

On the spider fauna (Arachnida, Araneae) of the Pasvik Nature Reserve (Kola Peninsula, Russia)

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The spider fauna of the Pasvik Natural Reserve (Kola Peninsula, Russia) has been studied and consists of 66 species of 12 families. Nine species – *Gnaphosa orites* Chamberlin, 1922, *G. sticta* Kulczyński, 1908, *Micaria aenea* Thorell, 1871, *Hypsosinga albovittata* (Westring, 1851), *Agyneta ramosa* Jackson, 1912, *A. suecica* Holm, 1950, *Gonatium rubellum* (Blackwall, 1841), *Hybauchenidium ferrumequinum* (Grube, 1861), *Mughiphantes cornutus* (Schenkel, 1927) – are reported from Kola Peninsula for the first time. *Agyneta suecica* Holm, 1950 is found in the spider fauna of Russia for the second time; the studied male of this species is illustrated.

Key words: spiders, new records, Pasvik, Kola Peninsula, Russia.

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Introduction

The territory of Kola Peninsula lies in different natural zones, from the northern taiga in its southern part to the coastal tundra at the shores of Barents Sea. Several nature reserves were established in Kola Peninsula to protect the wildlife from the human impact, such as, hunting, fishery and mining. Incidentally, to date, most surveys of the spider fauna have been carried out in non-protected areas, for instance, the tundra zone of Murman Coast or central parts of Kola Peninsula (e.g., Tanasevith & Rybalov 2010, Tanasevith & Kamayev 2011, Nekhaeva 2015a,b), whereas the protected territories of the Peninsula remain practically unexplored. The only exception is the Kandalaksha State Nature Reserve, of which the spider fauna was studied by Byzova *et al.* (1986) and Nekhaeva & Nekhaev (2011). Yet, no arachnological studies devoted to the western part of Kola Peninsula, where two prominent protected areas (viz., the Lapland and

Pasvik Nature Reserves) are situated, have been undertaken to date.

The present paper is based on the original material newly collected from the Pasvik Nature Reserve and presents the first account of its spider fauna.

Sampling area and methods

The Pasvik Nature Reserve is situated in the NW part of Kola Peninsula along the Russian-Norwegian border (Figure 1), entering the territory of the Pasvik-Inari Trilateral Park, and lies at the borderline between the forest-tundra and the northern taiga natural sub-zones. The reserve's landscape is formed by low mountains (up to 350–380 m a.s.l.) and includes three vegetation zones: lower parts of the slopes are covered by the pine forest turning at higher elevations into the mountain birch forest, with the crowberry and lichen mountain tundra occupying mountain



FIGURE 1. Map of the Pasvik Nature Reserve with sample sites.

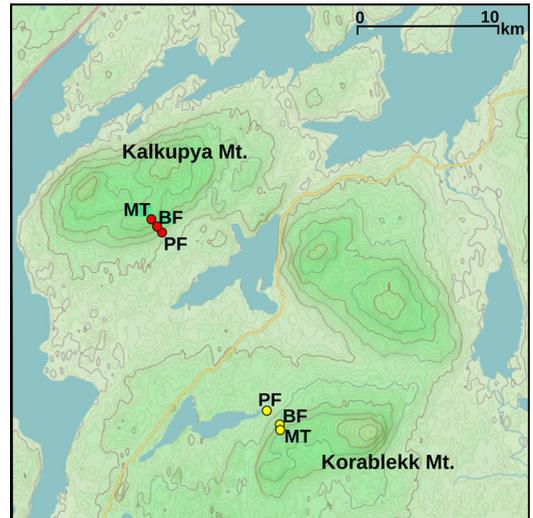


FIGURE 2. The sample sites. The localities are named according Table 1.

peaks (Zenkova 2013). The annual mean air temperature can reach -0.5°C , and the period with mean temperatures above zero is 73–119 days. The summer usually starts in the second decade of June and continues for 2–2.5 months (Yakovlev 1961).

Pitfall traps (500 ml plastic glasses, 87 mm at their upper diameter and 130 mm high, with 4% formaldehyde as a preservative) were set up to collect spiders from 28 June to 27 August 2012. Sampling sites were situated in the same vegetation zones of the SE slope of Kalkupya Mt. and the opposite, NW slope of Korablekk Mt. Six individual localities were surveyed (Figure 2), with 15 pitfall traps being set up in each of them. Based on Zenkova (2013), the studied localities can be characterized as follows:

Mountain Pine Forest (Kalkupya Mt.: $69^{\circ}16'58''\text{N}$, $29^{\circ}22'53''\text{E}$, 125 m a.s.l., dwarf shrub-green moss old pine forest; Korablekk Mt.: $69^{\circ}14'35''\text{N}$, $29^{\circ}26'52''\text{E}$, 130 m a.s.l., dwarf shrub-lichen sparse pine forest), with *Pinus sylvestris lapponica*, *Empetrum hermaphroditum*, *Vaccinium myrtillus*, *V. vitis-idaea*, *V. uliginosum*, *Cladonia* spp., *Cetraria* spp., *Stereocaulon* spp. and green mosses, *Pleurozium* spp., *Hylocomium* spp.

Birch Crooked Forest (Kalkupya Mt.:

$69^{\circ}17'02''\text{N}$, $29^{\circ}22'43''\text{E}$, 200 m a.s.l., dwarf shrub-herb dense birch crooked forest; Korablekk Mt.: $69^{\circ}14'23''\text{N}$, $29^{\circ}27'22''\text{E}$, 250 m a.s.l., open birch crooked forest), with *Betula tortuosa*, *Sorbus gorodkovii*, *Empetrum hermaphroditum*, *Vaccinium myrtillus*, *V. vitis-idaea*, *V. uliginosum*, *Ledum palustre*, *Rubus chamaemorus*, *Betula nana*, *Pleurozium* spp., *Hylocomium* spp., *Salix* spp., *Juniperus sibirica*.

Dwarf shrub-lichen Tundra (Kalkupya Mt.: $69^{\circ}17'08''\text{N}$, $29^{\circ}22'31''\text{E}$; Korablekk Mt.: $69^{\circ}14'20''\text{N}$, $29^{\circ}27'22''\text{E}$), with *Empetrum hermaphroditum*, *Cladonia* spp., lichens, sporadic *Betula czrepanovii*.

Only adult spider specimens were studied. The measurements of *Agyneta suecica* Holm, 1950 were taken by means of the Carton SPZT50 stereomicroscope with an eyepiece-micrometer. The studied material is temporary kept in the author's personal collection. The specimen of *A. suecica* is kept in the personal collection of Dr Andrey Tanasevitch (Severtsov Institute of Ecology and Evolution, Moscow). All the material will be later deposited in the Zoological Museum of the Moscow State University, Russia (curator – K. G. Mikhailov).

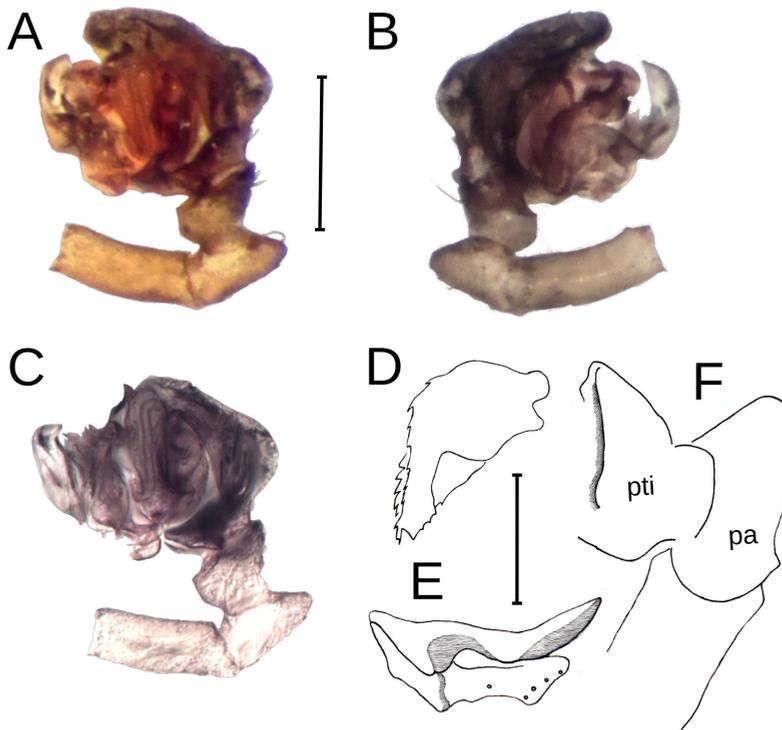


FIGURE 3. *Agyneta suecica* Holm, 1950 male palp: **A.** Retrolateral view. **B.** Prolateral view. **C.** Retrolateral view in transmitted light, scale bar = 0.2 mm. **D.** Lamella characteristica. **E.** Paracymbium. **F.** palpal tibia (pti) and patella (pa), scale bar = 0.1 mm.

Results and discussion

A total of 1485 spider specimens (1285 adults) were collected, belonging to 66 species of 12 families (Table 1). The most diverse family was Linyphiidae (46%, or 30 species of the entire species diversity), while representatives of Lycosidae were most abundant (71%, or 916 specimens of the total number of adults). Nine species (*Gnaphosa orites* Chamberlin, 1922, *G. sticta* Kulczyński, 1908, *Micaria aenea* Thorell, 1871, *Hypsosinga albovittata* (Westring, 1851), *Agyneta ramosa* Jackson, 1912, *A. suecica* Holm, 1950, *Gonatium rubellum* (Blackwall, 1841), *Hybauchenidium ferrumequinum* (Grube, 1861), *Mughiphantes cornutus* (Schenkel, 1927)) are reported from Kola Peninsula for the first time (Table 1).

The species diversity of both mountains was

similar (49 species in Kalkupya Mt. and 41 in Korablekk Mt.), as was that of all the studied habitats (from 18 to 24 species) (Table 1). The number of collected specimens from Kalkupya Mt. was almost twice as high as that from Korablekk Mt., 825 and 460 respectively.

The most abundant species were *Pardosa hyperborea* (444 collected specimens) and *P. lugubris* (238). The former was recorded in each zone of both mountains; yet, it was the most abundant in the tundra of Kalkupya Mt. (228), whereas only few specimens were collected from the pine and birch forests. In the Korablekk Mt., *P. hyperborea* was the most abundant in the birch forest (93) and tundra (88). The majority of *P. lugubris* specimens (150) was collected from the mountain birch forest of Kalkupya Mt., whereas the species was absent from the highest elevations of Kalkupya Mt. and from all natural zones of

TABLE 1. A total number of adult spiders (female/male) collected from the same vegetation zones of Kalkupya and Korablekk Mts. (Mp – mountain pine forest, Mb – mountain birch forest, Mt – mountain tundra, N – number of collected specimens, «» – species or sex absent from the habitat, «*» – species reported from Kola Peninsula for the first time).

Species / habitat	Kalkupya Mt.			Korablekk Mt.			Total	
	Mp	Mb	Mt	Mp	Mb	Mt	N	%
Fam. Hahniidae (2)								
<i>Cryphoea silvicola</i> (C.L. Koch, 1834)	1 / 8	-	-	-	-	-	9	0.7
<i>Hahnna ononidum</i> Simon, 1875	-	-	-	-	1 / 2	-	3	0.2
Fam. Lycosidae (10)								
<i>Alopecosa aculeata</i> (Clerck, 1758)	-	-	-	2 / 3	- / 2	- / 9	16	1.2
<i>Alopecosa pinetorum</i> (Thorell, 1856)	-	-	- / 1	- / 1	1 / 4	- / 2	9	0.7
<i>Alopecosa taeniata</i> (C. L. Koch, 1835)	2 / 6	2 / 4	5 / 6	-	-	-	25	1.9
<i>Pardosa eiseni</i> (Thorell, 1875)	-	-	- / 1	4 / 3	- / 5	- / 2	15	1.2
<i>Pardosa hyperborea</i> (Thorell, 1872)	- / 2	1 / 5	113 / 115	6 / 21	26 / 67	43 / 45	444	34.6
<i>Pardosa lapponica</i> (Thorell, 1872)	-	-	-	-	-	4 / 2	6	0.5
<i>Pardosa lugubris</i> (Walckenaer, 1802)	11 / 77	34 / 116	-	-	-	-	238	18.5
<i>Pardosa palustris</i> (Linnaeus, 1758)	-	- / 1	15 / 33	-	- / 2	3 / 10	64	5.0
<i>Pardosa riparia</i> (C. L. Koch, 1833)	1 / 4	5 / 24	38 / 26	-	-	-	98	7.6
<i>Pardosa sphagnicola</i> (Dahl, 1908)	-	-	- / 1	-	-	-	1	0.1
Fam. Liocranidae (1)								
<i>Agroeca proxima</i> (O. Pickard-Cambridge, 1871)	- / 13	- / 3	- / 7	- / 3	2 / 1	1 / 2	32	2.5
Fam. Gnaphosidae (9)								
<i>Gnaphosa lapponum</i> (L. Koch, 1866)	- / 1	-	- / 6	-	- / 3	2 / 11	23	1.8
<i>Gnaphosa microps</i> Holm, 1939	-	-	1 / 1	- / 7	- / 1	-	10	0.8
<i>Gnaphosa muscorum</i> (L. Koch, 1866)	-	-	- / 1	-	-	1 / -	2	0.2
<i>Gnaphosa orites</i> Chamberlin, 1922 *	-	-	-	-	-	1 / 9	10	0.8
<i>Gnaphosa sticta</i> Kulczyński, 1908 *	1 / -	-	-	2 / -	-	-	3	0.2
<i>Haplodrassus signifer</i> (C. L. Koch, 1839)	-	- / 1	1 / 1	- / 2	- / 5	-	10	0.8
<i>Haplodrassus soerenseni</i> (Strand, 1900)	-	- / 2	-	- / 1	- / 1	-	4	0.3
<i>Micaria aenea</i> Thorell, 1871 *	-	-	-	2 / -	-	-	2	0.2
<i>Micaria alpina</i> L. Koch, 1872	-	-	1 / 1	-	-	-	2	0.2
Fam. Thomisidae (7)								
<i>Ozyptila arctica</i> Kulczyński, 1908	-	-	-	-	-	1 / 1	2	0.2
<i>Ozyptila atomaria</i> (Panzer, 1801)	-	-	1 / -	-	-	-	1	0.1
<i>Ozyptila trux</i> (Blackwall, 1846)	-	3 / -	-	-	-	-	3	0.2
<i>Xysticus audax</i> (Schrank, 1803)	-	-	- / 1	-	-	-	1	0.1
<i>Xysticus cristatus</i> (Clerck, 1758)	-	-	-	1 / -	-	-	1	0.1
<i>Xysticus luctuosus</i> (Blackwall, 1836)	-	- / 3	- / 4	- / 1	-	-	8	0.6
<i>Xysticus obscurus</i> Collett, 1877	-	-	-	1 / -	2 / 2	-	5	0.4
Fam. Araneidae (2)								
<i>Cercidia prominens</i> (Westring, 1851)	-	-	-	-	- / 1	-	1	0.1
<i>Hypsosinga albovittata</i> (Westring, 1851) *	-	-	-	-	-	1 / -	1	0.1

TABLE 1. continued

Species / habitat	Kalkupya Mt.			Korablekk Mt.			Total	
	Mp	Mb	Mt	Mp	Mb	Mt	N	%
Fam. Philodromidae (1)								
<i>Thanatus formicinus</i> (Clerck, 1758)	-	-	- / 1	-	-	-	1	0.1
Fam. Linyphiidae (30)								
<i>Agyphantes expunctus</i> (O. Pickard-Cambridge, 1875)	-	-	-	1 / -	-	-	1	0.1
<i>Agyneta conigera</i> (O. Pickard-Cambridge, 1863)	- / 2	-	-	-	-	-	2	0.2
<i>Agyneta ramosa</i> Jackson, 1912 *	-	- / 1	-	-	-	-	1	0.1
<i>Agyneta subtilis</i> (O. Pickard-Cambridge, 1863)	- / 3	-	-	-	-	-	3	0.2
<i>Agyneta suecica</i> Holm, 1950 *	- / 1	-	-	-	-	-	1	0.1
<i>Bolephthyphantes index</i> (Thorell, 1856)	-	-	-	2 / -	1 / -	-	3	0.2
<i>Centromerus arcanus</i> (O. Pickard-Cambridge, 1873)	- / 2	-	1 / -	2 / -	-	-	5	0.4
<i>Cnephalocotes obscurus</i> (Blackwall, 1834)	-	-	1 / -	-	-	1 / -	2	0.2
<i>Diplocentria bidentata</i> (Emerton, 1882)	-	1 / -	-	-	-	-	1	0.1
<i>Diplocentria rectangulata</i> (Emerton, 1915)	1 / -	-	-	-	-	-	1	0.1
<i>Gonatium rubellum</i> (Blackwall, 1841) *	-	2 / 3	-	-	1 / 1	-	7	0.5
<i>Gonatium rubens</i> (Blackwall, 1833)	-	-	- / 1	-	-	1 / -	2	0.2
<i>Hilaira herniosa</i> (Thorell, 1875)	9 / 1	-	-	6 / 2	19 / 3	1 / -	41	3.2
<i>Hybauchenidium ferrumequinum</i> (Grube, 1861) *	-	-	-	-	1 / 1	2 / 4	8	0.6
<i>Maso sundevalli</i> (Westring, 1851)	- / 1	-	-	-	3 / 3	-	7	0.5
<i>Minyriolus pusillus</i> (Wider, 1834)	1 / 1	-	-	1 / -	-	-	3	0.2
<i>Mughiphantes cornutus</i> (Schenkel, 1927) *	- / 1	-	-	-	-	-	1	0.1
<i>Neriere clathrata</i> (Sundevall, 1830)	-	- / 1	-	1 / -	-	- / 1	3	0.2
<i>Palliduphantes antroniensis</i> (Schenkel, 1933)	- / 1	-	-	-	-	-	1	0.1
<i>Pelecopsis mengei</i> (Simon, 1884)	-	-	-	-	5 / 1	1 / -	7	0.5
<i>Pocadicnemis pumila</i> (Blackwall, 1841)	1 / -	-	- / 1	2 / -	2 / -	-	6	0.5
<i>Porrhomma pallidum</i> Jackson, 1913	-	-	-	1 / -	-	-	1	0.1
<i>Tapinocyba pallens</i> (O. Pickard-Cambridge, 1872)	-	1 / -	-	-	-	-	1	0.1
<i>Tenuiphantes alacris</i> (Blackwall, 1853)	4 / 3	1 / -	-	10 / 2	12 / 2	-	34	2.6
<i>Tenuiphantes mengei</i> (Kulczyński, 1887)	-	4 / -	-	-	-	-	4	0.3
<i>Tenuiphantes tenebricola</i> (Wider, 1834)	18 / 11	8 / 7	-	7 / 3	8 / 2	-	64	5.0
<i>Walckenaeria cuspidata</i> Blackwall, 1833	-	-	1 / -	-	-	-	1	0.1
<i>Walckenaeria karpinskii</i> (O. Pickard-Cambridge, 1873)	-	-	-	-	- / 1	-	1	0.1
<i>Walckenaeria nudipalpis</i> (Westring, 1851)	1 / -	1 / -	-	-	-	-	2	0.2
<i>Zornella cultrigera</i> (L. Koch, 1879)	1 / -	10 / -	-	3 / -	1 / -	-	15	1.2
Fam. Miturgidae (1)								
<i>Zora nemoralis</i> (Blackwall, 1861)	-	1 / -	-	-	-	-	1	0.1
Fam. Theridiidae (1)								
<i>Robertus scoticus</i> Jackson, 1914	-	- / 3	-	-	-	-	3	0.2
Fam. Salticidae (1)								
<i>Evarcha falcata</i> (Clerck, 1758)	-	-	-	1 / -	-	-	1	0.1

TABLE 1. *continued*

Species / habitat	Kalkupya Mt.			Korablekk Mt.			Total	
	Mp	Mb	Mt	Mp	Mb	Mt	N	%
Fam. Mimetidae (1)								
<i>Ero</i> sp.	1 juv	-	-	-	-	-	1	0.1
Total	191	248	386	104	195	161	1285	100
Number of species	24	22	22	25	24	18		

Korablekk Mt.

The predominance of *P. hyperborea* in pitfall traps was also noticed for northern Finland (the vicinity of the Kevo Subarctic Research Station) and Sweden (the Abisko Scientific Research Station) (Koponen 1975, Breitling & Buckland 2015), as well as for the central part of Kola Peninsula (Khibiny Mts.) (Nekhaeva 2015b) where the species was found in boggy habitats, the mountain birch forest and mountain tundra communities. Yet, although *P. hyperborea* was common in the Ural zonal and mountain tundras (Esyunin 1999), its records from the zonal tundras of Kola Peninsula were rather rare (Tanasevitch & Rybalov 2010).

The most interesting record seems to be that of *Agyneta suecica* Holm, 1950. A single male was collected from the pine forest of the south-east slope of Kalkupya Mt. Despite the specimen dried out during the trap exposure, it was still possible to identify it: its palpal patella is conical with a bristle on its apex and the lamella characteristica is typical of the species (Figure 3).

The female of *A. suecica* was originally described from northern Sweden (Holm 1950). Fifteen years later, the male was described from NW Finland (Palmgren 1965). To date, the species has been reported from Sweden, Finland and Norway (Holm 1968, Palmgren 1975, Hauge & Wiger 1980). A single male of *A. suecica* was hitherto reported from Russia, Nizhne-Svirsky State Nature Reserve (Oliger 2012). Finally, the most southern records of *A. suecica* from Ukraine were shown to actually belong to the recently described species *A. pinicola* Gnelitsa, 2014 (Gnelitsa 2014).

Spiders have been intensively surveyed in Kola Peninsula for the last five years mainly by means

of pitfall traps and hence some linyphiid species might have been overlooked. This is why earlier *A. suecica* was never found in Kola Peninsula. Yet, the species might have been omitted by hitherto collectors due its small size, while the females might have been confused with other *Agyneta* species.

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