

A revision of the Holarctic genus *Larinoides* Caporiacco, 1934 (Araneae: Araneidae)

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Abstract

All known species of *Larinoides* Caporiacco, 1934 are revised. Seven species are recognised, of which one is transferred from *Araneus* Clerck, 1757 as a new combination, *Larinoides jalimovi* (Bakhvalov, 1981) comb. n. The first description of a male of *L. jalimovi* is given. The following four new synonyms are proposed: *Epeira gracilis* Menge, 1878 syn. n. and *Aranea dumetorum islandicola* Strand, 1906 syn. n. = *L. patagiatus* (Clerck, 1757); *Araneus cungei* Bakhvalov, 1974, syn. n. = *Larinoides folium* (Schrank, 1803); and *Araneus sclopетarius* Clerck, 1757 syn. n. = *L. cornutus* (Clerck, 1757). Detailed illustrations of habitus, copulatory organs, and identification keys of males and females of all *Larinoides* species are provided.

Key words: Nearctic, new combination, new synonymy, Palaearctic, orb-weavers, taxonomy

Introduction

Larinoides Caporiacco, 1934 is a genus of orb-weaving spiders (Araneidae) known only from the Holarctic (Platnick 2014). It is a rather small taxon with only six species and one subspecies, all found near water (Nentwig *et al.* 2014; Platnick 2014). All of them occur in the Palaearctic, while three species, *L. cornutus* (Clerck, 1757), *L. patagiatus* (Clerck, 1757) and *L. sericatus* (Clerck, 1757), have circum-Holarctic ranges (Levi 1974). Five species and one subspecies are known from the Western Palaearctic (Helsdingen 2013) and four species occur in the East Palaearctic (Mikhailov 2013b). All species of the genus are rather well studied, except for *L. chabarovi* (Bakhvalov, 1981). These species have over 20 taxonomic entries (from 22 to 99) in Platnick's (2014) catalog and were included in the revisions of Nearctic, Japanese, Chinese and European faunas (e.g. Levi 1974; Song *et al.* 1999; Tanikawa 2007). However, the longtime confusion of *L. cornutus* and *L. folium* (previously known as *L. suspicax*) is likely to have caused misunderstandings about their biology and distribution. One species, *L. chabarovi*, has a much smaller range (from Yenisei River to the lower Amur River (Oliger *et al.* 2002)) than its congeners.

Historically, the nomenclature of *Larinoides* included a prominent name conflict between *L. folium* and *L. suspicax* (e.g. Kulczyński 1901, Thaler 1974, Levy 1998). Recently the issue was amended by Mikhailov (2013a) who revalidated the name *Aranea folium* Schrank, 1803, as was formerly proposed by Kulczyński (1901) and Thaler (1974).

In our studies of orb-weaving spiders of Siberia and Russian Far East, we found a *Larinoides* that was first thought to be a new species. However, a detailed literature search showed that it was *Araneus jalimovi* Bakhvalov, 1981, described from a female from Khabarovsk (Bakhvalov 1981b). Unfortunately, almost all Bakhvalov's types were lost after his death (S.L. Zonstein, pers. comm.) and we made an unsuccessful attempt to obtain information

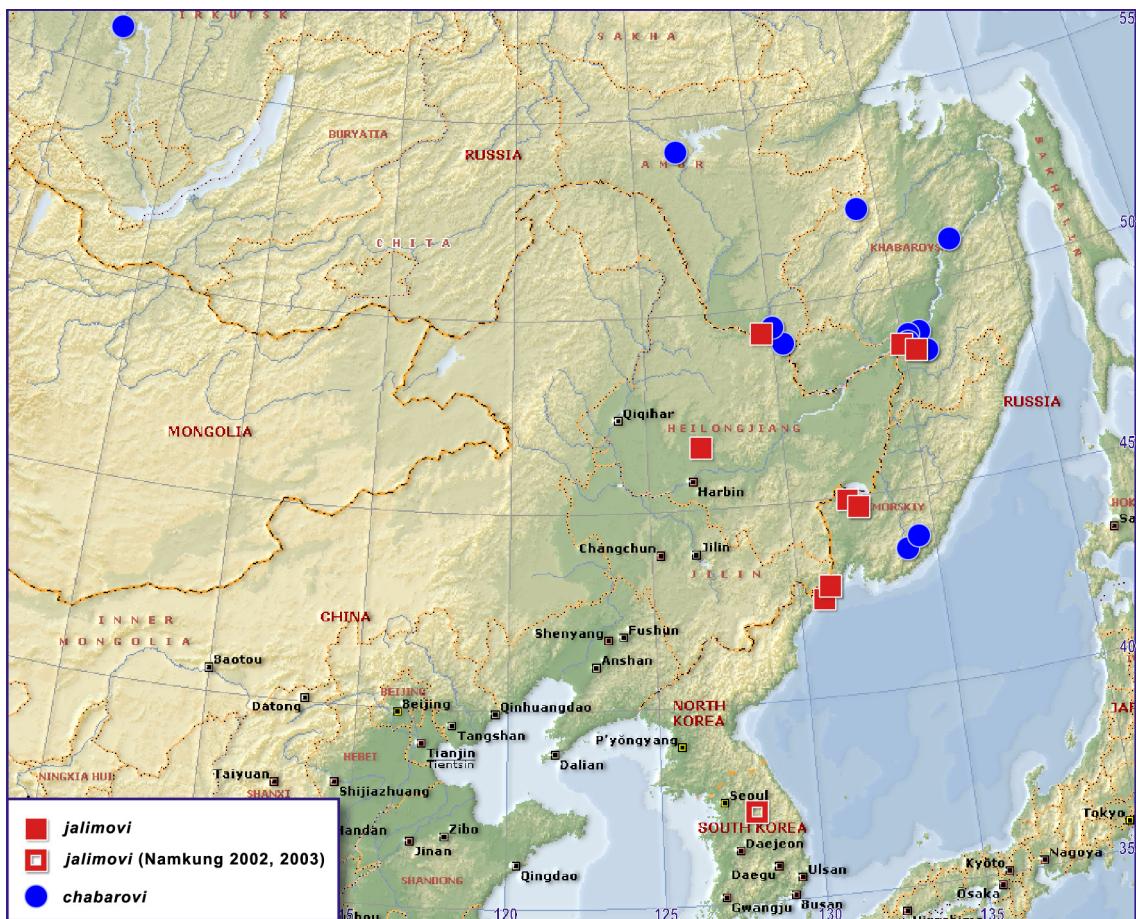


FIGURE 33. Distribution map of *Larinioides chabarovi* (circle) and *L. jalimovi* (square). Record from South Korea is based on misidentification by Namku

Comments. The species was known for a long time as *L. folium* Schrank, 1803. Levy (1998) considered this name a *nomen dubium*, and instead of introducing a neotype (to keep stability), he revalidated the name *L. suspicax*. In this paper, we follow Mikhailov (2013a) who reinstated *Epeira folium*.

The figures of *Araneus cungei* Bakhvalov, 1974 (cf. Bakhvalov 1974, 1981a) show a trapezoidal shape of the epigyne, which undoubtedly indicates its conspecificity with *L. folium*, and two names are synonymised here.

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References

- Agnarsson, I. (1996) Íslenskar köngulær. *Fjöldrit Náttúrufræðistofnunar*, 31, 1–175.
 Audouin, V. (1826) Explication sommaire des planches d'arachnides de l'Egypte et de la Syrie. *Histoire Naturelle*, 1 (4), 99–186.
 Bakhvalov, V.F. (1974) [Identification key of the spider family Araneidae from Kirgizia]. *Entomologicheskie Issledovaniya v Kirgizii*, 9, 101–112. [In Russian]

- Bakhvalov, V.F. (1981a) [New species of orb-weaving spiders (Aranei, Araneidae) from Kirghizia]. *Entomologicheskie Issledovaniya v Kirgizii*, 14, 137–141. [In Russian]
- Bakhvalov, V.F. (1981b) [New species of orb-weaving spiders (Aranei, Araneidae) from Siberia and Soviet Far East]. *Entomologicheskie Issledovaniya v Kirgizii*, 14, 142–150. [In Russian]
- Becker, L. (1896) Les arachnides de Belgique. *Annales du Musée royal d'histoire naturelle de Belgique*, 12, 1–378.
<http://dx.doi.org/10.5962/bhl.title.48721>
- Blackwall, J. (1846) Notice of spiders captured by Professor Potter in Canada, with descriptions of such species as appear to be new to science. *Annals and Magazine of Natural History*, 17, 30–44, 76–82.
- Blackwall, J. (1864) *A History of the Spiders of Great Britain and Ireland*, vol. 2. Ray Society, London, 209 pp.
- Brænegråd, J. (1958) Araneida. *The Zoology of Iceland*. 3 (54), 1–113.
- Bremi-Wolff, J.J. (1849) In: Menzel, A. (Eds.), *Kurzer Abriss einer Naturgeschichte der Spinnen. Ein Festageschenk für die Jugend*. Zürich, pp. 1–16.
- Caporiacco, L. di (1940) Aracnidi raccolte nella Reg. dei Laghi Etiopici della Fossa Galla. *Atti della Reale Accademia d'Italia*, 11, 767–873.
- Clerck, C. (1757) *Svenska spindlar, uti sina hufvud-slägter in delte samt under nögra och sextio särskilde arter beskrefne och med illuminerade figurer uplyste*. Stockholmiae, 154 pp.
- Dondale, C.D., Rédner, J.H., Paquin, P. & Levi, H.W. (2003) *The Insects and Arachnids of Canada. Part 23. The Orb-weaving Spiders of Canada and Alaska (Araneae: Uloboridae, Tetragnathidae, Araneidae, Theridiosomatidae)*. NRC Research Press, Ottawa, 371 pp.
- Dufour, L. (1831) Descriptions et figures de quelques Arachnides nouvelles ou mal connues et procédé pour conserver à sec ces Invertébrés dans les collections. *Annales des Sciences Naturelles, Zoologie*, 22, 355–371.
- Fage, L. (1921) Travaux scientifiques de l'Armée d'Orient (1916–1918). Arachnides. *Bulletin du Museum National d'Histoire Naturelle, Paris*, 1921, 96–102, 173–177, 227–232.
- Fischer-Waldheim, G. (1830) *Oryctographie du gouvernement de Moscou*. Moscow, 28 pp. [LXVI plates]
- Fourcroy, A.F. de (1785) *Entomologia parisiensis; sive catalogus insectorum quae in Agro parisiensi reperiuntur*. Paris, 544 pp. <http://dx.doi.org/10.5962/bhl.title.36528>
- Franganillo, B.P. (1925) Contribución al estudio de la geografía aracnológica de la Península Ibérica. *Boletín de la Sociedad entomológica de España*, 8, 31–40.
- Gerhardt, U. (1929) Weitere Untersuchungen zur Biologie der Spinnen. *Zeitschrift für Morphologie und Ökologie der Tiere*, 6, 1–77. <http://dx.doi.org/10.1007/bf00408427>
- Grasshoff, M. (1968) Morphologische Kriterien als Ausdruck von Artgrenzen bei Radnetzspinnen der Subfamilie Araneinae (Arachnida: Araneae: Araneidae). *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, 516, 1–100.
- Grasshoff, M. (1983) *Larinoides* Caporiacco 1934, der korrekte Name für die sogenannte *Araneus cornutus*-Gruppe (Arachnida: Araneidae). *Senckenbergiana biologica*, 64, 225–229.
- Hadley, A. (2008) CombineZP Image Stacking Software. Available from: <http://www.hadleyweb.pwp.blueyonder.co.uk/> (accessed 29 February 2012)
- Hahn, C.W. (1834) *Die Arachniden*. Nürnberg, Zweite Band, 56 pp.
<http://dx.doi.org/10.5962/bhl.title.43744>
- Helsingin, P. van (2013) Fauna Europaea: Araneae, Araneidae. Fauna Europaea version 2.6.2. Available from: <http://www.faunaeur.org> (accessed 12 May 2014)
- Hentz, M.N. (1847) Descriptions and figures of the araneides of the United States. *Boston Journal of natural History*, 5, 443–478.
- Izmailova, M.V. (1989) [Fauna of Spiders of the South Part of Eastern Siberia]. Irkutsk University Press, Irkutsk, 182 pp. [in Russian]
- Keyserling, E. (1865) Beiträge zur Kenntnis der Orbitelae Latr. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien*, 15, 799–856.
- Koch, C.L. (1834) Arachniden. In: Herrich-Schäffer, G.A.W.: *Deutschlands Insekten*, pp. 122–127.
- Koch, C.L. (1836) Arachniden. In: Herrich-Schäffer, G.A.W.: *Deutschlands Insekten*, pp. 134–141.
- Koch, C.L. (1844) *Die Arachniden*. Nürnberg, Eilfter Band, 174 pp. <http://dx.doi.org/10.5962/bhl.title.43744>
- Kulczyński, W. (1885) Araneae in Camtschadalia a Dre B. Dybowski collectae. *Pamiętnik Akademii Umiejętności w Krakowie Wydział Matematyczno-Przyrodniczygo*, 11, 1–60.
- Kulczyński, W. (1901) Arachnoidea. In: Horvath, G. (Ed.), *Zoologische Ergebnisse der dritten asiatischen Forschungsreise des Grafen Eugen Zichy*. Budapest, pp. 311–369.
- Levi, H.W. (1974) The orb-weaver genera *Araniella* and *Nuctenea* (Araneae: Araneidae). *Bulletin of the Museum of Comparative Zoology*, 146, 291–316.
- Levy, G. (1998) Twelve genera of orb-weaver spiders (Araneae, Araneidae) from Israel. *Israel Journal of Zoology*, 43 (4), 311–365.
- Loksa, I. (1972) Araneae II. *Fauna Hungariae*, 109, 1–112.
- Marusik, Y.M. (1989) [New data on the fauna and synonymy of the USSR spiders (Arachnida, Aranei)]. In: Lange, A.B. (Ed.), *Fauna i Ekologiya Paukov i Skorpionov: Arakhnologicheskiy Sbornik*. Akademiya Nauk SSSR, Moscow, pp. 39–52. [In Russian]

- Marusik, Y.M., Logunov, D.V. & Koponen, S. (2000) *Spiders of Tuva, South Siberia*. Institute for Biological Problems of the North, Magadan, 253 pp.
- Marusik, Y.M., Böcher, J. & Koponen, S. (2006) The collection of Greenland spiders (Aranei) kept in the Zoological Museum, University of Copenhagen. *Arthropoda Selecta*, 15, 59–80.
- McCook, H.C. (1894) H. C. *American Spiders and their Spinningwork*. Vol. 3. Academy of Natural Sciences, Philadelphia, 285 pp.
<http://dx.doi.org/10.5962/bhl.title.2681>
- Menge, A. (1866) Preussische Spinnen. *Schriften der naturforschenden Gesellschaft in Danzig (N.F.)*, 1 (3), 1–152.
- Menge, A. (1879) Preussische Spinnen. XI Fortsetzung und Schluss. *Schriften der naturforschenden Gesellschaft in Danzig (N.F.)*, 4 (3), 543–560.
- Mikhailov, K.G. (2013a) *Larinoides folium* (Schrank, 1803) is a valid species name (Aranei: Araneidae). *Arthropoda Selecta*, 22 (3), 265–266.
- Mikhailov, K.G. (2013b) The spiders (Arachnida: Aranei) of Russia and adjacent countries: a non-annotated checklist. *Arthropoda Selecta. Supplement 3*, 1–262.
- Namkung, J. (2002) *The Spiders of Korea*. Kyo-Hak Publishing Co., Soul, 648 pp [in Korean].
- Namkung, J. (2003) *The Spiders of Korea*. Kyo-Hak Publishing Co., Soul, 648 pp [in Korean].
- Nentwig, W., Blick, T., Gloor, D., Hänggi, A. & Kropf, C. (2014) Spiders of Europe. Version 6.2014. Available from: <http://www.araneae.unibe.ch> (accessed 5 June 2014)
- Ohlert, E. (1867) *Die Araneiden oder echten Spinnen der Provinz Preussen*. Leipzig, 172 pp.
- Oliger, T.I., Marusik, Y.M. & Koponen, S. (2002) New and interesting records of spiders (Araneae) from the Maritime Province of Russia. *Acta Arachnologica*, 51 (2), 93–98.
<http://dx.doi.org/10.2476/asjaa.51.93>
- Olivier, G.A. (1789) *Araignée, Aranea. Encyclopédie méthodique: Histoire naturelle. Insectes*, Vol. 4. Paris, pp. 173–240.
- Panzer, G.F.W. (1804) Systematische Nomenklatur über weiland Herrn Dr. Jacob Christian Schäffers natürlich ausgemahlte Abbildungen regensburgischer Insekten. In: Herrich-Schäffer, J.C. (Ed.), *Icones insectorum circa ratisbonensium, Editio nova*. Erlangen, 4, 1–260.
- Pickard-Cambridge, O. (1876) Catalogue of a collection of spiders made in Egypt, with descriptions of new species and characters of a new genus. *Proceedings of the Zoological Society of London*, 1876, 541–630.
- Pickard-Cambridge, O. (1881) On some spiders from Newfoundland. *Proceedings of the Royal Physical Society of Edinburgh*, 6, 112–115.
- Platnick, N.I. (2014) *The World Spider Catalog, version 14.5*. American Museum of Natural History. Available from: <http://research.amnh.org/iz/spiders/catalog/> (accessed 17 May 2014)
- Prószyński, J. & Staręga, W. (1971) Pajaki-Aranei. *Katalog fauny Polski*, 33, 1–382
- Razoumowsky, G. de (1789) Histoire naturelle du Jorat et de ses environs; et celle des trois lacs de Neufchatel, Morat et Bienna, précédées d'un essai sur le climat, les productions. *Lausanne*, 1, 241–247.
- Risso, A. (1826) Histoire naturelle des principales productions de l'Europe méridionale, et principalement de celles des environs de Nice et des Alpes maritimes. *Paris*, 5, 159–176.
- Roberts, M.J. (1995) *Collins Field Guide: Spiders of Britain & Northern Europe*. HarperCollins, London, 383 pp.
- Roșca, A. (1935) Neue Spinnenarten aus der Bukowina (Rumänien). *Zoologischer Anzeiger*, 111, 241–254.
- Schrank, F. von P. (1803) Fauna Boica. Durch dachte Geschichte der in Baiern einheimischen und Zahmen Tiere. *Landshut*, 3 (1), 229–244.
- Scopoli, J.A. (1763) *Entomologia carniolica, exhibens insecta carniolae indigena et distributa in ordines, genera, species, varietates. Methodo Linnaeano*. Vindobonae, 420 pp.
- Shear, W.A. (1967) Expanding the palpi of male spiders. *Breviora*, 259, 1–27.
- Simon, E. (1864) *Histoire naturelle des araignées (aranéides)*. Librairie encyclopédique de Roret. Paris, pp. 540 pp.
- Simon, E. (1874) *Les Arachnides de France I*. Librairie Encyclopédique de Roret, Paris, 272 pp.
- Simon, E. (1895) Arachnides recueillis par M.G. Potanine en Chine et en Mongolie (1876–1879). *Bulletin Scientifique/ Académie Impériale des Sciences de Saint Petersbourg*, 2, 331–345.
- Song, D.X., Zhu, M.S. & Chen, J. (1999) *The Spiders of China*. Hebei Science and Technology Publishing House, Shijiazhuang, 640 pp.
- Strand, E. (1906) Isländische Arachniden. *Jahrbücher des Nassauischen Vereins für Naturkunde*, 59, 279–284.
- Šestáková, A. & Krumpál, M. (2012) Female genital damage of *Larinoides patagiatus* (Araneae: Araneidae). In: *European Congress of Arachnology. Abstract Book*. EZlab, Ljubljana, Slovenia, pp. 1–135.
- Šestáková, A. & Omelko, M.M. (2012) A new combination expands the range of the African araneid spider *Singafrotypa* (Araneae, Araneidae). *ZooKeys*, 207, 79–84.
<http://dx.doi.org/10.3897/zookeys.207.3522>
- Tanikawa, A. (2007) *An Identification Guide to the Japanese Spiders of the Families Araneidae, Nephilidae and Tetragnathidae*. Arachnological Society of Japan, 121 pp. [in Japanese]
- Thaler, K. (1974) Eine verkannte Kreuzspinne in Mitteleuropa: *Araneus folium* Schrank (Kulczynski 1901) und *Araneus cornutus* Clerck (Arachnida: Aranei, Araneidae). *Zoologischer Anzeiger*, 193, 256–261.
- Thorell, T. (1873) *Remarks on synonyms of European spiders. Part IV*. Uppsala, pp. 375–645.

- Thorell, T. (1875) Descriptions of several European and North African spiders. *Kongliga Svenska Vetenskaps Akademien handlingar*, 13 (5), 1–203.
- Trotta, A. (2005) Introduzione ei Ragni italiani (Arachnida Araneae). *Memorie della Società Entomologica Italiana*, 83, 3–178. <http://dx.doi.org/10.4081/memorieSEI.2004.3>
- Walckenaer, C.A. (1802) *Faune parisienne. Insectes, ou Histoire abrégée des insectes de environs de Paris*. Vol. 2. Paris, pp. 187–250.
- Walckenaer, C.A. (1841) *Histoire naturelle des Insectes. Aptères*. Vol. 2. Paris, pp. 1–549.
- Westring, N. (1851) Förteckning öfver de till närvarande tid Kände, i Sverige förekommande Spindlarter, utgörande ett antal af 253, deraf 132 äro nya för svenska Faunan. *Göteborgs Kungliga Vetenskaps och Vitterhets Samhälles Handlingar*, 2, 25–62.
- Zhu, M.S. & Shi, J.G. (1983) [Crop field spiders of Shanxi Province]. Agriculture Planning Committee of Shanxi Province, 239 pp. [in Chinese]