

SPIDER FAUNA (ARANEAE) OF THE ARCTIC-SUBARCTIC ATLANTIC ISLANDS

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With 1 figure and 3 tables

ABSTRACT: The number of spider species of the North Atlantic islands varies greatly depending on the latitude, isolation and to some extent the land area; e.g., 5 species are known from Jan Mayen, 14 from Svalbard, 67 from the Faroe Islands, 70 from Greenland and 90 from Iceland. Among the few families (1-10) found on these islands, the family Linyphiidae (s. lat.) dominates in the number of species. Great faunal similarity is found between Iceland and Scandinavia (93 % of Icelandic species also occur in Scandinavia), between the Faroe Islands and Scandinavia (94 %), and between the Faroe Islands and Scotland (93 %). The Greenlandic (Nearctic) fauna differs from the European fauna.

The islands of the North Atlantic are characterized by the harsh oceanic climate with short summers and by the absence of coniferous forests. The terrestrial fauna of subarctic and arctic islands is poor compared with the more southern Atlantic islands. For example, altogether ca. 150 species of spiders are known from the Faroe Islands, Iceland, Svalbard and Greenland; the total ice-free area of these islands being 450 000 km². The same number of spider species (about 150) are also known from the island of Madeira with an area of 800 km². In the present paper, some general data on the spider faunas of the subarctic and arctic Atlantic islands is given, along with a brief comparison with the spider fauna of the Macaronesian islands.

The number of species and families of spiders known from certain North Atlantic islands (Fig. 1) is shown in Table 1, based on papers by LEECH (1966), HOLM (1967), ASHMOLE (1979), BENGTSON & HAUGE (1979), TOFT (1979) and KOPONEN (1982, 1992, 1993). The numbers of species and families on subarctic islands (67 and 9 on the Faroe Islands, 90 and 10 in Iceland, respectively) are of the same magnitude as in Greenland (70 and 10) with the ice-free area almost four-fold that of Iceland and 250-times that of the Faroe Islands. The spider fauna of Newfoundland is not very well studied; however, almost 250 species are known there (HACKMAN, 1954).

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For high arctic islands the species and family numbers are markedly lower: 5 and 1 for Jan Mayen, 14 and 2 for Svalbard, and 13 and 4 for Ellesmere Island, respectively (Table 1). When comparing two high arctic faunas, in Svalbard and Ellesmere Island, the species number is almost equal but the number of families is two for Svalbard and four for Ellesmere Island. The main factor resulting in only two families in Svalbard seems to be the isolation: the distance from Svalbard to Greenland is 450 km, to Scandinavia 700 km and to Novaya Zemlya 900 km. The sounds of Canadian high arctic archipelago are much narrower (ca. 100 km). Clearly richer spider fauna is found in the low arctic Belcher Islands in Hudson Bay: 33 species and 8 families.

The numbers of species and families in the surrounding areas (Scotland, Norway in Scandinavia, Quebec in eastern Canada) is much higher than that in the North Atlantic islands: 400-550 species and 20-30 families (KOPONEN, 1993).

The proportion of Holarctic species (Table 1) is lowest (one fourth) on the Faroe Islands and highest in Svalbard (86 %). More than half of the species are also Holarctic even in the northern Nearctic sites (Ellesmere Island 54 % and Belcher Islands 58 %). The composition of the Greenlandic fauna at the eastern border of the Nearctic region is special; Holarctic and Nearctic species each comprise about 40 % of the fauna, and Palaearctic species 20 % (cf. also HOLM, 1967 and KOPONEN, 1982).

The family Linyphiidae (s. lat.) is characteristic for northern areas (see KOPONEN, 1980, 1993). On the islands under consideration (Table 1), its proportion varies from 63 % of all indigenous species (Greenland) up to 93 % (Svalbard) and 100 % (Jan Mayen).

By comparison, the composition of the spider fauna of the Macaronesian islands, in the mid-Atlantic, is presented in Table 2 (based on WUNDERLICH, 1991). Naturally, the fauna is richer on these southern islands, and the proportion of Macaronesian endemics is markedly high (25 -75 %). There are no endemic spiders on the North Atlantic islands. The percentage of widely-distributed species (Cosmopolitan, Holarctic, Palaearctic, etc.) in Macaronesia varies between 15-45 %.

Linyphiidae (s. lat.) species comprise only about 15 % of the total number of spider species on the Macaronesian islands, which is a low figure compared with that of the North Atlantic islands. Only 7 % of the 150 species found on the North Atlantic islands are known also from the Macaronesian islands.

Faunal similarity (as a percentage of jointly-occurring species) in the North Atlantic area is shown in Table 3. The great similarity between Iceland and Scandinavia (93 %), and on the other hand, between the Faroe Islands and Scandinavia (94 %), and the Faroe Islands and Scotland (93 %) is found. The Nearctic island faunas of Greenland and the Belcher Islands differ from the others (i.e., European faunas). The rather narrow (300 km) sound between Iceland and Greenland seems to be a real barrier to dispersal for both directions; the faunal similarity is almost equal between Iceland and Greenland (40 %) and Iceland and Quebec (38 %).

TABLE 1 - Composition of the spider fauna in North Atlantic islands.

Area	Species	Families	Holarctic species %	Linyphiidae species %	Ice-free area 1000 Km ²
Faroe Islands	67	9	24	75	1.4
Iceland	90	10	36	70	89.7
Greenland	70	10	40	63	341.7
Jan Mayen	5	1	60	100	0.3
Svalbard	14	2	86	93	8.0
Ellesmere Island	13	4	54	69	117.6

Belcher Islands	33	8	58	70	2.9

TABLE 2 - Composition of the spider fauna in Macaronesian islands.

Area	Species	Families	Macaronesian endemics %	Widely distr. species %	Area 1000 Km ²
Azores	> 100	25	> 25	45	2.3
Madeira	150	32	> 50	30	0.8
Canary Islands	> 450	38	> 75	15	7.5

TABLE 3 - Faunal similarity (%) in the North Atlantic area.

	Faroe Islands	Iceland
Iceland	63	.
Scandinavia	94	93
Scotland	93	84
Svalbard	57	72
Greenland	23	40
Quebec	27	38
Belcher Islands	20	20

REFERENCES

ASHMOLE, N. P.:

1979. The spider fauna of Shetland and its zoogeographical context. *Proceedings of the Royal Society of Edinburgh* **78B**: 63-122.

BENGTSON, S.-A. & E. HAUGE:

1979. Terrestrial invertebrates of the Faroe Islands: I. Spiders (Araneae): Checklist, distribution, and habitats. *Fauna Norvegica* Ser. B **26**: 59-83.

HACKMAN, W.:

1954. The spiders of Newfoundland. *Acta Zoologica Fennica* **79**: 1-99.

HOLM, Å:

1967. Spiders (Araneae) from West Greenland. *Meddelelser om Grønland* **184**: 1-99.

KOPONEN, S.:

1980. Spider fauna in the Adventfjorden area, Spitsbergen. *Reports from the Kevo Subarctic Research Station* **16**: 13-16.
1982. Spiders (Araneae) from Narssaq, southern Greenland. *Entomologiske Meddelelser* **49**: 117-119.
1992. Spider fauna (Araneae) of the low arctic Belcher Islands, Hudson Bay. *Arctic* **45**: 358-362.
1993. On the biogeography and faunistics of European spiders: latitude, altitude and insularity. *Bulletin de la Société Neuchâteloise des Sciences Naturelles* **116**: 141-152.

LEECH, R. E.:

1966. The spiders (Araneida) of Hazen Camp 81°49'N, 71°18'W. *Quaestiones Entomologicae* **2**: 153-212.

TOFT, S.:

1979. Spiders from Jan Mayen. *Fauna Norvegica* Ser. B **26**: 24-25.

WUNDERLICH, J.:

1991. Die Spinnen-Fauna der Makaronesischen Inseln. *Beiträge zur Araneologie* **1**: 1-619.

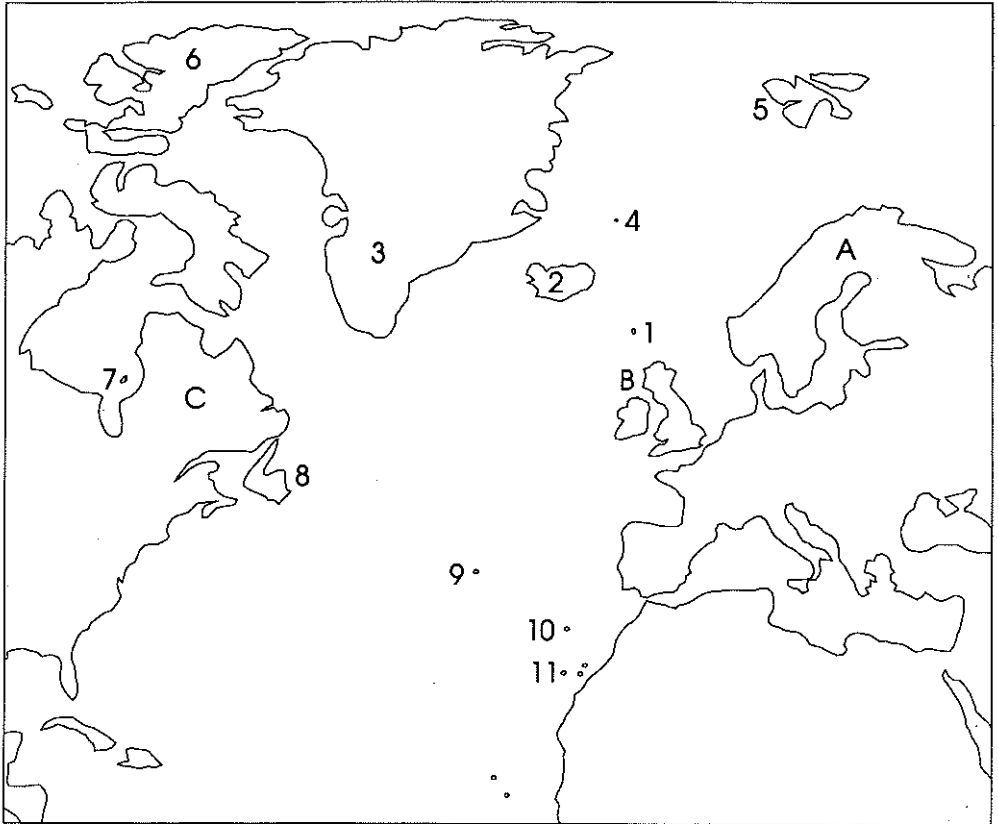


Figure 1 - The location of the islands (1-11) and surrounding areas (A-C) mentioned in the text; 1: Faroe Islands, 2: Iceland, 3: Greenland, 4: Jan Mayen, 5: Svalbard, 6: Ellesmere Island, 7: Belcher Islands, 8: Newfoundland, 9: Azores, 10: Madeira, 11: Canary Islands; A: Scandinavia, B: Scotland, C: Quebec.