

The spiders of Greenland – a checklist

(Arachnida: Araneae)

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The latest checklist of spiders from Greenland was published by Åke Holm in 1967 and included 64 species. The names for more than half of the species in his checklist are no longer valid, and additional species have been recorded as new for Greenland since then. The total number of spider species now known from Greenland is 70. This figure includes all species mentioned in the literature up to 2001 and species present in the spider collection at the Zoological Museum, Copenhagen. This museum probably holds the largest and most comprehensive reference collection of spiders from Greenland. Only 10 families of spiders have been recorded from Greenland and the majority of species (64%) belongs to the family Linyphiidae. Web builders constitute 81.4% of the species and the conspicuous wolf spiders 11%. Spiders of the family Salticidae (jumping spiders) were reported from Greenland by O. Fabricius in 1780, but have never been re-collected.

The species richness represents accumulated richness. The actual richness (instantaneous richness) of any given site in Greenland is much smaller. There are only very few published records. The largest number of species that has been found at any given locality during a short-term survey is 18.

The species richness of Greenland is low compared to that of other northern areas, and is to be explained by the isolated position of Greenland and its short postglacial colonization. The salticids are absent, even though the southern part of Greenland is at the same latitude as Oslo, Norway (59°55'N) from where 24 species of this family are recorded. Salticidae occur as far north as 69°20'N in Canada.

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Introduction

The spider fauna of Greenland has been the subject of many individual studies, but modern taxonomic work on the fauna has been rendered difficult by the lack of a modern checklist and key to the species. Until the late 1960's all taxonomic work referred to the checklist of Henriksen and Lundbeck (1917). Since then, many new records of spiders have been published by Brændegård (1934-1960) and Holm (1937-1967), and revisionary work has subsequently changed the combination of many names. Holm (1967) compiled all the records available for Greenland and produced a revised checklist of spiders from Greenland. His list includes 64 species and is the most recent checklist available. Half of the names on Holm's list are, however, no longer valid and several species new to Greenland have been recorded since 1967. A new revised checklist for Greenland was therefore much needed.

Historical background

Missionaries stationed in the cold island in the 18th century did the first studies of spiders in Greenland. David Crantz, a herrnhutian historian, gives a detailed description of the country, the nature, the people and the history of the Mission in Greenland in his "Historie von Grönland" (1765), and notes that "ausser kleinen Spinnen, kein giftiges Geschmeiss" (except from small spiders, no poisonous creeps).

Further observations were done by the missionary at Holsteinsborg (Sisimiut), H. C. Glahn in the same period. In 1771 he anonymously wrote a detailed and critical examination of the work of Crantz (1765): "Anmærkninger over de tre første bøger af Hr. Crantzes Historie om Grønland" (Remarks on the first three books of Mr. Crantz's History of Greenland). Here he describes some common spiders: "De store sorte med den longitudinaire hvide streg på ryggen" (the big black ones with a longitudinal white line on the back). Most likely Glahn is referring to the wolf spiders occurring in great numbers everywhere in Greenland.

The first real attempt to produce a systematic list of the spider species present in Greenland was done by the curate Otto Fabricius (a distant relative of the famous entomologist J.C. Fabricius) in 1780 when he published his "Fauna Groenlandica". This includes a list of all animals in Greenland known at that time and among these, six species of spiders. Only equipped with a hand lens and with limited access to the literature Fabricius identified them all to Scandinavian species. One of Fabricius identifications was questioned by Schiødte (1857), who suggested that the lycosid *Aranea saccata* was wrongly identified, but Schiødte gave no replacement name. Schiødte's opinion was supported by Thorell (1872) and Sørensen (1898) who also suggested that most of the other species listed by Fabricius were wrongly identified. The only species that may have been correctly identified is *Aranea scenica* (= *Salticus scenicus* Clerck, 1757), a species that has never been found in Greenland again! Sørensen's work (1898) included descriptions of new species and a number of new species records from Greenland. The Greenlandic fauna then counted 41 species of spiders. Almost 20 years later, Henriksen & Lundbeck (1917) published a catalogue of the terrestrial arthropods of Greenland. This catalogue included 46 spider species. Then followed a period with many important taxonomic contributions, primarily by Brændegård (1934, 1935, 1936, 1937, 1939, 1940, 1946, and 1960) and Holm (1937, 1956, 1958, 1960 and 1967, Carpenter & Holm 1939). Unfortunately, they did not collaborate, and thereby ended up dividing their efforts into work on East Greenland (Brændegård) and West Greenland (Holm). One of the last papers published on the Greenland spiders by Holm (1967) included a checklist of spider species from Greenland and a discussion of distribution patterns. Since then additional species have been recorded by Koponen (1982), Hillyard (1979), and Larsen & Rasmussen (1999).

The need for a revised checklist

A complete and updated list of spider species recorded from Greenland is important for the investigation of the arthropod fauna of Greenland. Without such a list, all taxonomic and ecological work is extremely troublesome. The following checklist has been compiled from the literature and the collection of Greenland spiders at the Zoological Museum in Copenhagen. The list does not include information about distribution of individual species since the knowledge about this is extremely limited. This is clearly emphasised by the discovery of *Pelecopsis parallela* (Wider, 1834) at Mellemfjord, Disko Island, during 4 days of fieldwork in 1998 (see details in the list below). The following statement made by Holm (1967 p. 93) is still valid: "The spider fauna of Greenland is

still rather incompletely known". The nomenclature in the list below follows the latest on-line catalogue of Platnick (2001). All families, genera and species are listed in alphabetical order. For each taxon, the genus name is cited first, then followed by species name, author of description, and year of publication. A reference is given to the source of information for each species and the original species combination is given, if different from the present.

Checklist

ARANEIDAE (4 species)

Araneus quadratus Clerck, 1757. Reference: Holm (1967).

Hypsosinga groenlandica Simon, 1889. Reference: Holm (1967, as *Singa groenlandica*).

Larinioides cornutus (Clerck, 1757). Reference: Holm (1967, as *Araneus cornutus*).

Larinioides patagiatus (Clerck, 1757). Reference: Holm (1967, as *Araneus ocellatus* Clerck, 1758).

DICTYNIDAE (2 species)

Dictyna major Menge, 1869. Reference: Brændegård (1946).

Emblyna borealis (O. P.-Cambridge, 1877). Reference: Brændegård (1946, as *Dictyna borealis*).

GNAPHOSIDAE (2 species)

Gnaphosa lapponum (L. Koch, 1866). Reference: Brændegård (1946, as *G. islandica* Sørensen, 1898).

Haplodrassus signifer (C. L. Koch, 1839). Reference: Brændegård (1946).

HAHNIDAE (1 species)

Hahnia glacialis Sørensen, 1898. Reference: Brændegård (1946)

LINYPHIIDAE (45 species)

Baryphyma groenlandicum (Holm, 1967). Reference: Holm (1967, as *Praestigia groenlandica*).

Bathyphantes simillimus (L. Koch, 1879). Reference: Holm (1967, as *B. eumenoides* Holm, 1967)

Bolephthyphantes index (Thorell, 1856). Reference: Brændegård (1946, as *Bolyphantes index*).

Collinsia holmgreni (Thorell, 1871). Reference: Brændegård (1946, as *Coryphaeolana holmgreni*).

Collinsia spetsbergensis (Thorell, 1871). Reference: Brændegård (1946, as *Microerigone spetsbergensis*).

Collinsia thulensis (Jackson, 1934). Reference: Brændegård (1946, as *Coryphaeolana thulensis*).

Diplocephalus barbiger (Roewer, 1955). Reference: Holm (1967, as *D. barbatus* L.Koch, 1897).

Dismodicus variegatus Jackson, 1938. Reference: Holm (1967, as *D. bifrons decemoculatus* Emerton, 1882).

Erigone arctica (White, 1852). Reference: Holm (1967, as *E. arctica soerenseni* Holm, 1956 in text and as *E.a. soerenseni* and *E. arctica arctica* (White, 1852) in Table 1.).

Erigone atra Blackwall, 1833. Reference: Holm (1967).

Erigone penessa Thorell, 1878. Reference: Thorell (1878). Not recorded since the original description and therefore very likely a synonym of another *Erigone* species. Buckle et al. (1998) suggest that this species may be a synonym of *Erigone whymperei*, but they did not check the type material of *penessa*.

Erigone psychrophila Thorell, 1871. Reference: Brændegård (1946).

Erigone tirolensis L. Koch, 1872. Reference: Brændegård (1946).

Erigone whymeri O. P. -Cambridge, 1877. Reference: Brændegård (1946).

Hilaira frigida (Thorell, 1872). Reference: Brændegård (1946).

Hilaira herniosa (Thorell, 1875). Reference: Hillyard (1979).

Hilaira vexatrix (O. P. -Cambridge, 1877). Reference: Brændegård (1946, as *H. curvitaris* Sørensen, 1898).

Hybauchenidium gibbosum (Sørensen, 1898). Reference: Holm (1967, as *Hybocoptus gibbosus*).

Improphantes complicatus (Emerton, 1882). Reference: Brændegård (1946, as *L. audax* Sørensen, 1898).

Islandiana princeps Brændegård, 1932. Reference: Brændegård (1946).

Lepthophantes turbatrix (O. P. -Cambridge, 1877). Reference: Brændegård (1946).

Mecynargus borealis (Jackson, 1930). References: Brændegård (1946, as *Typhochraestus borealis*), Holm (1967, as *Conigerella borealis*).

Mecynargus morulus (O. P. -Cambridge, 1873). Reference: Brændegård (1946, as *Rhaebothorax morulus*).

Mecynargus paetulus (O. P. -Cambridge, 1875). Reference: Holm (1967, as *Rhaebothorax paetulus*).

Mecynargus sphagnicola (Holm, 1939). Reference: Holm (1967, as *Rhaebothorax sphagnicola*).

Meioneta jacksoni Brændegård, 1937. References: Saaristo & Koponen (1998) and Platnick (2001). Note: there has been great confusion to the correct identity of the species of *Meioneta*/*Agyneta* occurring in Greenland. See Saaristo & Koponen (1998).

Meioneta nigripes (Simon, 1884). Reference: Brændegård (1946, as *Micryphantes nigripes*).

Metopobactrus prominulus (O. P. -Cambridge, 1872). Reference: Holm (1967).

Neriene peltata (Wider, 1834). Reference: Holm (1967, as *Linyphia peltata*).

Oreonetides vaginatus (Thorell, 1872). Reference: Brændegård (1946).

Pelecopsis parallela (Wider, 1834). Reference: One male specimen was caught in Mellemfjord (69°42'N, 54°35'W), Disko Island in a pitfall trap 24.-28. July 1998 (Larsen & Rasmussen, 1999). The species is otherwise known from Asia and Europe (Eskov, 1994).

Pocadicnemis pumila (Blackwall, 1841). Reference: Holm (1967).

Porthomma convexum (Westring, 1851). Reference: Koponen (1982).

Sciastes extremus Holm, 1967. Reference: Holm (1967).

Scotinotylus alpinus (Banks, 1896). References: Brændegård (1946, as *Coryphaeolana lapidicola* Sørensen, 1898); Holm (1967, as *Cochlembolus alpinus*).

Scotinotylus evansi (O. P. Cambridge, 1894). Reference: Brændegård (1946, as *Caledonia evansi*).

Scotinotylus sacer (Crosby, 1929). Reference: Holm (1967, as *Cochlembolus sacer*).

Semljicola obtusus (Emerton, 1915). Reference: Holm (1967, as *Latithorax obtusus*), new combination by Saaristo & Eskov (1996).

Tiso aestivus (L. Koch, 1872). Reference: Brændegård (1946).

Typhochrestus pygmaeus (Sørensen, 1898). Reference: Holm (1967).

Wabasso quaestio (Chamberlin, 1948). Reference: Holm (1967, as *Diplocentria replicata* Holm, 1950).

Walckenaeria castanea (Emerton, 1882). Reference: Koponen (1982, as *W. longidens* Holm, 1960).

Walckenaeria clavicornis (Emerton, 1882). Reference: Holm (1967, as *Cornicularia clavicornis*).

Walckenaeria cuspidata Blackwall, 1833. Reference: Holm (1967, as *Cornicularia cuspidata*).

Walckenaeria karpinskii (O. P. -Cambridge, 1873). Reference: Brændegård (1946, as *Cornicularia karpinskii*).

LYCOSIDAE (8 species)

Alopecosa exasperans (O. P. -Cambridge, 1877). Reference: Holm (1967, as *Tarentula exasperans*).

Arctosa alpigena (Doleschall, 1852). Reference: Brændegård (1946).

Arctosa insignita (Thorell, 1872). Reference: Brændegård (1946).

Pardosa albomaculata Emerton, 1885. Reference: Hillyard (1979).

Pardosa furcifera (Thorell, 1875). Reference: Brændegård (1946).

Pardosa glacialis (Thorell, 1872). Reference: Brændegård (1946).

Pardosa groenlandica (Thorell, 1872). Reference: Brændegård (1946).

Pardosa hyperborea (Thorell, 1872). Reference: Brændegård (1946, as *P. saltuaria* L. Koch, 1870).

PHILODROMIDAE (1 species)

Thanatus arcticus Thorell, 1872. Reference: Holm (1967).

TETRAGNATHIDAE (1 species)

Tetragnatha extensa (Linnaeus, 1758). Reference: Holm (1967).

THERIDIIDAE (4 species)

Achaearanea ohlerti (Thorell, 1870). Reference: Holm (1967).

Enoplognatha intrepida (Sørensen, 1898). Reference: Brændegård (1946).

Robertus fuscus (Emerton, 1894). Reference: Koponen (1982).

Thymoites oleatus (L. Koch, 1879). Reference: Holm (1967, as *Theridion oleatum*).

THOMISIDAE (2 species)

Xysticus deichmanni Sørensen, 1898. Reference: Brændegård (1946, as *X. labradorensis* Keyserling, 1887).

Xysticus durus (Sørensen, 1898). Reference: Brændegård (1946).

Platnick (2001) lists another 3 spider species from Greenland. These are *Linyphia emertonii* Thorell, 1875, *Thyphochrestus latithorax* (Strand, 1905) and *Erigonella groenlandica* Strand, 1905. These species are not included in this checklist for the following reasons:

Linyphia emertonii Thorell, 1875: One female was recorded under this name by Sørensen (1898) from Isortok, Greenland, on June 15, 1879. The specimen is kept in the collection of the Zoological Museum of Copenhagen and was examined by Holm (1967, p. 68). He was not able to locate the type material (2 males and 1 female from Labrador) but suggested that the specimen was a misidentified *Linyphia peltata* Wider, 1834 (now placed in *Neriene*). We have checked Sørensen's specimen and agree with Holm that it is a female *peltata*. We therefore remove *Linyphia emertonii* from the checklist of Greenland spiders.

Thyphochrestus latithorax (Strand, 1905): An adult female of this species was collected at "Havnen" (the Harbour), Rice Strait, by the second Norwegian Arctic Expedition in the "Fram" 1898-1902 and described by Strand as *Tarsiphantes latithorax*. Rice Strait is located between Pim Island and Johan Peninsula, Ellesmere Island, Canada. It has not been recorded from Greenland and should therefore be removed from the checklist of Greenland spiders. Details about the collecting sites are given in Isachsen (1907).

Erigonella groenlandica Strand, 1905: Another species (juvenile) collected by the “Fram” expedition and described by Strand. It came from Fort Juliane, Hayes Sound, Ellesmere Island, Canada. It has not been recorded from Greenland and should therefore be removed from the checklist of Greenland spiders.

Discussion

A total of 70 spider species belonging to 10 families are currently known from Greenland. This figure will no doubt increase in the future when more fieldwork is carried out in Greenland. The list lacks representatives of imported species that are associated with heated houses and storage facilities. Such species have not yet been recorded from Greenland but will no doubt turn up in the future. A juvenile *Tegenaria* has been registered from an expedition house in Peary Land (Brændegård, 1960) and *Pholcus phalangioides* (Fuesslin, 1775) is now established in similar places on Iceland (Agnarsson, 1996). *Pholcus phalangioides* has become a very common house spider in Denmark within the last 20 years and it is therefore very likely that it eventually will be introduced into Greenland. Given the harsh environment of Greenland, and the fact that a substantial amount of fieldwork has been carried out on arthropods, the number of additional native species to be expected is therefore estimated relatively low, perhaps within a range of 10-15%.

Almost two thirds (64,3%) of the spider species known from Greenland belong to the spider family Linyphiidae and 77,1% of the Greenland spider species can be classified as orb weavers (belonging to the superfamilies Araneoidea and Deinopoidea). An overview of the guilds is given in Table 1. From this it can also be seen that web constructions are extremely essential for arctic spiders. No less than 81.4% of the Greenland spider species belong to web building guilds. The spiders that layman and professional find most conspicuous, the Wolf spiders (Lycosidae), are only represented by 11,4% of the species. The high fraction of linyphiid species is normal for high northern latitudes (Koponen, 1996). This is in agreement with the spider fauna of Iceland where 73% of the 84 known species are linyphiids (Agnarsson, 1996).

Table 1: Guild classification of the Greenland spiders (guild designation sensu Uetz et al., 1999).

Family	Guild	No. of species	%
Araneidae	Orb weavers	4	5.7
Dictynidae	Space web builders	2	2.9
Gnaphosidae	Ground runners	2	2.9
Hahnidae	Sheet web builders	1	1.4
Linyphiidae	Wandering sheet/ tangle weavers	45	64.3
Lycosidae	Ground runners	8	11.4
Philodromidae	Ambushers	1	1.4
Tetragnathidae	Orb weavers	1	1.4
Theridiidae	Space web builders	4	5.7
Thomisidae	Ambushers	2	2.9
Total		70	100.0

The species richness of the checklist represents accumulated richness. The actual richness (instantaneous richness) of any given site in Greenland is much lower. The largest number of spider species found at any given locality in Greenland during an instantaneous survey is 24 (Koponen, 1982). This survey was carried out during 5 days at Narssaq (60°57'N, 46°05'W), but the size of the area sampled and the habitat types were not specified. In comparison, Larsen & Rasmussen (1999) found 18 species of spiders during 5 days of fieldwork in a meadow at Engelskmandens Havn (69°16'N, 53°35'W). The size of the sample area was 0.2 hectare. There are only very few published records like these, but a large scale environmental monitoring programme, BioBasis, at Zackenberg Ecological Research Station (74°30'N, 21°00'W) in north-eastern Greenland will provide important new information on local diversity patterns in the high arctic. Arthropods, including spiders, are collected with pitfalls during the snow-free months of June, July and August. This has been done every year since 1996. All arthropod material has been deposited at the Zoological Museum in Copenhagen.

The species richness of Greenland is low compared to other northern areas, and given its isolated position and short postglacial colonization the species richness should indeed be low. Finland (60°-70°N) stretches over roughly the same latitudes as Greenland and the area of Finland is similar in size to the ice-free area of Greenland. But the Finnish fauna counts 620 species compared to the 70 species of Greenland (Koponen, 1996). The number of native spider species known from Iceland is 84 (Agnarsson, 1996). Of these, only 29 species are shared with Greenland. This gives a complementarity or distinctness (*sensu* Colwell & Coddington, 1994) of 77%, where 0% represent identical species lists and 100% represent lists that are completely distinct. The Greenland spider fauna is thus quite distinct from that of Iceland. No less than 99% of the spider fauna of Iceland are shared with Fennoscandia (Agnarsson, 1996).

Even though Fabricius (1780) reported the jumping spider, *Salticus scenicus* (Clerck, 1757), from Greenland, it has not been possible to confirm his finding. Salticids are also absent from Iceland; though *Salticus scenicus* is fairly frequently imported with fruits etc., it has not yet been established in Iceland (Agnarsson, pers. comm.). The southern part of Greenland is at the same latitude as the south of Norway (59°55'N) from where 24 species of this family are recorded (Hauge, 1989) so it seems strange that there is no representative of this family in Greenland. Jumping spiders, like *Salticus scenicus* and *Sitticus lineolatus* (Grube), should be able to live in southern Greenland. Thus, *Sitticus lineolatus* is found in Alaska at 68°30'N and in Canada at 69°20'N (Cutler, 1982). The latter is found in polar tundra and areas like this are also present in Greenland. There must be other reasons, perhaps historical or physiological, to the absence of jumping spiders in Greenland.

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Dansk resumé

Den seneste checkliste over grønlandske edderkopper blev udgivet af Åke Holm i 1967 og inkluderede 67 arter. Mere end halvdelen af de da anvendte artsnavne er ikke længere gyldige og der er siden fundet flere nye arter for Grønland. Der kendes nu 70 arter af edderkopper i Grønland. Dette inkluderer alle de arter, som er nævnt i litteraturen ind-

til 2001, og de arter der findes i edderkoppesamlingen på Zoologisk Museum i København. Sidstnævnte er nok den største og mest omfattende referencesamling af edderkopper fra Grønland.

Kun 10 familier af edderkopper er repræsenteret i Grønland og over to trediedele af arterne tilhører familien Linyphiidae. Størstedelen (81.4%) af de grønlandske arter bygger fangstspind og kun 11% tilhører de ellers øjnedefaldende jagtedderkopper (Lycosidae) der jager uden spind. En enkelt springedderkoppeart (Salticidae) blev fundet i Grønland af O. Fabricius i 1780, men er aldrig blevet fundet siden.

Den artsrigdom, som checklisten repræsenterer, er akkumuleret artsrigdom - dvs. alle de arter der er registreret fra grønlandske lokaliteter gennem tiderne. Det maksimale antal arter, man kan finde på et givet tidspunkt på en given lokalitet, er meget mindre. Det største antal edderkoppearter, der er fundet på en enkelt lokalitet under en indsamling over et kortere tidsrum, er 18 arter.

Artsrigdommen er meget lav i Grønland sammenlignet med andre nordlige områder og der er ingen springedderkopper, selvom det sydlige Grønland er på samme breddegrad som det sydlige Norge, hvor der findes 24 arter fra denne familie. Springedderkopper findes så langt nordpå som 69°20'N i Canada.

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