



## ON A COLLECTION OF CRUSTACEA DECAPODA FROM THE SOUTHEASTERN SVALBARD

### INTRODUCTION

In 1991, during the Czechoslovak Arctic Biological and Diving Expedition, a scuba-diving method was used at the Bellsund region, western Spitsbergen (Svalbard), to collect marine benthic organisms. As a result of the faunal examination, eight species of decapod crustaceans were reported (Ďuriš, 1992) for the shallow-water environment of western fiords.

In the summer of 1992, the Czechoslovak Biological Diving Expedition took part in the international ecological campaign to the southern Spitsbergen aboard the Polish research vessel *Oceania*. The scuba-diving method was again applied to collect benthic organisms and to photo-sample benthic biocenoses off the Bölscheøya Island, Tusenøyane (i. e. the Thousand Islands, off southern Edgeøya Island), southeastern Svalbard (Fig. 1). Together with divers, dredged or bottom-grab material was collected by Polish specialists. A report of the decapod crustaceans collected during that campaign is presented in this paper. This also allows us to compare decapod faunae of the regions studied during the 1991 and 1992 expeditions. Only very poor information on the decapods of the eastern Svalbard may be found in literature.

The main part of the collected material will be deposited in the National Museum, Prague. The following abbreviations are used in the text: TL — the total length of the body measured from the posterior orbital margin of the carapace to the posterior margin of the telson; CL — the carapace length measured from the posterior orbital margin (in shrimps), or from the tip of rostrum (in crabs), to the posterior median margin of the carapace; SL — the shield length, i.e. median length of the shield-region of the carapace in hermit crabs; spm — specimen.

### MATERIAL AND METHOD

The scuba-diving method was used for immediate underwater observations and collections of the material. For quantitative sampling, a modified ben-

thometer with 0.5 mesh size sack, and limiting 0.25 m<sup>2</sup> of the bottom, was developed (Ďuriš, 1993). The quantitative samples were taken at five selected stations (D-H on Fig. 2), three samples at each of them. At six stations (01-06), a large dredge (1 m wide frame) with 0.5 mm mesh size sack was used from the r/v Oceania. Triplicate Van Veen samples were collected on two stations (I, J on Fig. 2). Fourty one dredging stations were made from Zodiac boat (Tab. 1, Fig. 2). by Polish research workers around Bölscheøya Island, two stations, T1 and T2, were made in Tjuvfjorden, off southern Edgeøya Island. A triangular dredge (of 35 cm side) with 0.5 mesh size sack was used. Dredging stations, as well as diving stations, were selected with the use of boat echosonder.

176 specimens of decapod crustaceans belonging to 6 species have been found in the collected material (Tabs. 1 and 3).

## SYSTEMATICS

### Family HIPPOLYTIDAE

#### *Eualus gaimardi gibba* (Krøyer, 1841)

(Figs. 3a-c)

*Hippolyte gaimardi gibba* Krøyer, 1841.

Synonymy: Doflein, 1900; Ďuriš, 1992.

*Material examined.* — 89 spms (see Tab. 3), including 16 males and 4 ovigerous females.

*Remarks.* — Specimens agree well with previous descriptions (Gaevskaya, 1948). The number of rostral teeth varies as in the formula 2-3 + 3-7/3-5, usually 2 + 4-6/3-5. Large males possess a distinct gibbous dorsal carina on the third abdominal segment. A large female CL 8.7 mm (sample # 1.2A) has the third left abdominal pleura of an abnormal shape — a deep notch is present on the ventrolateral border (Fig. 3a). Unusual form of the carapace has also been found in the female CL 4.0 mm (sample # 8.3): the dorsal side of the carapace is deformed, saddle-like (Fig. 3b), while in normal specimens the dorsal margin is strait behind rostral teeth (Fig. 3c).

Four specimens, two males and two females, were infested by the bopyrid ectoparasite *Phryxus abdominalis* attached ventrally to the first abdominal segment.

*E. gaimardi gibba* is the commonest decapod species in the investigated area. Four ovigerous females bearing numerous eggs at an early stage of development were collected during the first half of the August. Eggs measure 0.9-1.1 × 0.75-0.95 mm.

*Distribution.* — Circumpolar, boreoarctic. Not previously reported from the

region of the Edgeøya Island. It frequently occur at western Spitsbergen. Previous S. E. Svalbard record: off Hopen (see: Christiansen & Christiansen, 1962).

*Depth range.* — The present samples (23-40 m) correspond with the known depth range (2-355 m) of this species.

*Lebbeus polaris* (Sabine, 1824)  
(Figs. 3d-h)

*Alpheus polaris* Sabine, 1824.

Synonymy: Doflein, 1900; Ďuriš, 1992.

*Material examined.* — 11 spms (5 males, 5 females, 1 juvenile spm).

*Remarks.* — The rostral formula  $2+2/2$  in females agrees with data of the previous study (Ďuriš, 1992), the largest female CL 15.5 mm, however, bears rostrum with four teeth on each the upper and lower margin ( $2+4/4$ ). The largest male CL 10.7 mm has a quite typical for adult males rostral armation ( $0+0/3$ ) while two smaller males with a complete rostrum show the variation corresponding with the formula  $2+2-3/2-3$ . The juvenile specimen has the rostrum similar with that of females.

The largest female noted above has unusual, triplicate, distolateral spines on the left uropodal exopod (Fig. 3d, e). Although the telson is deformed that is visible on an irregular position of the dorsal spines and on asymmetry of the posterior spines (Fig. 3g, h).

*Distribution.* — Circumpolar, boreo-arctic. Frequent at the western Spitsbergen, no previous data are known from the southeastern Edgeøya.

*Depth range.* — The present samples (10-29.5 m) correspond with the known depth range (10-292 m) for Svalbard.

*Spirontocaris phippii* (Krøyer, 1841)

*Hippolyte Phippii* Krøyer, 1841.

*Hippolyte turgida* — Krøyer, 1841.

Synonymy: Doflein, 1900; Holthuis, 1947; Ďuriš, 1992.

*Material examined.* — 32 spms (see: Tab. 3) including 12 males, 1 ovigerous female, 13 non-ovigerous females, and 6 juveniles.

*Remarks.* — A common species. The rostral formula widely varies as follows:  $3-6+3-7/1-8$ , usually  $3-4+4-6/4-6$ . The rostral formula of a large female CL 8.0 mm (TL 33 mm) is  $6+6/8$ . The single ovigerous female (CL 8.3 mm) bears rostral armature agreeing with  $4+6/6$ . The egg mass consists of numerous ova in a late stage of development (with visible eyespots).

One of two postlarvae available belongs presumably to this species (see Ďuriš, 1992: p. 129, Fig. 7g, h [note — the figure captions of g, h and e, f are transposed]).

The present postlarva has a short, toothless rostrum, a pair of supraorbital spines, an exopod on the third maxilliped and reduced exopods on the first two pairs of pereopods, and epipods on the first to third pereopods. The carapace length (2.0 mm) is larger than the length reported by Āuriš (1992; 1.3-1.6 mm).

The synonyms of the species result now in slight taxonomic confusion and often are not correctly accepted by recent authors. Both Krøyer's original names, *S. phippi* and *S. turgida*, are widely used for the present species although their status has been clarified by Holthuis (1947) in his revision of the Hippolytidae. He reports (p. 38): „*Krøyer (1841) described two species: Hippolyte turgida and Hippolyte Phippsi, which as Goës (1864) pointed out only are the male and the female of one species. Though Hippolyte turgida was described before H. Phippsi in Krøyer's article, the name phippi must be used for the present species as it is used by the first reviser, viz., Goës, who pointed to the identity of the two species (vid. article 28 of the International Rules of Zoological Nomenclature)*”.

*Distribution.* — Circumpolar, boreo-arctic. Pfeffer (1890; see Doflein, 1900) and Hofsten (1916; see Christiansen & Christiansen, 1962) reported *S. phippi* from the eastern Spitsbergen and of Hope Island. Not previously reported from S. E. Edgeøya.

*Depth range.* — The present records, 4-40 m, correspond with the previous data for Svalbard, 2-200 m (see: Āuriš, 1992).

## Family CRANGONIDAE

### *Sclerocrangon boreas* (Phipps, 1774)

*Cancer boreas* Phipps, 1744.

Synonymy: Doflein, 1990; Āuriš, 1992.

*Material examined.* — 36 specimens collected (9 males, 7 females, 20 juveniles).

*Remarks.* — The present specimens correspond well with the material collected a year before at the western Svalbard (Āuriš, 1992). As well as the latter, the Bölscheøya specimens bear small but distinct posteroventral tooth on each of the second to third abdominal pleura. The teeth are yellowish-transparent and covered with marginal setae. This feature was overlooked in the previous study (Āuriš, 1992: p. 130, Fig. 8a), and is also absent in the figure given by Christiansen (1972).

Thanks to the opportunity to examine all decapod specimens from the 1992 cruise of the r/v Oceania to Svalbard, we can conclude that the genus *Sclerocrangon* is represented there only by one species, *S. boreas*. So, the specimens reported by Weslawski et al. (1992) as *S. ferox* (G. O. Sars, 1877) could also be referred as the present species.

*Distribution.* — Panarctic boreal species. Christiansen & Christiansen (1962) reports this species to be distributed along the whole coast of Spitsbergen and at Hope Island. Not previously reported from southern Edgeøya.

*Depth range.* — 1-1000 m, the present data — 15-29.5 m.

## Family PAGURIDAE

### *Pagurus pubescens* Krøyer, 1838

*Synonymy:* Doflein, 1900; Ďuriš, 1992.

*Material examined.* — 2 specimens collected (see Tab. 3), incl. 1 male and 1 ovigerous female.

*Remarks.* — The female bears a mass of small orange eggs with the diameter 0.9-1.0 mm. The male is infested by a large parasite attached ventrally to the anterior abdomen.

*Distribution.* — Widely distributed, panarctic boreal species. Christiansen & Christiansen (1962) have written that in Svalbard waters the species is found around Spitsbergen, and also at Hope Island. Not previously reported from S. E. Edgeøya.

*Depth range.* — The present data, 15 and 27 m, agree well with previous reports from the western Spitsbergen, 10-372 m (Christiansen & Christiansen, 1962).

## Family MAJIDAE

### *Hyas araneus* (Linnaeus, 1758)

*Cancer araneus* Linnaeus, 1758.

*Synonymy:* Doflein, 1900; Ďuriš, 1992.

*Material examined.* — 5 specimens collected (see Tab. 3), incl. 2 males, 1 ovigerous female, and 1 juvenile. The sex of 1 specimen indetermined.

*Remarks.* — The specimens collected by the dredging method are very damaged, partly or totally without pereopods. The undetermined specimen is represented by only two legs — one cheliped and one ambulatory leg.

*Distribution.* — Boreo-Arctic species. Known from the Western Spitsbergen and at Hope Island. Not previously reported from S. E. Edgeøya.

*Depth range.* — 1-292 m for the western Spitsbergen (Christiansen & Christiansen, 1962), the present records are from 3 to 40 m.

## DISCUSSION

The present material provides us with data of the decapod crustaceans from the Edgeøya Island, southeastern Spitsbergen, not studied previously. Much information is available on the crustacean group from the western Spitsbergen (Grieg, 1932; Christiansen & Christiansen, 1962; Węśławski, 1987; Klekowski & Węśławski, 1991; Āuriš, 1992). However, only limited data are present in the literature from the eastern Svalbard (Hofsten, 1916 — see Christiansen & Christiansen, 1962; Burukovsky, 1966; Węśławski & al., 1992). Our study gives us an opportunity to preliminarily compare the present crustacean materials from the Barents Sea region of Svalbard with the previously described collection from the Bellsund region, the Groenland Sea coasts of the same archipelago (Āuriš, 1992).

18 species of decapoda have been reported to the present time from the Svalbard waters. Eight of them have been found at the Bellsund region, western Spitsbergen, and only six off the southeastern Edgeøya (see. Tab. 1).

Although both collections mentioned were not taken as quantitative samples, the faunae and diversities of species collected, if the postlarvae are not mentioned, are evidently very similar. Only the hermit crab, *P. pubescens*, was rarer at Edgeøya, while shrimps *Spirontocaris spinus* and *Sabinea septemcarinata* were absent there. Future investigations will surely complete lists of species from the compared areas of rather different environmental conditions.

The Bellsund region lying at the western Svalbard has quite typical fiord conditions with its slow tidal currents, muddy waters with thick freshwater layer from glacier ablations, various coastal bottoms from shallow bays with clayed bottom to strong gravelled slopes, and covered with appropriate seaweed and algal zones. Moreover, the water temperature (up to +4°C in summer) along the western Spitsbergen coasts is higher as a result of an influence of a branch of temperate current from the Atlantic Ocean (see: Swerpel & Zajęzkowski, 1991; Āuriš, 1992).

The area investigated in 1992, off southern Edgeøya Island, is an open region with small islands and complicated character of strong currents of cold Arctic waters (from 0 to -0.5°C in summer; see Węśławski & al., 1992). Regarding present scuba-diving observations, the hard sandy-gravelled bottom is uniformly flat with patches of seaweeds *Alaria* and *Laminaria* with associated algae and sessile fauna. Only such places, as well as coastal rocks, are inhabited by decapods, the open bottom areas are practically devoid of epifauna due to currents and hard bottom. Shallow-water protected areas suitable for postlarval development of decapods, as were observed at Bellsund, are very limited in that region, and it is possible that the main population of the region is developed at the large fiord Tjuvfjorden of the southern coast of Edgeøya Island, and its species are widely distributed by currents.

Although the number of species known from the Barents Sea off the Svalbard is lower than in the western Svalbard, future data would distinctly complete our knowledge on decapod distribution at the archipelago. Although ecological conditions are rather different at the West and East, most species may also be widely distributed there through their wide ecological valence. For example, the absence of *S. spinus* or *S. septemcarinata* in the collection from Edgeøya must not be understood as a result of their absence in the investigated areas due to main hydrological conditions because both species are known also from the Franz Joseph Land (Golikov & Averintzev, 1977; Węśławski & Zajączkowski, 1992), where the environmental parameters in the sea are quite similar or even heavier (Swerpel, 1992).

Two shrimp postlarval species of different forms have been found in the Edgeøya collection. The first one well resembles the S1-form described by Ďuriš (1992: 129, Fig. 7g, h; see above — *S. phippi*, Remarks). The postlarva has the supraorbital spines on the carapace, exopods are well developed on the third maxilliped and on two anterior pereopods, epipods present on all maxillipeds and on the first to third pereopods. Ďuriš (1992) preliminarily determined the postlarval form with *S. phippi*, which corresponds with the presence of adult specimens of the species in the present material. The problem is with the second hippolytid postlarva available which is clearly the type „S2” sensu Ďuriš (1992: 129, Fig. 7e,f) who has assigned it to the related species, *S. spinus* (Sowerby, 1806). This postlarval specimen bears longer and deeper rostrum with 7 dorsal teeth, with 3 posterior teeth situated on the carapace, and 1 ventral tooth. The supraorbital spines are present, the exopod and epipod armation agree with the generic characters of *Spirontocaris*. If that postlarva can really belong to *S. spinus*, it is remarkable that no adult was collected in the material from Edgeøya Island. More detailed developmental studies and field collections are necessary for final conclusions on the specific status of the postlarvae mentioned above, and on the presence or absence of *S. spinus* in the studied area.

#### ACKNOWLEDGEMENTS

I am grateful to my friends and colleagues, dr J. Wiktor and dr M. Zajączkowski (Institute of Oceanology, Sopot, Poland), and Mr. J. Szymonik and Mr. J. Šabacký (Czech diver clubs of Ostrava), for their help and assistance in the field. We are deeply indebted to dr J. M. Węśławski and other specialists of the Arctic Ecology group of the Institute of Oceanology, Sopot, for organizing the international expedition aboard the research vessel Oceania of the Polish Academy of Sciences. Our expedition could not have been realized without valuable financial support of the NEWPORT UNIVERSITY, s.s r.o., Ostrava and OSTRAVAR Ostrava. Material help was provided by A.Q.C. Prague,

MIKROTECHNA Týn n.Vltavou, OREL Ostrava, LANEX Bolatice and OSTRAVAR Ostrava. We would like to express our cordial thanks to all of these institutions. The expedition was partly financed from the Norwegian-Polish research project in the frame of the project „Walrus” of the Norsk Polarinstitut, Oslo.

#### REFERENCES

- Burukovsky, R. N.*, 1966: A new species of the genus *Bythocaris*, and some problems of zoogeography of the genus. — Zoologicheskii Zhurnal, v. 45, n.4: 536-542 [Russ.; Engl. abstr].
- Christiansen, M. E., & B. O. Christiansen*, 1962: The Crustacea Decapoda of Isfjorden, a comparison with the Swedish Spitsbergen Expedition in 1908. Tromsø Museum Biological Svalbard Expedition 1958. — Acta Borealia, A. Scientia, n. 1: 1-53.
- Doflein, F.*, 1900: Die dekapoden Krebse der arktischen Meere. — Fauna Arctica, Jena, v. 1: 314-362.
- Đuriš, Z.*, 1992: On a small collection of Crustacea Decapoda from the Bellsund Region, Spitsbergen. — In: J. Repelewska-Pękalowa, K. Pękala (eds.), Wyprawy Geograficzne na Spitsbergen, 1993. UMCS, Lublin: 121-149.
- Đuriš, Z.*, 1993: A report on the Czechoslovak Biological Diving Expedition „ARCTIC '92”. — In J. Repelewska-Pękalowa, K. Pękala (eds.), Wyprawy Geograficzne na Spitsbergen, 1993. UMCS, Lublin (this volume).
- Gaevskaya, N. S.* (ed.), 1948: Opredelitel' fauny i flory severnykh morei SSSR [A key to the determination of the fauna and flora of northern seas of USSR]. — Moscow: Acad. Sci. USSR, 712 pp. [Russ.].
- Golikov, A. N., & V. G. Averintzev*, 1977: Biocoenoses of upper parts of the shelf of the Franz Josef Land archipelago and some regularities of their distribution. In: A. N. Golokov (ed.), Biocoenoses of the shelf of Franz Josef Land and the fauna of adjacent waters. — Explorations of the Fauna of the Seas, 14 (22): 5-54 (Zool. Inst., Acad. Sci. USSR) [Russ.].
- Grieg, J. A.*, 1926: Decapoda Crustacea from the West Coast of Norway and the North Atlantic. — Bergens Museums Aarbok (Naturvidenskabelig raekke), n. 7: 1-53.
- Grieg, J. A.*, 1932: Decapoda Crustacea fra bankene ved Svalbard. — Bergens Museums Aarbok (Naturvidenskabelig raekke), n. 2: 1-34 [Norw.].
- Holthuis, L. B.*, 1947: The Hippolytidae and Rhynchocinetidae. The Decapoda of the Siboga-Expeditie. Part IX. — Siboga-Expeditie, Monography 39a8: 100pp.
- Klekowski, R. Z., & J. M. Węslawski* (eds.), 1991: Atlas of the marine fauna of Southern Spitsbergen. Vol. 2. — Wrocław-Warszawa-Kraków-Gdańsk-Łódź, Ossolineum, Polish Academy of Sciences Press.
- Swerpel, S.*, 1992: Hydrometeorological conditions in Tikhia Bay, Franz Josef Land, during summer 1991. In: I. Gjertz & B. Mørkved (eds.), Environmental studies from Franz Josef Land, with emphasis on Tikhia Bay, Hooker Island. — Meddelelser, n. 120: 9-12.
- Swerpel, S., & M. Zajączkowski*, 1990: The physical environment of Southern Spitsbergen. — pp. 25-40, in: Klekowski, R. Z., & J. M. Węslawski (eds.), Atlas of the marine fauna of Southern Spitsbergen. Vol. 1. — Wrocław-Warszawa-Kraków-Gdańsk-Łódź, Ossolineum, Polish Academy of Sciences Press.
- Węslawski, J. M.*, 1987: Distribution of Decapoda (Crustacea) in South Spitsbergen coastal waters with remarks on their ecology and breeding biology. — Polish Polar Research, v. 8, n. 2: 121-134.



Węslawski, J. M., Wiktor, J., Ďuriš, Z., & M. Zajączkowski, 1992: Summer marine biological survey at Bölscheøya, Eastern Svalbard 1992. — Arctic Ecology Group Report, 1/92: 22 pp. (Inst. of Oceanology, Polish Acad. Sci., Sopot).

Węslawski, J. M. & M. Zajączkowski, 1992: Benthic fauna and its environment in Tikhaya Bay, Hooker Island. In: I. Gjertz & B. Mørkved (eds.), Environmental studies from Franz Josef Land, with emphasis on Tikhaya Bay, Hooker Island. — Meddelelser, n. 120: 35-42.

Address of the author: dr Zdeněk Ďuriš, Institute of Industrial Landscape Ecology, Czech Academy of Sciences, Hladnovska 9, Ostrava 2, Czech Republic

Tab.1. Comparison of Svalbard decapod crustaceans found at the Bellsund, western Svalbard, and Edgeøya Island, southeastern Svalbard during the expeditions 1991 and 1992. d - dominant, c - common, r - rare.

Svalbard species	Bellsund '91	S.Edgeøya '92
<i>Hymenodora glacialis</i> (Buchholz)	.	.
<i>Pandalus borealis</i> Krøyer	.	.
<i>Bythocaris grumanti</i> Burukovsky	.	.
<i>Bythocaris leucopis</i> Sars	.	.
<i>Bythocaris payeri</i> (Heller)	.	.
<i>Bythocaris simplicirostris</i> Sars	.	.
<i>Eualus gaimardi gibba</i> (Krøyer)	d	d
<i>Lebbeus polaris</i> (Sabine)	c	c
<i>Spirontocaris phippsi</i> (Krøyer)	c	c
<i>Spirontocaris spinus</i> (Sowerby)	r	?
<i>Sclerocrangon boreas</i> (Phipps)	c	c
<i>Sclerocrangon ferox</i> (G.O.Sars)	.	.
<i>Sabinea sarsi</i> Smith	.	.
<i>Sabinea septemcarinata</i> (Sabine)	c	.
<i>Lithodes maja</i> (Linnaeus)	.	.
<i>Paqurus pubescens</i> (Krøyer)	d	r
<i>Hyas araneus</i> (Linnaeus)	c	c
<i>Hyas coarctatus</i> Leach	.	.

Tab. 2. List of sampling stations (see Fig. 2).

SAMPLE No.	DATE	DEPTH [m]	SAMPLING METHOD	BOTTOM
01	07/08/1992	25.0	dredging	gravel, mud
02	07/08/1992	35.0	dredging	gravel, mud
03	07/08/1992	40.0	dredging	gravel, mud
04	07/08/1992	47.0	dredging	gravel, mud
05	07/08/1992	25.0	dredging	gravel, mud
06	07/08/1992	23.0	dredging	gravel, mud
1.1	08/08/1992	25.0	dredging	gravel, sand
1.2	08/08/1992	21.0	dredging	gravel, mud
1.3	08/08/1992	18.0	dredging	gravel, sand
1.4	08/08/1992	8.0	dredging	rock
1.1A	10/08/1992	23.0	dredging	gravel, mud
1.2A	10/08/1992	21.0	dredging	gravel, mud
1.3A	10/08/1992	17.0	dredging	gravel, mud
1.4A	10/08/1992	11.0	dredging	gravel, mud
2.1	09/08/1992	28.0	dredging	gravel, sand
2.2	09/08/1992	20.0	dredging	gravel, sand
2.3	09/08/1992	10.0	dredging	rock
3.1	09/08/1992	19.0	dredging	gravel, mud
3.2	09/08/1992	17.5	dredging	gravel, mud
3.3	09/08/1992	17.0	dredging	gravel, sand
3.4	09/08/1992	13.0	dredging	rock
4.1	10/08/1992	20.0	dredging	gravel, sand
4.2	10/08/1992	20.0	dredging	gravel, sand
4.3	10/08/1992	20.0	dredging	gravel, mud
4.4	10/08/1992	15.0	dredging	rock
5.1	11/08/1992	17.0	dredging	gravel, sand
5.2	11/08/1992	19.0	dredging	gravel, mud
5.3	11/08/1992	20.0	dredging	gravel, mud
6.1	11/08/1992	21.0	dredging	gravel, sand
6.2	11/08/1992	18.0	dredging	gravel, sand
6.3	11/08/1992	17.0	dredging	gravel, sand
7.1	13/08/1992	24.0	dredging	gravel, mud
8.2	13/08/1992	29.5	dredging	gravel, sand
8.3	13/08/1992	24.5	dredging	gravel, sand
8.4	13/08/1992	11.0	dredging	rock
9.1	13/08/1992	25.0	dredging	gravel, sand
9.2	13/08/1992	24.0	dredging	gravel, sand
10.1	14/08/1992	24.0	dredging	gravel, sand
11.1	14/08/1992	21.0	dredging	gravel, sand
11.2	14/08/1992	18.0	dredging	gravel, sand
12.1	14/08/1992	18.0	dredging	gravel, sand
A	08/08/1992	5.0	SCUBA-hand net	rock
B	09/08/1992	21-25	SCUBA-photo	gravel, mud
C	09/08/1992	3-24	SCUBA-photo	gravel - rock
D	11/08/1992	15.0	SCUBA-benthometer	gravel, sand
E	11/08/1992	23.0	SCUBA-benthometer	gravel, sand
F	13/08/1992	24.0	SCUBA-benthometer	gravel, mud
G	13/08/1992	15.0	SCUBA-benthometer	gravel, sand
H	14/08/1992	23.0	SCUBA-benthometer	gravel, mud
I	14/08/1992	18.0	grab sampler	gravel, mud
J	14/08/1992	19.0	grab sampler	gravel, mud
T1	13/08/1992	27.0	dredging	gravel, mud
T2	13/08/1992	30.0	dredging	gravel, mud

Tab. 3. List of decapod specimens examined (TL - total length, CL - carapace length, RL - rostral length, RF - rostral formula)

SAMPLE No.	SEX	TL [mm]	CL [mm]	RL [mm]	RF [mm]	EGG STAGE	REMARKS	
Eualus gaimardi gibba [89 spms]								
01-06	M	*	8.7	9.2	3+5/4		Bopyrized with male of <i>Phryxus abdominalis</i>	
" "	M	*	7.5	9.2	3+5/4			
" "	M	*	6.5	-	-		Rostrum broken	
" "	M	*	5.8	-	-		" "	
" "	Fov	*	9.2	10.3	2+6/3	early	Eggs 1.1x0.8 mm, numerous	
" "	Fov	*	9.6	9.6	3+5/3	early	Eggs 0.9-1.0 x 0.8-0.9 mm	
" "	F	*	8.8	8.4	2+6/3	-		
" "	F	*	8.1	8.1	2+5/4	-		
" "	F	*	8.0	-	-	-	Bopyrized with female of <i>Phryxus abdominalis</i>	
" "	F	*	7.5	8.0	2+4/2	-		
" "	F	*	7.3	8.2	3+5/4	-		
" "	F	*	7.2	8.2	2+5/4	-		
" "	F	*	7.2	-	-	-	Rostrum broken	
" "	F	*	7.2	-	-	-	" "	
" "	F	*	7.0	7.1	3+5/4	-		
" "	F	*	6.8	7.8	2+6/4	-		
" "	F	*	6.3	7.2	2+6/4	-		
" "	F	*	6.1	7.2	2+5/3	-		
" "	F	*	5.7	-	-	-	Rostrum broken	
" "	F	*	5.4	-	-	-	" "	
" "	F	*	4.8	-	-	-	" "	
" "	F	*	4.3	-	-	-	" "	
" "	F	*	4.1	4.6	2+5/2	-		
" "	F	*	4.1	4.6	2+4/2	-		
" "	F	*	4.0	4.0	2+5/2	-		
" "	F	*	3.9	4.5	2+5/4	-		
" "	F	*	3.8	4.5	2+5/3	-		
" "	F	*	3.8	4.3	2+5/3	-		
" "	F	*	3.7	-	-	-	Rostrum broken	
" "	F	*	3.6	3.9	2+4/3	-		
" "	F	*	3.6	4.2	2+5/3	-		
" "	F	*	3.5	3.7	2+4/2	-		
" "	F	*	3.5	3.4	2+4/3	-		
1/2 A	F		38.0	8.7	9.0	2+4/3	-	Large spm., abnormal 3-rd left abdom.pleura
"	F		24.5	5.4	6.4	2+5/4	-	
"	F		18.4	4.4	5.0	2+4/5	-	
"	F		17.3	3.8	4.4	2+7/3	-	
"	F		18.8	4.0	4.6	2+6/3	-	
"	F		16.5	3.7	4.0	2+4/3	-	
2/1	F		19.8	4.0	4.1	2+4/3	-	Without dorsal keel
"	F		20.7	4.6	5.4	2+6/4	-	
"	F		18.5	4.2	4.8	2+5/4	-	Body broken
"	F		18.2	3.9	4.5	2+5/4	-	
"	F		16.7	3.7	3.9	2+4/3	-	Telson broken

(cont.)

(Tab. . . , cont.)

SAMPLE No.	SEX	TL [mm]	CL [mm]	RL [mm]	RF [mm]	EGG STAGE	REMARKS
(Eualus gaimardii gibba - cont.)							
2/2	M	27.5	6.0	7.4	3+5/3		
"	F	19.0	4.3	5.4	2+5/3	-	Boprized with male of <i>Phryxus abdominalis</i>
"	F	16.7	3.5	4.1	2+4/4	-	
"	F	19.5	4.2	4.6	2+7/3	-	
"	F	18.0	3.6	4.5	2+5/3	-	
"	F	20.0	4.4	5.3	2+7/3	-	
"	F	17.5	3.7	4.7	2+6/3	-	
"	F	18.0	3.6	4.1	2+4/4	-	
"	F	17.2	3.5	-	-	-	Rostrum broken
"	F	18.7	3.6	4.3	2+4/3	-	
2/3	M	26.2	5.8	7.0	2+5/3		Dorsal keel
"	Fov	38.0	9.4	10.7	2+5/5	early	Several eggs of size 0.9-0.95x0.8 mm
"	Fov	36.5	8.6	8.9	3+4/2	early	Full egg mass, eggs 1-1.05x0.75-0.87 mm
"	F	27.6	6.0	7.7	3+4/3	-	
"	F	23.4	4.2	4.9	2+5/3	-	
"	F	18.4	3.9	-	-	-	Rostrum broken
4/4	F	29.5	6.3	7.0	2+3/3	-	
"	F	23.8	5.3	6.1	2+5/4	-	
"	F	19.0	4.4	5.2	2+5/4	-	
5/3	F	21.5	4.8	5.5	2+5/2	-	
"	F	16.8	3.8	4.3	2+5/2	-	
6/3	M	25.5	5.7	7.6	2+6/4		Small dorsal keel
"	M	19.5	4.1	5.4	2+6/3		Small app.masculina
"	M	18.8	4.0	4.7	2+6/3		Small app.masculina
"	F	25.4	6.1	6.7	2+4/3	-	
8/2	M	32.5	7.1	8.5	3+6/3		
"	M	18.0	3.9	4.8	2+5/4		Appendix masculina small
"	F	22.0	4.7	5.4	2+5/3	-	
"	F	18.5	3.9	5.6	2+5/4	-	
"	F	18.5	3.9	-	-	-	
8/3	F	16.0	3.7	4.0	2+4/3	-	Waking legs absent
"	F	17.5	4.0	4.9	2+4/3	-	Unusual cpx, body broken
9/1	M	18.0	3.4	-	-		Tip of rostrum broken
"	F	21.5	4.6	5.5	2+5/3	-	
"	F	19.5	4.3	4.9	2+5/3	-	
9/2	F	18.5	4.0	4.5	2+4/2	-	Most legs lost
A	M	*	8.4	8.7	2+4/4		Infected with female bopyrid <i>Phryxus abdominalis</i>
"	F	*	6.1	7.8	2+4/3	-	
"	F	*	6.1	7.8	2+5/3	-	
F	F	17.5	3.7	4.3	2+5/3	-	Most legs lost
T/1	M	26.5	6.2	-	-		
"	F	32.0	8.0	-	-		Carapace broken, part lost
"	M	26.5	6.2	-	-		Rostrum lost
"	F	28.8	6.3	7.1	3+4/3	-	
T/2	M	28.5	5.8	7.6	3+5/3		High dorsal keel on 3-rd abdominal segment

(cont.)

(Tab. . . , cont.)

SAMPLE No.	SEX	TL [mm]	CL [mm]	RL [mm]	RF [mm]	EGG STAGE	REMARKS
Lebbeus polaris [11 spms]							
01-06	M	*	9.0	-	-		
" "	M	*	7.5	7.0	2+3/3		
" "	M	*	6.5	-	-		
" "	M	*	5.7	5.8	2+2/2		
" "	F	*	11.3	9.0	2+2/2	-	
" "	F	*	8.2	7.9	2+2/2	-	
" "	F	*	7.9	7.5	2+2/2	-	
" "	F	*	5.7	-	-	-	
" "	juv	*	3.4	2.1	2+2/2		
8/2	M	43.0	10.7	9.0	0+0/3		
"	F	59.0	15.5	11.0	2+4/4	-	Unusual distolat.spines on left uropodal exopod
Spirontocaris phippii [32 spms]							
01-06	M	*	5.1	4.4	4+6/3		
" "	M	*	5.0	3.5	?+5/5		Carapace damaged
" "	M	*	4.7	3.7	3+5/4		
" "	M	*	4.5	4.0	3+6/4		
" "	M	*	4.3	3.5	4+6/5		
" "	M	*	4.2	3.3	3+6/6		
" "	Fov	*	8.3	5.7	4+6/6	eyespot	Numerous eggs 1.6x1.15 mm
" "	F	*	7.4	5.5	5+7/6	-	
" "	F	*	6.5	4.9	3+6.5	-	
" "	F	*	4.6	3.5	4+4/5	-	
" "	F	*	4.0	3.3	4+6/6	-	
" "	F	*	3.6	3.1	4+7/5	-	
" "	juv	*	2.6	1.6	3+4/1		
" "	juv	*	2.5	1.6	3+4/2		
" "	juv	*	2.5	1.5	3+3/2		
" "	juv	*	2.4	1.5	3+3/2		
1/2 A	F	21.0	4.8	4.0	3+6/5	-	
2/1	F	20.5	4.2	4.0	3+6/4	-	
"	M	18.8	4.1	3.6	4+5/5	-	
2/2	F	23.0	5.3	4.0	4+6/4	-	
"	juv	9.4	2.0	0.5	0/0	-	S1-postlarva, supraorbital spine present
4/3	F	18.5	4.2	3.5	4+4/4	-	
8/2	F	34.0	8.0	3.1	4+5/6	-	
"	M	17.5	3.7	-	-		
"	M	17.5	3.6	3.6	3+6/4		
8/3	M	18.0	3.9	3.2	3+5/4		
9/1	F	32.0	8.0	5.1	6+6/8	-	Large robust female
"	F	19.0	4.7	3.6	3+5/5	-	
"	M	17.5	4.1	3.1	3+6/4	-	
"	F	17.5	3.9	3.1	3+6/4	-	
"	juv	11.2	2.6	1.8	3+4/1		
D	M	19.0	3.9	3.2	3+6/4		

(cont.)

(Tab. ..., cont.)

SAMPLE No.	SEX	TL [mm]	CL [mm]	RL [mm]	RF [mm]	EGG STAGE	REMARKS
S2-postlarva (see Đuriš, 1992) [1 spm]							
8/2	juv	12.3	2.3	1.7	3+4/1		Mxp3 with exopod, P1-3 with epipods [?!]
Sclerocrangon boreas [36 spms]							
01-06	M	*	8.7	*	.		
" "	M	*	8.6	*	.		
" "	M	*	7.8	*	.		
" "	M	*	5.3	*	.		
" "	F	76.0	20.5	*	.	-	
" "	F	*	9.7	*	.	-	
" "	F	*	8.4	*	.	-	
" "	F	*	8.2	*	.	-	
" "	juv	*	6.7	*	.		
" "	juv	*	5.0	*	.		
" "	juv	*	3.1	*	.		
" "	juv	*	2.9	*	.		
" "	juv	*	2.8	*	.		
" "	juv	*	2.4	*	.		
1/1	juv	12.5	3.0	1.2	.		
1/2 A	juv	11.7	3.2	1.1	.		
2/1	juv	29.0	8.2	3.2	.		
"	juv	32.0	8.5	3.2	.		
"	juv	25.3	5.8	2.3	.		
"	juv	18.9	5.1	2.1	.		
"	juv	20.0	4.7	2.1	.		
"	juv	19.7	5.0	2.1	.		
"	juv	19.3	4.8	2.2	.		
"	juv	17.3	4.4	1.9	.		
4/2	juv	21.5	5.2	2.3	.		
8/2	M	52.0	13.3	3.6	.		
9/1	M	57.0	15.0	4.5	.		
9/2	M	57.5	14.8	4.2	.		
"	M	58.5	15.2	4.3	.		
"	juv	32.0	9.0	3.3	.		
C	F	72.0	18.0	5.2	.	-	
"	juv	20.5	5.1	2.4	.		
D	F	85.0	22.0	4.7	.	-	
T/1	juv	30.0	7.4	2.8	.		
B	M	*	11.8	*	.		
	F	*	23.6	*	.	-	

(cont.)

(Tab. . . , cont.)

SAMPLE No.	SEX	TL [mm]	CL [mm]	RL [mm]	RF [mm]	EGG STAGE	REMARKS
<b>Pagurus pubescens [2 spms]</b>							
D	Fov	.	22.0	.	.	early	Shield 12mm; eggs orange, diam. 0.9-1.0 mm
T1	M	.	19.5	.	.		Shield 9.0 mm, large parasite on abdomen
<b>Hyas araneus [5 spms]</b>							
01-06	Fov	.	56.0	.	.	early	CL incl.rostrum; CW 43 mm
	?	.	-	.	.		Fragments (2 legs)
	juv	.	7.0	.	.		CL incl.rostrum; CW 4.6mm
D	M	.	46.0	.	.		CL incl.rostrum; CW 38 mm
C	M	.	52.6	.	.		CL incl.rostrum; CW 39 mm; legs detached

Abbreviations: M - male, F - female, Fov - ovigerous female, juv - juvenile specimen, CL and CW - carapace length and width (respectively); \* - not measured, "-" - broken (rostrum) or absent (eggs); S1- and S2-postlarvae - after Đuriš (1992).

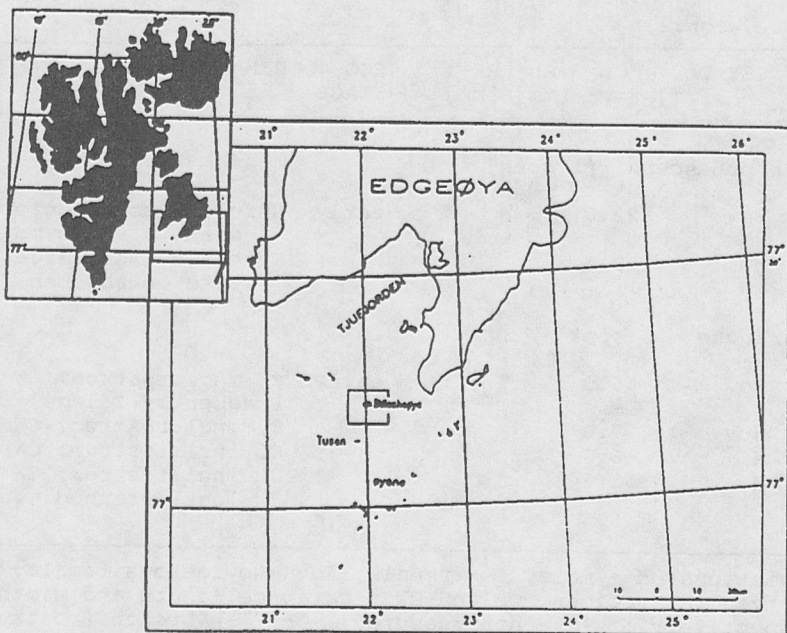


Fig. 1. Study area of southern Edeøya Island, Svalbard Archipelago (after Węśławski et al., 1992, changed)

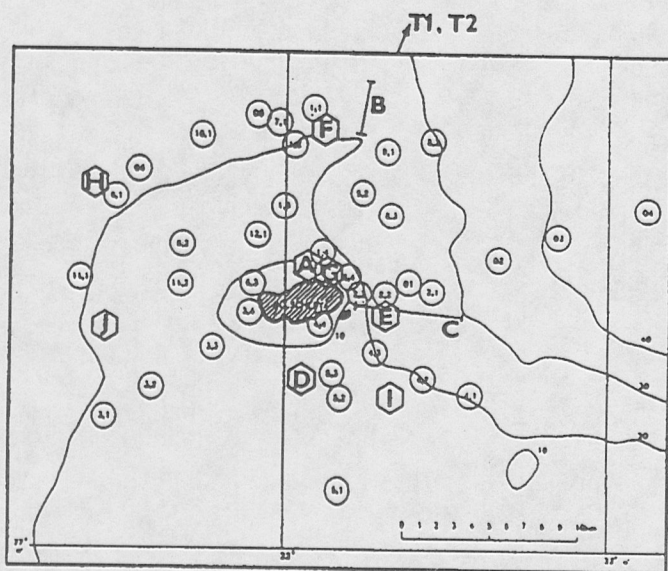


Fig. 2. Location of sampled stations around Bölscheøya Island (0.1-12.1, T1, T2 — dredge samples, A-H — dives (B, C — photo sampling, D-H — quantitative samples), I, J — quantitative grab samples (after Węśławski et al., 1992, changed)



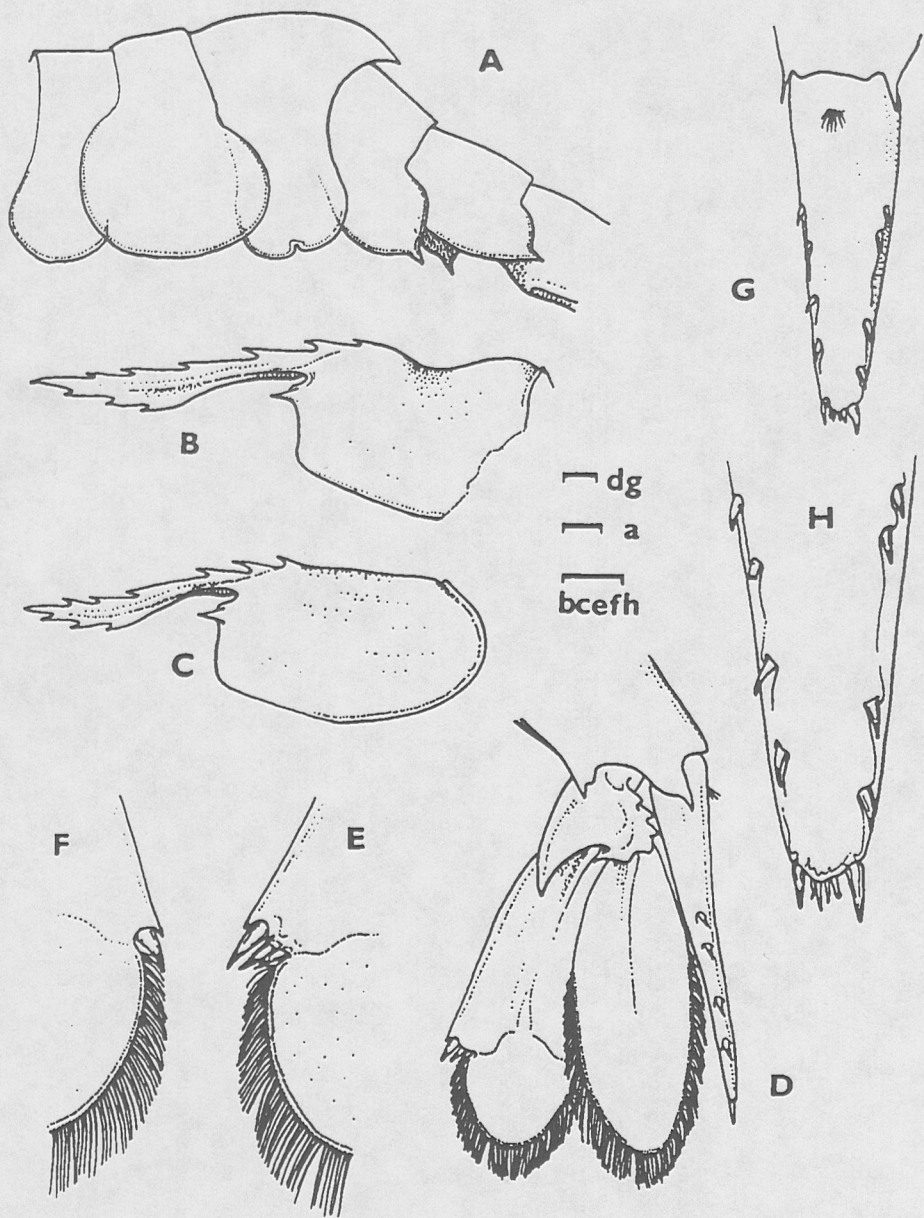


Fig. 3. Abnormalities found in examined shrimps. *Eualus gaimardi gibba* (Krøyer): a — abdominal segments and pleura, lateral aspect; b — carapace and rostrum; c — carapace and rostrum (normal shape); *Lebbeus polaris*: (Sabine): d — telson (lateral aspect) and left uropod; e — distolateral angle of left uropod; f — distolateral angle of right uropod (normal shape); g — telson, dorsal aspect; h — distal part of telson. Scale bars — 1 mm