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Notes on the systematics of the spider genus *Lepthyphantes* Menge (Aranei Linyphiidae Micronetinae).

Заметки о систематике пауков рода *Lepthyphantes* Menge (Aranei Linyphiidae Micronetinae).

M.I. Saaristo*, A.V. Tanasevitch**
М.И.Сааристо*, А.В.Танасевич**

* Zoological Museum, University of Turku, Turku 20500 Finland.
* Зоологический музей университета г. Турку, 20500 Финляндия.
** All – Russian Institute of Nature Conservation and Reserves, P.O. VILAR, Moscow 113628 Russia.
** Всероссийский научно – исследовательский институт охраны природы и заповедного дела Минэкологии России, п/о ВИЛАР, Москва 113628 Россия.

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ABSTRACT: The history, nomenclature, and current systematics of the genus *Lepthyphantes* are discussed. The genus is found to be extremely heterogeneous and polyphyletic. Future splitting of the genus suggests 31 supposedly monophyletic or monotypic species-complexes, including mainly Palaearctic *Lepthyphantes*. Two new synonyms and a new status are established: *Lepthyphantes chuktshorum* Marusik, 1991 = *Lepthyphantes sobrius* (Thorell, 1871), syn.n.; *Lepthyphantes klingelbachi* Wunderlich, 1977 = *Lepthyphantes occidentalis* Machado, 1949, syn.n., stat.n.; *Lepthyphantes himalayensis* Tanasevitch, 1987 stat.n. ex *L.uzbekistanicus himalayensis*.

РЕЗЮМЕ: В статье обсуждены проблемы систематики и номенклатуры рода *Lepthyphantes*, приведена краткая история его изучения. Констатируется гетерогенность и полифилия рода. На основе строения гениталий в таксоне выделен 31 монофилетический (или монотипический) видовой комплекс. Установлена синонимия и новый статус (см. резюме по-английски).

Introduction

With its over 400 species, the spider genus *Lepthyphantes* Menge, 1866, is by far the largest in the family Linyphiidae. The spiders included in this genus are found in almost all continents; they are an integral element of the biocenoses of all natural zones of the Holarctic (from polar tundra to deserts); they inhabit to one degree or another practically all biotopes and landscape types; they live at all altitudes - in mountainous belts up to the snow line, in caves and in human dwellings. How is it possible to explain such a wide range use of the natural environment by the genus as a whole and by its representatives in particular? Can it be explained by a high degree of ecological plasticity, the ability to locate and establish suitable sites or overcome gradient negative factors in extreme climatic regions? Or perhaps this is only the result of a wide interpretation of the genus?

It is our opinion that the last mentioned alternative is by far the most important reason, while the vast range of the genus is an artifact caused by lumping noncongeneric species in a single genus. Under these circumstances, it is obvious that a total revision of the genus is a necessity and the present paper is devoted for the start of such a revision.

1. The problem of type species.

When describing the genus *Lepthyphantes*, Menge [1866] originally included only two species, viz. *Lepthyphantes muscicola* Menge, 1866, and *Lepthyphantes crypticola* Menge, 1866 (non *Aranea crypticola* Walckenaer, 1802 = *Araneus cellulanus* Clerck, 1758). Both of these species have later proved to be junior synonyms of *Linyphia minuta* Blackwall, 1833, and *Linyphia nebulosa* Sundevall, 1830, respectively. As to the type species, Menge [1866] did not formally designate it. However, under the generic name *Lepthyphantes* he [Menge, 1866] placed a reference to the picture of *L.muscicola*, and just a little below in the «Char.» (= Diagnosis) division he pointed out some differences between *Lepthyphantes* and *Bolyphantes* C.L. Koch, using details of certain structures of *L.muscicola*, and

thus in effect designated it as the type species. According to the current requirements of the International Code of Zoological Nomenclature [ICZN, 1985], particularly article 67 (b & c), such a designation is invalid. Therefore it was Simon [1884: 265] who for the first time formally fixed *L.muscicola* as the type species of *Lepthyphantes* and in parentheses also indicated that he considered it to be a junior synonym of *L.minuta*. Later, Simon [1894: 705] without comment changed the type species to *L. nebulosus*, which was also accepted by Petrunkevitch [1928]. In her revision of *Lepthyphantes* species of the United States, Zorsch [1937] pointed out the illegality of this alteration of the type species. This, however, was not accepted by Bonnet [1957], who in his catalogue stated that the type species of *Lepthyphantes* is *L.nebulosus*. Bonnet [1957] briefly explained the history of the type species, ignoring Simon's first paper [1884] in which he designated the type, and instead referred to Simon's later paper [1894] in which the type species was changed. According to article 69 (a), a valid subsequent designation of type species cannot be changed. Accordingly, the type species of *Lepthyphantes* is *Lepthyphantes muscicola* Menge, 1866 = *Linyphia minuta* Blackwall, 1833, by subsequent designation [Simon, 1884: 265]. In fact, Simon's [1894] later designation of the type species is also invalid, for no such species as *nebulosus* had been originally included in *Lepthyphantes*.

2. Etymology.

The name *Lepthyphantes* originated from the Greek λεπτοσ *leptos* (slender, graceful) and νφαινω *hyphaino* (cloth, weave), which can be translated as «weaved gracefully.» The translation of phantes as «form» by some authors, relating to the creation of a new name [e.g. Dumitrescu, 1971], seems incorrect.

3. The orthography of the generic name.

There exist several different versions of the orthography of the name *Lepthyphantes* in the literature. This was already started by Menge [1866] himself, as the generic name of his second species (*L.crypticola*) was spelled *Leptyphantes*. It should be noted that his paper [Menge 1866] abounds with similar inaccuracies and misprints (e.g. *Stylophora* vz. *Stilophora*, etc.). Thorell [1869] corrected the spelling of *Lepthyphantes* according to translit-erations from Greek, with the result that the name appeared as *Lephthyphantes*. This version was widely used from the end of the last century to the beginning of this century. The name of *Leptyphantes* was least widely distributed and consistently used mainly by Simon in his numerous publications. Bonnet's [1957] appeal to reject other interpretations and accept the latter spelling, i.e. *Leptyphantes*, which he sincerely considered appropriate, has not been generally accepted. According to article 32 (a & b) [ICZN, 1985], the name of the taxa must be written as it was first used by its author. Therefore, *Lepthyphantes* should be considered orthographically correct, so it should not be referred to article 32 (c), and consequently is not subject to correction, as also stated by Wiehle [1956].

4. A short history of studies on *Lepthyphantes*.

As stated above, the genus *Lepthyphantes* was originally created for only two species and during the next 20 years no new species were added to this taxon. The reason for this was that Thorell [1869] had synonymized *Lepthyphantes* along with some other of Menge's [1866] genera, viz. *Bathyphantes*, *Bolyphantes*, and *Stemonyphantes*, with *Linyphia* Latreille, 1804.

The first great step toward working out the systematics of the genus was made by Simon [1884]. In his paper on arachnids of France, he not only described 24 new *Lepthyphantes* species, but also transferred about 40 species from other genera to *Lepthyphantes*. In addition, Simon gave an extensive description of the genus including keys and illustrations. The drawings were not too clear, but they made a great impact on the further study of *Lepthyphantes*.

After this abrupt leap in the number of species of *Lepthyphantes* (up until 1885 the genus consisted of 65 species) the tempo of its growth stabilized and into the new century, owing to the works of Kulczynski [1885, 1887, 1898], Czyser & Kulczynski [1894], Simon [1894] and some others, the genus grew to comprise about 100 species.

There were no great faunistic or systematic works published in the first quarter of this century relating to *Lepthyphantes*. However, about 40 species of *Lepthyphantes* were described in numerous scattered papers.

The next great step in the study of the genus is also associated with Simon. In his thoroughly prepared and extensive paper on French spiders [Simon, 1929], in addition to numerous descriptions of new *Lepthyphantes* species, he also undertook an attempt to create an infrageneric structure for the genus by dividing its contents into 5 groups. Up to

the beginning of the 50s, this paper formed the basis for European systematists in their studies of *Lepthyphantes*.

The very slow tempo of studying the Nearctic *Lepthyphantes* species took a sudden turn in the form of a revision of the *Lepthyphantes* species of the United States [Zorsch, 1937]. In her splendid paper, Zorsch [1937] described some new species and summed up previous investigations of Nearctic *Lepthyphantes* species carried out mainly by Emerton [1882, 1913, 1926] and Keyserling [1886], and accordingly she was able to list 23 *Lepthyphantes* species from the United States. Since then her list [Zorsch, 1937] has been increased by only 8 species: Chamberlin & Ivie [1943, 1947], Levi & Levi [1955], and Schenkel [1950].

During the 30s and 40s, the number of species of *Lepthyphantes* rose gradually. There were over 200 species in both Roewer's [1942] and Bonnet's [1957] catalogues (228 and 229 species, respectively).

During the 50s, two great identification books were published: one for British spiders [Locket & Millidge, 1953] and the other for German linyphiids [Wiehle, 1956]. In both books there were keys, good drawings and descriptions. From the publications of the 60"s containing information on *Lepthyphantes*, the following should be noted: a paper by Oi [1960] on Japanese spiders, an addendum by Wiehle [1965] on the German fauna, and especially van Helsdingen's paper [1965] on the sexual behavior of *Lepthyphantes leprosus* (Ohlert) which included very important information about the functioning of the secondary genital organs, their structure and nomenclature.

The next two decades were characterized by an intensification of studies regarding both arachnology as a whole and *Lepthyphantes* in particular. Wanless [1971, 1973] published two significant papers on British *Lepthyphantes*, in which he studied in detail the structure of the epigyne and proposed classifications based on female genitalia. Also, many *Lepthyphantes* were described and redescribed during the 70s and 80s from the Mediterranean region [Brignoli, 1971, 1979a & b, Deltshev, 1980, 1983, Dumitrescu & Georgescu, 1981, Wunderlich, 1979, etc.], the Alps [Thaler, 1972, 1982, 1984, etc.], the Himalayas [Thaler, 1987, Tanasevitch, 1987], and China [Zhu et al., 1983, etc.]. New species groups were established and old ones divided [Brignoli, 1971, 1978, 1979, Bosmans, 1978, Wunderlich, 1985, Tanasevitch, 1987, Tanasevitch & Eskov, 1987]. The paper by van Helsdingen et al. [1977] appeared to be the first (and so far the last) revision of one species group alone. Published handbooks for the identification of the spiders of Fennoscandia [Palmgren, 1975], Czecho-Slovakia [Miller, 1971], Britain and Ireland [Roberts, 1987] were very helpful and encouraged new investigations of *Lepthyphantes*. The beginning of broadly scoped research on the Afrotropical spider fauna included the discovery of a rich and peculiar fauna of *Lepthyphantes*, and increased the genus volume by 40 species [Locket, 1968, Bosmans, 1978, 1979, 1986, Bosmans & Jocque, 1983, etc.].

Thus, according to Brignoli's [1983] catalogue, 110 species were described between 1940 and 1981, and additional 107 species from 1981 to 1987 [Platnick, 1989]. Taking into consideration the already established synonyms and new combinations, the world's *Lepthyphantes* fauna so far consists of about 440 species.

Despite many publications containing descriptions of new species, the genus as a whole has been studied very poorly as regards its infrageneric structure, systematics, and distribution, not to mention ecology, biology, etc. There are no noticeable, specific systematic or morphological papers besides those mentioned above, viz. Simon [1929], van Helsdingen [1965], Wanless [1973], and van Helsdingen et al. [1977].

5. The position of *Lepthyphantes* in the Linyphiidae.

At present, most authors agree that Linyphiidae forms a single, well delimited family. Some earlier authors, notably Wiehle [1956, 1960], were of the opinion that it should be divided into two families, viz. Linyphiidae and Micryphantidae (= Erigoninae). In both cases several, often quite different opinions about the subgrouping of these taxa had been presented, the most elaborate being that of Wiehle [1956, 1960]. Thus, there are a vast number of names available for subfamilies, tribes, etc. This has also already brought some confusion and for example Lepthyphantinae Saaristo [1973] is, in accordance with article 11 (f) [ICZN, 1985], to be credited to Simon [1929]. On the other hand, Lepthyphantinae Simon, 1929, is a junior synonym of Micronetinae Hull, 1920.

The most recent and again highly deviating subdivisions of Linyphiidae are those presented by Millidge [1984] and Wunderlich [1986]. Of these two authors, Millidge [1984] divided the family Linyphiidae Blackwall, 1859, into the subfamilies Mynogleninae Lehtinen, 1967, non Blest auct., Erigoninae Emerton, 1882, non Simon auct., Drapetiscinae

Millidge, 1984, Linyphiinae Blackwall, 1859, non Simon auct., Micronetinae Hull, 1920, and a paraphyletic *Stemonyphantes*-group, while Wunderlich [1986] divided it into the subfamilies Pimoinae Wunderlich, 1986, Stenomyphantinae Wunderlich, 1986 as well as Mynogleninae, Erigoninae, and Linyphiinae consisting of two tribes, viz. Linyphiini and Micronetini. We shall not discuss in this paper the merits and demerits of these classifications, the number of subfamilies and their contents. However, according to the structure of secondary genital organs, *Lepthyphantes* is clearly related to *Micronеta* Menge and thus is a member of the subfamily Micronetinae. It is also our opinion that at present it is immature to divide Micronetinae into tribes and therefore it is impossible to place *Lepthyphantes* more precisely within the Micronetinae.

6. Infrageneric structure of *Lepthyphantes*.

Traditionally, the genus *Lepthyphantes* has been split into a number of species groups. The first author who did that was Simon [1929]. In his fundamental paper on French spiders, he placed the 62 species of *Lepthyphantes* found in France at that time into five groups. His grouping was based mainly on the chaetotaxy and abdominal patterns, as well as on the shape of the epigyne. To these groups, Simon assigned the numbers 1-5, although he also designed types for these groups. Later on these groups were named according to Simon's types for the groups as follows, except number 5: *nebulosus-*, *mughi-*, *tenuis-*, *obscurus-* and *pallidus*-group (instead of *culicinus*-group). Later both Locket & Millidge [1953] and Wiehle [1956] also placed *Lepthyphantes* species found in their countries in groups corresponding well with those of Simon [1929], although all of the French species are present neither in Britain nor in Germany. Such an agreement among researchers stabilizes the results of classifications. However, the use of apparently simple characters for separating these groups - chaetotaxy was a primary means for fixing them - gave rise to an oversimplified view regarding the criteria for group limits. On the other hand, the limited list of known European *Lepthyphantes* species at the time concurrent of the abovementioned authors allowed them to create fairly homogeneous groups according to chaetotaxy only, at least for local faunas.

During the last three-and-a-half decades, a great number of new *Lepthyphantes* species have been described from various parts of Europe, Africa, and Asia. However, the elevated number of species of the genus was not accompanied by a growing number of species groups. As a result of this discrepancy, the species groups became increasingly heterogeneous, for indeed 5-6 species groups could not embrace all known *Lepthyphantes* species. There were also numerous species assigned to none of the already established species groups, and by the 70s the genus as a whole became a too large, amorphous, indistinct and composite taxon.

The heterogeneous nature of the species groups was clear to many arachnologists and the necessity of establishing new groups became obvious. This process was started by Brignoli [1971], who defined the *afer*-group. Since then the following nine groups have been created: *pinicola-* [Brignoli 1978], *tropicalis-* [Bosmans, 1978], *spelaeorum-* [Brignoli, 1979], *liguricus-* [Brignoli, 1979], *keyserlingi-* [Wunderlich, 1985], *mansuetus-* [Wunderlich, 1985], *martensi-* [Tanasevitch, 1987], and the *incestus*-group [Tanasevitch & Eskov, 1987]. These groups together with the above ones form the present infrageneric structure of the genus.

This increase in the number of species groups reflects the heterogeneous nature of *Lepthyphantes*. In fact the majority of these groups most likely represent good, independent genera. There is an obvious need for a revision of *Lepthyphantes*. However, no-one has undertaken a revision of this large genus, which is impossible without a good overall knowledge of the subfamily Micronetinae, especially the genera *Bolyphantes* and *Poeciloneta*.

Seeing these difficulties, certain arachnologists have tried to «clean up» the genus by removing from it some species which are obviously uncongeneric with the type species. Thus, the following new genera have been established: *Parawubanoides* Eskov & Marusik, 1992, *Himalaphantes* Tanasevitch, 1992, for the *martensi*-group, *Incestophantes* Tanasevitch, 1992, for the *incestus*-group, *Herbiphantes* Tanasevitch, 1992, *Crispiphantes* Tanasevitch, 1992, and *Megalepthyphantes* Wunderlich, 1993, for the *nebulosus*-group. Although these actions have certainly made the concept of the genus *Lepthyphantes* more clear, it would be a mistake to assume that the remaining species would all be congeneric with the type species. On the contrary, it is certainly obvious that the remainder will be the most difficult to classify.

7. The species complexes of Palaearctic *Lepthyphantes*

In order to avoid a possible confusion with previous ideas about the subdivision of *Lepthy-*

phantes, we shall use the term species complex instead of species group. Delimitation of these complexes is based on genital morphology and, in our opinion, they are natural monophyletic groups. On the other hand, their taxonomic level is not necessarily always the same. In spite of this, they can be considered as basic elements for building up an infrageneric structure of the present *Lepthyphantes*. However, most of them seem to be so distantly related to the type species that they most certainly will merit the rank of separate genera.

The species complexes presented below do not include all known *Lepthyphantes* species, as a considerable number of them were not available for closer examination and many of the published figures are too superficial to warrant a proper placing of the species in question. Also many species are representatives of other genera or are already considered by us to belong to good separate taxa, so they are not dealt with here either. Furthermore, a number of species defy labeling under any of our complexes, as no obvious relation to any other species has been discovered. Their fate is not clear, either they should be separated into monotypic genera (in which case there will be quite many of them) or be included under already established complexes (taxa) which then will lose their homogeneity. In the latter case, the taxa will be artificial and delimitations will be by means of trivial features, for example chaetotaxy, which will be more convenient, but systematically incorrect.

For practical reasons the following species complexes are arranged in an alphabetical order according to their «type species».

Complex *abiscoensis*: *L.abiscoensis* Holm.

Complex *afer*: *L.afer* (Simon), *L.beroni* Deltshev, *L.beshkovi* Deltshev, *L.brevihamatus* Bosmans, *L.brignolianus* Deltshev, *L.centromeroides* Kulczynski, *L.emarginatus* Fage, *L.gadesii* Fage, *L.ibericus* Ribera, *L.kratochvili* Fage, *L.longihamatus* Bosmans, *L.perfidus* Tanasevitch, *L.ritae* Bosmans, *L.strinatii* Hubert, *L.venereus* Simon.

Complex *alacris*: *L.alacris* (Blackwall).

Complex *alpinus*: *L.alpinus* (Emerton), *L.nenilini* Tanasevitch.

Complex *alutacius*: *L.alutacius* Simon, *L.dentatidens* Simon, *L.fagicola* Simon, *L.sanctivincenti* (Simon).

Complex *angulatus*: *L.angulatus* (O. Pickard-Cambridge), *L.bipilis* Kulczynski, *L.cognatus* Tanasevitch, *L.geminus* Tanasevitch.

Complex *angulipalpis*: *L.angulipalpis* (Westring), *L.dybowskii* (O. Pickard-Cambridge), *L.cerinus* (L. Koch), *L.curvus* Tanasevitch, *L.karpinskii* (O. Pickard-Cambridge), *L.monticola* (Kulczynski), *L.maritimus* Tanasevitch, *L.sibiricus* Tanasevitch, *L.silli* Weiss, *L.ussuricus* Tanasevitch.

Complex *bergstroemi*: *L.bergstroemi* (L. Koch), *L.flagellifer* Tanasevitch.

Complex *cornutus*: *L.cornutus* Schenkel, *L.parvulus* Tanasevitch.

Complex *decipiens*: *L.decipiens* (L. Koch).

Complex *decolor*: *L.decolor* (Westring), *L.falcatus* Bosmans.

Complex *geniculatus*: *L.geniculatus* Kulczynski, *L.nitidus* (Thorell).

Complex *holmi*: *L.furcabilis* Wunderlich, *L.holmi* Kronestedt, *L.multidentatum* Wund.

Complex *improbulus*: *L.biconicus* Tanasevitch, *L.complicatus* (Emerton), *L.flexilis* Tanasevitch, *L.improbulus* Simon, *L.montanouralensis* Esyunin & Efimik, *L.pamiricus* Tanasevitch, *L.potanini* Tanasevitch.

Complex *insignis*: *L.arenicola* Denis, *L.bigerrensis* Simon, *L.bolivari* Fage, *L.byzantinus* Fage, *L.carusoi* Brignoli, *L.ceretanus* Denis, *L.ericeus* (Blackwall), *L.insignis* O. Pickard-Cambridge, *L.lorifer* Simon, *L.margaritae* Denis, *L.pillichi* Kulczynski, *L.schmitzi* Kulczynski, *L.stygius* Simon.

Complex *keyserlingi*: *L. keyserlingi* (Ausserer), *L. pepticus* Tanasevitch, *L. quadrimaculatus* Kulczynski, *L. spasskyi* Tanasevitch.

Complex *kronebergi*: *L.camelus* Tanasevitch, *L.kronebergi* Tanasevitch, *L.turkestanicus* Tanasevitch.

Complex *lephthyphantiformis*: *L.lephthyphantiformis* (Strand).

Complex *mansuetus*: *L.arciger* (Kulzcynski), *L.auruncus* Brignoli, *L.fragilis* (Thorell), *L.gladiolus* (Simon), *L.mansuetus* (Thorell), *L.ovalis* Tanasevitch, *L.parmatus* Tanasevitch, *L.pseudoarciger* Wunderlich, *L.rectilamellus* Deltshev, *L.rossi* di Caporiacco, *L.simoni* Kulczynski.

Complex *minitus*: *L.cruentatus* Tanasevitch, *L.leprosus* (Ohlert), *L.minutus* (Blackwall), *L.simiensis* Bosmans.

Complex *montanus*: *L.condradini* Brignoli, *L.montanus* Kulczynski.

Complex *mughi*: *L.brunneri* Thaler, *L.hadzii* Miller & Polenec, *L.hindukuschensis* Miller & Buchar, *L.merretti* Millidge, *L.mughi* (Fickert), *L.omega* Denis, *L.pulcher* Kulczynski, *L.rupium* Thaler, *L.triglavensis* Miller & Polenec.

Complex *nebulosus*: *L.collinus* (L. Koch), *L.nebulosoides* Wunderlich, *L.nebulosus* (Sundevall), *L.klingelbachi* Wunderlich, 1977 **syn.n.** = *L.occidentalis* Machado, 1949 **stat.n.**.

Complex *notabilis*: *L.magnesiae* Brignoli, *L.notabilis* Kulczynski.

Complex *pallidus*: *L.pallidus* (O. Pickard-Cambridge).

Complex *pinicola*: *L.cinereus* Tanasevitch, *L.cirratus* Thaler, *L.himalayensis* Tanasevitch **stat.n.**, *L.macer* Tanasevitch, *L.pinicola* Simon, *L.plumatus* Tanasevitch, *L.uzbekistanicus* Tanasevitch, *L.zonsteini* Tanasevitch.

Complex *spelaeorum*: *L.berlandi* Fage, *L.brignolii* Kratochvil, *L.epaminondae* Brignoli, *L.intirmus* Tanasevitch, *L.istrianus* Kulczynski, *L.serratistylus* Roewer, *L.slivensis* Drensky, 1931, *L.strandi* Kolosvary (the three latter probably are junior synonyms of *L.istrianus*), *L.khobarum* Charitonov, *L.liguricus* Simon, *L.oredonensis* Denis, *L.rubens* Wunderlich, *L.salfii* Dresco, *L.spelaeorum* Kulczynski, *L.trnovensis* Drensky.

Complex *sobrius*: *L. chuktshorum* Marusik, 1991 **syn.n.** = *L.sobrius* (Thorell) , *L.taczanowskii* (O. Pickard-Cambridge), *L.whymperi* F.O.Pickard-Cambridge.

Complex *suffusus*: *L.arlaudi* Denis, *L.armatus* Kulczynski, *L.aurantiipes* Simon, *L.ignavus* Simon, *L.johannislupi* Denis, *L.jugorum* Denis, *L.lithoclasicolus* Deltshev, *L.pyrenaeus* Denis, *L.suffusus* Strand, *L.styriacus* Thaler, *L.tienschangensis* Tanasevitch, *L.varians* (Kulczynski).

Complex *tchatkalensis*: *Bolyphantes hyperauritus* Loksa, *Bolyphantes mongolicus* Loksa, *L.rupeus* Tanasevitch, *L.tchatkalensis* Tanasevitch.

Complex *tenuis*: *L.aequalis* Tanasevitch, *L.ateripes* Tanasevitch, *L.canariensis* Wunderlich, *L.contortus* Tanasevitch, *L.cracens* Zorsch, *L.cristatus* (Menge), *L.drenskyi* van Helsdingen, *L.flavipes* (Blackwall), *L.floriana* van Helsdingen, *L.fogarasensis* Weiss, *L.fulvus* Wunderlich, *L.herbicola* Simon, *L.jacksoni* Schenkel, *L.jacksonoides* van Helsdingen, *L.leprosoides* Schmidt, *L.mengei* Kulzcynski, *L.miguelensis* Wunderlich, *L.morosus* Tanasevitch, *L.nigriventris* (L.Koch), *L.perseus* van Helsdingen, *L.retezaticus* Ruzicka, *L.spiniger* Simon, *L.striatiscapus* Wunderlich, *L.tenebricola* (Wider), *L.tenebricoloides* Schenkel, *L.tenuis* (Blackwall), *L.zebra* Zorsch, *L.zelatus* Zorsch, *L.zibus* Zorsch, *L.zimmermanni* Bertkau.

References

Bonnet P. 1957. Bibliographia araneorum. Toulouse. Vol.2. Pt.3 (F-M). P.1927-3026.

Bosmans R. 1978. Description of four new *Lepthyphantes* species from Africa, with a redescription of *L. biseriatus* Simon & Fage and *L. tropicalis* Tullgren // Bull.Brit.Arachnol.Soc. Vol.4. No.6. P.258-274.

Bosmans R. 1979. Spiders of the subfamily Linyphiinae from Mount Kenya (Araneae, Linyphiidae). Scientific report of the Belgian Mt. Kenya Bio-expedition 1975, No. 17 // Revue Zool. afr. T.93. Fasc.1. P.53-100.

Bosmans R. 1986. Scientific report of the Belgian Cameroon expeditions, 1981 and 1983: New species and new records of spiders of the family Linyphiidae: Araneae // Ibid. T.100. Fasc.2. P.171-204.

Bosmans R., Jocque, R. 1983. Scientific report of the Belgian Mount Cameroon expedition 1981, 9. Family Linyphiidae (Araneae) // Ibid. T.97. Fasc.3. P.581-617.

Brignoli P.M. 1971. Su alcuni *Leptyphantes* di Creta (Aran., Linyphiidae) // Fragmenta Ent. Vol.7. No.4. P.231-241.

Brignoli P.M. 1978. Su alcuni Linyphiidae ed Erigonidae cavernicoli di Gibilterra e del Marocco (Araneae) // Revue suisse Zool. T.85. Fasc.1. P.107-110.

Brignoli P.M. 1979a. Ragni di Grecia XI. Specie nuove o interessanti, cavernicole ed epigee // Ibid. T.86. Fasc.1. P.181-202.

Brignoli P.M. 1979b. Ragni d'Italia XXXI. Specie cavernicole nuove o interessanti (Araneae) // Quaderni Mus.Speleol.«V.Rivera». No.10. P.3-48.

Brignoli P.M. 1983. A catalogue of the Araneae described between 1940 and 1981. Manchester. 755 pp.

Chamberlin R.V., Ivie W. 1943. New genera and species of North American linyphiid spiders // Bull. Univ. Utah, Biol. Ser. Vol.7. No.6. P.1-39.

Chamberlin R.V., Ivie W. 1947. The spiders of Alaska // Ibid. Vol.10. No.3. P.1-103.

Chyzer C., Kulczynski W. 1894. Araneae Hungariae. T.2. Pt.1: Theridioidae. 151 pp. + pl. I-V.

Deltshev C.D. 1979. A contribution to the study of cave spiders (Araneae) in Greece. Four new species (Araneae, Nesticidae, Linyphiidae) from the islands of Crete and Thera // Acta Zool. Bulg. Vol.13. P.53-63.

Deltshev C.D. 1980. A contribution to the taxonomical study of *pallidus*-group of genus *Lepthyphantes* Menge (Araneae, Linyphiidae) in Bulgaria // Ibid. Vol.16. P.44-56.

Deltshev C.D. 1983. A contribution to the taxonomical and faunistic study of genus *Lepthyphantes* Menge (Araneae, Linyphiidae) from Pirin Mountains // Acta Zool. Bulg. Vol.23. P.25-32.

Dumitrescu M. 1971. Une Araignée nouvelle des grottes de Bulgarie *Anthrohyphantes rhodopicus* n.g.,n.sp. (Fam. Linyphiidae, sous-fam. Linyphiidae, série de genre Leptyphanteae) // Trav. Inst. Speol. «E. Racovitza». T.10. P.167-174.

Dumitrescu M., Georgescu M. 1981. Contribution à la connaissance des espèces cavernicoles du genre *Lepthyphantes* des grottes de Roumanie, 1re note // Ibid. T.20. P.9-28.

Emerton J. H. 1882. New England spiders of the family Theridiidae // Trans. Conn. Acad. Arts Sci. Vol.6. P.1-86.

Emerton J. H. 1913. New and rare spiders from within fifty miles of New York City // Bull. Amer. Mus. Nat. Hist. Vol.32. P.255-260.

Emerton J. H. 1926. New spiders from Canada and the adjoining states, No.5 // Canad. Ent. Vol.58. P.115-119.

Helsdingen P.J. van, Thaler K. & Deltshev C. 1977. The *tenuis* group of *Lepthyphantes* Menge (Araneae, Linyphiidae) // Tijdschr. Ent. Deel 120. No.1. P.1-54.

Helsdingen P.J. van. 1965. Sexual behaviour of *Lepthyphantes leprosus* (Ohlert) (Araneida, Linyphiidae) with notes on the

function of the genital organs // Zool. Meded. Deel 41. Pt.2. P.15-45.

Hull J.E. 1920. The spider family Linyphiidae: an essay in taxonomy // Vasculum. Vol.6. P.7-11.

Keyserling E. 1886. Die Spinnen Amerikas. Theridiidae, Teil II. 295 pp + 21 pl.

Kulczynski W. 1885. Araneae in Camtschadalia a D-re B.Dybowski collectae. Pajaki zebranae na Kamczatce przez Dra B. Dybowskiego // Pam. Akad. umiej. Krakow. T.11. P.1-60, pl. IX-XI.

Kulczynski W. 1887. Przyczynek do Tyrolskiej fauny pajeczakow // Rozpr. spraw. wydz. mat. przyrod. Akad. umiej. Krakow. T.16. P.245-356 + pl. V-VIII.

Kulczynski W. 1898. Symbola ad faunam aranearum Austriae inferioris cognoscendam // Ibid. T.36. P.1-114 + pl. I-II.

Lehtinen P.T., Saaristo M.I. 1972. *Tallusia* gen. n. (Araneae, Linyphiidae) // Ann. Zool. Fennici. Vol. 9. P.265:268.

Levi H.W., Levi L.R. 1955. Spiders and harvestmen from Waterton and Glacier national parks // Canad. Field Nat. Vol.69. No.2. P.32-40.

Locket G.H. 1968. Spiders of the family Linyphiidae from Angola // Publ. cult. Comp. Diam. Angola. T.71. P.63-144.

Locket G.H., Millidge A.F. 1953. British spiders. Vol.2. 449 pp.

Menge A. 1866. Preussische Spinnen. Erste Abtheilung // Schr. naturf. Ges. Danzig (N.F.). Bd.1. P.1-152.

Miller F. 1971. Araneae // Klic Zvireny C.S.S.R. T.4. P.51-306.

Millidge A.F. 1984. The taxonomy of the Linyphiidae, based chiefly on the epigynal and tracheal characters (Araneae: Linyphiidae) // Bull. Brit. arachnol. Soc. Vol.6. P.229-267.

Oi R. 1960. Linyphiid spiders of Japan // J. Inst. Polytechn. Osaka-City Univ. Ser.D. Vol.11. P.137-244.

Palmgren P. 1975. Die Spinnenfauna Finlands und Ostfennoskandiens. VI. Linyphiidae 1 // Fauna fenn. T.28. P.1-102.

Petrunkevitch A. 1928. Systema aranearum // Trans. Conn. Acad. Arts Sci. Vol.29. P.1-270.

Platnick N.I. 1989. Advances in spider taxonomy 1981-1987. A supplement to Brignoli's «A catalogue of the Araneae described between 1940 and 1981». Manchester. 673 pp.

Roberts M. J. 1987.The spiders of Great Britain and Ireland, Volume 2: Linyphiidae and check-list. London. 204 pp.

Roewer C.F. 1942. Katalog der Araneae von 1758 bis 1940. 1. Band. Bremen. 1040 pp.

Saaristo M.I. 1973. Taxonomical analysis of the type-species of *Agyneta*, *Anomalaria*, *Meioneta*, *Aprolagus* and *Syedrula* // Ann. Zool. Fenn. Vol.10. P.451-466.

Saaristo M.I. 1974. Taxonomical analysis of *Microneta viaria* (Blackwall, 1841), the type-species of the genus *Microneta* Menge, 1869 (Araneae, Linyphiidae) // Ibid. Vol.11. P.166-169.

Saaristo M.I. 1977. Secondary genital organs in the taxonomy of Lepthyphantinae (Araneae, Linyphiidae) // Reports Dept.Zool.Univ. Turku. Vol.5. P.1-16.

Schenkel E. 1950. Spinnentiere aus dem westlichen Nordamerika, gesammelt von Dr. Hans Schenkel-Rudin // Verh. naturf. Ges. Basel. Bd.61. S.28-92.

Simon E. 1884. Les Arachnides de France. Paris. T.5. No.2-3. P.180-808.

Simon E. 1894. Histoire naturelle des Araignées. Paris. T.1. No.3. P.489-760.

Simon E. 1929. Les Arachnides de France. Paris. T.6. No.3. P.533-772.

Tanasevitch A.V. 1987. The spider genus *Lepthyphantes* Menge 1866 in Nepal (Arachnida: Araneae: Linyphiidae) // Courier Forsch.-Inst. Senckenberg. Bd.93. S.43-64.

Tanasevitch A.V., Eskov K.Y. 1987. [Spiders of the genus *Lepthyphantes* (Aranei, Linyphiidae) in the fauna of Siberia and Soviet Far East] // Zool.Zhurn. Vol.66. No.2. P.185-197 [in Russian].

Thaler K. 1972. Über einige wenig bekannte Zwergspinnen aus den Alpen II // Ber. naturw.-med. Ver. Innsbruck. Bd.59. S.29-50.

Thaler K. 1982. Weitere wenig bekannte *Leptyphantes*-Arten der Alpen (Arachnida: Aranei, Linyphiidae) // Revue suisse Zool. T.89. Fasc.2. P.395-417.

Thaler K. 1984. Weitere *Lepthyphantes*-Arten der *mughi*-Gruppe aus den Alpen (Arachnida: Araneae, Linyphiidae) // Ibid. T.91. Fasc.4. P.913-924.

Thaler K. 1987. Über einige Linyphiidae aus Kashmir (Arachnida: Araneae) // Courier Forsch.-Inst. Senckenberg. Bd.93. S.33-42.

Thorell T. 1869. On European spiders. Part I. Review of the European genera of spiders, preceded by some observations on zoological nomenclature // Nova Acta reg.Soc.sci.Upsal. T.3. No.7. P.1-108.

Wanless F.R. 1971. The female genitalia of the spider genus *Lepthyphantes* (Linyphiidae) // Bull.Brit.arachnol.Soc. Vol.2. No.2. P.20-28.

Wanless F.R. 1973. The female genitalia of British spiders of the genus *Leptyphantes* (Linyphiidae) II // Ibid. Vol.2. No.7. P.127-142.

Wiehle H. 1956. Spinnentiere oder Arachnoidea. X.28. Familie Linyphiidae // Tierw. Dtschl. T.44. S.1-337.

Wiehle H. 1960. Spinnentiere oder Arachnoidea. XI. Micryphantidae // Ibid. T.47. S.1-620.

Wiehle H. 1965. Beiträge zur Kenntnis der deutschen Spinnenfauna IV // Mitt. Zool. Mus. Berlin. Bd.41. S.11-57.

Wunderlich J. 1980. Linyphiidae aus Süd-Europa und Nord-Afrika (Arachnida: Araneae) // Verh. naturw. Ver. Hamburg. Bd.23. S.319-337.

Wunderlich J. 1985. *Lepthyphantes pseudoarciger* n. sp. und verwandte Arten der *Lepthyphantes pallidus*-Gruppe (Arachnida: Araneae: Linyphiidae) // Senck. Biol. Bd.66. H.1-3. S.115-118.

Wunderlich J. 1986. Spinnenfauna gestern und heute: Fossile Spinnen in Bernstein und ihre heute lebenden Verwandten. Wiesbaden. 283 S.

Zhu C.D., Li Z.S. & Sha Y.H. 1986. Three new species of spiders of Linyphiidae from Qinghai Province, China (Araneae) // // Acta Zootaxon. Sin. Vol.11. No.3. P.264-269.

Zorsch H.M. 1937. The spider genus *Lepthyphantes* in the United States // Amer. Midl. Nat. Vol.18. No.5. P.856-898.