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LEADER: KNUD RASMUSSEN

I. SUPPLEMENTARY LIST TO
“SPIDERS (*ARANEINA*) FROM SOUTHEAST
GREENLAND”

II. *ARCTOSA ALPIGENA* DoL. OG
ARCTOSA INSIGNITA TH. (FAM. *LYCOSIDAE*)

BY

JENS BRÆNDEGAARD

WITH 5 FIGURES IN THE TEXT

KØBENHAVN

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BIANCO LUNOS BOGTRYKKERI A/S

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UDGIVET MED STØTTE AF CARLSBERGFONDET

INTRODUCTION

After the printing of "Spiders from Southeast Greenland" a few more spiders were found among the biological material brought home by the 6th and 7th Thule Expedition. These are now included in a supplementary list to this publication, which further contains a characterization of the two species, viz. *Arctosa alpigena* DOL. and *Arctosa insignita* TH. and also an account of the conditions of distribution of these species.

My work with the material of the 6th and 7th Thule Expedition led me to undertake the investigations on which the latter part of this paper is based. In "Preliminary Statement of the Synonymity of Certain Greenland Spiders" I merely mentioned that the two species were not synonymous, and in the interest of arachnological science it is, therefore, my duty to issue the present statement. Some foreign arachnologists have already felt the want of it and have addressed themselves to me regarding the determination of these species. In the arachnological collections all over the world there are, to my knowledge, only 36 specimens of the species *Arctosa insignita* TH. 33 of these are, however, represented in the collections of the Zoological Museum at Copenhagen, and if only for this reason I have also considered it my duty to publish the present statement.

I hereby render due thanks to Professor SV. EKMAN, Zoologiska Institution in Upsala, for having given me an opportunity to investigate THORELL's type of *Arctosa insignita*, and to Dr. E. SCHENKEL of Basle for having sent me some specimens of *Arctosa alpigena* DOL. from the Alps.

I. SUPPLEMENTARY LIST TO SPIDERS (*ARANEINA*) FROM SOUTHEAST GREENLAND

1. *Pardosa groenlandica* THORELL 1872.

63°30' Skjoldungeøen, August 28, 1931: 1 ♂ jun.

2. *Hilaira frigida* THORELL 1872.

59°55' Ikerasak, July 30, 1933: 1 ♂ jun.

3. *Erigone tirolensis* L. KOCH 1872.

65°30' Kap Dan, October 1, 1933: 1 ♂ ad. 1 ♀ jun.

4. *Drassodes signifer* C. L. KOCH 1839.

60°05' north of Augpilagtoq in Qaqarssuaq Sund, October 1, 1932:
1 ♀ juv.

60°25' Tiningnertoq, September 14, 1932: 1 ♂ jun.

63°25' western part of Nukarfik, August 4, 1932: 1 ♂ juv.

Drassodes signifer C. L. K. does not occur in the principal list (1937).
The number of species brought home from Southeast Greenland by
the 6th and 7th Thule Expedition is, therefore, increased to 26.

II. *ARCTOSA ALPIGENA* DOLESCHALL 1852 AND *ARCTOSA INSIGNITA* THORELL 1872

1. CHARACTERIZATION

After having completed his investigations on the spiders of Greenland, WILLIAM SØRENSEN arrived at the result that there was only one species of the genus *Arctosa* in Greenland, and this he had determined as *Trochosa (Arctosa) insignita* THORELL (SØRENSEN 1898). The Icelandic individuals belonging to the same genus he also (1904) classes as being of this species, but EMB. STRAND (1906) calls the species *Arctosa alpigena* DOL., as he is of the opinion that the two species are synonymous, and this has since then been the prevailing opinion.

WILLIAM SØRENSEN, however, (1904) called attention to the fact that the heart spot is yellow on the Icelandic specimens, but white on the Greenlandic ones, and that the dark and light curved stripes behind the heart spot are most clearly defined in the former; this fact I bore in mind when preparing the material of spiders collected on Iceland by CARL H. LINDROTH (BRÆNDEGAARD 1929, 1932).

The colour of the above-mentioned heart spot is due to the hairs covering it. In order to make the colour of these hairs stand out more clearly the animals must be dried, so that the hairs are no longer soaked with alcohol. My investigations led to the result that the colour of the hairs of the heart spot was yellow in the case of the female, whereas in the case of the male it was white, though, it is true, with a faint yellowish tinge. This not only applied to the specimens collected by LINDROTH, but also to the Icelandic individuals of the species, which had been determined by SØRENSEN, and which are to be found in the Zoological Museum of Copenhagen. A male and a female from the Alps, which E. SCHENKEL of Basle kindly presented me with, was throughout of a somewhat darker colour, but the colour of the hairs of the heart spot agreed with those of the Icelandic individuals. I was, therefore, almost inclined to consider the information given by SØRENSEN of the difference in colour between the Icelandic and the Greenlandic specimens as a slip of memory on his part, and to let the matter rest there, until I

began to prepare the material of spiders which was brought home from East Greenland by the 6th and 7th Thule Expedition (BRÆNDEGAARD 1937).

As regards the colour of the hairs of the heart spot the same conditions applied to the East Greenlandic as to the Icelandic specimens, and I was now almost convinced that when SØRENSEN pointed out the difference in colour, he was guilty of an error. In order to be quite certain of the matter, I finally investigated the whole collection of *Trochosa* (*Arctosa*) *insignita* TH. which was to be found in the Zoological Museum, and which had been determined by SØRENSEN, and thus, contrary to expectation, I arrived at the result that the collections from Greenland comprised not one but two species of the genus *Arctosa* (BRÆNDEGAARD 1934).

By making a direct comparison with THORELL's type *Trochosa* (*Arctosa*) *insignita*, it was possible with certainty to refer the other species to this one. These two species which had hitherto been regarded as synonymous may be distinguished from each other by the following characters:

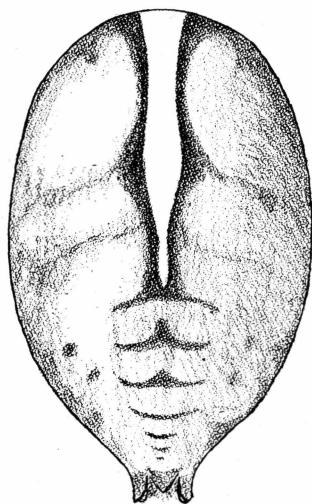
Arctosa insignita TH.

1. The heart spot is long, narrow (fig. 1) and covered by snow-white hairs in ♂ and ♀.
2. The epigynum of the female as fig. 3.
3. The dorsal maculation on the abdomen of the female faint (fig. 1).
4. Outside the heart spot the dorsal hairs of the female are nearly uniform in colour, the brown fundamental colour being not at all or only faintly marked by cross-lines and spots.

Arctosa alpigena DOL.

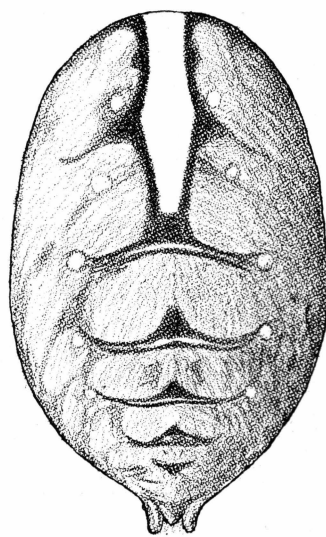
1. The heart spot is shorter, broader, somewhat blunt at the back (fig. 2) and covered by yellow (♀) or white hairs with a faint yellowish tinge (♂).
2. The epigynum of the female as fig. 4.
3. The dorsal maculation on the abdomen of the female very pronounced, with clearly defined cross-lines (fig. 2).
4. Outside the heart spot the dorsal hairs of the female are greatly variegated, the brown fundamental colour being marked by black and white cross-lines and white spots.

Owing to the characteristic lamellæ of the epigynum there is no difficulty in determining adult females. The palpus organs of the males (fig. 5) are nearly alike and, therefore, cannot be used for the determination of species. This also applies to the dorsal hairs of the abdomen,



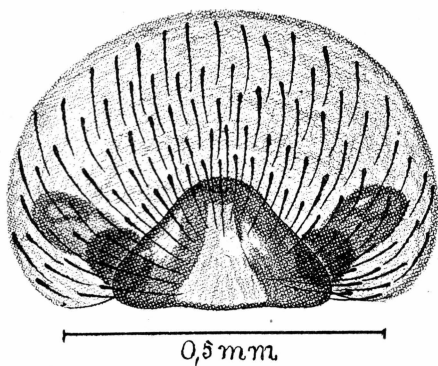
1mm

Fig. 1. *Arctosa insignita* ♀. Dorsal view of the abdomen.



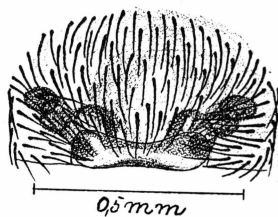
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Fig. 2. *Arctosa alpigena* ♀. Dorsal view of the abdomen.



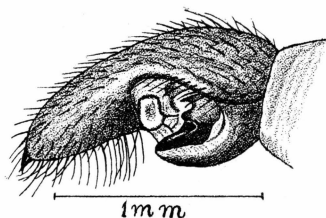
0,5mm

Fig. 3. *Arctosa insignita* ♀. Epigynum.



0,5mm

Fig. 4. *Arctosa alpigena* ♀. Epigynum.



1mm

Fig. 5. *Arctosa alpigena* ♂. Left palpus, ventro-lateral view.

which outside the heart spot are of a uniform greyish brown in the males of both species. The shape of the heart spot, on the other hand, seems a reliable character for the determination of adult males, as also of juvenile specimens. This does not apply to the colour of the hairs of the heart spot, as two adult females (*A. insignita*) with yellow-haired heart spots have been found at Igaliko in Southwest Greenland. A couple of juvenile specimens from West Greenland also had a yellow-haired heart spot, but because of the shape of the heart spot, I think it possible with certainty to refer them to *A. insignita* TH. In the males of both species the heart spot is somewhat broader than in the females and always extends somewhat beyond the centre of the abdomen. In the females of *A. alpigena* DOL. the heart spot never extends as far as the centre, whereas in *A. insignita* TH. it nearly always extends beyond the centre. In three adult females (*A. insignita* TH.) from West Greenland the point of the heart spot hardly extended as far as the centre of the abdomen.

Table I.

Adult <i>Arctosa insignita</i> TH. from West Greenland															
sex	length of cephalothorax in mm												total	numbers	average
♂	3.6	3.7	3.8	3.9	4.0								19.0	5	3.8
♀	3.6	3.6	3.6	3.7	3.8	4.1	4.1	4.1	4.3	4.5	4.5	4.6	48.5	12	4.0

The size of the cephalothorax of the individuals appears from table I. It will be seen that the adult females vary greatly in size (3.6 mm—4.6 mm), whereas the variation of size in the case of the males is somewhat less. On an average the cephalothorax of the male is a little (0.2 mm) smaller than that of the female.

2. SYNONYMS

Arctosa alpigena.

Lycosa alpigena DOLESCHALL 1852.

Lycosa superba L. KOCH 1872.

Trochosa biunguiculata CAMBRIDGE 1873 and 1881.

Lycosa insignita SIMON 1876.

Lycosa albohastata EMERTON 1895.

Trochosa insignita SOERENSEN 1898. (ad. part.) and 1904.

Arctosa alpigena FR. DAHL 1908.

Arctosa lamperti FR. DAHL 1908.

*Arctosa insignita.**Trochosa insignita* THORELL 1872.*Trochosa insignita* SOERENSEN 1898 (ad. max. part.).

Arctosa lamperti FR. DAHL, a few specimens of which have been found in Germany and a single one in Denmark, is a lighter race living in sphagnum mosses. I have formerly (1934) been of opinion that *Lycosa albohastata* EM. was synonymous with *Trochosa insignita* TH.; but by a direct comparison of the individuals of *Lycosa alpina* DOL. from the Alps and *Lycosa albohastata* EM., W. I. GERTSCH (1934) arrives at the result that the latter are synonymous. It is probable that also in America the two closely related species, viz. *A. alpigena* DOL. and *A. insignita* TH. have up to the present been confounded with one another (see post-script p. 12).

3. DISTRIBUTION

Arctosa insignita THORELL.

In Greenland: In the Zoological Museum of Copenhagen there are 17 adult and 15 juvenile specimens from West Greenland. THORELL's type originated from West Greenland, and this also applies to an adult male recorded by A. RANDELL JACKSON in 1937. According to these finds the species is on record from Ilua (59°55') to Jacobshavn (69°15') in West Greenland. A young female has been found at Kangerdluarak (60°35') in East Greenland, which must presumably be referred to this species.

Out of Greenland: Up to the present the species is hitherto only on record from Greenland; but W. I. GERTSCH informs me that an adult female was found at Churchill (Manitoba, Canada), which he supposed belonged to this species. A sketch of the epigynum of the latter was sent to me and proved his supposition to be correct. Therefore, *A. insignita* TH. must be considered a nearctic species.

Arctosa alpigena DOL.

In Greenland: With the exception of the young female already mentioned from Kangerdluarak, all the other individuals of the genus *Arctosa* from East Greenland belong to this species. 13 individuals in all have been found, of which however only three adult males and one adult female. On the strength of these finds the species is known from eastern Ikerasak (59°50') and as far as Scoresby Sund (70°25'). The species is not on record from West Greenland.

Out of Greenland: Western Siberia, the Murman Coast, Iceland, Norway, Sweden, Denmark, Germany, the Alps, the British Isles, the

United States of America and Canada. In Europe the species seems to prefer humid localities, and this agrees very well with its occurrence in East Greenland.

4. CLIMATIC-ECOLOGICAL CONDITIONS

Judging by the finds at hand, these two closely related species live each in their clearly defined area on Greenland, and it is therefore an obvious task to try to find out what may be the cause of this, in other words whether this fact may be explained by climatic-ecological conditions.

One of the results of the investigations in East Greenland which were begun in 1931—32 (6th—7th Thule Expedition, 2nd Scoresby Sound Expedition and the Three-Year East Greenland Expedition) is that it can now be regarded as a fact that there are two fauna areas in East Greenland, *viz.* a northern and arid, and a southern and humid one (BRÆNDEGAARD 1936, DEGERBØL 1937).

DEGERBØL is of the opinion that the boundary line between the two fauna areas must be drawn approximately at Kap Ravn ($68^{\circ}30'$) where many icebergs ground on the submarine ridge, which extends from Greenland to Iceland and forms an obstacle to the free drift of the pack ice in a southern direction, whereas the Irminger current (a branch of the Gulf Stream) makes its influence felt south of this latitude. He demonstrated the most southerly occurrence of many of the arid arctic species in Wiedemanns Fjord directly north of Kap Ravn and is, therefore, of the opinion that it would be more correct to draw the boundary line here than at Scoresby Sund (BRÆNDEGAARD 1936).

In the case of the spiders three species are of such common occurrence north of Scoresby Sund that they may be termed characteristic of the arid arctic fauna. In the Franz Joseph Fjord area (72° — 73°) I have myself had the opportunity to notice that all three are pronouncedly heliophilous animals and, therefore, cannot be imagined to live in the humid arctic area, where fog, rain and sleet are the rule and sunshine the exception. These species and their distribution in Greenland appear from table II.

Table II.

	East coast	West coast
<i>Dictyna borealis</i> CB.	$68^{\circ}10'$ — $76^{\circ}50'$	$59^{\circ}55'$ — 74°
<i>Pardosa glacialis</i> TH.	$69^{\circ}24'$ — $76^{\circ}50'$	$64^{\circ}10'$ — $74^{\circ}44'$
<i>Hilaira curvitaris</i> SOER.	$70^{\circ}25'$ — $76^{\circ}50'$	$68^{\circ}45'$ — 74°

The most southerly occurrence of the three species on the east coast is in Mikis Fjord, Kap Dalton and Scoresby Sund, respectively,

and this at least seems to indicate that Blosseville Kyst (68° — $69^{\circ}30'$) must be regarded as a boundary area. On the west coast the area of distribution of these species extends considerably farther south. This, however, also applies to other animals, as e.g. to insects belonging to the arid arctic area. The cause of this is beyond doubt that the climatic-ecological conditions on the east coast are different from those on the west coast.

From Scoresby Sund (70°) the east coast consists of a narrow, ice-free coast land, where the ocean may everywhere make its influence felt, whereas the corresponding southerly part of the west coast nearly everywhere consists of a broad ice-free coast land, which in the Holsteinsborg District even attains a width of about 200 km. Here it is, therefore, only the actual coast land which has an oceanic climate of a similar character to that of the east coast, whereas the hinterland is comparatively arid in character and so offers excellent conditions for the development of the heliophilous species. From here they naturally also emigrate in the direction of the coast, whereas the humid species emigrate in the opposite direction, thus giving rise to the composite fauna, which is characteristic of the southern part of the west coast.

As already mentioned, *Arctosa insignita*'s area of distribution extends from Ilua ($59^{\circ}55'$) and as far as Jacobshavn ($69^{\circ}15'$). Should it be supposed to be one of the heliophilous species of the west coast, it is only natural that the species cannot live on the humid part of the east coast. The single specimen found on the east coast in Kangerdluarak ($60^{\circ}35'$) may have emigrated there from the west coast which in this place lies very near it.

The above-mentioned find of *Arctosa insignita* TH. from Churchill supports the supposition that it is a species belonging in arid and sunny areas; but this question can only be answered with any degree of certainty, when a greater number of finds are at hand from the nearctic area outside Greenland.

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Post scriptum

After this paper had passed into print, Dr. W. J. GERTSCH, New York, sent me the following information with permission to publish the same:

"During the past few months I have been able to study a considerable amount of material in this group (*Arctosa*) from the Museum of Comparative Zoology at Cambridge, Mass., and from the Canadian National Collections at Ottawa, Ontario, as well as the specimens in the American Museum of Nat. Hist., New York. Up to the present time I have seen nine females of *A. insignita* TH. from the following localities: Natchook Bay (Labrador), Churchill (Manitoba), Point Burwell (Quebec), Lake Harbour (Baffin Island), Great Whale River (New Quebec), Richmond Gulf (New Quebec)".

This proves the supposition that American scientists have hitherto confounded *A. insignita* TH. and *A. alpigena* DOL. and also that *A. insignita* TH. is a nearctic species.