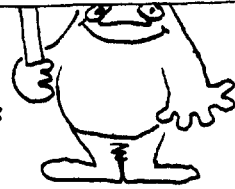


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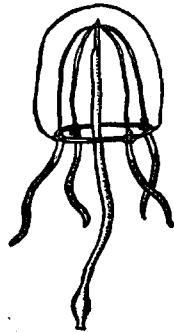


**THE GENERA *SPIRONTOCARIS*, *LEBBEUS*, *EUALUS*
AND *THORALUS* IN NORWEGIAN WATERS (CRUST. DEC.)**

By

LITA GREVE

Zoological Museum, Bergen



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ABSTRACT

The paper deals with the genera *Spirontocaris*, *Lebbeus*, *Eualus* and *Thoralus*, with eight species (see Contents), their systematic position, and their occurrence along the Norwegian coast. *S. lilljeborgii*, *L. polaris* and *E. pusiolus* are common in the whole area. *T. cranchii* and *E. occultus* are frequently found in southern Norway. *E. occultus* is recorded for the first time from Norway. *S. spinus*, *S. phippsi* and *E. gaimardii* are common in north Norway, having their southern limit in western Norway. A key to the Norwegian species is given, and a short note on the two parasitic isopods found.

INTRODUCTION

Seven of the species treated here have been surveyed earlier by APPELLÖF (1906) in western Norway, and by DONS (1915) in northern Norway. Since then much new material has been collected and new species have been found elsewhere demanding a new investigation of the Norwegian species.

According to HOLTHUIS's (1947) revision, the genus *Spirontocaris* BATE, 1888 numbers four genera in Norwegian waters, *Spirontocaris* BATE, 1888; *Lebbeus* WHITE, 1847; *Eualus* THALLWITZ, 1892 and *Thoralus* HOLTHUIS, 1947, with eight species: *S. spinus* SOWERBY, 1805; *S. lilljeborgii* DANIELSEN, 1859; *S. phippsi* KRÖYER, 1841; *L. polaris* SABINE, 1821; *E. pusiolus* KRÖYER, 1841; *E. gaimardii* H. MILNE-EDWARDS, 1837; *E. occultus* LEBOUR, 1936; *T. cranchii* LEACH, 1817. None of these species is specific for Norwegian waters, and in other parts of the world the genera number many more species.

¹ Contribution from the Biological Station, Espeland, Blomsterdalen.

MATERIAL

The survey is based on 3413 specimens of the eight above-mentioned species. The major part of the material was obtained from the zoological museums in Oslo (Z.M.O.), Bergen (Z.M.B.), Trondheim and Tromsø. The rest of the material was collected by me in the area around the Biological Station, Espegrend, except for a few specimens which Mr. F. BEYER collected for me in the Oslofjord. The following measurements have been taken: 1) The total length from the point of rostrum to the edge of telson. 2) From the point of rostrum to the posterior edge of the carapace (The latter measurement in brackets in the key and Table 1). The first measurement is helpful for comparison with older records, the second measurement is unaffected by the pronounced hump of the abdomen. Only two species, *S. lilljeborgii* and *L. polaris*, are occasionally taken in larger numbers. I have not discussed any of the larval stages, for these see e.g. LEBOUR, 1932, 1937, 1940.¹

Key to the Norwegian species

1. Carpus of second pereopod with six segments. Max. size 22 (6) mm . . . *T. cranchii* (p. 38)
Carpus of second pereopod with seven segments 2
2. Two supraorbital spines (Gen. *Spirontocaris*) 3
One supraorbital spine. Max. size 66 (23) mm *L. polaris* (p. 35)
No supraorbital spine (Gen. *Eualus*) 5
3. Spines on dorsal edge of rostrum reach from point of rostrum to posterior edge of carapace. Third abdominal segment drawn out dorsally into a process partly covering the fourth segment. The two suborbital spines of equal size. Max. size 50(17) mm . . . *S. spinus* (p. 30)
Spines on dorsal edge of rostrum do not reach the posterior end. No dorsal process on third abdominal segment 4
4. Rostrum distally slightly upwards bent. Spines on dorsal edge reach from point of rostrum approximately $\frac{2}{3}$ way back towards posterior edge of carapace. The two supraorbital spines of equal size, both clearly visible. Eye + eyestalks $< \frac{1}{2}$ rostrum. Max. size 74 (28) mm *S. lilljeborgii* (p. 32)
Rostrum straight. Spines on dorsal edge reach from point of rostrum approximately $\frac{1}{2}$ back towards posterior edge of carapace. One supraorbital spine usually smaller than the other, and often hidden by the bigger one. Eye + eyestalks $\leq \frac{1}{2}$ rostrum. Max. size 32 (11) mm *S. phippii* (p. 33)
5. Three first pairs of pereopods with epipodits. Rostrum occasionally bifurcate. Max. size 28 (7) mm *E. pusiolus* (p. 35)
Two first pairs of pereopods with epipodits 6
6. Rostrum never furcate. Spines on both dorsal and ventral edge of rostrum. Max. size 76 (26) mm *E. gaimardii* (p. 36)
Rostrum always bi- or trifurcate (cf. *E. pusiolus*). No spines on ventral edge of rostrum. Max. size 22 (6) mm *E. occultus* (p. 38)

Spirontocaris spinus (FABRICIUS, 1775) SOWERBY, 1805.

(Fig. 1A, C)

S y n o n y m y. HOLTHUIS, 1947.

M a t e r i a l. 313 specimens (220 ♀♀, 90 ♂♂, 3 sex.?).

¹ A list covering the total number of stations can be found in L. GREVE "Noen systematisk-ökologiske undersøkelser over slektene *Spirontocaris*, *Lebbeus*, *Thoralus* og *Eualus* i norske farvann" (unpublished) deposited under "Msex" at the University Library in Bergen.

Description. For a good description see BALSS, 1926. *S. spinus* is of the same size as *S. lilljeborgii*.

Discussion. For systematic characteristics of *S. spinus* see the key. Formerly some authors placed *S. spinus* and *S. lilljeborgii* together as races of *S. spinus* (HANSEN, 1887; DOFLEIN, 1900). Sex-dimorphism occurs, most pronounced in older individuals. The females are stouter than the males. Rostrum of the female with several small spines between the point of rostrum and the first large ventral spine (Fig. 1A). These spines are missing in the male (Fig. 1C), the rostrum of which resembles that of *S. lilljeborgii* (cf. Fig. 1B, D); this resemblance may have been the main reason for earlier confusion of *S. spinus* and *S. lilljeborgii*.

Size. See. Table 1.

Table 1. Own size measurements. in mm (numbers in brackets length of rostrum + carapace).

Species (race)	No. of specimens measured	Norwegian waters				Other localities				Smallest with eggs in Norwegian waters
		♀♀	No.	♂♂	No.	♀♀	No.	♂♂	No.	
<i>S. spinus</i>	313	17(5)–50(17)	171	21(7)–35(11)	60	30(10)–60(21)	43	27(10)–55(19)	28	28(10)
<i>S. lilljeborgii</i>	616	14(4)–74(28)	410	17(6)–47(18)	144	14(4)–69(21)	45	31(9)	3	39(14)
<i>S. phippii</i>	222	17(5)–32(11)	146	15(5)–24(8)	46	33(11)–59(29)	20	—	—	—
<i>L. polaris</i>	610	14(5)–66(23)	303	24(8)–51(17)	108	23(18)–90(33)	105	30(11)–82(30)	64	43(17)
<i>E. gaimardii</i>										
<i>gaimardii</i>	1177	12(3)–57(21)	903	18(6)–40(15)	225	—	—	—	—	33(14)
<i>E. gaimardii gibba</i>	103	51(18)–76(26)	14	38(13)–65(25)	6	27(10)–57(20)	56	41(14)–53(19)	27	—
<i>E. gaimardii belcheri</i>	78	—	—	—	—	43(16)–80(30)	49	39(19)–60(23)	25	—
<i>E. pusiotus</i>	231	9(3)–28(7)	193	11(3)–16(4)	13	9(3)–23(7)	11	13(3)	1	16(4)
<i>E. occultus</i>	21	9(3)–22(6)	20	10(4)	1	—	—	—	—	13(4)
<i>I. cranchii</i>	42	11(4)–22(6)	37	13(3)–15(4)	2	—	—	—	—	14(4)

Colour. SMITH (1879) describes the colour as like that of *S. lilljeborgii*. I have not seen any living specimens myself.

Spawning. GRIEG (1926) mentions females with ripe eggs in February to April at localities in western Norway. According to HOFSTEN (1916) and CHRISTIANSEN and CHRISTIANSEN (1962) females carry eggs during summer and early autumn in arctic waters. I have females with ripe eggs taken in March at two localities in northern Norway, and I have seen females with eggs from Ellesmere Land taken 27 July. A difference in time of spawning for individuals from arctic and boreal waters is thus not unlikely. For smallest female with eggs see Table 1.

General distribution. From Bay of Massachusetts to Gulf of St. Lawrence (SMITH, 1879); west coast of Greenland (HANSEN, 1887); Ellesmere Island (HEEGAARD, 1941); Iceland (STEPHENSON, 1939); Jan Mayen, Spitzbergen, Franz Josephs land (HEEGAARD, 1941); Cheskaya Bay, Novaja Semlja (SUWOROV, 1929); coast of Norway, south to Moster (DANIELSEN, 1861); Bohuslän, Sweden (APPELLÖF, 1906).

Norwegian distribution. *S. spinus* is common in north Norway, rare in western Norway, where it occurs south to Moster. Most probably the record from

Bohuslän (APPELLÖF, 1906) is due to confusion with *S. lilljeborgii*, which is common in the Bohuslän area. The southern border line for *S. spinus* in Europe is therefore probably in western Norway. In Norway *S. spinus* has been found down to 400 m, but most localities are above 200 m. STEPHENSEN (1935) reports specimens taken at 930 m on the coast of west Greenland, but most of his specimens were taken above 300 m. *S. spinus* is found on both hard and sandy bottoms, often among algae.

Spirontocaris lilljeborgii DANIELSSEN, 1859.

(Fig. 1B, D)

Synonymy. HOLTHUIS, 1947.

Material. 616 specimens (465 ♀♀, 149 ♂♂, 2 sex?).

Description. For a good and detailed description see HOLTHUIS, 1950. Discussion. For systematic characteristics see the key. A certain sex-dimorphism exists, but is not so well marked in *S. lilljeborgii* as in other species, e.g. *S. spinus*. The females are stouter than the males. The ventral part of the rostrum of the female is pronouncedly convex, tapering rapidly towards the point (Fig. 1B), and that of the male is narrow and only slightly convex (Fig. 1D), but intermediate rostrum forms are common, especially in young individuals. Sex-dimorphism is most pronounced in older individuals.

Size. See Table 1. The specimens from north Norway are smaller than those from south Norway.

Colour. Body bright red. Extremities with ribbons of red. Ends of claws, and the eyes brownish black.

Spawning. The females carry their eggs during the winter months (cf. PIKE, 1954). My material contains females with eggs from November to May. For smallest female with eggs in my material see Table 1.

General distribution. Massachusetts Bay to Nova Scotia (SMITH, 1879); Nova Scotia to Davis Strait (HEEGAARD, 1941); Greenland (STEPHENSEN, 1912(?)); Iceland (STEPHENSEN, 1939); northern Norway (DONS, 1915); western Norway (APPELLÖF, 1906); Oslofjord area (DANIELSSEN and BOECK, 1872); Skagerak, Kattegat (BALSS, 1872); Kiel (KEMP, 1910); Holland (HOLTHUIS, 1947); Scotland, Isle of Man, Plymouth (PIKE, 1954); Irland (KEMP, 1910).

Norwegian distribution. *S. lilljeborgii* is common along the Norwegian coast, but becomes scarcer in Finnmark. In the Bergen area I have obtained fifty to hundred specimens in one trawl haul. Southern Norway seems to be in the center of its area of distribution, and the specimens here are of maximum size. *S. lilljeborgii* prefers waters between 30 and 300 m deep and is seldom taken above this level though occasionally deeper. Greatest depth of my material is 600 m in Oksfjord, Finnmark. SMITH (1882-83) reports a locality at app. 1000 m from New England.

S. lilljeborgii is found on varying bottoms, both hard and muddy, but seems to prefer mud bottom. My largest catch is from such a bottom.

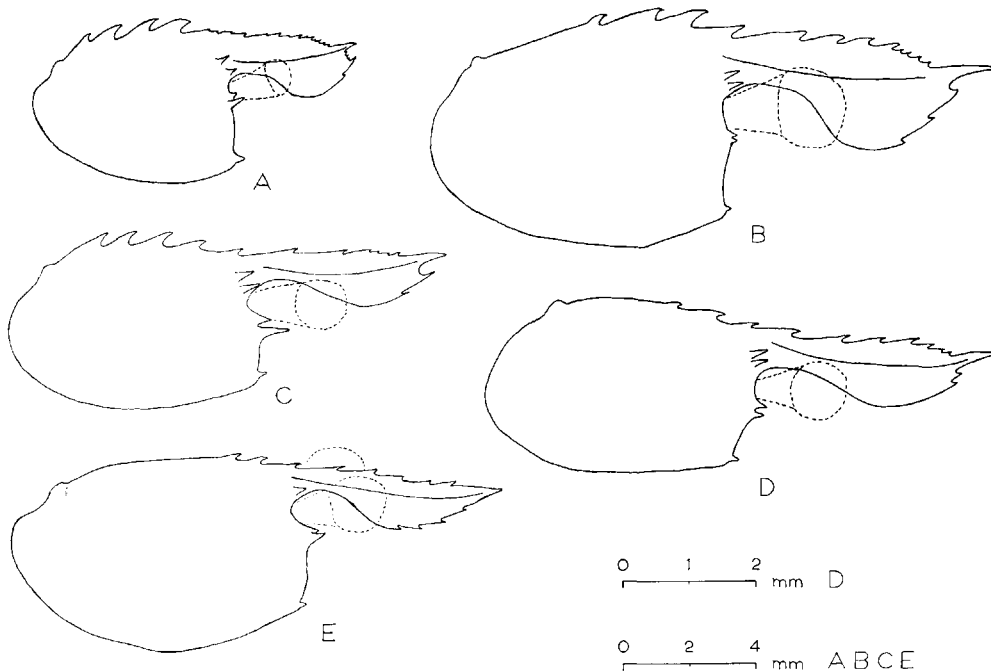


Fig. 1. A. *Spirontocaris spinus* ♀. B. *S. lilljeborgii* ♀. C. *S. spinus* ♂. D. *S. lilljeborgii* ♂. E. *Lebbeus polaris* ♀.

Spirontocaris phippisi KRÖYER, 1941.

(Fig. 2C, D)

Synonymy. HOLTHUIS, 1947.

Material. 222 specimens (173 ♀♀, 46 ♂♂, 3 sex?).

Description. For systematic characteristics see the key. Some specimens have weakly developed supraorbital spines and individuals with one spine only occur (SMITH, 1879; SIVERTSEN, 1932). When two spines occur the bigger one can cover the other one more or less. Sex-dimorphism occurs and is most marked in older individuals. In the female the number of spines on the dorsal edge of rostrum varies from 13 to 9, on the ventral edge from 6 to 3 (Fig. 2C). In the male the number of spines on the dorsal edge of rostrum varies from 12 to 7, on the ventral edge from 4 to 1 (Fig. 2D). Thus a marked indication of a smaller number of spines in the males is found, but intermediate forms of rostrum do occur in both sexes.

Size. See Table 1.

Colour. See SMITH (1879).

Spawning. KLÆR (1904) has finds in autumn and winter from northern Norway. DONS (1915) says that he has no finds from May to September in the

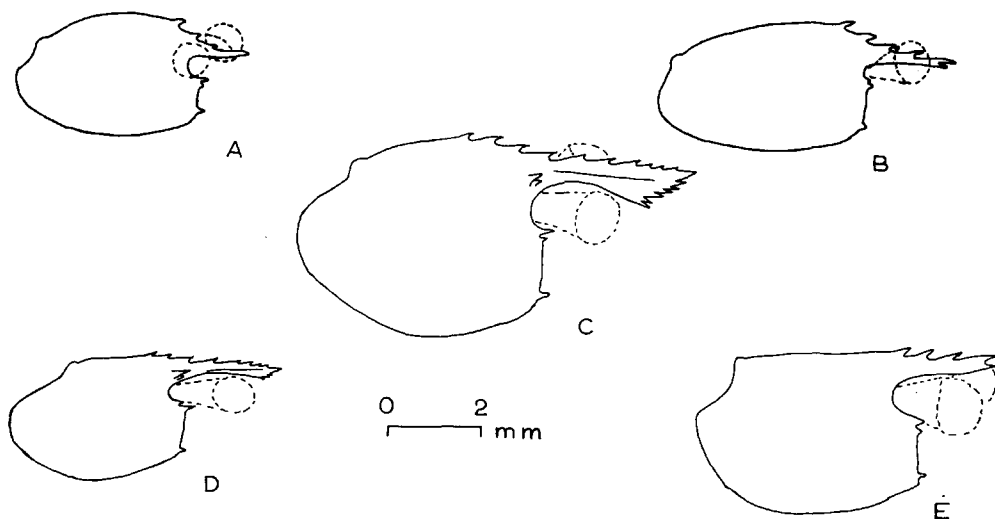


Fig. 2. A. *Eualus pusiolus*, normal rostrum. B. *E. pusiolus*, abnormal bifurcate rostrum. C. *Spirontocaris phippii* ♀. D. *S. phippii* ♂. E. *Eualus occultus*.

same area. HEEGAARD (1941) reports females with eggs in earliest stage from July and August in east Greenland. A difference in spawning time between boreal and arctic waters is thus not unlikely. I have no observations of my own.

General distribution. Aleutian Islands, north coast of Alaska, Bering Strait, east Siberia (STIMPSON, 1860); west Siberia (BIRULA, 1910); Novaja Semlja (HELLER, 1875); Cheskaya Bay (SUVOROV, 1929); Franz Josephs Land (MIERS, 1881); Spitsbergen (HOFSTEN, 1916); northern Norway (DONS, 1915); Bergen? (see below); Koster, Bohuslän Sweden (HOFSTEN, 1916); north east Greenland (STEPHENSEN, 1912); Massachusetts Bay to Nova Scotia (SMITH, 1879).

Norwegian distribution. *S. phippii* is not so common in northern Norway as the other North-Norwegian species treated here. It is found south to the Trondheimsfjord, but there it grows scarce. Z.M.B. has one locality labelled "Bergen, Koren", but according to verbal information from J. KJENNERUD and H. TAMBS-LYCHE this label is probably not trustworthy. However, HOFSTEN (1916) mentions localities from Bohuslän and Koster in Sweden. I have not gone through his material, but there is reason to believe that it is wrongly determined, and that the southern border for *S. phippii* is Kristiansund N. (KRÖYER, 1841; HOLTHUIS, 1947).

In Norwegian waters *S. phippii* prefers shallow areas, 5 to 55 m (DONS, 1915). HEEGAARD (1941) records it from 290 m in the White Sea. My observations show that *S. phippii* prefers *Laminaria* and *Lithotamnion* and often occurs on sandy bottoms (cf. HEEGAARD, 1941).

Lebbeus polaris SABINE, 1821.

(Fig. 1E)

Synonymy. HOLTHUIS, 1947.

Material. 610 specimens (420 ♀♀, 179 ♂♂, 11 sex ?).

Description. See SABINE, 1821.

Discussion. *L. polaris* can always be identified by means of its single supra-orbital spine. Sex-dimorphism is well pronounced in older individuals. Rostrum of the female with spines on both dorsal and ventral edges (Fig. 1E). Spines are lacking in older males. Such males were described as a separate species, *Hippolyte borealis*, by KRÖYER (1841). In younger males, however, rostrum types occur which are intermediate between those of the females and older males. Spinous rostrum forms have been observed in males up to a size of 43 mm.

Size. See Table 1.

Colour. *L. polaris* has "colour pale with red spots and markings" SABINE (1821). Points of claws, and eyes brownish black.

Spawning. Both NORDGAARD (1911) and GRIEG (1926) report females with eggs in November from western Norway. NORDGAARD also records a female with eggs from 15 July 1902. I have not found this female in the collections of Z.M.B. HEEGAARD (1941) has females from east Greenland with eggs the whole year. From northern Norway I have females with eggs in the summer months; from western Norway in March and May, females with eggs near hatching. Either the females carry all through the year, or there is a difference in the time of spawning between southern and northern Norway. For smallest female with eggs in my material see Table 1.

General distribution. Cape Cod (HOLTHUIS, 1947); Massachusetts Bay to Labrador (SMITH, 1879); west Greenland (HANSEN, 1887); Iceland (STEPHENSEN, 1939); Jan Mayen (HANSEN, 1908); northern Norway (DONS, 1915); western Norway (APPELLÖF, 1906); Skagerak, Kattegat (BALSS, 1926); the Faroes (HANSEN, 1908); Shetland (KEMP, 1910).

Norwegian distribution. *L. polaris* is common all along the Norwegian coast from the littoral down to 700 m, but most localities are between 30 and 300 m. STEPHENSEN (1935) has one locality from 930 m off west Greenland. He also mentions that small individuals prefer shallower water than bigger ones. My material does not support this view.

L. polaris is found on varying bottom material from hard to mud bottom. I have often taken it in trawls from the layer immediately over a muddy bottom.

Eualus pusiolus KRÖYER, 1841.

(Fig. 2A, B)

Synonymy. HOLTHUIS, 1947.

Material. 231 specimens (212 ♀♀, 14 ♂♂, 5 sex ?).

Description. For a detailed description see HOLTHUIS, 1950. *E. pusiolus* is of the same size group as *E. occultus* and *T. cranchii*.

Discussion. For systematic characteristics see the key. There is no distinct difference between the two sexes. Nearly all specimens (99%) in my material have a rostrum like Fig. 2A. Occasionally a few individuals have bifurcate rostrums (Fig. 2B). The number of spines on the dorsal edge varies from 2 to 5, the higher number occurring in older specimens, though one specimen 9 mm long had as many as four spines. Specimens longer than 13 mm, and with less than 3 spines have never been observed.

Size. See Table 1. One female from the Hardangerfjord 28(7) mm (Z.M.B.) represents maximum size for Europe (cf. HOLTHUIS, 1950).

Colour. Dark brownish green, very like the colour of the *Laminaria* among which it prefers to reside. Stripes of red-brown on body and extremities. Eyes blackish brown. Eggs green.

Spawning. At fourteen localities from all parts of Norway berried females were observed. In January the eggs were undeveloped, in August near hatching. No obvious difference in spawning time for northern and southern Norway.

General distribution. From Gulf of Connecticut to Gulf of St. Lawrence (SMITH, 1879); coast of Murman (DOFLEIN, 1900); north Norway (DONS, 1915); western Norway (APPELLÖF, 1906); Skagerak, Belt Sea, north part of the Sound (SCHELLENBERG, 1928); Shetland (WHITE, 1857); Scotland (DOFLEIN, 1900); Isle of Man (MOORE, 1937); Ireland (KEMP, 1910); England (WHITE, 1857); Holland (HOLTHUIS, 1950); western part of the Mediterranean (ZARIQUIEY CENARRO, 1935); Alaska, Aleutian Islands, Bering Island (HOLTHUIS, 1947).

Norwegian distribution. *E. pusiolus* is found all along the Norwegian coast. It is one of the most common prawns in northern Norway (DONS, 1915). I have found it from the littoral down to 810 m off Granvin in the Utnefjord, (part of the Hardangerfjord). Earlier it had not been found deeper than 500 m (APPELLÖF, 1906; HOLTHUIS, 1947).

E. pusiolus prefers sandy bottom with algae; some of my localities consisted merely of *Lithothamnion*, and at the locality in the Utnefjord of fine, sandy clay.

Eualus gaimardii MILNE-EDWARDS, 1837.

(Fig. 3)

Synonymy. HOLTHUIS, 1947.

Material. 1358 specimens (1046 ♀♀, 286 ♂♂, 26 sex ?).

Description. For a detailed description of the three races see BIRULA (1910). *E. gaimardii gaimardii* and *E. gaimardii gibba* occur in Norwegian waters, *E. gaimardii belcheri* in the Arctic, east of Norway.

Discussion. For safe characteristics see the key. Females of *E. g. gibba* and *E. g. gaimardii* are not clearly differentiated from each other. See DONS (1915).

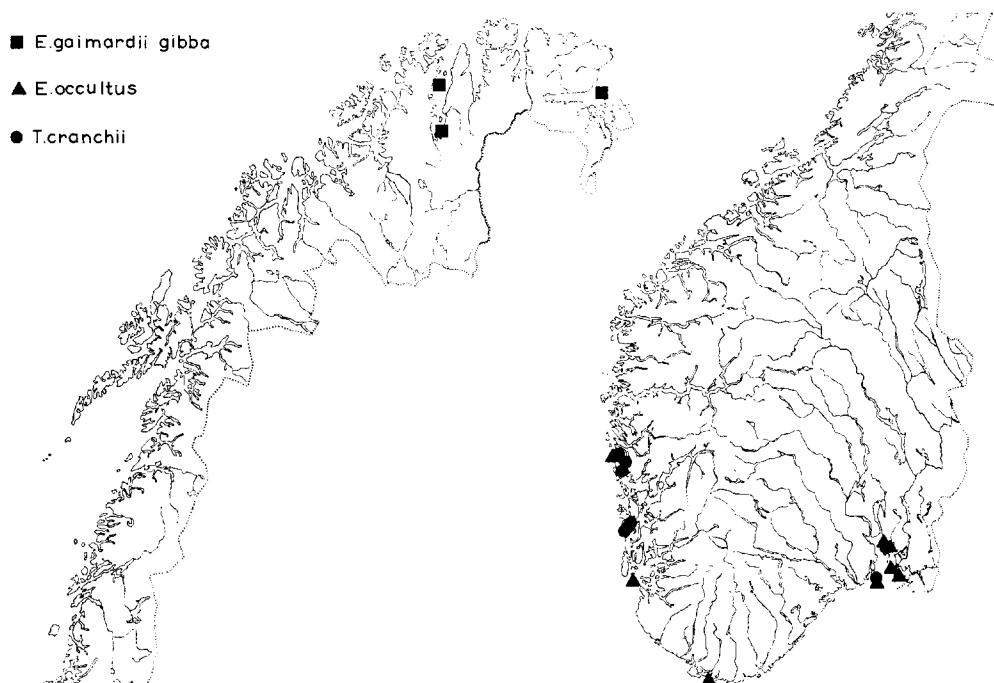


Fig. 3. Distribution of *Eualus gaimardii gibba*, *E. occultus* and *Thoralus cranchii*.

Size. See Table 1.

Colour. SMITH (1897) describes the colour as greenish-brown, viz. like *E. pusiolus*, but I have seen specimens coloured like *L. polaris* (see p. 35).

Spawning. GRIEG (1926) reports females from western Norway with eggs in the winter months. From the same area I have a female with unripe eggs taken late September, and females with eggs near hatching in March. The material is small, but egg-carrying during the winter months is thus indicated for *E. g. gaimardii*.

In northern Norway *E. g. gibba* females with eggs were taken twice in July. I have seen some specimens from the Arctic belonging to *E. g. gibba* and *E. g. belcheri* with eggs in the summer months.

General distribution. Boston to Labrador (SMITH, 1879 *E. g. gaimardii*); Hudson Bay (STEPHENSEN, 1935 *E. g. gibba*); west Greenland (STEPHENSEN, 1912 *E. g. gibba*); east Greenland (HEEGAARD, 1941 *E. g. gaimardii* and *E. g. gibba*); Jan Mayen (STEPHENSEN, 1912 *E. g. gibba*); Iceland (STEPHENSEN, 1939, BIRULA, 1907 *E. g. gibba*); Franz Josephs land (SCOTT, 1899 *E. g. gibba*); Cheskaya Bay (SUVOROV, 1929 *E. g. gaimardii* and *E. g. gibba*); Iceland (STEPHENSEN, 1935 *E. g. gaimardii*); northern Norway (DONS, 1915 *E. g. gibba* and *E. g. gaimardii*); western Norway (APPELLÖF, 1906 *E. g. gaimardii*); Kiel (DAHL, 1928 *E. g. gaimardii*); Shetland, Scotland, England (WHITE, 1857 *E. g. gaimardii*), The third race, *E. g. belcheri*, has been recorded from the Kara Sea (GORBUNOW, 1934) and east Siberia (SIVERTSEN, 1932).

Norwegian distribution. Of the two races, *E. g. gaimardii* occurs all along the coast, but is rare in the Oslofjord area, and *E. g. gibba* eastwards from the Porsangerfjord, see map (Fig. 3). In the last century *E. g. gaimardii* was common along the whole coast of southern Norway (KRÖYER, 1841), but it is not a common species in southern Norway nowadays.

E. g. gaimardii prefers shallow water from the littoral down to 50 m, my deepest locality being 275 m. All my *E. g. gibba* from Norwegian waters were taken deeper than 100 m. STEPHENSEN (1935) has taken *E. g. gibba* at 930 m off west Greenland.

E. g. gaimardii has been taken among algae on sandy bottom, hard bottom and clay bottom. *E. g. gibba* lives on harder mud bottom with stones and gravel off east Greenland (HEEGARD, 1941).

Eualus occultus LEBOUR, 1936.

(Fig. 2E, 3)

Synonymy. HOLTHUIS, 1947.

Material. 21 specimens (20 ♀♀, 1 ♂).

Description. For a detailed description see LEBOUR, 1936.

Discussion. *E. occultus* is easy to distinguish from *E. g. gaimardii* because of the bi- or tri-furcate rostrum of the former. For other safe characteristics see the key. *E. occultus* also possesses a two-jointed mandibular palp. The spines on the dorsal edge of rostrum may vary from 2 to 4. The males tend to be smaller than the females. Shape of rostrum (Fig. 2E).

Size. See Table 1.

Colour. Like *E. pusiolus*.

Spawning. At five localities berried females were observed from late April (with unripe eggs) to August (eggs near hatching).

General distribution. Cadaques, north-east Spain (ZARIQUIEY ALVAREZ, 1956); coast of Catalonia (ZARIQUIEY CENARRO, 1935); Plymouth (LEBOUR, 1936); the Gullmarfjord and the Koster area, Sweden (P. TULKKI, verbal information).

Norwegian distribution. See map, Fig. 3. *E. occultus* is not found north of the Bergen area. It is found from the littoral to 25–40 m.

E. occultus prefers *Laminaria* and *Fucus* on sandy bottom, and often occurs together with *T. cranchii*.

Thoralus cranchii LEACH, 1817.

(Fig. 3)

Synonymy. HOLTHUIS, 1947.

Material. 42 specimens (37 ♀♀, 2 ♂♂, 3 sex ?).

Description. For a detailed description see HOLTHUIS, 1950.

Discussion. For systematic characteristics see the key. The rostrum of

T. cranchii cannot be distinguished from that of *E. occultus*. This is the reason why previous authors often group the two species together.

S i z e. See Table 1.

Colour. Like *E. pusiolus*.

Spawning. At four localities in southern Norway berried females were observed from June to August; in August the eggs were near hatching.

General distribution. Before 1936, and probably confused with *E. occultus*. Vadsö (?) (DANIELSSEN and BOECK, 1872); Tromsö (DONS, 1915); western Norway (APPELLÖF, 1906); Bohuslän, Sweden (DOFLEIN, 1900); coast of Ireland (KEMP, 1910); south coast of England (WHITE, 1857); the English Channel, Belgium, St. Malo, the Adriatic (DOFLEIN, 1900). After 1936. Cadaques, north-east Spain (ZARIQUIEY ALVAREZ, 1956); coast of Catalonia (ZARIQUIEY CENARRO, 1935); Holland (HOLTHUIS, 1950); Plymouth (LEBOUR, 1936).

Norwegian distribution. I doubt whether this species occurs far north of Bergen. The distribution is similar to *E. occultus* (see map, Fig. 3), but *T. cranchii* is more common. DANIELSSEN and BOECK (1872) wrongly called an *E. pusiolus* for *T. cranchii*. The specimen of DONS (1915) must also be an *E. pusiolus* with a bifurcate rostrum, since he mentions the number of segments on the carpus of second pereopod as seven.

The deepest locality in my material was 25 to 40 m, the shallowest 3 to 7 m. KEMP (1910) has taken the species at 130 m in the Adriatic.

T. cranchii prefers the same habitat as *E. occultus*. It is easily overlooked by collectors because its colour resembles that of *Laminaria*, and because of its tendency to cling to the algae when taken out of the water.

PARASITES

Two parasitic isopods have been observed in my material (see Table 2): 1) Of *Bobyroides hippolytes* 12 specimens were taken at 9 localities (8 south of the Trondheimsfjord and 1, on *S. spinus*, from Finnmark). All specimens were collected from March to November at depths varying from 90 to 200 m. The smallest infected specimen, *S. lilljeborgii*, was 26 (10) mm. One female with eggs in May from western Norway. 2) Of *Phryxus abdominalis* 55 specimens

Table 2. List of infected species in Norwegian waters.

Species	<i>Bobyroides hippolytes</i>	<i>Phryxus abdominalis</i>
<i>S. spinus</i>	1	12
<i>S. lilljeborgii</i>	9	3
<i>S. phippi</i>	0	6
<i>L. polaris</i>	2	6
<i>E. pusiolus</i>	0	10
<i>E. g. gaimardii</i>	0	19

were taken at 42 localities along the Norwegian coast from March to October. The depths varied from 5 to 810 m, but only 7 localities were deeper than 100 m. Smallest infected specimen, *E. pusiolus*, 15 (4) mm. At 5 localities females with eggs were found in July and August, all from Trøndelag. *E. occultus* and *T. cranchii* yielded no infected specimens.

SUMMARY

The rostrum is not a good taxonomic characteristic for the species mentioned here; therefore a key is given, based on safe systematic characteristics.

None of the 8 species is specific for Norwegian waters. *E. occultus* is recorded for the first time from Norway. *E. occultus* and *T. cranchii* have their northern East-Atlantic border in western Norway. In the same area *S. spinus* and *S. phippii* have their southern East-Atlantic border. *S. lilljeborgii*, *L. polaris* and *E. pusiolus* are common along all the Norwegian coast. *E. gaimardii* which is reported common in southern Norway by previous authors, is now common north of Bergen only. I have no finds in the Oslofjord area.

The shallow water species *E. occultus* and *T. cranchii* have specific demands as to depth and bottom, the other species are more euryoecious in this respect. *E. pusiolus* is recorded 300 m deeper than previously. Two size measurements have been taken, and the time of spawning is discussed for each species. Two parasitic isopods found are briefly mentioned.

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A.S JOHN GRIEGS BOKTRYKKERI, BERGEN