

Taxonomic study of the isopod crustaceans from the Spanish expedition "Antártida 1986-11" in the Scotia Sea, South Atlantic*

J. CASTELLÓ

Departament de Didàctica de les Ciències Experimentals i de la Matemàtica, Universitat de Barcelona, Passeig de la Vall d'Hebron, 171, 08035 Barcelona, Spain.

SUMMARY: This paper summarizes the results of a taxonomic study of the isopods collected during the "Antártida 1986-11" expedition. A total of 123 specimens were studied, of which 99 were in the adult or juvenile phases and 24 were in the postmanca phase. The specimens were attributed to 11 species, 9 genera, 5 families and 4 suborders. The most abundant species were *Glyptonotus antarcticus* and *Ceratoserolis trilobitoides*. Several records are reported for the first time from the archipelagos of the Scotia Arc.

Key words: Isopoda, taxonomy, Antarctica.

RESUMEN: ESTUDIO TAXONÓMICO DE LOS CRUSTÁCEOS ISÓPODOS DE LA CAMPAÑA ESPAÑOLA "ANTÁRTIDA 1986-11" EN EL MAR DE ESCOCIA, ATLÁNTICO SUR. – En este trabajo se dan a conocer los resultados del estudio de la colección de isópodos recolectados durante la campaña "Antártida 1986-11". Se han estudiado un total de 123 ejemplares, de los cuales 99 se encuentran en estado adulto o juvenil y 24 en estado postmanca. Los ejemplares se reparten en 11 especies, pertenecientes a 9 géneros, 5 familias y 4 subórdenes. Las especies más abundantes son *Glyptonotus antarcticus* y *Ceratoserolis trilobitoides*. Se dan diversas primeras citas para los diferentes archipiélagos del Arco de Escocia.

Palabras clave: Isopoda, taxonomía, Antártida.

INTRODUCTION

This paper describes the Crustacea Isopoda collected during the "Antártida 1986-11" expedition in the Scotia Sea between November 1986 and February 1987. This expedition was performed aboard the B/F "Pescapuerta Cuarto", a commercial fishing vessel equipped to evaluate Antarctic fishing resources. Qualitative and quantitative observations

were made of species of commercial interest (for the expedition objectives see Balguerías *et al.*, 1989).

The material collected that did not belong to species of commercial interest was separated according to taxonomic groups and sent to specialists at universities throughout Spain. Although the expedition was not performed with the specific objective of sampling isopods, following an initial evaluation of the material collected, this was considered a matter of interest. The results obtained from this study are reported here.

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TABLE I. – List of trawl stations and material examined.

Station / Sample	Trawl position		Depth (m)	Date	Species
014 / 002	53°22.20'S 41°58.20'W	53°24.70'S 42°01.80'W	167 - 162	25-11-86	<i>A. hempeli</i>
015 / 003	53°23.33'S 42°07.42'W	53°23.06'S 42°10.62'W	199 - 232	25-11-86	<i>A. hempeli</i>
018 / 006	53°43.70'S 41°45.20'W	53°43.40'S 41°49.50'W	177 - 164	26-11-86	<i>S. pagenstecheri</i>
036 / 022	53°43.70'S 41°34.10'W	53°44.50'S 41°37.40'W	175 - 179	28-11-86	<i>A. hempeli</i>
043 / 028	53°50.50'S 41°45.80'W	53°51.80'S 41°43.10'W	350 - 348	29-11-86	<i>A. hempeli</i> <i>S. pagenstecheri</i>
050 / 033	53°58.29'S 39°07.60'W	53°56.90'S 39°05.80'W	244 - 228	30-11-86	<i>S. pagenstecheri</i> <i>N. meridionalis</i>
051 / 034	53°48.60'S 39°10.60'W	53°46.60'S 39°11.30'W	330 - 336	30-11-86	<i>S. pagenstecheri</i> <i>A. hempeli</i>
071 / 048	54°40.30'S 37°55.30'W	54°42.10'S 37°54.90'W	145 - 140	03-12-86	<i>A. spinacoronatus</i>
073 / 049	54°41.80'S 38°01.10'W	54°42.20'S 38°04.40'W	177 - 170	03-12-86	<i>A. spinacoronatus</i>
076 / 051	54°43.00'S 38°13.30'W	54°41.80'S 38°15.90'W	215 - 184	03-12-86	<i>A. spinacoronatus</i>
094 / 064	53°55.80'S 37°34.80'W	53°53.50'S 37°34.10'W	100 - 106	06-12-86	<i>A. spinacoronatus</i>
098 / 067	53°39.30'S 37°30.50'W	53°36.90'S 37°30.60'W	334 - 277	06-12-86	<i>A. spinacoronatus</i> <i>S. pagenstecheri</i>
102 / 070	53°45.30'S 37°09.90'W	53°42.30'S 37°07.80'W	147 - 157	07-12-86	<i>A. spinacoronatus</i>
113 / 077	54°01.70'S 36°04.40'W	54°02.90'S 36°02.30'W	266 - 260	08-12-86	<i>A. spinacoronatus</i>
127 / 087	54°38.90'S 34°56.40'W	54°37.40'S 34°58.90'W	341 - 340	09-12-86	<i>A. hempeli</i>
152 / 103	55°00.00'S 34°31.20'W	55°02.20'S 34°32.50'W	105 - 091	13-12-86	<i>G. antarcticus</i>
153 / 104	55°04.10'S 34°41.50'W	55°04.00'S 34°45.20'W	100 - 102	13-12-86	<i>A. spinacoronatus</i>
155 / 106	55°10.20'S 34°58.30'W	55°11.90'S 34°56.10'W	330 - 279	13-12-86	<i>A. spinacoronatus</i>
163 / 114	54°55.50'S 35°36.80'W	54°55.70'S 35°30.90'W	265 - 304	15-12-86	<i>A. spinacoronatus</i>
173 / 122	53°57.10'S 35°41.90'W	53°56.40'S 35°44.70'W	342 - 373	17-12-86	<i>S. pagenstecheri</i>
182 / 131	54°33.60'S 35°48.20'W	54°33.40'S 35°44.40'W	086 - 176	18-12-86	<i>G. antarcticus</i>
232 / 137	58°26.30'S 26°14.20'W	58°28.30'S 26°14.20'W	076 - 076	23-12-86	<i>G. antarcticus</i>
256 / 140	58°57.90'S 26°38.10'W	58°56.70'S 26°35.50'W	188 - 100	26-12-86	<i>G. antarcticus</i>
269 / 145	60°30.70'S 44°42.70'W	60°31.40'S 44°46.10'W	338 - 348	29-12-86	<i>C. trilobitoides</i>
274 / 149	60°37.20'S 44°58.90'W	60°35.40'S 44°58.30'W	322 - 369	30-12-86	<i>C. trilobitoides</i>
279 / 153	60°50.50'S 44°14.50'W	60°52.30'S 44°14.70'W	180 - 201	31-12-86	<i>G. antarcticus</i>
282 / 156	60°49.10'S 44°24.00'W	60°48.90'S 44°28.20'W	200 - 173	31-12-86	<i>G. antarcticus</i>
297 / 164	61°18.40'S 44°02.00'W	61°16.60'S 44°03.60'W	444 - 437	03-01-87	<i>A. spinacoronatus</i>
306 / 170	61°53.90'S 44°57.30'W	61°51.80'S 44°56.70'W	430 - 423	04-01-87	<i>C. trilobitoides</i>
311 / 173	61°36.90'S 44°51.80'W	61°37.40'S 44°56.10'W	381 - 383	05-01-87	<i>C. longispinosus</i>
312 / 174	61°35.60'S 45°13.00'W	61°33.60'S 45°14.90'W	315 - 258	05-01-87	<i>C. trilobitoides</i>

TABLE 1. (Cont.) – List of trawl stations and material examined.

Station / Sample	Trawl position		Depth (m)	Date	Species
374 / 222	60°45.20'S 44°19.30'W	60°44.10'S 44°18.10'W	125 - 118	13-01-87	<i>G. antarcticus</i>
377 / 225	60°34.50'S 44°52.60'W	60°34.90'S 44°56.20'W	181 - 083	13-01-87	<i>G. antarcticus</i>
379 / 227	60°35.60'S 45°12.50'W	60°35.40'S 45°16.30'W	149 - 086	13-01-87	<i>S. pagenstecheri</i>
380 / 228	60°34.80'S 45°20.70'W	60°33.10'S 45°23.30'W	050 - 106	13-01-87	<i>G. antarcticus</i>
398 / 236	61°12.10'S 54°41.20'W	61°13.60'S 54°44.00'W	237 - 250	16-01-87	<i>G. antarcticus</i>
408 / 243	61°30.10'S 55°16.70'W	61°29.80'S 55°12.10'W	438 - 471	17-01-87	<i>A. spinacoronatus</i>
422 / 253	61°12.40'S 54°35.60'W	61°10.50'S 54°33.80'W	400 - 324	19-01-87	<i>S. bouvieri</i>
435 / 263	60°56.50'S 55°11.60'W	60°55.50'S 55°15.50'W	395 - 364	20-01-87	<i>C. trilobitoides</i>
438 / 266	60°53.70'S 55°19.60'W	60°53.80'S 55°14.80'W	445 - 453	20-01-87	<i>C. trilobitoides</i>
459 / 283	61°39.20'S 57°41.10'W	61°38.80'S 57°45.90'W	410 - 355	23-01-87	<i>I. trilobatus</i> <i>Antarcturus</i> sp.
460 / 284	61°38.90'S 57°51.40'W	61°39.90'S 57°55.30'W	333 - 319	23-01-87	<i>A. spinacoronatus</i>
470 / 290	61°50.90'S 58°36.00'W	61°50.35'S 58°31.10'W	154 - 150	24-01-87	<i>A. hempeli</i>
472 / 292	61°57.50'S 58°43.60'W	61°59.00'S 58°46.90'W	116 - 060	24-01-87	<i>G. antarcticus</i>
491/ 305	62°14.80'S 59°47.80'W	62°14.80'S 59°42.00'W	063 - 063	27-01-87	<i>P. polita</i> <i>G. antarcticus</i> <i>L. antarcticus</i>
493 / 306	62°02.80'S 60°26.30'W	62°01.90'S 60°24.30'W	352 - 412	28-01-87	<i>C. trilobitoides</i> <i>N. meridionalis</i>
494 / 307	61°59.70'S 60°17.60'W	61°58.90'S 60°14.80'W	384 - 400	28-01-87	<i>C. trilobitoides</i>
541 / 329	62°41.90'S 61°57.10'W	62°43.70'S 61°59.30'W	440 - 490	02-02-87	<i>C. trilobitoides</i>
556 / 341	61°51.20'S 57°39.00'W	61°52.40'S 57°37.00'W	202 - 150	04-02-87	<i>G. antarcticus</i>
557 / 342	61°56.30'S 57°03.20'W	61°54.30'S 57°04.30'W	430 - 383	05-02-87	<i>A. spinacoronatus</i> <i>N. meridionalis</i>

MATERIAL AND METHODS

The sampling area included the continental shelf of the Scotia Sea archipelagos (Shag Rocks, South Georgias, South Sandwich, South Orkneys, Elephant, South Shetland), to a depth of 500 m. The area was contained within the meridians 62°22'50" and 26°14'20" of longitude W and the parallels 53°18'40" and 63°02'20" of latitude S. Table 1 shows the material examined and the sampling data. Furthermore, in Table 2, the trawling activity in each archipelago is indicated.

Comparative sampling was performed using semipelagic gear with a nylon sleeve and with a 68 mm mesh size in the cod-end. For selectivity experiments, an additional 40 mm mesh size cod-end was

added to the gear, completely covering the original but spaced at a distance of 2 m (Balguerías *et al.*, 1989).

At each fishing station a 30 minute trawl haul was taken, using a stratified random sampling method. The shelf of each island was divided in strata of 150 m (100 m at Elephant island). The number of trawls depended on the area of the strata. The total number of samples obtained from each archipelago, the number containing isopods, and the percentage of samples with isopods with respect to the total are indicated in Table 2.

The material captured was frozen and maintained at a temperature between -30 and -40°C awaiting transfer to the laboratory. After de-icing, the specimens were fixed in 70% ethyl alcohol. In studying

TABLE 2. – Number of samples obtained at each Scotia Arc archipelago: SHR, Shag Rocks; SG, South Georgia; SS, South Sandwich Islands; SO, South Orkneys; E, Elephant Island; SSH, South Shetlands.

Archipelago	Total samples	Samples containing isopods	Percentage
SHR	29	5	17.2
SG	104	16	15.4
SS	8	2	25.0
SO	93	12	12.9
E	46	5	10.9
SSH	65	10	15.4

the specimens, dissections were unnecessary. They were sufficiently large to enable taxonomically distinctive characters to be observed with the naked eye or with the aid of a stereoscopic microscope.

Serolidae species were identified using the keys of Bastida and Torti (1973), Brandt (1988), and also the notes of Wägele (1994), while Arcturidae species were recognized using the keys of Wägele (1991).

RESULTS

The number of trawls carried out was 345, from 50 of which isopods were collected. A total of 123 specimens were examined, of which 99 were adult or juveniles and 24 were postmanacs (the latter are not considered in Table 3).

In the Scotia Sea, 11 isopod species, attributed to 9 genera, 5 families and 4 suborders, were collected during the “Antártida 1986-11” expedition. Their systematic position is as follows:

Order Isopoda Latreille, 1817

Suborder Asellota Latreille, 1802

Family Janiridae Sars, 1897

Iathrippa trilobatus (Richardson, 1910)

Suborder Cymothoidea Leach, 1814

Family Cirolanidae Dana, 1853

Natatolana meridionalis (Hodgson, 1910)

Suborder Sphaeromatidea Wägele, 1989

Family Serolidae Dana, 1853

Ceratoserolis trilobitoides (Eights, 1833)

Paraserolis polita (Pfeffer, 1887)

Serolella bouvieri (Richardson, 1906)

Serolella pagenstecheri (Pfeffer, 1887)

Suborder Valvifera Sars, 1882

Family Chaetiliidae Dana, 1853

Glyptonotus antarcticus Eights, 1852

Family Arcturidae White, 1850

Antarcturus hempeli Wägele, 1988

Antarcturus spinacoronatus Schultz, 1978

Chaetarcturus longispinosus Brandt, 1990

Litarcturus antarcticus (Bouvier, 1910)

The percentages of species collected, by suborders, were: Asellota, 9.1%; Cymothoidea, 9.1%; Sphaeromatidea, 36.3%; Valvifera, 45.4%.

The abundance of the species varied in the area of study; *Glyptonotus antarcticus* (25.2%), *Ceratoserolis trilobitoides* (24.2%) and the two species of *Antarcturus* (*A. spinacoronatus* (16.1%) and *A. hempeli* (15.1%)) were most abundant. *Serolella pagenstecheri* (9.1%) was sampled in moderate numbers while the remainder were quite scarce (Table 3).

The number in which species appeared varied among geographical areas. *Antarcturus hempeli* was

Table 3. – Number of specimens collected and distribution of species at each Scotia Arc archipelago (abbreviations as in Table 2).

	SHR (5 stations, from 14 to 43)*		SG (16 stations, from 50 to 182)		SS (2 stations, from 232 to 256)		SO (12 stations, from 269 to 380)		E (5 stations, from 398 to 438)		SSH (10 stations, from 459 to 557)		Total number of specimens
	No. specimens	P/S**	No. specimens	P/S	No. specimens	P/S	No. specimens	P/S	No. specimens	P/S	No. specimens	P/S	
<i>Antarcturus hempeli</i>	11	S	3	S	0		0	P	0	P	1	P, S	15
<i>Antarcturus spinacoronatus</i>	0		11	S	0		2	S	1	P, S	2	P, S	16
<i>Ceratoserolis trilobitoides</i>	0		0	P	0	P	6	P, S	8	P, S	10	P, S	24
<i>Chaetarcturus longispinosus</i>	0		0		0		1	S	0		0	P	1
<i>Glyptonotus antarcticus</i>	0		5	P, S	6	P, S	10	P, S	1	P, S	3	P, S	25
<i>Litarcturus antarcticus</i>	0	P	0	P	0	P	0		0	P	1	P, S	1
<i>Natatolana meridionalis</i>	0		1	S	0		0		0	P	2	P, S	3
<i>Paraserolis polita</i>	0		0	P	0	P	0		0	P	2	P, S	2
<i>Serolella bouvieri</i>	0		0		0	P	0	P	1	P, S	0	P	1
<i>Serolella pagenstecheri</i>	3	P, S	5	P, S	0		1	P, S	0	P	0		9
<i>Iathrippa trilobatus</i>	0		0	P	0		0		0		2	S	2
Total number of specimens	14		25		6		20		11		23		99

* For positions cf. Table 1

** P, previously cited (mainly from Winkler, 1994)

S, found in the present study

the prevailing species in the Shag Rocks island, while *A. spinacoronatus* prevailed in the South Georgias. *Glyptonotus antarcticus* was the most abundant species in the South Sandwich Islands and the South Orkneys, while *Ceratoserolis trilobitoides* was characteristic of Elephant Island and South Shetland (Table 3).

Only 21% of Serolidae and 12.5% of Arcturidae species were collected with respect to the species previously found in the archipelagos of the Scotia Arc (19 species of Serolidae and 32 species of Arcturidae (Winkler, 1994)). Several species have been recorded for the first time in some archipelagos: *Antarcturus hempeli*, in the Shag Rocks and the South Georgias; *Antarcturus spinacoronatus*, in the South Georgias and the South Orkneys; *Chaetarcturus longispinosus*, in the South Orkneys; *Natatolana meridionalis*, in the South Georgias; and *Iathrippa trilobatus*, in the South Shetlands (Table 3).

DISCUSSION

The presence of only 123 specimens in 345 trawl hauls is very low. However, a semipelagic trawl was used, and the fact that trawling was not conducted with the purpose of capturing isopods, meant that small specimens were not collected with the meshes employed (40 mm). Only the largest species (*Glyptonotus antarcticus*, *Ceratoserolis trilobitoides*, *Antarcturus hempeli*, *A. spinacoronatus*) were captured in higher numbers with this mesh size (Table 3). A more accurate sampling procedure would have resulted in the collection of many more specimens, especially Asellota.

Furthermore, the same number of trawls was not performed in each archipelago, therefore the number

cannot be simply compared. Yet, the ratio between number of samples and number of samples containing isopods (Table 2) seems to confirm that with more intense sampling the number of species would most likely be higher.

Species biogeography in the Subantarctic region suggests two subregions (Magellan and Scotia Arc), probably due to the Antarctic Convergence (Winkler, 1994). In the species cited by Brandt (1991) as being exclusive to either the Magellan or the Scotia Sea subregions, *Iathrippa trilobatus* and *Ceratoserolis trilobitoides* were the only two species recorded here to be cited in the Magellan subregion. Therefore, our results confirm the marked distinction between the fauna of both subregions.

All the 11 species sampled have previously been mentioned as pertaining to the Scotia Sea (Brandt, 1991; Winkler, 1994).

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