma radewi Roewer, 1926: 299.

Nemastoma radevi—Wolf 1938: 630 (misspelling); Šilhavý 1966a: 68.


Nemastoma markovi—Šilhavý 1966a: 68.


Paranemastoma radevi—Avram 1973a: 34.

Paranemastoma atanasovi—Avram 1973a: 35.

Paranemastoma paspalevi—Avram 1973a: 35.

Nemastoma sillii (Herman, 1871); loc. typ.: Romania, Sibiu.


Nemastoma quadripunctatum sillii—Roewer 1923: 662.

Nemastoma bishopi Roewer, 1951: 106;—syn. Martens 1978: 126. Remarks. The type locality (Germany, Black Forest, Titi Lake) is situated within the geographical range of P. quadripunctatum, not of sillii. The issue is only of academic interest as it would place bishopi in the synonymy of another Paranemastoma species.


Nemastoma simplex Giltay, 1932; comb. n.: Roewer (1951) related simplex to Nemastoma filipes, which is unlikely for geographical reasons. He seems the only one to have discussed this species, which, according to the original description, is a Paranemastoma and distinct from others from the Greece mainland. Paranemastoma is confirmed for the Peloponnes (Martens pers. comm.).

Crosbycus graecus Giltay, 1932: 2; syn. n.: Judging from Giltay’s (1932) drawings (single opisthosomal sclerite) and from the body size (3 mm), the type of Crosbycus graecus is a juvenile Paranemastoma. Rambla (1968: 69) and Gruber and Martens (1968: 138) came to the same conclusion, but did not assign C. graecus to a valid species, although it is likely conspecific with P. simplex specimens collected from the very same spot.


Nemastoma superbum bacurianum—Mcheidze 1964: 117 (misspelling).

Nemastoma (Paranemastoma) superbum—Stařečka 1966a: 392.

Nemastoma thessalum Simon, 1885a; loc. typ.: Greece, Ossa Mountains, summit.

Nemastoma quadripunctatum thessalum—Roewer 1923: 662.


Nemastoma titaniacum (Roewer, 1914); loc. typ.: Bosnia (not further specified).

Nemastoma bimaculosum Roewer, 1914: 162.

Nemastoma bimaculosum Roewer, 1951: 118; syn. n.: Novak 2005: 316 related bimaculosum to P. titaniacum, which is followed here.

Nemastoma (Dromedostoma) titaniacum—Kratochvíl 1958: 538.

**werneri** (Kulczyński, 1903); loc. typ.: Turkey, Uludağ Mt. (orig. Olympus Bithynicus).
Nemastoma quadripunctatum werneri—Roewer 1923: 663.
**Paranemastoma werneri; new rank:** Cîrdei (1960: 80) recorded *werneri* from former Yugoslavia and Šilhavý (1956a: 142) cited the name for Poland. Staęga (1978: 205) interpreted these specimens as *silli*, and regarded *werneri*, described from the Anatolian Peninsula, as separate. Unlikely to be a subspecies of *quadripunctatum* for geographical reasons, *werneri* is treated here as species until it is revised. The presence of *Paranemastoma* at the type locality has been confirmed (NHMW).

**Paranemastoma considered as nomina dubia:** Most of the following names have never been mentioned following the original publication and are not identifiable as distinct species. On the basis of their descriptions, e.g. body size and spination, they can be transferred to *Paranemastoma*. Many have been described by Roewer (1951), in detail difficult to recognise for likely using false localities and already described species. Others were described by Hadži (1973a) upon variants and many of his types are lost and, thus recognition of his species is also difficult. If these names cannot be assigned to distinct species, they should be treated as invalid.

**aeginum** (Roewer, 1951).
Nemastoma aeginum Roewer, 1951: 121.
**Paranemastoma aeginum comb. n.**

**amseli** (Roewer, 1951).
Nemastoma amseli Roewer, 1951: 123.
**Paranemastoma amseli**—Marcellino 1980: 333. **Remarks.** Never collected again, *Paranemastoma* probably does not occur in Sardinia and *amseli* is likely to be another “misplaced” Roewer species.

**amuelleri** (Roewer, 1951).
Nemastoma amülleri Roewer, 1951: 118.
**Paranemastoma amuelleri comb. n.**

**bolei** (Hadži, 1973a).
Nemastoma (Dromedostoma) bolei Hadži, 1973a: 38.
**Paranemastoma bolei comb. n.**

**brevipalpatum** (Roewer, 1951).
Nemastoma brevipalpatum Roewer, 1951: 122.
**Paranemastoma brevipalpatum**—Prieto 2008: 56 (assumed false loc. typ.; not Spain).

**caporiaccoi** (Roewer, 1951).
Nemastoma caporiaccoi Roewer, 1951: 123.
**Paranemastoma caporiaccoi comb. n.:** According to the original illustrations and size, it is definitely a *Paranemastoma*, a genus not present in Sicily.
**carneluttii** (Hadži, 1973a).
 *Paranemastoma* carneluttii **comb. n.**

**emigratum** (Roewer, 1959).
 *Nemastoma* emigratum Roewer, 1959: 37.
 *Paranemastoma* emigratum **comb. n.**: According to Roewer’s drawings (1959: 38) this is most likely a *Paranemastoma*. While the collector K. Lindberg insisted that his specimen is from India, this is unlikely given the known distribution of the genus and family. Confusion with Lindberg’s rich collections from Greece and Turkey, where *Paranemastoma* is present, seems likely.

**ferkeri** (Roewer, 1951).
 *Nemastoma* ferkeri Roewer, 1951: 121.
 *Paranemastoma* ferkeri **comb. n.**

**gigas montenegrinum** (Nosek, 1904)
 *Nemastoma* gigas montenegrinum Nosek, 1904: 4.
 *Paranemastoma* gigas montenegrinum **comb. n.**: The name seemingly was not used after the original description and the type locality, Montenegro, is not in the distribution area of *silli*, with which *gigas* was synonymised. Avram (1973a), discussing the synonymy of *gigas*, did not mention subspecies of *gigas*, some of which were later accepted as species (e.g. *longipes*). According to the description, *montenegrinum* could conform to *titaniacum*, rendering the latter synonymous. For the lack of an explicit type locality and the likely loss of the *montenegrinum* type, *titaniacum* is preserved for now.

**gostivarense** (Hadži, 1973a).
 *Nemastoma* gostivarense Hadži, 1973a: 32.
 *Paranemastoma* gostivarense **comb. n.**

**ikarium** (Roewer, 1951).
 *Nemastoma* ikarium Roewer, 1951: 125.
 *Paranemastoma* ikarium **comb. n.**

**ios** (Roewer, 1917).
 *Nemastoma* quadripunctatum ios Roewer, 1917: 143.
 *Nemastoma* ios—Roewer 1951: 121.
 *Paranemastoma* ios **comb. n.**

**kaestneri** (Roewer, 1951).
 *Nemastoma* kästneri Roewer, 1951: 121.
 *Paranemastoma* kaestneri **comb. n.**

**longipalpatum** (Roewer, 1951).
 *Paranemastoma* longipalpatum **comb. n.**

**macedonicum** (Hadži, 1973a).
 *Nemastoma* macedonicum Hadži, 1973a: 25.
 *Paranemastoma* macedonicum **comb. n.**

**machadoi** (Roewer, 1951).
 *Nemastoma* machadoi Roewer, 1951: 123.
mackenseni (Roewer, 1923).
  
Nemastoma mackenseni Roewer, 1923: 668.

Paranemastoma mackenseni **comb. n.**

multisignatum (Hadži, 1973a).

Nemastoma (Dromedostoma) multisignatum Hadži, 1973a: 35

Paranemastoma multisignatum **comb. n.**

nigrum (Hadži, 1973a).

Nemastoma (Dromedostoma) nigrum Hadži, 1973a: 32.

Paranemastoma nigrum **comb. n.**

perfugium (Roewer, 1951).

Nemastoma perfugium Roewer, 1951: 110.

Paranemastoma perfugium **comb. n.**: Roewer (1951) placed perfugium in the group of Paranemastoma-like Nemastomatidae. The type locality (Elba, Italy) is otherwise not known to be inhabited by Paranemastoma and hence doubtful.

redikorzevi (Roewer, 1951).

Nemastoma redikorzevi Roewer, 1951: 125.

Paranemastoma redikorzevi—Staręga 1978: 205.

Paranemastoma roeweri Staręga, 1978: 205;—Chevrizov 1979: 14; **syn. n.**: Staręga (1978: 205) found Nemastoma redikorzevi Roewer (loc. typ. Ukraine “Krim”) to be preoccupied by Nemastoma redikorzevi Charitonov, renamed it roeweri and transferred it to Paranemastoma. In this case of primary homonymy, the younger name is not to be automatically replaced, as Staręga transferred the species to different genera in the same paper, not notifying the commission (ICZN 23.9.5).

santorinum (Roewer, 1951).

Nemastoma santorinum Roewer, 1951: 124.

Paranemastoma santorinum **comb. n.**

senussium (Roewer, 1951).

Nemastoma senussium Roewer, 1951: 123.

Paranemastoma senussium **comb. n.**: According to drawing and size, it is definitely a Paranemastoma unlikely to occur in the North African Kufra Oasis.

sketi (Hadži, 1973a).

Nemastoma (Dromedostoma) sketi Hadži, 1973a: 41.

Paranemastoma sketi **comb. n.**

spinosulum (L. Koch, 1869).

Nemastoma spinosulum L. Koch, 1869: 165.

Nemastoma spinulosum—Roewer 1951: 140 (misspelling).

Paranemastoma spinosulum **comb. n.** **Remarks.** L. Koch (1869) provided descriptions as a determination key, allowing association with Paranemastoma from the mentioned pair of prominent spines only. Roewer (1951: 140) mentioned it as *N. spinulosum*, while the species seems not recognisable any more.

umbo (Roewer, 1951).

Nemastoma umbo Roewer, 1951: 122.

Paranemastoma umbo—Staręga 1978: 206; Martens 2006: 206. **Remarks.** Described from the Caucasus, Martens (2006: 207) questioned that umbo originates from this geographic area, but was unable to assign it to another species.
Genus *Pyza* Staręga, 1976 (4 species)


**Remarks.** Gruber (1979) revised the genus and mentioned that the type species, *P. bosnica*, is distantly related to the remaining species and only tentatively placed them in *Pyza*. A phylogenetic comparison with *Mediostoma* and *Vestiferum* is advised.

**Etymology.** Gender feminine; although sounding similar to modern Neapolitan fast food, the true titular saints are globular Polish potato dumplings, in resemblance to the body form of these opilionids.

*anatolica* (Roewer, 1959); loc. typ.: Turkey, Cheykhan, caves 30 km N Mardine.

*Crosbycus anatolicus* Roewer, 1959: 38.

*Pyza anatolica*—Gruber 1979: 572.

*bosnica* (Roewer, 1917); loc. typ.: Bosnia, Miljačka River Valley near Sarajevo.

*Nemastoma bosnicum* Roewer, 1917: 150.


*navarrense* (Roewer, 1951); loc. typ.: Spain, Navarra. **Remarks.** According to Gruber (1979: 561) the type locality is incorrect. He showed that the species is widely distributed in Greece and subsequent records from the Pyrenees are absent.

*Nemastoma navarrense* Roewer, 1951: 130.


*Pyza navarrense*—Gruber 1979: 561.

*taurica* Gruber, 1979: 566; Turkey; loc. typ.: Turkey, Vilayet Antalya, 18 km W Topraktepe, E Manavgat.

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Genus *Saccarella* Schönhofer & Martens, 2012 (1 species)


**Etymology.** Gender feminine; derived from the name of the type locality Monte Saccarello.


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Genus *Starengovia* Snegovaya, 2010 (1 species)

*Starengovia* Snegovaya, 2010: 351; type species *Starengovia kirgizica* Snegovaya, 2010 by monotypy and original designation.

**Etymology.** Gender feminine; in honor of the Polish arachnologist Wojciech Staręga.

*kirgizica* Snegovaya, 2010; typ. loc.: Kyrgyzstan, Alash Mountain Ridge and River valley, near Alash.

*Starengovia kirgizica* Snegovaya, 2010: 352.

*Starengovia kirgisica*—Snegovaya, 2010: 353. **Remarks.** The spelling is hereby fixed to *kirgizica* (ICZN 24.2.3).
Genus *Vestiferum* Martens, 2006 (2 species)

*Vestiferum* Martens, 2006: 175; type species *Nemastoma funebre* Redikorzev, 1936 by original designation.

**Remarks.** Martens (2006) united two species in *Vestiferum*, which he considered as not very closely related. He mentioned affinities of *alatum* to the Turkish species of the heterogenous *Pyza*.

**Etymology.** Gender neuter; Latin “vestis” (dress, blanket) and the ending „ferum“ (bearing) referring to the soil incrusted body, which is unusual within Nemastomatidae.


*funebre* (Redikorzev, 1936); loc. typ.: Abchasia, Gagra, Kvemo-Azara near Tkvarčeli.


*Vestiferum funebre*—Martens 2006: 175.

**Remarks.** As both names were published in the same paper, Stareča (1978; as first revising author) gave *funebre* precedence over *brunneum* (ICZN 24.2.2).

Nemastomatinae incertae sedis (3 species)

Species listed here are not assignable to any genus and do not belong in *Nemastoma* sensu Gruber and Martens (1968). Formally excluded from *Nemastoma*, they require re-definition.

*daciscum* L. Koch, 1869: 164; loc. typ.: not given. **Remarks.** L. Koch (1869) described this *Nemastoma* in a short key. Roewer (1914: 144) listed it with *Nemastoma quadripunctatum* but found it not recognisable. It is recommended to not use *daciscum* any further.

*lilliputanum* Lucas, 1849; loc. typ.: Algeria, Oran, Djebel Santon Mountain.


*Nemastoma lilliputanum*—Simon 1879a: 289; Roewer 1914: 138.

*Nemastoma (Lugubrostoma) lilliputanum*—Kratochvíl 1958: 539.

**Remarks.** The cheliceral apophysis of the type (depicted by Roewer 1914: 138) is very unique and may point to separate generic status.

*rude* Simon, 1881b: 90; loc. typ.: France, Dép. Alpes-Maritimes, St. Martin Lantosque. **Remarks.** The body length of 9 mm stated for this *Nemastoma* (Simon 1881b) exceeds that of any other species in the family and is therefore most likely an error. The description faintly suggests *Nemastoma dentigerum*, the type needs re-investigation.

Family Nipponopsalididae Martens, 1976


Genus *Nipponopsalis* Martens & Suzuki, 1966 (3 species, 2 subspecies)


**Etymology.** Gender feminine; from Kanji “Nippon” (Japan) and Greek “psalis” (scissors), referring to the enlarged chelicerae and the partly Japanese distribution.
abei abei (Sato & Suzuki, 1939); loc. typ.: Japan, Iwakuni, Yamaguti-Ken.


coreana (Suzuki, 1966); loc. typ.: South Korea, Chungbug, Chungju, Betal Cave.

yezoensis (Suzuki, 1958); loc. typ.: Japan, Hokkaido, Orofure-tôge.

Family Trogulidae Sundevall, 1833

Trogulides Sundevall, 1833: 35 (proposed as family; compr. Trogulus, Caeculus); type genus Trogulus Latreille, 1802, inferable from the stem of the family name (ICZN 11.7.1.1);—C.L. Koch 1839b: 7 (compr. Trogulus).
Trogulini—Sørensen 1873: 515; Thorell 1876: 468 (as subfamily; compr. Anelasma, Trogulus).

Remarks. Trogulus is understood as the type genus since Sundevall (1833: 35). Albeit C.L. Koch (1850: 98) indirectly designated Trogulus when assuming the group monotypic, Shear (1974: 67) seems the first to explicitly state Trogulus as the type genus. Some of the suggested changes in this family originate from a PhD thesis (Schönhofer 2009), which may not qualify as a valid taxonomic publication, hence they are given as new.

Genus Anarthrotarsus Šilhavý, 1967 (1 species)


Etymology. Gender masculine; Greek, from „an“ (no), “arthron” (joint) and “tarsus” referring to the one-segmented tarsi of all legs.

martensi Šilhavý, 1967: 176; loc. typ.: The original type locality Greece, Corfu, provided by Roewer, is doubtful for his known meddling with localities (Helversen & Martens 1972) and because the species was never collected there again. If it can’t be confirmed, the affirmed paratype locality (Greece, Crete, Bay of Sithia) should be preferred (ICZN 76A.2).

Genus Anelasmocephalus Simon, 1879a (13 species)

Anelasma Sørensen, 1873: 519; type species Anelasma lycosinum Sørensen, 1873 by subsequent designation (Thorell 1876: 468).
Anelasmocephalus Simon, 1879a: 297; replacement name for Anelasma Sørensen, 1873, preoccupied by Anelasma Darwin, 1854.
Rhexana Sørensen, 1879: 124; the other suggested replacement name, Anelasmocephalus Simon, 1879a, has priority.
**Etymology.** Gender masculine; Greek, from „an“ (no) and “elasma” (plate) “kephalé” (head) referring to the small head cap in comparison to *Dicranolasma* (Sørensen 1873).

*balearicus* Martens & Chemini, 1988: 35; loc. typ.: Spain, Mallorca, settlement near Palma.


*cambridgei* (Westwood, 1874); **nomen protectum**; loc. typ.: Great Britain, Dorset, Bloxworth near Blandford.

*Trogulus violaceus* Gervais, 1844: 130; **nomen oblitum**: Assigned to *Anelasmocephalus* by Schönhofer (2009: 187). Pabst (1953: 22) mentioned the striking colouration as characteristic for all juveniles of this species. Being the older name it is here suggested to treat *violaceus* as nomen oblitum in favour of the established name *cambridgei* (nomen protectum; ICZN 23.9.1). *Trogulus violaceus* has not been used as valid name after its year of description (ICZN 23.9.1.1) and at least 150 works list the name *Anelasmocephalus cambridgei* (ICZN 23.9.1.2).

*Trogulus cambridgei* Westwood, 1874: 202; citation misspelled as *cambridgii* in Martens & Chemini 1988: 36.


*Anelasmocephalus cambridgei*—Simon 1879a: 299; Martens 1978: 176; Martens & Chemini 1988: 36 (redescr.).

*crassipes* (Lucas, 1849); loc. typ.: Algeria, Eastern part. **Remarks.** The syntype series most likely comprises material pooled from four localities mentioned in the original description (according to the number of individuals and the label stating “Algérie”); for other examples of mixed Simon series see Schönhofer & Martens 2008, e.g. p. 548). According to ICZN 73.2.3, the type locality comprises all these localities until a lectotype is designated.

*Trogulus crassipes* Lucas, 1849: 305.


*Anelasmocephalus oblongus*—Simon 1879a: 301.

*Metopoctea annulipes*—Simon 1879a: 311.

*Anelasmocephalus crassipes*—Roewer 1923: 646; Martens & Chemini 1988: 26 (redescr.).

*hadzii* Martens, 1978; loc. typ.: Austria, Karawanken, Eisenkappel.


*lycosinus* (Sørensen, 1873); loc. typ.: Italy, Prov. Rome, Gennazzano.

*Anelasma lycosinum* Sørensen, 1873: 521.

*Anelasmocephalus lycosinus*—Simon, 1879a: 297; Martens & Chemini 1988: 12 (redescr.).


*pusillus* Simon, 1879a; loc. typ.: France, Corsica (not further specified).

*Anelasmocephalus pusillus* Simon, 1879a: 300;—Martens & Chemini 1988: 11 (redescr.).

*pyrenaicus* Martens, 1978; loc. typ.: Spain, Central Pyrenees, Ordesa Valley.

**rufitarsis** Simon, 1879a; loc. typ.: France, Basses-Alpes, Digne.


**tuscus** Martens & Chemini, 1988: 22; loc. typ.: Italy, Abetone, Cimone Mountain.

**Genus Calathocratus** Simon, 1879a (9 species)

*Calathocratus* Simon, 1879a: 301; type species *Trogulus africanus* Lucas, 1849 by monotypy.


**Remarks.** When describing *Calathocratus*, Simon (1879a) defined *Trogulus africanus* as the type species, but based the description of the genus on a different species, rendering the description invalid. The genus name remained available by specification of the type species and a redescription of the genus should consider the original type series of *africanus* (MHNP 2201; Schönhofer 2009: 172).

Schönhofer and Martens (2010a) united three poly- and paraphyletic genera within *Calathocratus*. A list of taxonomic changes deemed unnecessary. The same authors also showed cryptic diversity to be extraordinarily high, while clear species delineation on the basis of molecular genetics or morphology could not be realised.

**Etymology.** Gender masculine; maybe from Greek „kalathos“ (flared fruit basket borne on the head as a symbol of fruitfulness in Greek and Egyptian mythology; compare Gruber 2003 for Simon’s preference to integrate Egyptian mythology in taxonomy) and “kratos” (authority, maybe in terms of “head of”), likely circumscribing the conspicuous head cap of these opilionids.

*africanus* (Lucas, 1849); loc. typ.: Algeria, surroundings of Algiers (as specified on the label of the type series MHNP 2201; Schönhofer 2009: 173).

*Trogulus africanus* Lucas, 1849: 304.

*Calathocratus africanus*—Simon 1879a: 301.

*Trogulocratus tunetanus* Roewer, 1950; syn. n.: Schönhofer (2009: 173) found the types of *tunetanus* to be conspecific with the types of *africanus*.


*caucasicus* (Šilhavý, 1966b); loc. typ.: Russia, Kuban, Michajlov.

*Platybessobius caucasicus* Šilhavý, 1966b: 151.

*Calathocratus caucasicus*—Schönhofer & Martens 2010a: 71.

*hirsutus* Snegovaya, 2011 (in Snegovaya & Chumachenko 2011: 117); loc. typ.: Russia, Sochi, N Khosta, Caucasian State Natural Biospheric Reserve, yew and box-tree grove.

*intermedius* (Roewer, 1940); loc. typ.: Greece, Crete, Meskla. **Remarks.** The locality is doubtful for reasons explained under *Anarthrotarsus* and *Kofiniotis*, and because the species has never been recollected on Crete.


**Trogulocratus rhodiensis** (Gruber, 1963); loc. typ.: Greece, Rhodos, Apollo Temple on Smith Mountain.
*Trogulocratus rhodiensis* Gruber, 1963: 308.
*Calathocratus rhodiensis*—Schönhofer & Martens 2010a: 71.

**Trogulocratus singularis** (Roewer, 1940); loc. typ.: Greece, Crete, Topolia Gorge.
*Platybessobius singularis* Roewer, 1940: 27.
*Calathocratus singularis*—Schönhofer & Martens 2010a: 71.

**Trogulocratus sinuosus** (Sørensen, 1873); loc. typ.: Italy, Prov. Rome, Gennazzano.
*Trogulus sinuosus* Sørensen, 1873: 522.
*Trogulus albicerus* Sørensen, 1873: 523; **syn. n.**: Described from the same locality, *albicerus* is based on juveniles of *sinuosus* (Schönhofer 2009: 173).
*Trogulocratus sinuosus*—Chemini & Gruber 1976: 132.
*Calathocratus sinuosus*—Schönhofer & Martens 2010a: 71.

**Remarks.** Brignoli and Raffaelli (1978: 94) synonymised the Italian *apenninicus* with the supposedly Greek *intermedius*, but given the geographic distance, it is unlikely that both are conspecific. Chemini and Gruber (1976: 132) redirected the synonymy of *apenninicus* to the Italian *sinuosus*.

**Genus Kofiniotis Roewer, 1940 (1 species)**

*Kofiniotis*—Roewer, 1940: 29.

**Etymology.** Gender masculine; Roewer (1940) spelled “Kofiniotis” in the header of the genus description and “Kofiniotis” elsewhere. No meaning for *Kofiniotis* was given, but *Kofiniotis*, derived from the Latin “confinium”, the “bordered” or “limited”, is reasonable in view of the species exhibiting rows of long papillae along the legs to “confine” several of the distal segments. However, Roewer did not explain the etymology to infer a spelling error. According to ICZN 24.2.4, Roewer (1950: 56) as first revising author fixed *Kofiniotis* by listing only this name. The gender of the species-name *creticus* specifies the gender of the genus as masculine (ICZN 30.2.3).

**creticus** Roewer, 1940: 29; loc. typ.: Greece, Crete, Meskla. **Remarks.** The type locality is likely erroneous as the species was never collected again on Crete and as the type label states “Topolia Cave”, a locality which Roewer used for several problematic species (Helversen & Martens 1972). It is advised to use “Greece, Levkas Island”, the second reported (Roewer 1950) and reconfirmed locality (Schönhofer & Martens 2010a) as type locality.

**Genus Trogulus Latreille, 1802 (32 species)**

*Trogulus* Latreille, 1802: 61; type species *Acarus nepaeformis* Scopoli, 1763 by subsequent designation (Thorell 1876: 468).
*Metopoctea* Simon, 1879a: 309; type species *Phalangium melanotarsum* Hermann, 1804, here designated type species as none was designated before;—syn. Dahl, 1903: 283.
*Trogulus*—C.L. Koch 1839a: 7 (misspelling).

**Remarks.** Schönhofer and Martens (2010a) showed that cryptic diversity was largely underestimated. The revision of the genus is a tedious process due to its homogeneous morphology.

**Etymology.** Gender masculine; Latreille (1802: 61) stated the chelicerae and palps to be hidden under a small hood (coqueluchon = petite capuchon) and applied the name “Trogule”. The exact meaning remains unclear, while in view of Latreille’s explanation the interpretation of Perrier et al. (1929; de “trogein”, rongé = gnawed) has to be rejected.
**aquaticus** Simon, 1879a; loc. typ.: France, Corsica, Haute Corse, Corte.

*Trogulus aquaticus* Simon, 1879a: 306;—Schönhofer & Martens 2008: 533 (redescr.).

Metopoctea exarata Simon, 1879a: 310; *syn. n.*

*Trogulus exaratus*—Schönhofer & Martens 2008: 553 (considered invalid).

**Remarks.** Simon’s original description of *exarata* (1879a: 306) matches only the largest specimen of the syntype series, thereby identifiable as its lectotype (ICZN 74.4). The lectotype represents a juvenile of *aquaticus* (7.5 mm body length, length of the tarsal segments II almost equal), fixing the type locality to Corsica (ICZN 76.2). The other juvenile paralecotypes cannot be assigned and may originate from other localities mentioned in the description, e.g., the Pyrenees. *Metopoctea exarata* is hereby placed in the synonymy of *Trogulus aquaticus*, against Schönhofer and Martens’ (2008: 553) recommendation to neglect *exarata* without affiliating it to a species. Schönhofer and Martens (2008: 553) specified a neotype for *aquaticus*, which, in fact, is a lectotype, because it originates from the syntype series.

**balearicus** Schönhofer & Martens, 2008: 537; loc. typ.: Spain, Balearic Islands, Ibiza, Sierra Grosa, valley facing to San José.

**banaticus** Avram, 1971; loc. typ.: Romania, Banat Mountains, Scorilla Valley, Poiana Mărului.

*Trogulus banaticus* Avram, 1971: 261;—Schönhofer & Novak 2011: 8; Schönhofer et al. 2013a: 371 (both redescr.).

**cisalpinus** Chemini & Martens, 1988: 71; loc. typ.: Italy, Como, Brunate.

**closanicus** Avram, 1971; loc. typ.: Romania, Carpathian, Plateau de Mehedintză, Cloșani.


*Trogulus asperatus* C.L. Koch, 1839a: 146; *nomen oblitum*: The holotype of *asperatus* represents a not assignable juvenile of the *nepaeformis-squamatus*-complex, of which at the type locality of *asperatus* (Zweibrücken, Germany) only *closanicus* was found abundant. As the name never played a role in the taxonomic literature, it is proposed as a nomen oblitum and *closanicus* as a *nomen protectum* (see Remarks on *niger* under *nepaeformis*).

**coriziformis** C.L. Koch, 1839a; loc. typ.: Italy, Lazio, Roma Prov., Monti della Tolfa, between Tolfa and Rota (restricted by neotype locality; Schönhofer & Martens 2008: 538).

*Trogulus coriziformis* C.L. Koch, 1839a: 128;—Schönhofer & Martens 2008: 538 (redescr.).


**cristatus** Simon, 1879a; loc. typ.: France, Provence, Dép. Alpes-Maritimes.

*Trogulus cristatus* Simon, 1879a: 308;—Schönhofer & Martens 2008: 543 (redescr.).

**falcipenis** Komposch, 2000; loc. typ.: Austria, Carinthia, Karawanken, Koschuta, S Zell-Pfarre.

*Trogulus falcipenis* Komposch, 2000: 2;—Schönhofer & Martens 2009: 1239 (redef.).

**graecus**, Dahl, 1903, loc. typ.: Greece (not further specified).


*Trogulus corcyraeus* Dahl, 1903: 285;—syn. Staněk 1976: 301. **Remarks.** Schönhofer and Martens (2010a) assumed that many cryptic species were summarised under the name *graecus*. *Trogulus corcyraeus* (loc. typ.: Greece, Corfu) likely belongs to one of these cryptic species and should be considered for a revision (Schönhofer 2009: 176).

**gypseus** Simon, 1879b: 75; loc. typ.: Jerusalem. **Remarks.** Schönhofer and Martens (2010) assumed several cryptic species summarised under this name.
**hirtus** Dahl, 1903; loc. typ.: Bosnia-Herzegovina, Konjsko.  
*Trogulus tricarinatus* subspecies *hirta* Dahl, 1903: 289.  
*Trogulus tricarinatus hirtus*—Roewer 1923: 641.  
*Trogulus hirtus*—Schönhofer & Martens 2009: 1226 (redescr.).

**huberi** Schönhofer & Martens, 2008: 548; loc. typ.: Portugal, Algarve, 50 km N Faro, Alte.

**karamanorum** Schönhofer & Martens, 2009: 1244; loc. typ.: Republic of Macedonia, Gostivar, near Gjonovica Cave.

**lusitanicus** Giltay, 1931; loc. typ.: Portugal, Lisboa, Sintra (Cintra).  
*Trogulus lusitanicus* Giltay, 1931: 1;—Schönhofer & Martens 2008: 549 (redescr.).  
**Remarks.** *T. lusitanicus* includes cryptic species (Schönhofer & Martens 2008).

**martensi** Chemini, 1983; *nomen protectum*; loc. typ.: Italy, Trento, Pergine Valsugana.  
*Trogulus tuberculatus* Canestrini, 1874: 221; *nomen oblitum*; Chemini (1986) did not mention *T. tuberculatus* from the Canestrini Collection and the type can be presumed lost. *Trogulus martensi* is widespread and abundant in the Po-Valley and is the only species likely to occur at the type locality of *tuberculatus* (Italy, Padova, Cervarese). However, *tuberculatus* is not recognisable from the description, featuring a juvenile (e.g. body ash-grey, only tarsi dark) and compared with other *Trogulus* of questionable definition (*nepaeformis* sensu Koch 1839a; *squalidus, asperatus*). Furthermore, the name *Trogulus tuberculatus* has not played a role in taxonomic literature after 1899 (only once mentioned as a synonym; Roewer 1923: 639; ICZN 23.9.1.1) and a minimum of 25 works mention *T. martensi* (ICZN 23.9.1.2). *Trogulus tuberculatus* is suggested as *nomen oblitum* (ICZN 23.9) to favour the established name *Trogulus martensi* (*nomen protectum*).  

**megaligrava** Schönhofer et al., 2013a: 373; loc. typ.: Greece, Corfu, S Loutses, Megali Grava Cave.

**melitensis** Schönhofer & Martens, 2009: 1236; loc. typ.: Croatia, Mljet Island, Soline, Bjejajka, in pit Jama u uvali šume Bjejajka.

**nepaeformis** (Scopoli, 1763); loc. typ.: Scopoli (1763) stated only “Discovered once in moss near beech roots”. T. Novak (pers. comm.) assumed that the type was collected at Scopolis workplace, Slovenia, Idrija, where the species is present and which should be fixed as type locality.  
*Acarus nepaeformis* Scopoli, 1763 (in index without page numbers).  
*Acarus nepaeformis*—Scopoli, 1763: 390.  
*Trogulus nepaeformis*—Latreille 1802: 61.  
*Trogulus rostratum*—Latreille 1802: 61.  
**Remarks.** Hermann’s (1804) drawings of *melanotarsum* show an early instar not assignable to any species. At the locus typicus (Strasbourg, France) presence of four species is possible, but no later reference to *melanotarsum* can be clearly associated with any of these (e.g. Koch 1839a, Simon 1879a, Ausserer 1867, Kraepelin 1896) or other species. The type is lost and the name never played a role in systematic literature (Schönhofer 2009: 181). Here, Dahl (1903: 288) is followed, suggesting *T. melanotarsus* as a synonym of *T. nepaeformis*.  
**Remarks.** A *Trogulus* from BMNH is labelled *niger* and the museum data (not the label) states “Triest” as locality and “Graf Jeniston” as the collector, conforming to C.L. Koch’s data of the type. It is not labelled as type and should not be considered one to keep the name in synonymy, as it never played a role in taxonomic literature. *Trogulus niger* was already considered as a synonym of *nepaeformis* by Dahl (1903: 287) and Roewer (1923: 639), only discussed by Hadži (1928: 9), who confused *tingiformis* for *nepaeformis* and *nepaeformis* for *niger*. The BMNH specimen conforms to *Trogulus closanicus* Avram, 1971, a name in prevailing use since the species...
was accepted by Weiss (1978) and redescribed by Chemini (1984). References for Germany alone (Staudt 2013) provide the required minimum of 25 works (ICZN 23.9.1.2). In case of doubt, protecting \textit{closanicus} and considering \textit{niger} as nomen oblitum is advised.

\textit{Trogulus melanotarsus}—C.L. Koch 1839a: 148.


\textit{Trogulus nepiformis}—Thorell 1876: 468; Latreille 1804: 328 (misspelling).

\textit{Anelasmocephalus niger}—Simon 1879a: 301.

\textit{Metopoctea melanotarsus}—Simon 1879a: 309.


\textit{Trogulus galasensis} Avram, 1971: 255; \textit{syn. n.}: Weiss doubted the species status of \textit{galasensis} and pointed to the similarity with \textit{T. nepaeformis} and \textit{T. martensi} (Weiss 1978: 226; 1998: 26). Although the penis depicted by Avram (1971) is damaged, it is similar to that of \textit{T. nepaeformis}. Until the species is collected again at the type locality (Romania, Apuseni Mountains, Vallée du Criș Repede) the name should be treated as a synonym of \textit{T. nepaeformis} (contrary to Schönhofer 2009: 177; proposed as a nomen oblitum).

\textit{Trogulus roeweri} Avram, 1971: 257; \textit{syn. n.}: The type locality of \textit{roeweri} is vague (Bosnia), the type series is questionable (should contain a male and a female, but contains 3 females; the label states 8 specimens), and the description is based on a damaged male (Schönhofer 2009: 177). Weiss (1978: 226) questioned species status of \textit{roeweri} and compared it with \textit{nepaeformis}, which is here followed.

\textit{oltenicus} Avram, 1971: 242; loc. typ.: Romania, Carpathian, Plateau de Mehedintzi, Massif de Virotape, N Obirșia Cloșani. \textbf{Remarks}. Recollected from Romania, \textit{oltenicus} can be considered as valid. A redescription is necessary to explain what Avram (1971) meant and to delineate it from similar species summarised in \textit{T. tricarinatus} (Schönhofer 2009: 182). As only one male was available for description, holotype and type locality are unambiguous, although they were not specified.

\textit{ozimeci} Schönhofer \textit{et al.}, 2013a: 374; loc. typ.: Croatia, Dubrovnik, Osojniki, Močiljska špilja.

\textit{pharensis} Schönhofer & Martens, 2009: 1234; loc. typ.: Croatia, Hvar Island, entrance of road tunnel from Pitve to Zavala.

\textit{prieto} Schönhofer & Martens, 2008: 551; loc. typ.: Spain, Andalucía, Málaga Prov., ruins 6 km S of Villanueva de la Concepcion.


\textit{rossicus} Šilhavý, 1968: 25; loc. typ.: Russia, Kuban, Gorjačij ključ.

\textit{setosissimus} Roewer, 1940; loc. typ.: Croatia, Hvar Island (Lesina).

\textit{Trogulus setosissimus} Roewer, 1940: 28;—Schönhofer \textit{et al.}, 2013a: 379 (redescr.).

\textit{squamatus} C.L. Koch, 1839a; loc. typ.: Dalmatia. \textbf{Remarks}. According to the historic definition of Dalmatia and known distribution of \textit{T. squamatus}, the type locality narrows down to the coastal area between the Gulf of Kotor and the mouth of the Neretva River. The species is otherwise abundant in large parts of Montenegro.

\textit{Trogulus squamatus} C.L. Koch, 1839a: 140;—Westwood (1874: 202).

\textit{Trogulus squammatus}—C.L. Koch 1850: 98 (misspelling).

\textit{tenuitarsus} Schönhofer \textit{et al.}, 2013a: 376; loc. typ.: Macedonia: Bistra Mountain, Monastir Sveti Jovan Bigorski near Rostuše.

\textit{thaleri} Schönhofer & Martens, 2009: 1230; loc. typ.: Croatia: Drvenik.
tingiformis C.L. Koch, 1847; loc. typ.: Germany, Upper Bavaria (not further specified).

Trogulus tingiformis C.L. Koch, 1847: 70 (not 1848; see Brignoli 1985);—Martens 1978: 172 (redescr.).


tricarinatus (Linnaeus, 1767); loc. typ.: Germany, Saxony, Dresden.

Phalangium tricarinatum Linnaeus, 1767: 1029.

Phalangium carinatum—Olivier 1792: 460 (misspelling).


Trogulus tricarinatus—C.L. Koch 1839a: 145 (redefinition).

Remarks. Schönhofer and Martens (2010a) assumed several cryptic species summarised under this name.

torosus Simon, 1885b; loc. typ.: Montenegro, Spica, Sutomore.

Trogulus torosus Simon, 1885b: 218;—Schönhofer et al., 2013a: 381 (redescr.).

uncinatus Gruber, 1969: 83; loc. typ.: Turkey, Yalova.

Trogulus considered as nomina dubia

coreiformis C.L. Koch, 1839a: 133; loc. typ.: not specified. Remarks. Koch’s (1839a) drawings do not allow identification of the species, and the type seems lost. Ausserer (1867: 160) mentioned coreiformis from Tyrol, Austria (Paschberg, Mühlau), but his data provide no evidence for a distinct species (see also Schönhofer 2009: 176).

lygaeiformis C.L. Koch, 1839a; loc. typ.: not specified.

Trogulus lygaeiformis C.L. Koch, 1839a: 130.

Trogulus ligaeiformis—C.L. Koch 1850: 98 (misspelling). Remarks. Koch’s (1839a: 130) insufficient description compared lygaeiformis with nepaeformis which he understood to be much larger than nepaeformis as presently accepted. Dahl’s (1903: 287) synonymisation of lygaeiformis with nepaeformis is therefore inappropriate. The type seems to be lost and it is advisable not to use this name any longer (Schönhofer 2009: 180) as no species is recognisable.

templetonii Westwood, 1833: 453; loc. typ.: Valparaiso. Remarks. Further listing restricted to Westwood (1874: 202) and Sherborn (1933: 1058). The species is not recognisable, and the type locality refers to either a city in Chile (unlikely) or Valparaíso de Abajo in Central Spain. The type is stated to be in the Belfast Natural History and Philosophical Society Museum and should be investigated.

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