

## Faunal diversity of the benthic amphipods (Crustacea) of the Magellan region as compared to the Antarctic (preliminary results)\*

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**SUMMARY:** To investigate the marine benthic ecosystems of the Magellan region and to compare them with the better known Antarctic systems, three campaigns were recently carried out in this area: the Joint Magellan "Victor Hensen" Campaign 1994, the "Polarstern" ANT XIII/4 cruise 1996, and the "Vidal Gormaz" CIMAR FIORDO II cruise 1996. Numerous and diverse zoobenthos samples were collected mostly with an Agassiz trawl and with a small dredge, an epibenthic sledge, with baited traps or by diving. All gears together gathered more than 132,000 specimens of gammaridean and caprellidean amphipods. 137 species of gammaridean amphipods have been identified from the material to date. About 20% of these species appear to be new for science. This taxonomic work takes place in the framework of a general revision of the Southern Ocean amphipod fauna undertaken by the "Antarctic Amphipodologists Network". A complete list of the benthic species of gammaridean and caprellidean amphipods is presented, including the zoogeographical distribution and the new records. The new abundant material collected, still under study, will allow a comparison of faunal diversity, zoogeographical and ecological traits of the Magellan benthic amphipod taxocoenoses with those of the West and East Antarctic benthos.

*Key words:* Biodiversity, Amphipoda, benthos, Magellan region, zoogeography.

**RESUMEN:** DIVERSIDAD FAUNÍSTICA DE LOS ANFÍPODOS (CRUSTACEA) DE LA REGIÓN DE MAGALLANES EN COMPARACIÓN CON LA DE LA ANTÁRTIDA (RESULTADOS PRELIMINARES). – En el área de Magallanes se han llevado a cabo recientemente tres campañas de investigación: la campaña con B/I "Victor Hensen" en 1994, y las campañas "Polarstern" ANT XIII/4 y CIMAR FIORDO II con el B/O "Vidal Gormaz" en 1996. En las tres campañas se recolectaron numerosas y muy variadas muestras de organismos bentónicos. Las muestras se recogieron principalmente con la red Agassiz y mediante buceo. Los anfípodos se recolectaron también mediante una pequeña rastra y con trampas con cebo. En el conjunto de todas las muestras se recolectaron más de 132.000 especímenes de anfípodos gammáridos y caprélidos. La mayor parte de estos ejemplares se ha identificado, habiéndose obtenido unas 137 especies de las que un 20% son especies nuevas para la ciencia. El trabajo taxonómico efectuado se ha desarrollado en el marco del programa de revisión de la fauna de anfípodos del Océano Austral que lleva a cabo la "Antarctic Amphipodologists Network". El abundante material nuevo recolectado, en parte aún por estudiar, permitirá reevaluar las afinidades zoogeográficas, el origen y la dispersión de la fauna de anfípodos bentónicos de la región de Magallanes en relación con la fauna antártica del grupo.

*Palabras clave:* Biodiversidad, Amphipoda, bentos, región de Magallanes, zoogeografía.

## INTRODUCTION

The marine benthic fauna and flora of the Magellan area as well as the structure and function of its benthic ecosystems remain poorly known in comparison with the more quickly developing knowledge of the contiguous Antarctic ocean. Three different campaigns were recently carried out to investigate the Magellan area: the Joint Magellan "Victor Hensen" Campaign 1994 (Arntz and Gorny, 1996), the "Polarstern" ANT XIII/4 cruise 1996 (Fahrbach and Gerdes, 1997; Arntz *et al.*, 1997) and the "Vidal Gormaz" CIMAR FIORDO II cruise 1996 (Mutschke *et al.*, 1995). Numerous and diverse zoobenthos samples were collected in the channels between Puerto Montt and Puerto Natales ("Vidal Gormaz"), in the Magellan Straits, in the Magdalena, Cockburn, Brecknock, Ballenero and Beagle Channels, in the region off the eastern entrance of the Beagle Channel down to Cape Horn ("Victor Hensen") and on the northern slope of the Drake Passage ("Polarstern").

The objectives of the amphipod study conducted in these three cruises were to compare faunal diversity, biogeographical traits and ecological roles of the benthic amphipod taxocoenoses of the Magellan region with the West and East Antarctic benthos (De Broyer and Rauschert, 1996). This paper presents some first results on the composition and affinities of the benthic amphipod fauna of the Magellan region.

## MATERIAL AND METHODS

Most of the zoobenthos samples were collected with an Agassiz trawl (frame 150 x 50 cm, "Polarstern": 300 X 100 cm; mesh size in codend: 10 mm) and some by diving with hand nets. The bulk of the amphipod material studied here was sampled using a small dredge (frame of 48 x 18 cm, mesh size: 1.0 mm; "Victor Hensen" cruise: 0.3 mm). In addition, baited traps and a suprabenthic sledge (Brandt *et al.*, 1996) were used during the "Victor Hensen" and the "Polarstern" campaigns.

Sampling equipment (including the suprabenthic sledge) together provided more than 132,000 specimens of gammaridean and caprellidean amphipods. Identification of the material is still under way. The systematic arrangement used here refers to De Broyer and Jazdzewski (1993; 1996) as well as the zoogeographical scheme which is based on Hedgpeth (1969).

## PRELIMINARY RESULTS

### Species richness and taxonomic diversity

According to De Broyer and Jazdzewski (1993, 1996), the gammaridean amphipod fauna of the Magellan area comprises 174 benthic and pelagic species belonging to 104 genera and 36 families. The part of the new benthic material identified to date from all three cruises consists of 137 species (Table 1). About twenty percent (28 species) of all these species appear to be new for science (including 2 spp already described by Rauschert, 1996, 1998). The new species belong to the families Cyproideidae, Eusiridae s.l., Gammaridae s.l., Liljeborgiidae, Lysianassidae s.l., Stegocephalidae and Stenothoidae. The new additions brought the Magellan gammaridean amphipod fauna to at least 206 spp (including 2 spp described by Alonso de Pina, 1997), 113 genera and 42 families (Table 2). A list of the Magellan caprellidean amphipods is given in Table 1 but the new material is still under study.

The material from the "Vidal Gormaz" CIMAR FIORDO II cruise 1996, which is nearly completely identified, comprises 68 species, which seems relatively few in comparison with the number of species from the two other cruises. However, the channels between Puerto Montt and Puerto Natales – where this material was collected – lie mostly under the influence of large glaciers and high sedimentation rates have a negative impact on zoobenthos diversity. The amphipod fauna, and the benthic fauna in general, immediately in front of the glaciers is poor in species as well as in individuals. The bulk of the amphipod fauna that was collected from the front of glaciers is formed of species from the burrower families Oedicerotidae and Phoxocephalidae. On the other hand, the amphipod samples collected by "Vidal Gormaz" from open sea areas appear richer in species than the Beagle Channel and the Magellan Strait fauna. However, the species composition shows a slightly different picture. Detailed analysis and comparison of the faunal diversity within the different Magellan areas (and with the Antarctic sub-regions) await the completion of processing of the whole material of the three expeditions. Present results nevertheless allow a preliminary comparison of the species occurrence in the East and West Antarctic and the Magellan sub-regions (Table 1). The presence in the Magellan sub-region of at least 11 genera (*Eusiroides*, *Lepidepcreoides*, *Melphidippa*, *Mesoproboloides*, *Oradarea*, *Platyschno-*

TABLE 1. – List of benthic gammaridean and caprellidean amphipod species known from the Magellan sub-region (including the provisional list of new records) and their occurrence in the East and West Antarctic sub-regions, the Subantarctic Islands sub-region and outside the Southern Ocean. Legend: E: East Antarctic sub-region; W: West Antarctic sub-region; G: South Georgia district; S: Subantarctic Islands sub-region; M: Magellan sub-region; A: South America (north to M); O: outside Southern Ocean and South America; XX: new records for the Magellan sub-region. New material listed in bold face.

GAMMARIDEA										
Fam. Acanthonotozomellidae										
<i>Acanthonotozomella barnardi</i> Watling & Holman, 1980										
									M	
<i>Acanthonotozomoides sublitoralis</i> Schellenberg, 1931										
									M	
Fam. Ampeliscidae										
<i>Ampelisca anversensis</i> Karaman, 1975										
	E	W	G						M	
<i>Ampelisca composita</i> Schellenberg, 1931										
									M	
<i>Ampelisca dentifera</i> Schellenberg, 1931										
									M	
<i>Ampelisca gracilicauda</i> Schellenberg, 1931										
									M	A
<i>Ampelisca macrodonta</i> Goeke, 1987										
									M	
<i>Ampelisca statenensis</i> K.H. Barnard, 1932										
									M	
<b>gen. spp.</b>										
									M	
Fam. Amphilochoidea										
<i>Amphilocheus marionis</i> Stebbing, 1888										
					S				M	O?
<i>Gitanopsis squamosa</i> (Thomson, 1880)										
		W			S		T		M	O
Fam. Ampithoidae										
<i>Peramphithoe femorata</i> (Kroyer, 1845)										
									M	A
Fam. Cheidae										
<i>Cheus amae</i> Thurston, 1982										
									M	
Fam. Colomastigidae										
<i>Colomastix castellata</i> K.H. Barnard, 1932										
	E	W	G	S					M	
<i>Colomastix fissilingua</i> Schellenberg, 1926										
									M	
Fam. Corophiidae s.l.										
<i>Aora anomala</i> Schellenberg, 1926										
									M	A O
<i>Aora cf. anomala</i> Schellenberg, 1926										
									M	
<i>Corophium bonellii</i> Milne Edwards, 1830										
									M	O
<i>Corophium cylindricum</i> (Say, 1818)										
									M	O
<i>Gammaropsis (Gammaropsis) ctenura</i> (Schellenberg, 1931)										
									M	
<i>Gammaropsis (Gammaropsis) cf. ctenura</i> (Schellenberg, 1931)										
									M	
<i>Gammaropsis (Gammaropsis) deseadensis</i> Alonso, 1981										
									M	
<i>Gammaropsis (Gammaropsis) longicornis</i> Walker, 1906										
	E	W	G	S					M	
<i>Gammaropsis (Gammaropsis) longitarsus</i> (Schellenberg, 1931)										
				S					M	
<i>Gammaropsis (Gammaropsis) monodi</i> (Schellenberg, 1931)										
									M	A
<i>Gammaropsis (Gammaropsis) remipes</i> (K.H. Barnard, 1932)										
							T		M	
<i>Gammaropsis (Paranaenia) dentifera</i> (Haswell, 1879)										
				S					M	
<i>Gammaropsis (Paranaenia) typica</i> (Chilton, 1884)										
									M	A O
<i>Haplocheira balssi</i> Schellenberg, 1931										
									M	A
<i>Haplocheira barbimana robusta</i> K.H. Barnard, 1932										
									M	O?
<i>Lembos argentinensis</i> Alonso, 1992										
									M	
<i>?Lembos fuegiensis</i> (Dana, 1853)										
		W?							M	O?
Fam. Cyproideidae										
<i>Victorhensenoides arntzi</i> Rauschert, 1997										
									XX	
Fam. Dexaminidae										
<i>Atylus dentatus</i> (Schellenberg, 1931)										
									M	
<i>Atylus villosus</i> Bate, 1862										
					S				M	A
<i>Atylus cf. villosus</i> Bate, 1862										
									M	
<i>Atylus sp.</i> Alonso, 1980										
									M	
<i>Paradexamine nana</i> Stebbing, 1914										
									M	
<i>Paradexamine pacifica</i> (Thomson, 1879)										
					S				XX	A O
<i>Polycheria acanthocephala</i> Schellenberg, 1931										
									M	A
<i>Polycheria macrophthalma</i> Schellenberg, 1931										
									M	A
<i>Polycheria similis</i> Schellenberg, 1931										
									M	A
Fam. Eophliantidae										
<i>Bircenna fulva</i> Chilton, 1884										
									M	A O
Fam. Epimeriidae										
<i>Epimeria inermis</i> Walker, 1903										
	E	W							M	
<i>Metepimeria acanthura</i> Schellenberg, 1931										
									M	
Fam. Eusiridae s.l.										
<i>Atyloella dentata</i> K.H. Barnard, 1932										
	E	W		S					M	A
<i>Atyloella magellanica</i> (Stebbing, 1888)										
									M	A

Table 1. (Cont.)

<i>Eusiroides monoculoides</i> (Haswell, 1879)			G	S		M		O
<i>Eusirus antarcticus</i> Thomson, 1880	E	W	G	S		M		O
<i>Oradarea megalops</i> (Nicholls, 1938)	E	W				XX		
<i>Oradarea cf. megalops</i>						XX		
<i>Oradarea sp.n.1</i>						XX		
<i>Oradarea sp.n.2</i>						XX		
<i>Paramoera brachyura</i> Schellenberg, 1931			G			M		
<i>Paramoera fissicauda</i> (Dana, 1852)			G	S		M	A	O
<i>Paramoera gregaria</i> (Pfeffer, 1888)	E		G	S	T	M		
<i>Paramoera hermitensis</i> K.H. Barnard, 1932						M		
<i>Paramoera obliquimana</i> K.H. Barnard, 1932						M		
<i>Paramoera parva</i> Ruffo, 1949						M		
? <i>Paramoera pfefferi</i> Schellenberg, 1931			G			M	A	
<i>Paramoera sp.</i> Stebbing, 1914						M		
<i>Paramoera sp.</i> Monod, 1926						M		
<i>Paramoera sp.</i> Ruffo, 1947						M		
<i>Rhachotropis antarctica</i> K.H. Barnard, 1932	E	W	G			M		
<i>Rhachotropis schellenbergi</i> Andres, 1982		W				M		
<i>Rhachotropis sp.n.</i>						XX		
<i>Tylosapis dentatus</i> (Stebbing, 1888)						M		
<i>Tylosapis sp. n.</i>						XX		
<i>gen. spp.</i>						M		
Fam. Exoedicerotidae								
<i>Bathyporeiapus magellanicus</i> Schellenberg, 1931						M		
<i>Exoediceropsis affinis</i> Alonso de Pina, 1997						M		
<i>Exoediceropsis lobata</i> Alonso de Pina, 1997						M		
<i>Exoediceropsis chiltoni</i> Schellenberg, 1931						M		
<i>Exoediceropsis cf. chiltoni</i> Schellenberg, 1931						M		
<i>Metoediceros fuegiensis</i> Schellenberg, 1931						M		
Fam. Gammarellidae								
<i>Austroregia batei</i> (Cunningham, 1871)						M		
<i>Austroregia huxleyana</i> (Bate, 1862)						M		
<i>Austroregia regis</i> (Stebbing, 1914)						M		
<i>Chosroes incisus</i> Stebbing, 1888						M		
<i>Gondogeneia antarctica</i> (Chevreux, 1906)		M				M		
<i>Gondogeneia dentata</i> Alonso, 1986		W				M		
<i>Gondogeneia gracilicauda</i> (Schellenberg, 1931)						M		
<i>Gondogeneia macrodon</i> (Schellenberg, 1931)						M		
<i>Gondogeneia cf. macrodon</i> (Schellenberg, 1931)						M		
<i>Gondogeneia patagonica</i> Alonso, 1986						M		
<i>Gondogeneia simplex</i> (Dana, 1852)				S		M	A	
<i>Gondogeneia thurstoni</i> Alonso, 1989						M		
<i>Gondogeneia ushuaiae</i> (Schellenberg, 1931)						M		
<i>Gondogeneia sp.</i> (Ruffo, 1949)						M		
<i>Gondogeneia sp. 1</i>						M		
<i>Gondogeneia sp. 2</i>						M		
<i>Gondogeneia sp.n.</i>						XX		
<i>gen. sp.n.</i>						XX		
Fam. Gammaridae s.l. (Gammarida : <i>Ceradocus</i> group)								
<i>Maera eugeniae</i> Schellenberg, 1931						M		
Fam. Hyalidae								
<i>Hyale hirtipalma</i> (Dana, 1852)		W		S	T	M	A	O
<i>Hyale media</i> (Dana, 1853)				S	T	M	A	
Fam. Iphimediidae								
<i>Iphimedia imparilabia</i> Watling & Holman, 1980						M		
<i>Iphimedia macrocystidis</i> (K.H. Barnard, 1932)						M		
<i>Iphimedia magellanica</i> Watling & Holman, 1980						M		
<i>Iphimedia multidentata</i> (Schellenberg, 1931)						M		
<i>Labriphimedia vespuccii</i> K.H. Barnard, 1931						M		
<i>Pariphimedia normani</i> (Cunningham, 1871)		W				M		
<i>Pseudiphimediella glabra</i> (Schellenberg, 1931)						M		
<i>Pseudiphimediella cf. glabra</i> (Schellenberg, 1931)						M		
<i>Pseudiphimediella nodosa</i> (Dana, 1852)						M		
Fam. Ischyroceridae								
<i>Cerapus sp.</i> Alonso, 1980						M		
<i>Ischyrocerus hortator</i> J.L. Barnard, 1964						M		
<i>Ischyrocerus sp.</i> Alonso, 1986						M	A	
<i>Jassa alonsoae</i> Conlan, 1990			G	S	T	M		O
<i>Jassa justii</i> Conlan, 1990			G	S		M		O

Table 1. (Cont.)

<i>Jassa marmorata</i> Holmes, 1903					M	A	O
<i>Jassa</i> sp.					M		
<i>Pseudischyrocerus denticauda</i> Schellenberg, 1931					M		
<i>Ventojassa georgiana</i> (Schellenberg, 1931)	E	W	G	S	M		
Fam. Laphystiopsidae							
<i>Prolaphystiopsis platyceras</i> Schellenberg, 1931					M		
Fam. Leucothoidae							
<i>Leucothoe spinicarpa</i> (Abildgaard, 1789)	E	W	G	S	M		O
Fam. Liljeborgiidae							
<i>Liljeborgia falklandica</i> K.H. Barnard, 1932					M		
<i>Liljeborgia longicornis</i> (Schellenberg, 1931)		W	G	S	M	A	
<i>Liljeborgia macrodon</i> Schellenberg, 1931					M		
<i>Liljeborgia</i> cf. <i>macrodon</i> Schellenberg, 1931					M		
<i>Liljeborgia</i> cf. <i>octodentata</i> Schellenberg, 1931					M		
<i>Liljeborgia quadridentata</i> Schellenberg, 1931			G		XX		
<i>Liljeborgia quinquedentata</i> Schellenberg, 1931		W			M		
<i>Liljeborgia</i> sp.n. 1					XX		
<i>Liljeborgia</i> sp.n. 2					XX		
Fam. Lysianassidae s.l.							
<i>Acontiosoma marionis</i> Stebbing, 1888				S	M		
<i>Amaryllis</i> sp. (or spp.) cf. <i>macrophtalma</i> Haswell, 1879					M		O?
<i>Amaryllis</i> sp.					M		
<i>Aristias antarcticus</i> Walker, 1906	E	W	G	S	M		
<i>Aruga falklandica</i> (K.H. Barnard, 1932)					M		
<i>Erikus dahli</i> Lowry & Stoddart, 1987					M		
<i>Falklandia reducta</i> (Schellenberg, 1931)	E				M		
<i>Lepidepecreoides</i> sp.					XX		
<i>Lysianopsis subantarctica</i> (Schellenberg, 1931)		W?			M		
<i>Orchomenella</i> ( <i>Orchomenopsis</i> ) <i>cavimana</i> (Stebbing, 1888)	E	W	G	S	M		
<i>Orchomenella</i> ( <i>Orchomenopsis</i> ) <i>cavimana</i> <i>rostrata</i> (Schellenberg, 1931)					M		
<i>Orchomenella</i> ( <i>Orchomenopsis</i> ) <i>chilensis</i> (Heller, 1865)					M		
<i>Orchomenella</i> ( <i>Orchomenopsis</i> ) sp.1					M		
<i>Orchomenella</i> ( <i>Orchomenopsis</i> ) sp. n.					XX		
<i>Orchomenella</i> ( <i>Orchomenyx</i> ) <i>schellenbergi</i> (Thurston, 1972)		W	G		M		
<i>Pachychelium barnardi</i> Alonso, 1993					M		
<i>Pachychelium</i> cf. <i>schellenbergi</i> Lowry, 1984					M		
<i>Paralysianopsis odhneri</i> Schellenberg, 1931					M		
<i>Parawaldeckia kidderi</i> (Smith, 1876)	E	W	G		M		O
<i>Pseudokoroga barnardi</i> Schellenberg, 1931					M		
<i>Socarnoides unidentatus</i> (Schellenberg, 1931)					M		
<i>Stephensenia haematopus</i> Schellenberg, 1928					M		
<i>Stomacontion pepinii</i> (Stebbing, 1888)				S	M		
<i>Stomacontion</i> sp. 1					M		
<i>Stomacontion</i> sp. 2					M		
<i>Tryphosella bispinosa</i> (Schellenberg, 1931)	E	W	G		M		
<i>Tryphosella castellata</i> (K.H. Barnard, 1932)					M		
? <i>Tryphosella paramoi</i> (Schellenberg, 1931)					M		
<i>Tryphosella schellenbergi</i> (Schellenberg, 1931)					M	A	
? <i>Tryphosella serrata</i> (Schellenberg, 1931)			G		M	A	
<i>Tryphosites chevreuxi</i> Stebbing, 1914					M	A	
<i>Tryphosoides falcatus</i> Schellenberg, 1931					M		
<i>Uristes gigas</i> Dana, 1849	E	W	G	S	M		
<i>Uristes serratus</i> Schellenberg, 1931					M		
<i>Uristes subchelatus</i> (Schellenberg, 1931)					M		
<i>Stenia magellanica</i> Dana, 1852					M		
gen. spp.					M		
Fam. Melphidippidae							
<i>Melphidippa</i> sp.					XX		
Fam. Ochlesidae							
<i>Curidia magellanica</i> Coleman & Barnard, 1991					M		
Fam. Oedicerotidae							
<i>Monoculodes</i> sp.					M		
<i>Monoculopsis vallentini</i> Stebbing, 1914					M		
<i>Oediceroides cinderella</i> Stebbing, 1888				S?	M		O
<i>Oediceroides lahillei lahillei</i> Chevreux, 1911		W			M		
<i>Oediceroides</i> cf. <i>macrodaetylus</i> Schellenberg, 1931					M		
<i>Oediceroides</i> cf. <i>newnesi</i> (Walker, 1903)					M		
<i>Paraperiocolodes brevirostris</i> (Schellenberg, 1931)		W			XX		



Table 1. (Cont.)

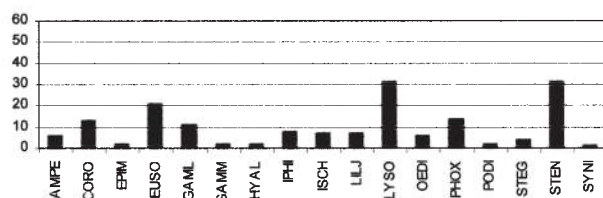
<i>Parapericulodes cystiferus</i> (Schellenberg, 1931)						M	
<i>Parapericulodes cf. cystiferus</i> (Schellenberg, 1931)						M	
<i>gen. spp.</i>						M	
Fam. Pagetiniidae							
<i>Pagetina reducta</i> Holman & Watling, 1981						M	
Fam. Pardaliscidae							
<i>Pardalisca magellanica</i> Schellenberg 1931						M	
<i>Pardalisca cf. magellanica</i> Schellenberg, 1931						M	
Fam. Phoxocephalopsidae							
<i>Eophoxocephalopsis rhachianensis</i> Thurston, 1989						M	
<i>Phoxocephalopsis gallardoii</i> Barnard & Clark, 1984						M	
<i>Phoxocephalopsis cf. gallardoii</i> Barnard & Clark, 1984						M	
<i>Phoxocephalopsis zimmeri</i> Schellenberg, 1931						M	A
<i>Puelche orensanzi</i> Barnard & Clark, 1982						M	
Fam. Phoxocephalidae							
<i>Birubius ?rostratus</i> (Dana, 1853)						M	O?
<i>Fuegiphoxus abjectus</i> Barnard & Barnard, 1980						M	
<i>Fuegiphoxus fuegiensis</i> (Schellenberg, 1931)					T	M	
<i>Heterophoxus videns</i> K.H. Barnard, 1930	E	W	G			M	A
<i>Heterophoxus cf. videns</i> K.H. Barnard, 1930						M	
<i>Metharpinia longirostris</i> Schellenberg, 1931						M	A
<i>Microphoxus cornutus</i> (Schellenberg, 1931)						M	A
<i>Phoxorgia sinuata</i> (K.H. Barnard, 1932)			G			M	A
<i>Phoxorgia cf. sinuata</i> (K.H. Barnard, 1932)						M	
<i>Proharpinia antipoda</i> Schellenberg, 1931						M	
<i>Proharpinia stephenseni</i> (Schellenberg, 1931)						M	
<i>Proharpinia cf. stephenseni</i> (Schellenberg, 1931)						M	
<i>Pseudfoxiphalus setosus</i> Andres, 1991						M	
<i>Pseudharpinia dentata</i> Schellenberg, 1931		W				M	A
<i>Pseudharpinia obtusifrons</i> (Stebbing, 1888)				S		XX	
<i>gen. sp. 1</i>						M	
<i>gen. sp. 2</i>						M	
<i>gen. sp. 3</i>						M	
<i>gen. sp. 4</i>						M	
Fam. Platyschnopidae							
<i>Eudevenopus gracilipes</i> (Schellenberg, 1931)						M?	A
<i>Platyschnopus sp.</i>						M	
Fam. Pleustidae							
<i>Parepimeria irregularis</i> (Schellenberg, 1931)						M	
Fam. Podoceridae							
<i>Podocerus brasiliensis</i> (Dana, 1853)						M	A O
<i>Podocerus cristatus rotundatus</i> Schellenberg, 1931		W	G			M	A
Fam. Sebiidae							
<i>Seba saundersii</i> Stebbing, 1875				S		M	
<i>Seba subantarctica</i> Schellenberg, 1931			G			M	
<i>Seba typica</i> (Chilton, 1884)						M	O
<i>Seba sp. Homan &amp; Watling, 1983</i>						M	
Fam. Stegocephalidae							
<i>Andaniotes corpulentus</i> (Thomson, 1882)		W				M	
<i>Andaniotes linearis</i> K.H. Barnard, 1932	E	W	G			M	
<i>gen. sp. 1</i>						M	
<i>gen. sp. 2</i>						M	
<i>gen.(nov.?) sp. n.1</i>						XX	
<i>gen.(nov.?) sp. n.2</i>						XX	
Fam. Stenothoidae							
<i>Mesoproboloides cornutus</i> (Schellenberg, 1926)	E					XX	
<i>Metopoides cf. clavatus</i> Schellenberg, 1931						M	
<i>Metopoides cf. heterostylis</i> Schellenberg, 1926						M	
<i>Metopoides longicornis</i> Schellenberg, 1931						M	
<i>Metopoides magellanicus</i> (Stebbing, 1888)			G	T		M	
<i>Metopoides sp.</i>						M	
<i>Metopoides sp.n. 1</i>						XX	
<i>Metopoides sp.n. 2</i>						XX	
<i>Metopoides sp.n. 3</i>						XX	
<i>Probolisca elliptica</i> (Schellenberg, 1931)		W				M	
<i>Probolisca cf. elliptica</i> (Schellenberg, 1931)						M	

Table 1. (Cont.)

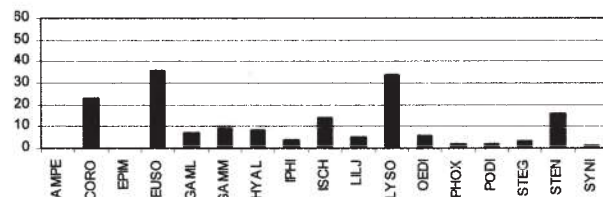
<i>Probolisca nasutigenes</i> (Stebbing, 1888)				S		XX	A	
<i>Probolisca ovata</i> (Stebbing, 1888)	W	G		S		M	A	O
<i>Prometopa</i> sp.n.						XX		
<i>Pseudothaumatelson patagonicum</i> Schellenberg, 1931						M		
<i>Scaphodactylus</i> sp.n.						XX		
<i>Stenothoe falklandica</i> Schellenberg, 1931						M		
<i>Stenothoe magellanica</i> Rauschert, 1997						XX		
<i>Stenothoe cf. magellanica</i> Rauschert, 1997						XX		
<i>Thaumatelson herdmani</i> Walker, 1906	E	W	G	S		M		
<i>Torometopa cf. andresi</i> (Rauschert, 1990)						M		
<i>Torometopa compacta</i> (Stebbing, 1888)			G			M		
<i>Torometopa crassicornis</i> Schellenberg, 1931						M		
<i>Torometopa crenatipalmata</i> (Stebbing, 1888)	E		G	S	T	M		
<i>Torometopa cf. crenatipalmata</i> (Stebbing, 1888)						M		
<i>Torometopa parallelocheir</i> (Stebbing, 1888)			G			M		
<i>Torometopa porcellana</i> (K.H. Barnard, 1932)						M		
<i>Torometopa</i> sp.n. 1						XX		
<i>Torometopa</i> sp.n. 2						XX		
<i>Torometopa</i> sp.n. 3						XX		
<i>Torometopa</i> sp.n. 4						XX		
<i>Torometopa</i> sp.n. 5						XX		
<i>Torometopa</i> sp.n. 6						XX		
<i>Torometopa</i> sp.n. 7						XX		
<i>Torometopa</i> sp.n. 8						XX		
<i>Torometopa</i> sp.n. 9						XX		
Fam. Stenothoidae, cont'd.								
<i>gen. spp.n.</i>						M		
Fam. Stilipedidae								
<i>gen. sp.</i>						M		
Fam. Synopiidae								
<i>Synopia</i> sp.						XX		
Fam. Talitridae								
<i>Orchestia gammarellus</i> (Pallas, 1776)					T	M		O
<i>Orchestia scutigera</i> Dana, 1852			G		T	M		O
<i>Orchestoidea tuberculata</i> Nicolet, 1849						M	A	
<i>Protorchestia nitida</i> (Dana, 1852)						M		
<i>Transorchestia chiliensis</i> (Milne-Edwards, 1840)						M	A	
Fam. Urohaustoriidae								
<i>Huarpe escofeti</i> Barnard & Clark, 1982						M		
Fam. Urothoidae								
<i>Urothoe falcata</i> Schellenberg, 1931						M	A	
Fam. Zobrachoidae								
<i>Chono angustiarum</i> Clark & Barnard, 1987						M		
<i>Tonocote introflexidus</i> Clark & Barnard, 1988						M		
<i>Tonocote magellani</i> Clark & Barnard, 1986						M		
<b>CAPRELLIDEA</b>								
Fam. Phtisicidae								
<i>Aeginoides gaussi</i> Schellenberg, 1926	E	W				M		
<i>Caprellina longicollis</i> (Nicolet, 1849)						M?	A	O
<i>Dodecasella georgiana</i> (Schellenberg, 1931)		W		S		M		
<i>Pseudoprotomima hedgpethi</i> McCain & Gray, 1971		W				M	A	
Fam. Caprellinoididae								
<i>Caprellinoides mayeri</i> (Pfeffer, 1888)			G	S		M		
<i>Dodecas elongata</i> Stebbing, 1883	W			S		M		
Fam. Caprellidae								
<i>Caprella equilibra</i> Say, 1818						M	A	O
<i>Caprella penantis</i> Leach, 1814				S	T	M	A	O
<i>Caprella unguolina</i> Mayer, 1903						M		O
<i>Caprella</i> sp. McCain & Gray, 1971						M		
Fam. Pariambidae								
<i>Luconacia vema</i> McCain & Gray, 1971						M		
<i>Triantella solitaria</i> Mayer, 1903						M	A	
Fam. Protellidae								
<i>Mayerella magellanica</i> McCain & Gray, 1971						M	A	
<i>Protella trilobata</i> McCain & Gray, 1971						M		

TABLE 2. – Taxonomic diversity of the benthic gammaridean amphipods of the Southern Ocean (updated from De Broyer and Jazdzewski, 1996, for the Magellan region; provisional identifications excluded)

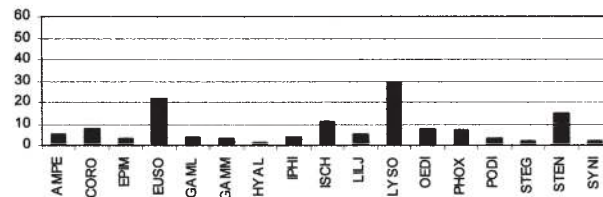
	N spp (N endemics)	N gen (N endemics)	N fam (N endemics)		N spp (N endemics)	N gen (N endemics)	N fam (N endemics)
Magellan sub-region (this paper)	206 (113)	113	42	West Antarctic sub-region	376 (197)	139	38
<i>De Broyer and Jazdzewski (1996)</i>	170 (85)	104	38	East Antarctic sub-region	222 (83)	99	30
Subantarctic Islands sub-region	186 (73)	111	38	<b>Total Antarctic region</b>	<b>470</b> <b>(369)</b>	<b>175</b> <b>(47)</b>	<b>42</b>
<b>Total Subantarctic region</b>	<b>361</b> <b>(202)</b>	<b>166</b> <b>(23)</b>	<b>47</b>	<b>Total Southern Ocean</b>	<b>720</b> <b>(624)</b>	<b>262</b> <b>(101)</b>	<b>54</b> <b>(3)</b>



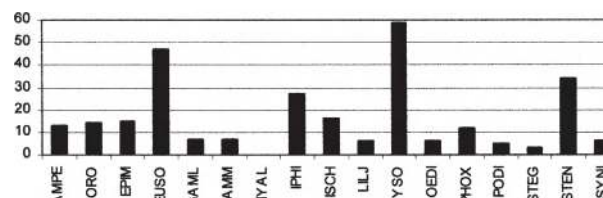
**M**  
n = 163  
n total = 206



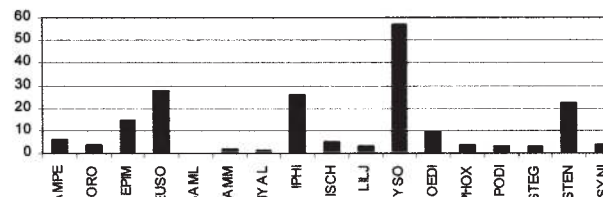
**S**  
n = 170  
n total = 196



**G**  
n = 132  
n total = 153



**W (incl. G)**  
n = 277  
n total = 323



**E**  
n = 192  
n total = 216

FIG. 1. – Comparative species richness of the 17 most speciose families of the different zoogeographic sub-regions of the Southern Ocean (n = cumulated number of species of these 17 families; n total = number of species of all families from the whole faunule; *n.b.*: W includes G in the calculation). M, A, S, G, W, E; see Table 1. AMPE: Ampeliscidae; CORO: Corophiidae s.l.; EPIM: Epimeriidae; EUSO: Eusiridae s.l.; GAML: Gammarellidae; GAMM: Gammaridae s.l.; HYAL: Hyalidae; IPHI: Iphimediidae; ISCH: Ischyroceridae; LILJ: Liljeborgiidae; LYSO: Lysianassidae s.l.; OEDI: Oedicerotidae; PHOX: Phoxocephalidae; PODI: Podoceridae; STEG: Stegocephalidae; STEN: Stenothoidae; SYNI: Synopiidae.



*pus*, *Prometopa*, *Scaphodactylus*, *Synopia*, *Victorhensenoides*, and a new genus of Gammaridae *s.l.*) is recorded for the first time or confirmed in case of previous doubtful records (*Eusiroides* and *Platyischnopus*).

The species richness of the 17 most speciose gammaridean families in the different zoogeograph-

ical sub-regions of the Southern Ocean is compared in Figure 1.

With the discovery of the new species *Victorhensenoides arntzi* Rauschert, the family Cyproideidae was represented for the first time in the Magellan area by its collection during the “Victor Hensen” cruise 1994 (Rauschert, 1996). The

TABLE 3. – Scavenger amphipods and other organisms collected in baited traps in the area of the eastern entrance of the Beagle Channel (Joint Magellan “Victor Hensen” Campaign 1994)

Station	Locality	Depth	Hours on bottom	Species	N. ind.
1147	Isla Picton	115m	72h	AMPHIPODA	Lysianassidae <i>s.l.</i> : <i>Orchomenella (Orchomenopsis) cavimanus</i> 30 <i>Orchomenella (Orchomenopsis) chilensis</i> 4792 <i>Orchomenella (Orchomenopsis) n.sp.1</i> 69 <i>Tryphosella schellenbergi</i> 51 <i>Tryphosites chevreuxi</i> 1298
				ISOPODA	Cirolanidae <i>gen. sp.1</i> 10
				COPEPODA	<i>gen. sp.</i> 10
				DECAPODA	<i>Munida subrugosa</i> (juv.) 2
1171	Isla Picton	40m	52h	AMPHIPODA	Lysianassidae <i>s.l.</i> : <i>Orchomenella (Orchomenopsis) chilensis</i> 9 <i>Tryphosella schellenbergi</i> 177 <i>Tryphosites chevreuxi</i> 29
				ISOPODA	Cirolanidae <i>gen.sp.1</i> 9
				LEPTOSTRACA	<i>gen. sp.</i> 1
				DECAPODA	<i>Munida subrugosa</i> (juv.) 2
1198	Isla Picton	60m	37h	AMPHIPODA	Lysianassidae <i>s.l.</i> : <i>Erikus dahli</i> 5 <i>Orchomenella (Orchomenopsis) cavimanus</i> 1 <i>Orchomenella (Orchomenopsis) chilensis</i> 1 <i>Tryphosella schellenbergi</i> 25 Ischyroceridae <i>gen. sp.1</i> 2 Eusiridae <i>s.l.</i> : <i>Paramoera sp.1</i> 1 Oedicerotidae <i>gen. sp.</i> 3 Stenothoidae <i>gen. sp.</i> 1 Stegocephalidae <i>gen. sp.</i> 1
				ISOPODA	Cirolanidae <i>gen. sp.1</i> 11 Sphaeromatidae <i>gen. sp.</i> 2 <i>gen. sp.</i> 1 <i>gen. sp.</i> 6
				COPEPODA	<i>gen. sp.</i> 1
				PYCNOGONIDA	<i>gen. sp.</i> 1
1226	Isla Lennox	24m	49h	AMPHIPODA	Lysianassidae <i>s.l.</i> : <i>Tryphosella schellenbergi</i> 7 Ischyroceridae <i>gen. sp.2</i> 1 Cirolanidae <i>gen. sp.1</i> 12
				ISOPODA	<i>gen. sp.</i> 1
				MYSIDACEA	<i>gen. sp.</i> 2
				POLYCHAETA	Myxinidae <i>gen. sp.</i> 68
				AGNATHA	
1230	Punta Aaron	50m	11h	AMPHIPODA	Lysianassidae <i>gen. sp.</i> 2
				ISOPODA	Cirolanidae <i>gen. sp.1</i> 3
				DECAPODA	<i>Munida subrugosa</i> (juv.) 2
				AGNATHA	Myxinidae <i>gen. sp.</i> 12
Total	5 sta.		221h	AMPHIPODA	gen: 10 spp: 12 6505
				ISOPODA	gen: 2 spp: 2 45
				COPEPODA	gen: 2 spp: ? 11
				LEPTOSTRACA	gen: 1 spp: 1 1
				DECAPODA	gen: 1 spp: 1 6
				PYCNOGONIDA	gen: 1 spp: 1 1
				POLYCHAETA	gen: 1 spp: 1 2
				AGNATHA	gen: 1 spp: 1 80

family was previously unknown from the Subantarctic and Antarctic regions. Related genera are known from Australia, New Zealand and the Mediterranean Sea.

The family Stenothoidae, under revision by one of us (M.R.), received particular attention. Stenothoids are widespread in the Southern Ocean where they constitute the third most speciose gammaridean family. Representatives of this family are often overlooked or misidentified due to their small size. Their ecology remains poorly known. They could be associated with different sessile benthic organisms like algae, Hydrozoa, Ascidiacea, Porifera, or Octocorallia. Thirteen species were previously known from the Magellan area (De Broyer and Jazdzewski, 1993); 18 additional species were collected during the new campaigns. These new findings make the Stenothoidae the most speciose family for the Magellan area, along with the

Lysianassidae *s.l.* (Fig. 1). Until now, the genus *Scaphodactylus* Rauschert and Andres appeared to be endemic to the South Shetland Islands but its occurrence is extended now into the Magellan area where it was detected for the first time during the "Vidal Gormaz" cruise 1996 (Estrecho Nelson, 51°41,40'S 73°13,40'W, 90m depth).

### Composition of the scavenger component of the amphipod fauna

The bulk of the species collected by baited traps during the "Victor Hensen" campaign was made up of lysianassoids (Table 3). In addition to Amphipoda, a number of Isopoda (Cirolanidae) and Agnatha (Myxinidae) and few (accidental?) Copepoda (2 spp, 6 ind.), Leptostraca (1 spp, 1 ind.), Decapoda (*Munida subrugosa* juv.), Pycnogonida, and Polychaeta were also caught in baited traps.

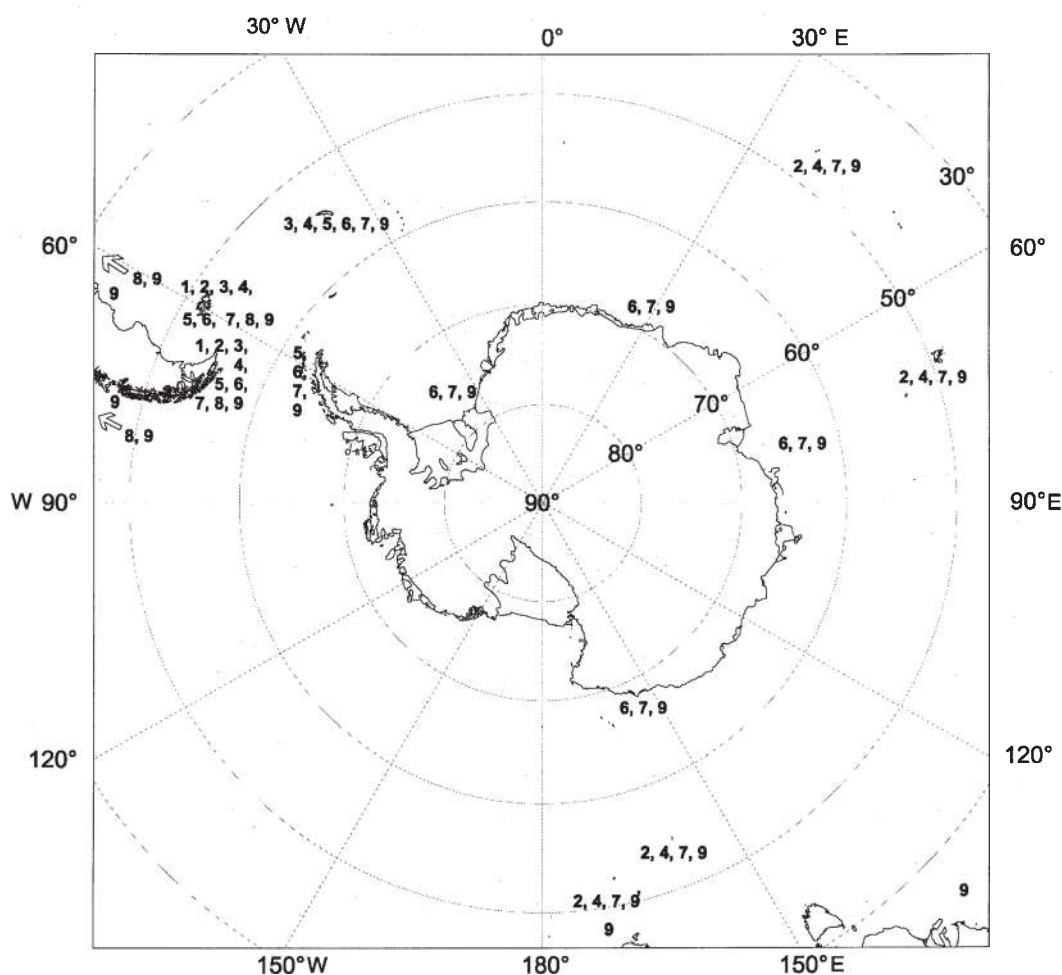


FIG. 2. – The different types of geographical distribution of the Magellan amphipod fauna (1. Endemic; 2. Circumsubantarctic; 3. Magellan subregion + South Georgia; 4. Magellan subregion + West Antarctic + Subantarctic Islands; 5. Magellan + West Antarctic; 6. Magellan + Antarctic; 7. Circumpolar; 8. South America; 9. Austral; 10. "Cosmopolitan"). For significance of numbers see text.

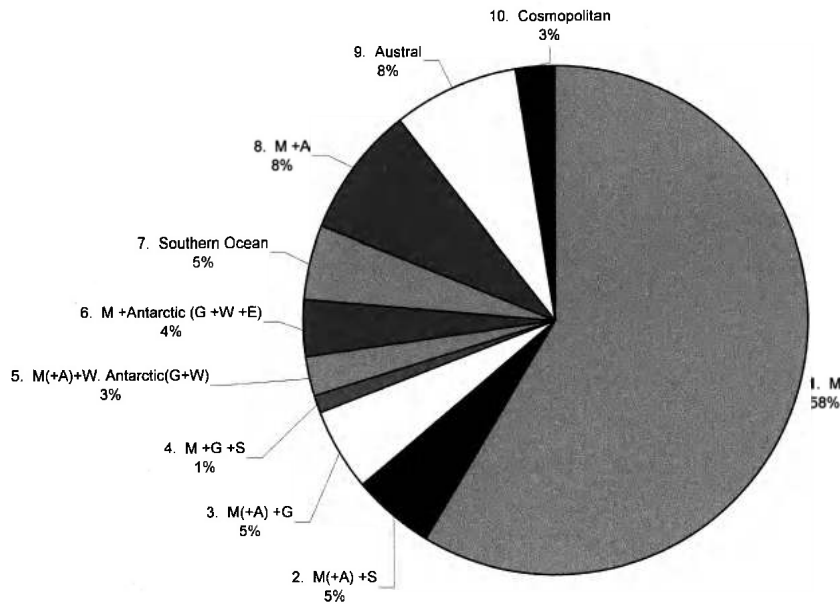


FIG. 3. – Zoogeographical affinities of the Magellan gammaridean amphipods. Legend: **E**: East Antarctic sub-region; **W**: West Antarctic sub-region; **G**: South Georgia district; **S**: Subantarctic Islands sub-region; **M**: Magellan sub-region; **A**: South America (north to M); **Austral**: South America and Southern Hemisphere.

### Zoogeographical affinities of Magellan amphipod fauna

Benthic gammaridean amphipods of the Magellan area exhibit different patterns of distribution in the Southern Ocean or the Southern Hemisphere (Fig. 2 and 3):

1. Endemic: Magellan sub-region (M= 112 spp). Examples: *Orchomenella (Orchomenopsis) chilensis*, *Torometopa crassicornis*.
2. Circumsubantarctic: Magellan sub-region + Subantarctic Islands (M+S= 8 spp; +A= 2 spp), e.g. *Acontiosoma marionis*, *Stomacontion pepinii*, *Gammaropsis longitarsus*.
3. Magellan sub-region + South Georgia (M+G= 7 spp; +A= 3 spp), e.g. *Metopoides magellanicus*, *Seba subantarctica*.
4. Magellan sub-region + South Georgia + Subantarctic Islands (M+G+S= 2 spp): *Orchomenella (Orchomenyx) schellenbergi*, *Torometopa parallellocheir*.
5. Magellan sub-region + West Antarctic, including South Georgia (M+W+G= 3 spp; +A= 2 spp), e.g. *Gondogeneia antarctica*, *Oediceroides lahillei*.
6. Magellan + Antarctic (M+G+W+E= 7 spp), e.g. *Rhachotropis antarctica*, *Paralysianopsis odhneri*.
7. Circumpolar (whole Southern Ocean; M+S+G+W+E = 9 spp), e.g. *Aristias antarcticus*, *Colomastix fissilingua*, *Paramoera gregaria*.

8. South American: Magellan + north to Chile and Argentina (in some cases to Peru or Brasil); M+A = 16 spp, e.g. *Ampelisca gracilicauda*, *Peramphithoe femorata*, *Tryphosites chevreuxi*.

9. Austral (= widely distributed in South America and the Southern Hemisphere); 15 spp: e.g. *Gitanopsis squamosa*, *Hyale hirtipalma*, *Probolisca ovata*.

10. “Cosmopolitan” (5 spp): species distributed worldwide (e.g. *Leucothoe spinicarpa*) or occurring in the Northern Hemisphere (e.g. *Corophium bonellii*) or circumtropical (e.g. *Podocerus brasiliensis*).

### DISCUSSION

#### Taxonomical and zoogeographical preliminary results

In addition to an important catch of unknown species and new records for the area, the abundance of material collected will allow revision of a great part of the Magellan fauna. This taxonomic work takes place in the framework of a general revision of the Southern Ocean amphipod fauna, undertaken by the “Antarctic Amphipodologists Network” (Andres, Bellan-Santini, Berge, Coleman, Conlan, De Broyer (coord.), Hendrycks, Jazdzewski, Rauschert, Takeuchi, Thurston). A brief comparison of the dif-

ferent Southern Ocean faunules (Fig. 1) showed that the Magellan gammarideans are dominated by lysianassoids (which are however about half the number of Antarctic species), stenothoids and eusiroids. The high number of stenothoid species – as in the West Antarctic – is probably a result of the relative importance of the study effort. Gammarellids (which here comprise a significant part of species formerly attributed to Pontogeneiidae) appear the most diverse in the Magellan area. Thirty-three (16 %) of the benthic species of the Magellan subregion co-occur in the Antarctic region (12 spp or 6 % extend only to South Georgia): they belong mostly to the free-living Eusiridae (10 spp) and Lysianassoidea (8 spp), to Stenothoidea living in association with different benthic animals or algae (8 spp), and to the burrowing Phoxocephalidae (4 spp).

The new material should also allow reevaluation of the zoogeographical affinities and tracing of the origin(s) and dispersal of the Magellan amphipod fauna in comparison with the traits of the West- and East Antarctic faunas. This preliminary zoogeographical analysis showed that an important part (not less than 29 spp) of the species occurring in the Magellan region are distributed also along the South American shelf, in the Atlantic ocean sometimes to Brazil (see for instance Wakabara *et al.*, 1991) or to Peru on the Pacific side. The species with extended distribution, in particular the so-called “cosmopolitans” or the australasian species recorded in the southernmost part of South America, most often demand careful re-examination and confirmation of their identity.

### Scavenger fauna

Trap samples usually provide scavenging species which are not commonly taken by trawls, sledge and dredge. They also give indication of the relative importance of the scavenger component in benthic communities. The most successful sample was taken at “Victor Hensen” station 1147 (72h at 115m) and is probably due to the longer residence time on the bottom. The transect off Isla Picton (“Victor Hensen” stations 1147, 1171, 1198) indicates the probable preference of *Orchomenella chilensis* and *Tryphosites chevreuxi* for depths below 100m and of *Tryphosella schellenbergi* for depths shallower than 60m. Except detailed analysis of population structure or stomach contents of the samples, more precise interpretation of trap results (e.g. selective attractivity to different baits) seems difficult due to

the small number of operations, the different residence times on the bottom and the use of non standard baits. At station 1198, traps contained a small number of amphipods belonging to species or families not usually known as scavengers and their attraction to bait should be confirmed. Some samples from stations shallower than 50m *i.e.* sta. 1226 (49h at 24m) and sta. 1230 (11h at 50m) were partly spoiled due to significant presence of Myxinidae in the traps which provided abundant mucus and could have ingested trapped amphipods.

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