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SEA BENTHOS SURVEY

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ciation of Marine Science and Technology

Council for the Exploration of the Sea
Benthos Ecology Working Group

Commission of the European Communities
Science Programme

31280

TAXONOMY OF NORTH SEA BENTHOS

PROCEEDINGS OF A WORKSHOP ORGANIZED IN HELGOLAND 8-12 FEBRUARY 1988

EDITORS: CARLO HEIP(1) & ULRICH NIERMANN(2)

(1) Delta Institute for Hydrobiological Research, Yerseke, The Netherlands

(2) Biologische Anstalt Helgoland, Hamburg, W. Germany

Delta Institute for Hydrobiological Research
Vierstraat 28
NL-4401 EA Yerseke
The Netherlands, 1989

Communication nr. 445

- 1989 -

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BIOLOGISCHE ANSTALT HELGOLAND
MEERESSTATION

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PREFACE

Research on subtidal benthos has greatly expanded over the last decade with the increasing realisation of the importance of the sediment and its inhabitants in shallow coastal ecosystems and the applicability of this research in pollution studies. European cooperation in benthic research has also greatly increased through programmes such as COST 647 'Coastal Benthic Ecology' of the CEC and the creation of the Benthos Ecology Working Group within the International Council for the Exploration of the Sea.

Through the efforts of the Benthos Ecology Working Group, the benthos of the Southern North Sea was sampled quasi-synoptically in April-May 1986 with seven ships from five European countries using comparable methods. Ten laboratories from France, Belgium, The Netherlands, Germany and the United Kingdom joined the effort that will take about five years to complete. The North Sea Benthos Survey has been accepted as a network in the oceanography programme of the European Association of Marine Science and Technology in the Council of Europe and receives support from the Science Programme of the CEC.

The North Sea Benthos Survey made clear again that even in this area, which is amongst the best studied in the world, our lack of knowledge is still immense. Around one thousand macrobenthic species have now been inventarised and this number is even exceeded by the much less explored meiofauna. Also for quantitative purposes species determination is a prerequisite. One of the main problems encountered in treating the data is taxonomic: even well established laboratories with long traditions may have different opinions on the taxonomy of species even in well known genera. A workshop in which these differences could be discussed was generally felt to be of great importance. From 8-12 February 1988 the workshop on Taxonomy of North Sea Benthos was organised in Helgoland: 29 scientists participated, amongst which well-established taxonomists as well as graduate students.

It was a great success, not in the least due to the stormy setting. The crossing from Cuxhaven in gales of force 11-12 will remain in memories for a long time. Even hardy North Sea scientists had difficult times aboard the Friedrich Heincke and much organic matter was involuntarily added to the already large North Sea pool, though quickly replaced in a more liquid form once arrived upon the island.

We thank the Council of Europe and the Biologische Anstalt Helgoland who contributed financially to the success of the workshop. We also thank the Biologische Anstalt for lodging and providing us with excellent laboratory facilities.

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Kröncke	Ingrid	Benthos of the Dogger Bank	idem 040 - 89693 177
Niermann	Ulrich	Benthos of the eastern German Bight	idem 040 - 89693 171

SECTION I. METHODOLOGY

EXAMINATION OF ECHINODERMS AND NEMERTEANS 31282

Ilse Bartsch
Biologische Anstalt Helgoland

Echinodermata

For fixation good quality, buffered formaldehyd (4-5%) or alcohol (70-75%) can be used. When alcohol is used, washing with tap water is recommended. As formalin may corrode calcareous structures, the echinoderms should be transferred to alcohol (70%) as soon as possible. Live specimens can be relaxed by adding magnesium sulfate or icy salt water (fresh water) prior to fixation. Outlines and details of plates and calcarous appendages are more easily recognized when the specimens surface is dried.

For identification use Mortensen, T., 1927, Handbook of the Echinoderms of the British Isles; for material from Danish seas the Danish edition, Mortensen, T., 1924, Pighude (Echinodermer), Danmarks Fauna, is recommended. Juveniles of Ophiura albida and Ophiura ophiura can be identified using Webb, C.M. & P.A. Tyler, 1985, Marine Biology 89. A quantitative survey of echinoderms in the Central North Sea is presented in Ursin, E., 1960, Meddr Danm. Fish- Havsunders. N.S. 2.

Nemerteans

In general, identification of nemerteans requires sectioning; though external and internal structurs may help to identify families, genera or even species. Significant external features are general body shape, outline of cephalic region, presence of cephalic slits or grooves, number and arrangement of ocelli, opening of mouth and proboscis pore, presence of ventral sucker and caudal cirrus. Appropriate internal structures (distinguishes in specimens lightly flattened or transferred into glucerine) are cerebral ganglia, rhyncocoel, proboscis armature, intestine. Colour patterns of nemerteans may vary considerably, and is thus usually not sufficient for species identification.

For identification of nemerteans use Gibson, R., 1982, British Nemerteans, Synopsis of the British Fauna (New Series) 24. Nemerteans from Danish waters are described in Brunberg, L., 1964, Ophelia 1.

SUGGESTED PROCEDURE FOR FIXATION AND PRESERVATION OF BENTHOS SAMPLES (METAZOANS) 31283

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Except for larger macrofauna use:
2% formaldehyde (pure quality) in seawater or demineralized H_2O, buffer with Borax so pH is as least 7,5 (prepare the fluid before use !); make sure that bulk samples are fixed throughout; if necessary exchange fluid; fixation time 1-2 days; then exchange formaldehyde solution as soon as possible with 70% ethanol (final concentration) after short washing with tap water (to remove salt).
This would be a good general method for most taxa of Metazoa.

Special methods:

1. Early spat of shelled molluscs are best kept in 90% ethanol after short washing with tap water. Store samples in the dark.

2. Larval molluscs: Best kept in Carriker's solution: 1 liter of filtered seawater + 10 ml of 40 or 30% formaldehyde (analytical quality) + 100 g of cane sugar and buffered with Borax to get pH of 8 (or slightly higher). Check pH !! (This medium is, however, not good for e.g. planktonic Crustacea).
   Store in darkness.

3. Really good material of polychaetes requires narcotizing with isotonic $mgCl_2$ before fixation in 2% formaldehyde.

4. When changing preservation fluids of bulk samples, use sieves with meshsize well below that used earlier during sampling.

5. Use for nomenclature the checklist of marine Molluscs from Hoisaeter, T. (1986) Sarsia 71: 73-145.

Section II. Literature

A PRELIMINARY LIST OF LITERATURE FOR THE IDENTIFICATION OF JUVENILES AND LARVAE OF MARINE MACROBENTHIC BIVALVES (MOLLUSCA)

31284

A. Bosselman

Alfred Wegener Institut, Bremerhaven

AABEL, J.P. (1983): Morphology and function in postmetamorphal Abra alba (Bivalvia: Tellinacea). Sarsia, 68: 213-219.

ANSELL, A.D. (1962): The functional morphology of the larval and the post-larval development of Venus striatula (Da Costa). J. mar. biol. Ass. U.K., 42 (2): 419-443.

FOSSHAGEN, A. (1965): Bunnetvertebratlarver over et Venus-sam-funn i Oresund. Unpubl. cand. real. thesis, Univ. Bergen, 70 pp.

GAGE, J. (1966): The life-histories of the bivalves Montacuta substriata and M. ferruginosa, commensals with Spatangoids. J. mar. biol. Ass. U.K., 46: 499-511.

JØRGENSEN, C.B. (1946): Lamellibranchia. In: G. THORSON. Reproduction and larval development of Danish marine bottom invertebrates, with special reference to the planktonic larvae in the Sound (Øresund). Meddr. Kommn. Danm. Fisk. - og. Havunders., Ser. Plankton 4: 217-311.

LE PENNEC, M. (1980): The larval and post-larval hinge of some families of bivalve molluscs. J. mar. biol. Ass.U.K., 60: 601-617.

LUTZ, R.A. & H. HIDU (1979): Hinge morphogenesis in the shells of larval and early postlarval mussels (Mytilus edulis L. and Modiolus modiolus (L.)). J. mar. biol. Ass.U.K., 59: 111-121.

LUTZ, R.A., R.A. MANN, J.G. GOODSELL & M. CASTAGNA (1982): Larval and post-larval development of Acartica islandica. J. mar. biol. Ass. U.K., 62 (4): 745-769.

REES, C.B. (1950): The identification and classification of lamellibranch larvae. Hull. Bull. mar. Ecol., III (19): 73-104.

RUMOHR, H. (1980): Der Benthosgarten in der Kieler Bucht-Experimente zur Bodentierökologie. Rep. Sonderforschungsbereich 95, Univ. Kiel, 55: 1-179.

SCHWEINITZ, E. & R.A. LUTZ (1976): Larval development of the northern horse mussel, Modiolus modiolus (L.), including a comparison with the larvae of Mytilus edulis L. as an aid in planktonic identification. Biol. Bull., 150: 348-360.

WEBB, C.M. (1986): Post-larval development of the Tellinacean Bivalves Abra alba, Tellina fabula and Donax vittatus (Mollusca: Bivalvia), with reference to the late larva. J. mar. biol. Ass. U.K., 66: 749-762.

WEBB, C.M. (1987): Post-larval development of the Bivalves Nucula turgida, Venus striatula, Spisula subtruncata and S. ellyptica (Mollusca: Bivalvia), (with reference to the late larva). J. mar. biol. Ass. U.K., 67: 441-459.

A BIBLIOGRAPHY ON COMMON LITERATURE OF IDENTIFICATION OF MACROZOOBENTHOS.

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Crustacea

LINCOLN, R.J. (1979): British Marine Amphipoda: Gammaridea. 658 pp. British Museum (Natural History), London.

CHRISTIANSEN, M.E. (1969): Crustacea, Decapoda, Brachyura. 143 pp. Marine Invertebrates of Scandinavia, Universitetsfarlaget, Oslo.

SMALDON, G. (1979): British Coastal Shrimps and Prawns. Synopses of the British Fauna (New Series), No. 15, 126 pp. Academic Press, London.

JONES, N.S. (1976): British Cumaceans. Synopses of the British Fauna (New Series), No. 17, 66 pp. Academic Press, London.

MAUCHLINE, J. (1984): Euphausiid, Stomatopod and Leptostracan Crustaceans. Synopses of the British Fauna (New Series), No. 30, 91 pp. E.J. Brill/ Dr. W. Bachhuys, London - Leiden - Köln - Kobenhavn.

INGLE, R.W. (1983): Shallow -Water Crabs. Synopses of the British Fauna (New Series), No.25, 206 pp. Cambridge University Press, Cambridge - London - New York.

HOLDICH, D.M. and J.A. JONES (1983): Tanaids. Synopses of the British Fauna (New Series), No. 27, 98 pp. Cambridge University Press, Cambridge - London - New York.

Echinodermata

MORTENSEN, T.H. (1927): Handbook of the Echinoderms of the British Isles. 471 pp. Humphrey Milford Oxford University Press.

WEBB, C.M. and P.A. TYLER (1985): Post-larval development of the common north-west European brittle stars Ophiura ophiura, O. albida and Acrocrida brachiata (Echinodermata : Ophiuroidea). Marine Biology 89: 281-292

Mollusca

TEBBLE, N. (1966): British Bivalve Seashells. The British Museum (Natural History), London, 1966: 212 pp.

ZIEGELMEIER, E. (1966): Die Schnecken der deutschen Meeresgebiete und brackigen Kustengewässer. Sonderabdruck aus: Helgol. Meeresunters. 13: 1-61.

ZIEGELMEIER, E. (1957): Die Muscheln der deutschen Meeresgebiete. Sonderabdruck aus: Helgol. wiss. Meeresunters. 6.

THOMPSON, T.E. and. G.H. BROZON (1976): British Opisthobranch Molluscs. Synopsis of the British Fauna (New Series), No. 8, 203 pp. Academic Press, London.

THOMPSON, T.E. (1988): Molluscs: Benthic Opisthobranchs (Mollusca: Gastropoda). Synopsis of the British Fauna, No. 8, 368 pp. E.V. Brill, Leiden.

GRAHAM, A. (1971): British Prosobranchs. Synopsis of the British Fauna (New Series), No. 12, 112 pp. Academic Press, London.

GRAHAM, A. (1988): Molluscs: Prosobranch and Pyramidellid Gastropods. Synopsis of the British Fauna, No. 2, 680 pp., E.J. Brill, Leiden.

JONES, A.M. and J.M. BAXTER (1987): Molluscs: Caudofoveata, Solenogastres, Polyplacophora and Scaphopoda. Synopsis of the British Fauna (New Series), No. 37, 123 pp. E.J. Brill/Dr. W. Bachhuys, London - Leiden -Köln -Kobenhavn.

HOISAETER, T. (1986): An annotated check-list of Marine Molluscs of the norvegian coast and adjacent seawaters. SARSIA 71: 73-145 (with an extensive literature index).

Polychaeta

HARTMANN-SCHRODER, G. (1971): Annelida, Borstenwürmer, Polychaeta. Die Tierwelt Deutschlands, 58. Teil, VEB Gustav Fischer Verlag, Jena (out of print).

HOLTE, T. (1986): Polychaeta, Terebellomorpha. Marina Invertebrates of Scandinavia, No. 7, 194 pp. Norwegian University Press.

TEBBLE, N. and S. CHAMBERS (1982): Polychaetes from Scotish Waters, Part I: Family Polynoidae, 73 pp. Royal Scotish Museum, Edinburgh.

CHAMBERS, S. (1985): Polychaetes from Scottish Waters, Part II: Families Aphroditidae, Sigalionidae and Polyodontidae. 38 pp. Royal Scottish Museum, Edinburgh.

FAUCHALD, K. (1977): The Polychaete Worms. Definitions and Keys to the Orders, Families and General. 188 pp. Natural History Musum of Los Angeles County.

GEORGE, J.D. and G. HARTMANN-SCHRODER (1985): Polychaetes: British Amphinomida, Spintherida and Eunicida. Synopsis of the British Fauna (New Series), No. 32, 221.E.J. Brill/Dr. W. Bachhuys, London - Leiden-Köln - Kobenhavn.

STRELZOV, V.E. (1979): Polychaetes worms of the family Paraonidae, CERRUTI, 1909, (Polychaeta, Sedentaria). 212 pp. Amerind Publishing CO.PVT.LTD., New Dehli, 1979.

A PARTIAL BIBLIOGRAPHY ON THE IDENTIFICATION OF THE POLYCHAETA FROM THE NORTH WEST ATLANTIC

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General faunal works

DALES, R.P. and PETER, G. (1972). A synopsis of the pelagic Polychaeta. Journal of Natural History, 6: 55-92.

DAY, J.H. (1967). A monograph on the Polychaeta of southern Africa London (British Museum (Natural History)) Pt. 1 Errantia: 1-458; Pt. 2. Sedentaria: 459-878.

FAUCHALD, K. (1977). The polychaete worms. Definitions and keys to the orders, families and genera. Natural History Museum of Los Angeles, Science Series, 28: 1-190.

FAUVEL, P. (1923). Polychétes errantes. Faune de France, 5: 1-488.

FAUVEL, P. (1927). Polychétes sédentaires. Addends aux errantes, archi-annélides, myzostomaires. Faune de France, 16: 1-494. Although quite old, missing many species and with poor diagrams, these two volumes along with Hartmann-Schröder (1971) are the most extensive faunal works for european waters.

FRIEDRICH, H. (1938). Polychaeta. Die Tierwelt des Nor- und Ostsee. G. Grimpe & Wagler, Leipzig. Lieferung 32 (6b). 201 pp.

HARTMAN, O. (1951). Literature of the polychaetous annelids. Vol. 1. Bibliography. Edwards Brothers, Michigan: 1-290. With Hartman (1959 and 1965), this book is useful for finding references to original descriptions of species and most early polychaete literature.

HARTMAN, O. (1959). Catalogue of the polychaetous annelids of the world. Parts 1 and 2. Occasional Papers of the Allan Hancock Foundation 23: 1-628.

HARTMAN, O. (1965). Catalogue of the polychaetous annelids of the world. Supplement 1960-1965 and index. Occasional Papers of the Allan Hancock Foundation 23: 1-197. Together with the preceeding reference, the only comprehensive list of polychaete species available. Useful as an index for synonyms.

HARTMANN-SCHRÖDER, G. (1971). Annelida, Borstenwurmer, Polychaeta. In: Die Tierwelt Deutschlands, F. Dahl (ed.) 594 pp. Fischer Verlag, Jena.

MIKKELSEN, P. and R. VIRNSTEIN (1982). An illustrated Glossary of Polychaete terms. Harbor Branch Foundation, technical report no. 46. A useful compendium of polychaete terminology with clear drawings.

PETTIBONE, M.H. (1963). Marine Polychaete Worms of the New England Region. Aphroditidae through Trochochaetidae. Bulletin of the Natural History Museum, U.S. 227 (1): 1-356. Descriptions are short and some drawings are poor.

UEBELACKER, J. and P.G. JOHNSTON (eds.) (1986). Taxonomic guide to Polychaetes of the Northern Gulf of Mexico. 7 vols. Barry Vittor and Associates. A thorough review of the polychaete fauna of the area with clear descriptions and excellent drawings. A useful cross reference.

SYSTEMATIC

Orbiniida

DAY, J.H. (1977). A review of the Australian and New Zealand Orbiniidae (Annelida: Polychaeta). 217-246in "Essays on Polychaetous Annelids in memory of Dr. Olga Hartman". Allan Hancock Foundation Special publication, Los Angeles, 604 pp.

GIBBS, P.E. (1965). Recent additions to the marine fauna of Whitstable, with a description of Aricidea minuta Southward (Annelida: Polychaeta). Annals and Magazine of Natural History, series 13, 7: 33-36.

GLEMAREC, M. (1966). Paraonidae de Bretagne. Description de Paradoneis armata sp.n. Vie et Milieu, 17: 1045-1052.

HARTLEY, J.P. (1981). The family Paraonidae (Polychaeta) in British waters: A new species and new records with a key to species. Journal of the Marine Biological Association U.K., 61: 133-149.

HARTLEY, J.P. (1984). Cosmopolitain polychaete species: the status of Aricidea belgica (Fauvel, 1936) and notes on the identity of A. seucica Eliason, 1920 (Polychaeta: Paraonidae). Proceedings of the First International Conference, Sydney. Linnean Society of New South Wales: 7-20.

HARTMAN, O (1957). Orbiniidae, Apistobranchidae, Paraonidae and Longosomidae. Allan Hancock Pacific Expedition, 15: 211-393.

HOBSON, K.D. (1970). Novaquesta trifurcata, a new genus and species of the family Questidae (Annelida, Polychaeta) from Cape Cod Bay, Massachusetts. Proceedings of the Biological Society of Washington, 83: 191-194.

KATZMANN, W. and L. LAUBIER (1975). Paraonidae (Polychétes sédentaires) de l'Adriatique. Annln. naturh. Mus. Wien 79: 567-588.

LAUBIER, L. (1967). Sur quelques Aricidea (Polychètes, Paraonidae) de Banyuls-sur-mer. Vie Milieu 18 (1A): 99-132.

LAUBIER, L. and J. RAMOS (1974). Paraonidae (Polychètes Sédentaires) de Méditerranée. Bulletin du Museum d'histoire naturelle, Paris. Sér. 3, 168 (1973): 1097-1148.

MACKIE, A.S.Y. (1987). A review of species currently assigned to the genus Leitoscoloplos Day, 1977 (Polychaeta: Orbiniidae), with descriptions of species newly referred to Scoloplos Blainville, 1828. Sarsia 72: 1-28.

O'CONNOR, B. DINNEEN, M. CONNEELY and T. BOWMER (1984). Notes on the Irish Paraonidae (Polychaeta) with records of two species new to Ireland. Irish Naturlists Journal, 21: 220-226.

RAMOS, J.M. (1970). Haploscoloplos kerguelensis McIntosh, 1885 nouvel Orbiniidae en Mediterranée occidentale. Vie Milieu, 16 (1A): 1-10.

STRELZOV, V.E. (1979). Polychaete worms of the Family Paraonidae Cerruti 1909 (Polychaeta Sedentaria). 212 p. Amerind Publishing Co., New Delhi.

CTENODRILIDA

LAUBIER, L. (1961). Montecellina heterochaeta n.g., n.sp. cténodrilide (Polychètes sédentaires) des vases côtières de Banyuls-sur-mer. Vie Milieu, 11: 601-604.

PSAMMODRILLIDA

COSSURIDA

DAY, J.H. (1963). The Polychaete fauna of South Africa. Part 8. New species and records from grab samples and dredgings. Bulletin of the British Museum of Natural History (Zoology), 10: 384-445.

LAUBIER, L. (1963). Découverte de genre Cossura (Polychète Cossuridae) en Méditeranée: Cossura soyeri n.sp. Vie Milieu, 14: 833-842.

SPIONIDA

BANSE, K. (1969). Acrocirridae n. fam. (Polychaeta Sedentaria). Journal of the Fisheries Research Board of Canada, 26 (10): 2595-2620.

BLAKE, J.A. (1971). Revision of the genus Polydora from the east coast of North America (Polychaetes: Spionidae). Smithsonian Contribution to Zoology, 75: 1-32.

BLAKE, J.A. and J.D. KUDENOV (1978). The Spionidae (Polychaeta) from southeastern Australia and adjacent areas with a revision of the genera. Memoirs of the Natural History Museum Victoria, 39: 171-280.

CHRISTIE, G. (1984). A new species of Tharyx (Polychaeta: Cirratulidae) from five estuaries in North-East England. Sarsia, 69: 69-73.

ELEFTHERIOU, A. (1970). Notes on the polychaete Polydora pulchra from British waters. Cahiers de Biologie Marine, 11: 459-474.

FOSTER, N.M. (1971). Spionidae (Polychaeta) of the Gulf of Mexico and the Caribbean Sea. Studies on the Fauna of Curaçao and other Caribbean Islands, 63: 1-183.

GIBSON, P.H. (1978). Systematics of Dodecaceria (Polychaeta: Annelida) and its relation to the reproduction of its species. Zoological Journal of the Linnean Society, 63: 275-287.

GLEMAREC, M. (1973). Les Magelonidae des Côtes de Bretagne descriptions de Magelona wilsoni n. sp. Vie Milieu, 17: 1077-1085. Includes a short key to the species and a description of M. wilsoni nov. sp.

GUERIN, J.P. and P. KERAMBRUN (1984). Role of reproductive characters in the taxonomy of spionids and elements of speciation in the "Malacoceros fuligenosus" complex. Fortschrifte der Zoologie, 29: 317-333.

HAMMOND, R. (1962). On some Polychaetes from the Coast of Norfolk. Annals and Magazine of Natural History, ser. 13, (5): 567-576. Contains a key to the species of Caulleriella.

HANNERZ, L. (1961). Polychaeta: larvae. Families: Spionidae, Disomidae, Poecilochaetidae. Fiches d'Identification de Zooplancton, 91: 1-12.

HARTMAN, O. (1957). Orbiniidae, Apistobranchidae, Paraonidae and Longosomidae. Allan Hancock Pacific Expedition, 15: 211-393.

JONES, M.L. (1977). A redescription of Magelona papillicornis O.F. Müller. In "Essays on Polychaetous annelids". Eds. Reish, d.J. and Fauchald, K. Allan Hancock Foundation Special Publication, Los Angeles. pp. 247-266.

LAUBIER, L., C. PICARD and J. AMOS (1972-73). Les Heterospionidae (annélides polychètes sédentaires) de Méditerranée occidentale. Vie Milieu 23 (2A): 243-254.

LAUBIER, L. and J. RAMOS (1973). A new genus of Poecilochaetidae (Polychaetous annelid) in the Mediterranean: Elicodasia mirabilis. Proceedings of the Biological Society of Washington, 86: 69-78.

LAUBIER, L. and J. RAMOS (1974). Polydora guillei sp. nov. nouvelle espèce de polychète spionidien en Méditerranée occidentale. Vie Milieu, 24: 479-486.

LIGHT, W.J. (1978). Spionidae Polychaeta Annelida (Invertebrates of the San Francisco Bay estuary system). The Boxwood Press 183 Ocean View Blvd. Pacific Grove, CA 93950.

MACIOLEK, N. (1981). A new genus and species of Spionidae (Annelida: Polychaeta) from the North and South Atlantic. Proceedings of the Biological Society of Washington, 94: 228-239.

MACIOLEK, N. (1985). A revision of the genus Prionospio Malmgren, with special emphasis on species from the Atlantic Ocean and new records of species belonging to the genus Aprionospio Foster and Paraprionospio Caullery (Polychaeta, Anneleida, Spionidae). Zoological Journal of the Linnean Society, 84; 325-383.

MACIOLEK, N. (1987). New species and records of Scolelepis (Polychaeta: Spionidae) from the East coast of North America, with a review of the subgenera. Bulletin of the Biological Society of Washington, 7: 16-40.

MACKIE, A. (1984). On the identity and zoogeography of Prionospio cirrifera Wirén 1883 and Prionospio multibranchiata Berkeley, 1927 (Polychaeta: Spionidae). Proceedings of the First International Conference, Sydney. Linnean Society of New South Wales: 35-47.

MACKIE, A.S.Y. and DUFF, A.A. (1986). Atherospio disticha gen.et sp. nov (Polychaeta: Spioniae) from Loch Tuirnaig, west coast of Scotland. Ophelia, 25: 139-146.

MESNIL, F. (1896). Etudes de morphologie externe chez les Annelides 1. Les Spionidiens des côtes de la Manche. Bull. Sci. Fr. Belg. 29: 110-287 & pl. 7-15.

MUSTAQUIM, J. (1986). Morphological variations in Polydora ciliata complex (Polychaeta: Annelida). Zoological Journal of the Linnean Society, 86: 75-88.

PILATO, G. and G. CANTONE (1976). Nuove specie di Polydora ciliata complex (Polychaeta: Annelida). Zoological Journal of the Linnean Society, 86: 75-88.

PLEIJEL, F. (1985). Prionospio ockelmanni sp.n. (Polychaeta: Spionidae) from the Oresund and the northern part of the Swedish west coast. Ophelia, 24: 177-181.

RAMBERG, J.P. and T.A. SCHRAM (1983). A systematic review of the Oslofiord species of Polydora Bosc and Pseudopolydora Czerniavsky, with some new biological and ecological data (Polychaeta: Spionidae). Sarsia, 68 (4): 233-247.

RAMOS, J.M. (1976). Aonides oxychephala remarques taxonomiques. Vie Milieu, 26: 11-20.

READ, G.B. (1986). New deep seas Poicilochaetidae (Polychaeta: Spionida) from New Zealand. Journal of Natural History, 20: 399-413. This includes an up to date key to the species.

RULLIER, F. (1963). Devellopment de Polydora antennata Claparede var. pulchra Carazii. Cahiers de Biologie Marine, 6: 233-250.

THULIN, G. (1957). Über einige Spioniden (Polychaeta) aus dem Oresund. Kungl. Fysiografiska Sällskapets i Lund Forhandlinger, 27: 49-49.

WESENBERG-LUND, E. (1939). Polydora antennata Claparede, a spionid polychaete new to Norway. Det Kongelige Norske Videnskapers Selskab Forhandlinger, 11: 193-195.

WILSON, D. (1958). The polychaete Magelona alleni n.sp. and a re-assessment of Magelona cincta Ehlers. Journal of the Marine Biological Association, U.K., 37: 617-626.

WILSON, D.P. (1959). The polychaete Magelona filiformis sp. nov. and notes on other species of Magelona. Journal of the Marine Biological Association, U.K. 38: 547-556.

CAPITELLIDA

ARWIDSSON, I. (1907). Studien über die skandinavischen und arktische Maldaniden nebst Zusammenstellung der ubrigen bisher bekannten Arten dieser Familie. Zoologisches Jahrbuch Suppl. 9 (1): 1-308.

ARWIDSSON, I.(1911). On some Irish Maldanidae. Proceedings of the Royal Irish Academy, 29: 209-228.

ARWIDDSON, I. (1922). Systematic notes on some maldanids. Kungl. Svenska Vetenskapsakademiens Handlingar. 63: 1-46.

BOLETZKY, S. and W. DOHLE (1967). Observations sur une capitellide (Capitella hermaphrodita sp.nov.) et d'autres polychètes habitant la ponte de Loligo vulgaris. Vie Milieu,18: 79-98.

CECILIA, A. and Z. AMARAL (1983). Breve caracterizacao dos gêneros de familia Capitellidae Grube (Annelida,Polychaeta) e descricao de Nonatus longilineus gen. sp. nov. Universidade Estadual de Campinas - Departmento de Zoologia. Diagrammatic representation of chaetae and branchiae for genera.

CLARKE, R.B. (1956). Capitella capitata as a commensal, with a bibliography of a parasitism and commensalism in the polychaetes. Annals and Magazine of Natural History, series 12, 9: 433-448.

DINNEEN, P. (1982). Peresiella clymenoides Harmelin, 1968: a capitellid polychaete new to Ireland and Great Britain. Irish Naturalists Journal, 20: 471-475.

EWING, R.M. (1982). A partial revision of the genus Notomastus (Polychaeta: Capitellidae) with a description of a new species from the Gulf of Mexico. Proceedings of the Biological Society of Washington, 95: 232-237.

EWING, R.M. (1984). Generic revision of Mastibranchus and Peresiella (Polychaeta: Capitellidae) with descriptions of two new species from the Gulf of Mexico and Atlantic Ocean. Proceedings of the Biological Society of Washington, 97: 792-800.

FAUCHALD, K. (1975). Notes on Southern California Capitellidae. In Word, J.Q. and Charwat, D.K. (Editors). Invertebrates of southern California coastal waters El Segundo, California (Southern California Coastal Water Research Project). 1: 299-333.

HARMELIN, J.G. (1968). Note sur trois Capitellidae (Annélides polychètes) récoltés en Méditerranée avec description d'un nouveau genre: Peresiella. Rec. Trav. Stn. mar. Endoume, 43 (59): 253-259.

HARTMAN, O. (1947). Polychaetous annelids. Part VIII. Capitellidae. Allan Hancock Pacific Expedition 10 (4): 3911-481.

Diagrammatic representation of setae and brachiae for genera.

McCAMMON, J.A. and STULL, J.K. (1978). A new genus and species of Capitellidae (Polychaeta) from California. Bulletin of the Southern Californian Academy of Science, 77: 40-43.

NOLTE, W. (1913). Zur kenntnis der Maldaniden der Nord- und Ostsee. Wissenschaftliches Meeresforschungen der Kieler Kommission, Abteilung Kiel, neue Folge. 15: 1-94.

PILTZ, F.M. (1977). A new genus and species of polychaete (family Capitellidae) from southern California. Bulletin of the Southern Californian Academy of Science, 76: 57-60.

TEBBLE, N. (1954). On the polychaete Dasybranchus from British waters. Annals and Magazine of Natural History, 7 (12): 316-320.

THOMASSIN, B. (1970). Contribution a l'etude des polychètes de la region de Tulear (S.W. de Madagascar). III. Sur les Capitellidae des sables coralliens. Rec. Trav. Station Marine d'Endoume. Fasc. hors serr suppl. 10: 71-101.

WARREN, L.M. (1976). A review of the genus Capitella (Polychaeta, Capitellidae). Journal of the Zoological Society of London, 180: 195-209.

WARREN, L. (1979). Mediomastus fragilis Rasmussen (Polychaeta: Capitellidae), a species newly recorded from British waters. Journal of the Marine Biological Association, U.K. 59: 757-760.

WELLS, G.P. (1959). The genera of Arenicolidae (Polychaeta). Proceedings of the Zoological Society of London, 133: 301-314.

WOLF, P. (1983). A revision of the Bogueidae Hartman and Fauchald, 1971, and its reduction to Boguenae, a subfamily of Maldanidae (Polychaeta). Proceedings of the Biological Society of Washington, 96: 238-249.

OPHELIIDA

AMOUREUX, L.and DAUVIN, J.-C. (1981). Ophelia celtica (annélide polychète, nouvelle espece avec quelques remarques sur les divers especes du genre. Bulletin de la Societe Zoologiques de France, 106: 189-194.

BLAKE, J.A. (1981). The Scalibregmatidae (Annelida: Polychaeta) from South America and the Antarctic collected chiefly during the cruise of the R/V Anton Brun, R/V Hero and USNS Eltanin. Proceedings of the Biological Society of Washington, 94: 1131-1162.

KUDENOV, J.D. and BLAKE, J.A. (1978). A review of the genera and species of the Scalibregmidae (Polychaeta) with descriptions of one new genus and three new species from Australia. Journal of Natural History, 12: 422-444.

PILATO, G., BELCASTRO, G. and CASSIBBA, R. (1978). Il valore specifico di Ophelia barquii Fauvel 1927. (Annelida, Polychaeta). Animalia, 5: 395-403.

STOP-BOWITZ, C. (1945). Les ophéliens Norvègiens. Meddelelser fra det Zoologiske Museum, Oslo. 52: 21-61.

STOP-BOWITZ, C. (1945). Les scalibregmiens de Norvège. Meddelelser fra det Zoologiske Museum, Oslo. 55: 63-87.

STOP-BOWITZ, C. (1958). Polihetaj novajov el Norvegujo. Scientcaj Studoj, 213-216.

TEBBLE, N. (1951). On three species of the genus Ophelia (Polychaeta) from British and Adjacent waters. Annals and Magazine of Natural History, ser. 12, 5: 553-571.

TEBBLE, N. (1953). A review of the genus Ophelia (Polychaeta) with descriptions of new species from South African and California waters. Annals and Magazine of Natural History, 6: 361-368.

ALOS, C. and CAMPOY, A. (1981). Typosyllis gerundensis n.sp: neuvo Syllidae (Annelida, Polychaeta) del Mediterraneo. P. Dert. Zool. Barcelona, 7: 21-27.

ALOS, C., SAN MARTIN, G. and SARDA, R. (1983). Tres neuvos Sillidos para el littoral iberico; Exogone rostrata (Naville, 1933), Parapionosyllis brevicirra (Day, 1954) y Pseudobrania balani (Hartmann-Schröder, 1960). Investigacion Pesquera, 47: 285-294.

BANSE,K. (1973). The ventral parapodial cirrus of the benthic Phyllocodicae (Polychaeta), with special reference to Clavadoce Hartman and Bergstroemia Banse. Journal of Natural History, 7: 683-689.

BANSE,K. (1971). A new species and additions to the descriptions of Syllides Orsted (Syllidae Polychaeta). Journal of the Fisheries Research Board of Canada, 28: 1469-1481.

BERGSTROM, E. (1914). Zur systematik der Polychaeten - Familie Phyllodocidae. Zool. Bidr. Uppsala 3: 37-224.

CHAMBERS, S. (1985). Polychaetes from Scottish Waters. Part 2. Families Aphroditidae, Sigalionidae and Polyodontidae. Royal Scottish Museum Studies.

CLAUSEN, C. (1986). Microphthalmus ephippiophorus sp.n. (Polychaeta: Hesionidae) and two other Microphthalmus species from the Bergen area, Western Norway. Sarsia, 71: 177-191.

DAUVIN, J.-C. and LEE, J.H. (1983). Description d'une nouvelle espece de Syllidae: Pionosyllis propre-weismanni n.sp. (Annelide polychete) de la region de Roscoff. Bulletin de la Societe Zoologique de France, 108: 129-134.

EMERSON, R.R. and FAUCHALD, K. (1971). A revision of the genus Loandalia Monro with description of a new genus and species of pilargid polychaete. Bulletin of the Southern Californian Academy of Science, 70: 18-22.

EIBYE-JACOBSEN, D. (1987). Eumida ockelmanni sp.n. (Polychaeta: Phyllodocidae) from the Northern part of the Oresund. Ophelia, 27: 43-52.

GIBBS, P.E. and PROBERT, K. (1971). Notes on Gyptis capensis and Sosane sulcata (Annelida: Polychaeta) from the benthos off the south coast of Cornwall. Journal of the Marine Biological Association, U.K. 53: 397-401.

GIDHOLM, A. (1966). A revision of Autolytinae (Syllidae, Polychaeta) with special reference to Scandinavian species, and with notes on external and internal morphology, reproduction and ecology. Arkiv für Zoologie,

Ser. 2,19: 157-213.

GINNET, P. (1986). Variations de la distribution des paragnathes chez Nereis diversicolor dans l'estuaire de Bov Regreg (Maroc). Cahiers de Biologie Marine, 28: 481-490.

HAMOND, R. (1967). Polychaeta. Family: Syllidae. Subfamily: Autolytinae. Fiches d'Identification de Zooplancton, 113: 1-4.
Provides details of pelagic stages from North European waters.

HAMOND, R. (1969). Intergradation in Norfolk waters between some species of Autolytus (Polychaeta, Syllidae). Cahiers de Biologie Marine, 10: 289-300.

HARTMAN, O. (1950). Goniadidae, Glyceridae and Nephytidae. Allan Hancock Pacific Expedition 15 (1): 1-181.

HARTMANN-SCHRODER, G. (1974). Die unterfamile Macellicephalinae Hartmann-Schröder, 1071. Mitteilungen des Hamburger Zoologischen Museums und Instituts 71: 75-85.

HARTMANN-SCHRODER, G. (1977). The genera Ceratocephale Malmgren, Olganereis n. gen., and Profundilycastis n. gen. (Nereidae, Polychaeta) with a key to the nereid genra without chitinous paragnaths. In Reish, D.J. and Fauchald, K. (Editors). Essays on polychaetous annelids in memory of Dr. Olga Harman Los Angles (Allan Hancock Foundaiton): 141-156.

HARTMANN-SCHRODER, G. (1983). Zur Kenntnis einiger Foramenifera rengehause bewohnender Polychaeten aus den Nordostatlantik. Mitteilungen des Hamburger Zoologischen Museums und Instituts 80: 167-176.
Reviews, in tabular form, all species of Mystides and Favelopsis.

HARTMANN-SCHRODER, G.(1985). Polynoe caeciliae Fauvel (Polynoidae), ein mit Korallen assoziierter Polychaet. Mitteilungen des Hamburger Zoologischen Museums und Instituts 82: 31-35.

HARTMANN-SCHRODER, G. Revision der gattung Mystides Theel (Phyllodocidae; Polychaeta Errantia) mit bemerkungen zur Systematik der gattungen Eteonides Hartmann-Schröder und Protomystides Czerniavsky und mit Beschriebungen zweier neuer Arten aus dem Mittelmeer und einer neuen Art aus Chile. Zool. Anz, 171: 203-243.

HILBIG, B. and DITTMER, J.D. (1979). Gyptis helgolandica sp. n. (Hesionidae, Annelida), eine neue Polychaetnart aus dem Sublitoral der Deutchen Bucht. Veröff. Inst. Meeresforsch. Bremerh. 18: 101-110 (1979).

KATZMANN, W., LAUBIER L. and RAMOS, J. (1974). Pilargidae (annélides polychètes errantes) de Méditerranée. Bulletin de l'Institut Océanographique, Monaco. 71 (1428): 1-40.

KIRKEGAARD, J.B., and BILLETT, D. (1980). Eunoe laetmogonensis, a new species of polynoid worm, commensal with the bathyal hohothurian Laetmogone violacea, in the North East Atlantic. Steenstrupia, 6: 101-109.

KRAVITZ, M.J. and JONES, H.R. (1979). Systematics and ecology of benthic Phyllodocidae (Annelida: Polychaeta) off the Columbia River, U.S.A. Bulletin of South Californian Academy of Science, 78: 1-19.

LAGARDERE, F. (1970, 1971). Remarques systematiques et écologiques sur quelques Annélides polychétes des genes Malmgrenia et Lumbriconereis. Tethys 2 (4): 821-826.

LAUBIER, L. (1960). Mystides coineaui n.sp., un phyllodocien des eaux souterraine littorales de Méditterranée occidentale. Rapp. et P.V. Comm. Int. Explor. Sci. 16: 461-464.

LAUBIER, L. (1961). Podarkeopsis galangaui n.g., n.sp., hésionide des vases côtièrs de Banyuls-sur-mer. Vie et Milieu, 12: 211-217.

LAUBIER, L. (1961). Acanthocolepis cousteaui n.sp., un Aphroditien de profondeur recolte par la soucoupe plongeante. Bulletin de l'Institute Oceanographique, Monaco, 122: 1-12.

LAUBIER, L. (1964). Contribution a la faunistique du Coralligène. VI. Présence de Chrysopetalum caecum Langerhans dans l'endofaune coralligéne. Vie et Milieu, 15: 125-138.

LAUBIER, L. (1965). Contribution a la faunsitique du Coralligène. VII. A propos de quelques annélides polychètes rares ou nouvelles (Chrysopetalidae, Syllidae et Spionidae). Annales de l'Institut Océanographique, 46: 79-144.

LAUBIER, L. (1972). Découverte d'une annelide polychete de l'Atlantique Boreal dans l'etage bathyal de Mediterranée Occidentale. Vie Milieu, 23: 255-261.

LAUBIER, L. (1975a). Lacydonia laureci sp.n., annélide polychète nouvelle de l'étage abyssal de Méditerranée orientale. Vie et Milieu, 25: 75-82.

LAUBIER, L. (1975b). Adaptations morphologiques et biologiques chez un aphroditien interstitiel: Pholoe swedmarki sp.n. Cahiers de Biologie Marine, 16: 671-683.

LOSHAMN, A. (1981). Descriptions of 5 polynoid species (Polychaeta) from the coasts of Norway and Sweden, including three new species, one new genus and one new generic name. Zoologica Scripta, 10: 5-13.

LÜTZEN, J. (1961). Sur une nouvelle espèce de polychète Sphaerodordium commensalis n.gen., n. spec., (Polychaeta Errantia, famille des Sphaerodoridae) vivant en commensal de Terebellides stroemi Sars.

Cahiers de Biologie Marine, 2: 409-416.

MUIR, A. (1982). Generic characters in the Polynoinae (Annelida, Polychaeta) with notes on the higher classification of the scale-worms (Aphroditacea). Bulletin of the British Museum of Natural History, 43: 153-177.

MUUS, B.J. (1953). Polychaeta. Families: Aphroditidae, Phyllodocidae and Alciopidae. Fiches d'Identification de Zooplancton, 52: 1-6.

MUUS, B.J. (1953). Polychaeta. Families: Tomopteridae and Typhloscoleidae. Fiches d'Identification de Zooplancton, 53: 1-5.

NUNEZ, J., M.C. BRITO and J.J. BACALLADO (1984). Nueva contribucien al conocimients de la familia Nereidae (Annelida Polychaeta) cen la descripcien de una nueva especia para Las Islas Canarias. An. Fac. Ciencias 10: 13-24.

O'CONNOR, B. and SHIN, P.K.S. (1983). Hesiospina similis (Hessle) (Polychaeta: Hesionidae) from the west coast of Ireland with notes on its taxonomic status and distribution. Cahiers de Biologie Marin, 24: 355-361.

O'CONNOR, B. (1985). Polychètes Glycéridés. In "Peuplements profonds du Golfe De Gascogne": 351-353. Eds. L. Laubier and C. Monniot. IFREMER, Brest.

O'CONNOR, B. (1987). A review of the Glyceridae (Polychaeta) from the North east Atlantic with descriptions of two new species. Journal of Natural History, 21: 167-189.

PARKER, M. (1987). Anaitides longipes Kinberg, 1866 (Polychaeta: Phyllodocidae) notes on nomenclature, identification, habitat and distribution. Irish Naturalists Journal, 22: 193-194.

PAXTON, H. (1983). Revision of the genus Micronereis (Polychaeta: Nereididae: Notophycinae). Records of the Australian Museum, 35: 1-18.

PEARSON, T. Litocorsa stremma a new genus and species of pilargids (Polychaeta, Annelida) from the west coast of Scotland with notes on two other species. Journal of Natural History, 4: 69-77.

PERKINS, T. (1985). Chrysopetalum, Bhawania and two new genera of Chrysopetalidae (Polychaeta) principally from Florida. Proceedings of the Biological Society of Washington, 98: 856-915.

PERKINS, T. (1987). Levidoridae (Polychaeta), new family with descriptions of two new species of Levidorum from Florida. Proceedings of the Biological Society of Washington, 7: 162-168.

This new family has only been recorded from the southwest and northwest Atlantic Ocean.

PETTIBONE, M.H. (1966). Revision of the Pilargidae (Annedida: Polychaeta), including descriptions of new species, and redescription of the pelagic Podarmus ploa Chamberlin (Polynoidae). Proceedings of the National Museum, 118 (3525): 155-208.

PETTIBONE, M.H. (1969). Revision of the aphroditid polychaetes of the Family Eulepethidae Chamberlin (=Eulepidinae Darboux; = Pareulepidae Hartman). Smithsonian Contribution to Zoology, 41: 1-44.

PETTIBONE, M.H. (1970). Revision of some species referred to the genus Leanira Kinberg (Polychaeta, Sigalionidae). Smithsonian Contribution to Zoology, 53: 1-25.

PETTIBONE, M.H. (1970). Revision of the genus Euthalanessa Darboux (Polychaeta, Sigalionidae). Smithsonian Contribution to Zoology. 52: 1-30.

PETTIBONE, M.H. (1971). Revision of some species reffered to Leptonereis, Nicon, and Laeonereis (Polychaeta; Nereididae). Smithsonian Contribution to Zoology, 104: 1-53.

PETTIBONE, M.H. (1971). Partial revision of the genus Sthenelais (Polychaeta, Sigalionidae) with diagnoses of two new genera. Smithsonian Contribution to Zoology. 109: 1-405.

PETTIBONE, M.H. (1976). Revision of the genus Macellicephala and the subfamily Macellicephalinae Hartmann-Schröder (Polychaeta: Polynoidae). Smithsonian Contribution to Zoology, 229: 1-71.
Includes keys to all the subfamilies and genera of the family Polynoidae.

PLEIJEL, F. (1987). Three new phyllodocid species (Polychaeta) from the Tronheimsfjorod in Norway, including some notes concerning the validity of the genus Steggoa. Zoologica Scripta, 16: 25-31.

PLEIJEL, F. (1987). Two new european species of Eulalia (Polychaeta: Phyllodocidae). Journal of the Marine Biological Association, U.K. 67: 399-405.

PLEIJEL, F. (1988). Phyllodoce (Polychaeta, Phyllodocidae) from Northern Europe. Zoologica Scripta 17 (2): 141-153.

RASMUSSEN, K.J.F. (1973). A new species of Pilargis (Polychaeta, Pilargidae) from the deep soft sediments of Fensfjorden, western Norway. Sarsia, 53: 19-24.

SAN MARTIN, G. (1982). Pseudosyllides balearica n.sp.: un nuevo syllido (Poliquetos: Errantes) desl Mar Mediterraneo. Cahiers de Biologie Marine, 23: 21-27.

SAN MARTIN, G. (1982). Una nueva especie de Nephtyidae (Poliquetos:

Errantes) del Mediterraneo: Micronephtys maryae n.sp. Cahiers de Biologie Marine, 23: 427-434.

SARDA, R. (1984). La subfamilia Exogoninae (Polychaeta: Syllidae) de Gibraltar, con descripcion de Pseudobrania euritmica n.sp. Publicaciones del Departamento de Zoologica, Universidad de Barcelona.

SCHIEDGES, K. (19080). Morphological and systematic studies of an Autolytus population (Polychaeta, Syllidae, Autolytinae) from the Oosterschelde Estuary. Netherlands Journal of Sea Research, 14: 208-219.

STOP-BOWITZ, C. (1941). Les glycériens de Norvège. Meddelelser fra det Zoologiske Museum, Oslo 51: 181-250.

STOP-BOWITZ, C. (1987). A new genus and species (Yndolacia lopadorhynchoides) of pelagic polychaetes, representative of a new family, Yndolaciidae. Bulletin of the Biological Society of Washington, 7: 129-130.

This new family is presently only known from deep water near the Gulf of Guinea.

TEBBLE, N. and CHAMBERS, S. (1982). Polychaetes from Scottish Waters Part 1. Family Polynoidae Royal Scottish Museum Studies.

WESTHEIDE, W. (1967). Monographie der Gattungen Hesionides Friedrich und Microphthalmus Mecnikow (Polychaeta, Hesionidae). Zoologie Morhologie Tiere, 61: 1-159.

USHAKOV, P.V. (1972). Polychaetes Vol. 1. Polychaetes of the suborder Phyllodociformia. Israel Program for Scientific Translations, Jerusalem 1974.

AMPHINOMIDA

GEORGE, D. and HARTMANN-SCHRODER, G. (1985). See Eunicida.

O'CONNOR, B. (1984). Hipponoa gaudichaudi Audouin and Milne Edwards (Polychaeta: Amphinomidae), an interesting new stranding on Irish shores. Irish Naturalists Journal, 21: 262-264.

SPINTHERIDA

GEORGE, D. and HARTMANN-SCHRODER, G. (1985). See Eunicida.

Families not assigned to an order

NEPHTYIDAE

FAUCHALD, K. (1963). Nephtyidae (Polychaeta) from Norwegian waters. Sarsia, 13: 1-32.

FORET-MONTARDO, P. (1969). Etude systématique et écologique des Nephthydidae (Polychètes Errantes) des parages de Marseille. Tethys, 1 (3): 807-832.

HEINEN, A. (1911). Die Nephthydeen und Lycoridean der Nord- und Ostsee einschlieblich der verbundem Meeresteile. Wissenschaftliche Meeresuntersuchungen. Neue Folge, 13: 1-86.

RAINER, S.F. (1984). Nephtys pente sp.nov. (Polychaeta: Nephtyidae) and a key to Nepthys from Northern Europe. Journal of the Marine Biological Association, U.K. 64: 899-907.

WOLFF, W.J. (1968). De Familiie Nephtyidae (Polychaeta). Koninklijke Nederlandse Natuurhistorische Vereniging, 22: 1-7.

SPHAERODORIDAE

DESBRUYERES, D. (1980). Sphaerodoridae (Annélides Polychètes) profonds du Nord-Est Atlantique. Bull. Mus. natn. Hist. nat. Paris, 4e sér. 2A (1): 109-128.

EUNICIDA

BLAKE, J.A. (1979). A redescription of Pettiboneia sanmatiensis Orensanz (Polychaeta: Dorvilleidae) and a revised key to the genera of the Dorvilleidae. Bulletin of the Southern California Academy of Science, 78 (2): 136-140.

CAMPOY, A. and SAN MARTIN, G. (1980). Pettiboneia urciensis sp.n.: un nouveau Dorveilleidae (Polychetes Errantes) de la Mediterranée. Cahiers de Biologie Marine, 21: 201-207.

CASTELLI, A. (1982). Onuphis falesia, a new species of Onuphinae (Polychaeta, Eunicidae). Bulletin of Zoology, 49: 45-49.

CLARK, R.B. (1953). Lumbrinereis cluthensis n.sp. (Eunicidae), a new polychaete from the Firth of Clyde. Annals and Magazine of Natural History, series 12, 6: 45-949.

EULENSTEIN, F. (1914). Über Onuphiden der Nordsee. Wissenschaftliche Meeresuntersuchungen. Neue Folge Abteilung Kiel, 16: 129-172 & 2 plates.

GASTON, G.R. and BENNER, D.A. (1981). On Dorvilleidae and Iphitimidae (Annelida: Polychaeta) with a resdescription of Eteonopsis geyonicola and a new host record. Proceedings of the Biological Society of Washington, 96 (1): 76-87.

GEORGE, J.D. and HARTMANN-SCHRODER, G. (1985). Polychaetes: British Amphinomida, Spintherida and Eunicida. Published for the Linnean Society of London and the estuarine and Brackish-water Sciences Association. Brill. Leiden. A compilation of descriptions from various sources. Missing several new species and reviews. i.e. Fauchald's 1982 revision of Onuphis, Nothria etc., Winsnes 1981 and 1985, Gaston and Benner 1981, O'Connor 1984 on Hipponoa and Oug 1978.

GOVAERE, J. (1976). On Stauronereis caecus (Dorvilleidae, Polychaeta) new for the Southern North Sea. Cahiers de Biologie Marine. 17: 31-36.

FAUCHALD, K. (1970). Polychaetous annelids of the families Eunicidae, Lumbrinereidae, Iphitimidae, Arabellidae, Lysaretidae and Dorvilleidae from western Mexico. Allan Hancock Monograph on Marine Biology, 5, 335 pp.

FAUCHALD, K. (1982). Revision of Onuphis, Nothria and Paradiopatra (Polychaeta: Onuphidae) based upon type material. Smithsonian Contributions to Zoology, 356: 1-109.

HAMOND, R. (1974). The culture, experimental taxonomy and comparative morphology of the plantonic stages of Norfolk autolytids (Polychaeta, Syllidae, Autolytidae). Zoological Journal of the Linnean Society, 54: 299-320.

HARTMAN, O. (1944). Polychaetous annelids. part V. Eunicea. Allan Hancock Pacific Expedition. 10 (1): 1-237.

IMAJIMA, M. (1977). A new polychaete family, Hartmaniellidae, from Japan. In Reish, D.J. and Fauchald, K. (Editors). Essays on polychaetous annelids in memory of Dr. Olga Hartman Los Angeles (Allan Hancock Foundation): 211-216.

JOSEFSON, A. (1975). Ophryotrocha longidentata sp n. and Dorvillea erucaeformis (Malmgren) (Polychaeta, Dorveilleidae) from the west coast of Scandanavia. Zoologica Scripta, 4: 49-54.

JUMARS, P.A. (1974). A generic revision of the Dorvilleidae (Polychaeta), with six new species from the deep North Pacific. Journal of the Linnean Society, 54: 101-135.

MIURA, T. (1980). Lumbrineridae (Annelides Polychètes) abyssaux recoltes au cours de campagnes du cantee Oceanologique de Bretagne dans l'Atlantique et la Mèditerranee. Bulletin du Museum national d'histoire

naturelle, Paris series 4, 2 (A): 1019-1057.

MOORE, P G. and GORZULA, S.J. (1973). A note on the commensal eunicean Iphitime paguri Fage and Legendre (Polychaeta) in the Firth of Clyde. Journal of Natural History, 7: 161-164.

ORENSANZ, J.M. (1973). Los anelidos poliquetos de la provincia biogeografica Argentina III Dorvilleidae. Physis A. 32 (85): 325-342.

ORENSANZ, J.M. (1973). Los anelidos poliquetos de la provincia biogeografica Argentina. IV Lumbrineridae. Physics B. (A) 32 (85): 343-393.

ORENSANZ, J.M. (1974). Los annelidos poliquetos de la provincia biographica Argentina IV. Lumbrineridae. Physis (A) 32: 343-393.

ORENSANZ, J.M. (1974). Los annelidos poliquetos de la provincia biogeographica Argentina VI Arabellidae. Physis A. 33 (87): 381-408.

OUG, E. (1978). New and lesser known Dorvilleidae (Annelida, Polychaeta) from Scandinavian and North east American waters. Sarsia, 63: 285-303.

PAXTON, H. (1986). Generic revison and relationships of the family Onuphidae (Annelida: Polychaeta). Records of the Australian Museum 38: 1-74.

PAXTON, H. (1986). Revision of the Rhamphobrachuim complex (Polychaeta: Onuphidae). Records of the Australian Museum, 38: 75-104.

PETTIBONE, M.H. (1957). Endoparastic polychaetous annelids of the Family Arabellidae with descriptions of new species. Biological Bulletin of the marine biological Laboratory, Woods Hole, 113 (1): 170-187.

PETTIBONE, M.H. (1961). New species of polychaete worms from the Atlantic Ocean, with a revision of the Dorvilleidae. Proceedings of the Biological Society of Washington, 74: 67-185.

RAMOS, J. (1973). Annelides polychetes du plateau continental de la cote Catalague Espagnole. Doctorale thesis Paris University VI (Unpubl.).

RAMOS, J.M. (1976). Arabellidae (polychètes Errantes) de Méditerranée. Ann. Inst. Océanogr., Paris, 52 (2): 246-137.

RAMOS, J.M. (1976). Lumbrineridae (polychètes errantes) de Méditerranée. Annales, Monaco. 52 (1): 103-137.

SOUTHWARD, C.E. (1977). A new species of Hyalinoecia (Polychaeta: Eunicidae) from deep water in the Bay of Biscay. pp. 173-187 in "Essays on Polychaetous Annelids". Ed. Reish. D.J. & Fauchald, K. Allan Hancock Foundation Special publication, Los Angeles 604 pp.

WESENBERG-LUND, E. (1938). Ophryotrocha geryonicola (Bidenkap) (=Eteonopsis geryonicola Bidenkap) refound and redescribed. Goteborgs Kungl. vetenskaps - och vitterhets - samhalles Handlingar Sjatte Folden. Ser. B. 6 (8): 1-14.

WESTHEIDE, W. and NORDHEIM, H. von (1985). Interstitial Dorvilleidae (Annelida, Polychaeta) from Europe, Australia, and New Zealand, Zoologica Scripta. 14 (3): 183-199.

WESTHEIDE, W. and RISER, N.W. (1983). Morphology and phylogenetic relationships of the neotonic interstitial polychaeta Apodotrocha generans n.gen., n.sp. (Annelida). Zoomorphology, 103: 67-87.

WINSNES, I. (1981). A new species of Lumbrineris (Polychaeta) and a new subspecies of Lumbrineris scopa Fauchald from the coast of Norway. Zoologica Scripta, 10: 91-94.

WINSNES, I.M. (1985). The use of methyl green as an aid in species discrimination Onuphidae (Annelida: Polychaeta). Zoologica Scripta, 14 (1): 19-23.

WINSNES, I.M. (1987). Augeneria algida (Wiren) comb. nov., a deep-sea lumbrinerid from Spitzbergen with aberrant setae (Annelida, Polychaeta): redescription of holotype. Zoologica Scripta, 16 (1): 39-45.

WOLF, P.S. (1986a). Four new genera of Dorvilleidae (Annelida: Polychaeta) from the Gulf of Mexico. Proceedings of the Biological Society of Washington, 99: 616-626.

WOLF, P.S. (1986b). Three new species of Dorvilleidae (Annelida: Polychaeta) from Puerto Rico and Florida and a new genus for dorvillids from Scandanavia and North America. Proceedings of the Biological Society of Washington, 99: 627-638.

ZIBROWIUS, H., SOUTHWARD, E. and DAY, J.H. (1975). New observations on a little known species of Lumbrineris (Polychaeta) living on various cnidarians, with notes on its recent and fossil scleractinian hosts. Journal of the Marine Biological Association U.K., 55: 83-108.
Keys provided to all Mediterranean genera and species (Spirorbidae included).

STERNASPIDA

OWENIIDA

NILSEN, R. and HOLTHE, T. (1985). Arctic and Scandanavian Oweniidae (Polychaeta) with a description of Myriochele fragilis sp n., and comments on the phylogeny of the family. Sarsia, 70: 17-32. Includes a key to the local species.

FLABELLIGERIDA

LAUBIER, L. (1974). Chauvonelia biscayensis gen. sp. nov., un Flabelli-

geridae (Annélide polychète sédentaire) aberrant de l'étage abyssal du Golfe de Gascogne. Bulletin de la Société Zoologique de France, 99: 391-399.

STOP-BOWITZ, C. (1948). Les flabelligériens Norvégiens. Bergens. Mus. Arb. 1946/1947 (2): 1-59.

FAUVELOPSIDA

HARTMAN, O. (1971). Abyssal polychaetous annelids from the Mozambique Basin off south-east Africa, with a compendium of abyssal polychaetous annelids from world-wide area. Journal of the Fisheries Research Board of Canada, 28: 1407-1428.

TEREBELLIDA

DAY, J.H. (1964). A review of the Family Ampharetidae (Polychaete). Annals of the South African Museum, 48 (4): 97-120.

DESBRUYERES, D. (1978). Melythasides laubieri gen. sp. nov. Ampharetidae (Annélides Polychètes sedentaires) abyssal de la mer de Norvège. Bull. Mus. Natn. Hist. nat., Paris 3e ser.No 514 Zoologie 252: 231-238.

DESBRUYERES, D. & LAUBIER, L. (1977). Noanelia hartmanae gen. sp.n., Ampharetidae (Annélida Polychètes Sedéntaires) abyssal du Golfe de Gascoyne. pp. 279-287 in "Essays on Polychaetous Annelids etc" Ed. Reish, D.J. & Fauchauld, etc. Allan Hancock Foundation Special Publication, Los Angeles 604 pp.

ELIASON, A. (1955). Neue oder weinig bekannte Schwedische Ampharetiden (Polychaeta). Göteburgs Kungl. Vetenskaps - och vitterhets - samhalles Handlinger Sjatte Folden. Ser. B. 6 (16): 1-17.

GIANGRANDE, A., GAMBI, M.C. & FRESI, E. (1981). Two species of polychaetes new to the mediterranean fauna. Boll. Zool. 48: 311-317. (Streblosoma hesslei Day, 1955 and Lumbrinereis inflata).

HARTLEY, J.P. (1985). The re-establishment of Amphicteis midas (Gosse, 1855) and redescription of the type material of A. gunneri (M. Sars, 1835) (Polychaeta: Ampharetidae). Sarsia, 70: 309-315.

HARTMAN, O. (1941). Polychaetous annelids. Part IV. Pectinariidae, with a review of all species from the western hemisphere. Allan Hancock Pacific Expedition, 7 (5): 325-345.

HARTMAN, O. (1944). Polychaetous annelids. Part VI. Paraonidae, Magelonidae, Longosomidae, Ctenodrilidae and Sabellaridae. Allan Hancock Pacific Expedition, 10 (3): 311-389.

HOLTHE, T. (1975). A simple key to the northern European species of Terebellomorph Polychaeta. Trondheim (Scandinavian University Books) 1-32 pp.

HOLTHE, T. (1976). Paramphitite tetrabranchia gen.et sp. nov. A new terebellid polychaete from western Norway. Sarsia, 61: 59-62.

HOLTHE, T. (1986a). Polychaeta Terebellomorpha from the Northern Norwegian Sea and the Polar Sea, with descriptions of Mugga bathialis sp.n. and Ymerana pteropoda gen. and sp.n. Sarsia, 71: 227-234.

HOLTHE, T. (1986b). Evolution, systematics and distribution of the Polychaeta Terebellomorpha with a catalogue of the taxa and a bibliography. Gunneria, 55: 1-236.

HOLTHE, T. (1986c). Polychaeta Terebellomorpha. Marine Invertebrates of Scandanavia. No. 7. Norwegian University Press, Oslo.
Contains descriptions and small drawings of the 79 terebellomorphs (ex. Sabellariidae) recorded off the Scandanavian coast line.

HUTCHINGS, P. and GLASBY, C. (1986). A revision of the genus Euthelepus (Terebellidae: Thelepinae). Records of the Australian Museum, 38: 105-117.

KINGSTON, P. and MACKIE, A. (1980). Octobranchus floriceps sp. nov. (Polychaeta: Trichobranchidae) from the Northern North Sea with a re-examination of O. antarcticus Monro. Sarsia, 65: 249-254.
Contains a table of the morphological features of all Octobranchus species.

LAUBIER, L. (1973). Uschakovius enigmaticus gen.sp.n. Ampharetidae (Annélides Polychètes sédentaires) aberrant de Méditerranée orientale profonde. C.R.Acad.Sc. Paris, 277: 2723-2725.

NOLTE, W. (1912). Zur kenntnis der Maldaniden der Nord- und Ostsee. Wissenschaftliche Meeresuntersuchungen Kiel 15 (1): 1-94.

PEARSON, T.H. (1969). Scionella lornesis sp.nov., a new terebellid (Polychaeta: Annelida) from the west coast of Scotland, with notes on the genera of the Terebellidae recorded from European waters. Journal of Natural History. 3: 509-516.

WILLIAMS, S. (1984). The status of Terebellides stroemi (Polychaeta: Trichobranchidae) as a cosmopolitain species based on a world-wide morphological survey including descriptions of new species. Proceedings of the First International Polychaete Conference, Sydney. The Linnean Society of New South Wales, 118-142.

AL-OGILY, S.M. and KNIGHT-JONES, E.W. (1981). Circeis paguri, the spirorbid polychaete associated with the hermit carb Eupagurus bernhardus. Journal of the Marine Biological Association U.K., 61: 821-826.

BANSE, K. (1970). The small species of Euchone Malmgren (Sabellidae, Polychaete). Proceedings of the Biological Society of Washington, 83 (35): 387-408.

BANSE, K. (1972). Redescription of some species of Chone Kröyer and Euchone Malmgren, and three new species (Sabellidae: Polychaeta). U.S. Fishery Bulletin, 70 (2): 459-495.

BAILEY, J.H. (1969). Spirorbinae (Polychaeta: Serpulidae) from Chios (Aegean Sea). Zoological Journal of the Linnean Society, 48: 363-385.

GAMBI, M.C., GIANGRANDE, A. and FRESI, E. (1983). Présence d'Oriopsis eimeri Langerhans, 1880 (Polychaeta, Sabellidae) en Méditerranée. Vie milieu, 33 (3/4): 213-217.

GEE, J.M. and KNIGHT-JONES, E.W. (1962). The morphology and larval behaviour of a new species of Spirorbis (Serpulidae). Journal of the Marine Biological Association U.K., 42: 641-654.

HARRIS, T. (1968). Spirorbis species (Polychaeta: Serpulidea) from the Isles of Scilly, including description of two new species. Journal of the Marine Biological Association, U.K., 48: 593-602.

HARRIS, T. and KNIGHT-JONES, E.W. (1964). Spirorbis infundibulum sp.nov. (Polychaeta: Serpulidae) from Tenarea shelves on the Costa Brava. Annals and Magazine of Natural History, 13: 347-351.

HOFSOMMER, A. (1913). Die Sabelliden-Aubente der "Poseidon" Fahrten und die Sabelliden der Kieler Bucht. Wissenschaftliche Meeresuntersuchungen. Neue Folge. 15: 305-364 & Pl.IV.

HOVE, H.A. ten (1974). Notes on Hydroides elegans (Haswell, 1883) and Mercierella enigmatica Fauvel, 1923, alien serpulid polychaetes introduced into the Netherlands. Bull. Zool. Mus. Univ. Amsterdam 4 (6): 45-51.

HOVE, H.A. ten (1985). Distinguishing the genera Apomatus Philippi, 1884 and Protula Risso, 1976 (Polychaeta: Serpulidae), a further plea for a methodical approach to Serpulid taxonomy.
Zool. Meded. Leiden. 59 (32): 419-437.

HOVE, H.A. ten and WEERENBERG, J.C.A. (1978). A generic revision of the brackish-water serpulid Ficopomatus Southern 1921 (Polychaeta: Serpulinae), including Mercierella Fauvel 1923, Sphaeropomatus

Treadwell 1934, Mercierellopsis Rioja 1945 and Neopomatus Pillai 1960. Biological Bulletin of the marine biological Laboratory, Woods Hole, 154: 96-120.

KNIGHT-JONES, E.W. and KNIGHT-JONES, P. (1980). Pacific spirorbids in the east Atlantic. Journal of the Marine Biological Association, U.K., 60: 461-464.

KNIGHT-JONES, P. (1983). Contributions to the taxonomy of Sabellidae (Polychaeta). Zoological Journal of the Linnean Society, 79: 245-295.

KNIGHT-JONES, P. and KNIGHT-JONES, E.W. (1977). Taxonomy and ecology of British Spirorbidae (Polychaeta). Journal of the Marine Biological Association U.K. 57: 453-499.

KNIGHT-JONES, P. and KNIGHT-JONES, E.W., THORP, C.H. and GRAY, P.W.G. (1975). Immigrant spirorbids (Polychaeta Sedentaria) on the Japanese Sargassum at Portsmouth, England. Zoologica Scripta, 4: 145-149.

KNIGHT-JONES, P. and WALKER, A.J.M. (1985). Two new species of Demonax (Sabellidae: Polychaeta) from Liverpool Bay. Journal of Natural History, 19: 605-612.

NELSON-SMITH, A. and GEE, J.M. Serpulid tubeworms (Polychaeta,Serpulidae) around Dale, Pembrokeshire. Field Studies, 2: 331-357.

O'CONNOR, B. (1982). Pomatoceros lamarcki (Quatrefages) (Polychaeta Serpulidae), a polychaete new to Irish Waters. Irish Naturalists Journal, 20: 401.

PERKINS, T.H. (1984). Revision of Demonax Kinberg, Hypsicomus Grube, and Notanlax Tauber, with a review of Megalomma Johansson from Florida (Polychaeta: Sabellidae). Proceedings of the Biological Society of Washington, 97 (2): 285-368.

SOUTHWARD, E.D. (1963). Some new and little-known serpulid polychaetes from the continental slope. Journal of the Marine Biological Association U.K. 43: 574-589.

Contains a key to all the serpulid genera.

ZIBROWIUS, H. (1968). Etude morphologique, systématique et écologiques des Serpulidae (Annelida Polychaeta) de la region de Marseille. Rec. Trav. Stn. mar. Endoume Hors Sér. Suppl. 59: 81-253.

ZIBROWIUS, H.W. (1969). Review of some little known genera of Serpulidae (Annelida: Polychaeta). Smithsonian Contributions to Zoology, 42: 1-22.

ZIBROWIUS, H.W. (1971). Revision of Metavermilia Bush (Polychaeta, Serpulidae), with description of three new species from off Portugal, Gulf of Guinea, and Western Indian Ocean. Journal of the Fisheries Research Board of Canada, 28: 1373-1383.

ZIBROWIUS, H.W. & BELLAN, G. (1969). Sur un nouveau cas de salissives biologiques favorissés par la chlore. Tethys, 1 (2): 375-382.

ARCHIANNELIDS ETC.

FAUBEL, A. (1978). Neue Nerillidae (Archiannelida) aus dem Sublitoral der Nordzee und des Mittelatlantik (Nordwest-Afrika). Zoologica Scripta, 7 (4): 257-262.

HARTMAN, O. (1978). Polychaeta from the Weddell Sea Quadrant, Antarctica. Antartic Research Series Washignton 26 (4): 125-223.
The family Helmetophoridae described.

JOUIN, C. (1971). Status of the knowledge of the systematics and ecology of Archiannelida. Smithsonion Contribution to Zoology, 76: 47-56.
Contains useful notes and a biliography concerning the 'Archiannelida' especially the family Nerillidae.

NORTH EASTERN ATLANTIC OCEAN

AMOUREUX, L. (1970). Annélides Polychètes du Golfe de Tarenta. Resultats de nouvelles coisieres de l'Albatross (1968-1969). Armali del Museo Cinco di Storia Naturale, Genova, 78: 1-20.

AMOUREUX, L. (1972). Annélides Polychètes du Maroc. Bull. Soc. Sci. nat. phys. Maroc. 52/4: 47-72.

AMOUREUX, L. (1972). Annélides Polychètes recueillies sur les pentes du talus continental, au large de la Galice (Espagne) Campagnes 1967 et 1968 de la "Thalassa. Cahiers de Biologie Marine, 13: 63-89.

AMOUREUX, L. (1973). Annélides Polychètes recueillies sur les pentes du talus continental au nord de la côte espagnole. Campagne 1970 de la "Thalassa". Cahiers de Biologie Marine, 14: 429-452.

AMOUREUX, L. (1974). Annélides Polychètes du banc Le Danois. Campagne 1971 de la "Thalassa" (Octobre) Bol. R. Soc. Espanola Hist. Nat. (Biol.) 72: 101-127.

AMOUREUX, L. (1974). Annélides Polychètes recueillies sur les pentes du talus continental au nord-ouest de l'Espagne et du Portugal (Campagne 1972 de la "Thalassa"). Cuadernos Ciencia Biologica. 3: 121-154.

AMOUREUX, L. (1977). Annélides Polychètes Errantes recueilles sur les pentes du talus continental a l'entrée de la Manche, avec la description de deux espéces nouvelles. Campgane 1973 de la "Thalassa". Cahiers de Biologie Marine, 18: 391-411.

AMOUREUX, L. (1982). Annélides Polychètes recueillies sur la pente continentale de la Bretagne à l'Irlande. Campgange 1973 de la "Thalassa" (suite et fin) avec la description de quatre espèces nouvelles pour la science. II. Inventaire taxonomique annoté de toutes les Polychètes sedentaires. Cahiers de Biologie Marine, 23: 179-214.

BELLAN, G. (1969). Contribution à l'étude des annélides polychètes de la région de Rovinj. (Yougoslavie). Rad jugosl. Akad. Znan. Umjetn. 354: 25-55.

BEN-ELIAHU, M.N. (1975). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat: Sabellidae (Polychaeta Sedentaria). Israel Journal of Zoology, 24: 54-70.

BEN-ELIAHU, M.H. (1975). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Nereidae (Polychaeta Errantia). Israel Journal of Zoology, 24: 177-191.

BEN-ELIAHU, M.H. (1976). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Serpulidae (Polychaeta Sedentaria). Israel Journal of Zoology, 25 (3): 103-119.

BEN-ELIAHU, M.H. (1976). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Sedentaria. Israel Journal of Zoology, 25(4): 121-155.

BEN-ELIAHU, M.H. (1976). Errant polychaete cryptofauna (excluding Syllidae and Nereidae) from rims of similar intertidal veremetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Israel Journal of Zoology, 25 (4): 156-177.

BEN-ELIAHU, M.H. (1977). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Syllinae and Eusyllinae (Polychaeta Errantia: Syllidae). Israel Journal of Zoology, 26(1-2): 1-58.

BEN-ELIAHU, M.H. (1977). Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the Mediterranean coast of Israel and in the Gulf of Elat. Exogoninae and Autolytinae (Polychaeta Errantia: Syllidae). Israel Journal of Zoology, 26(1-2): 59-99.

CABIOCH, L., L.'HARDY, J.P. and RULLIER, F. (1967). Inventaire de la fauna marin de Roscoff. Annélides. Travaux de la station biologique de Roscoff. 17: 1-96.

CLARK, R.B. (1951-52). New records of sub-littoral polychaetes from the Clyde Sea area, with a description of a new species. Proceedings of the Royal Society of Edingburgh, 65: 1-26.

CLARK, R.B. (1960). The fauna of the Clyde sea area. Polychaeta, with keys to the British genera Millport (Scottish Marine Biological Association) 71 pp.

CLARK, R.B. & DAWSON, P.G. (1063). On some polychaetes from the Firth of Clyde and the west of Scotland. Annals and Magazine of Natural History, Ser. 13, 6: 641-657.

DINNEEN, P., KEEGAN, B.F., CROWE, W.A., O'CONNOR, B., McGRATH, D., COSTELLOE, M. and KONNECKER, G. (1986). Littoral and Benthic Investigations on the South Coast of Ireland. I. Macrofaunal Distribution patterns and their relationship to the sedimentary environment. I. Kinsale Harbour. Proceedings of the Royal Irish Academy, 86B: 81-106.

ELIASON, A. (1962). Undersökningar over Oresund XXXXI Weitere untersuchungen über die polychaetenfauna des Oresunds. Lunds Universitets Arsskrift NF. Avdeling 2. 58 (9): 1-98.

ELIASON, A. (1962). Biologisch-Faunistische Untersuchungen aus dem Oresun V. Polychaeta. Lunds Universitets Arsskrift NF. Avdeling 2. 16 (6): 1-103.

ELIASON, A. (1962). Die polychaetes der Skagerak - Expedition 1933. Zool. Bidr. Upps. 33: 207-293.

ELWES, E.V. (1908). Notes on the littoral Polychaeta of Torquay. Journal of the Marine Biological Association U.K., 2: 197-206.

FAUCHALD, K. (1972). Some polychaetous annelids from the deep basins in Sognefjorden, Western Norway. Sarsia, 49: 89-106.

FAUCHALD, K. (1974). Deep-water errant polychaetes from Hardangerfjorden, Western Norway. Sarsia, 57: 1-31.

FAUVEL, P. (1940). Annelides polychetes de la Haute-Adriatique. Thalassia 4: 1-24.

FRIEDRICH, H. (1937). Polychaeten Studies I-III. Kieler Meeresforschungen 1 (2): 343-351.

FRIEDRICH, H. (1939). Polychaeten Studies IV. Zur Polychaetenfauna der Barents-See. Kieler. Meeresforschungen 3: 122-132.

FRIEDRICH, H. (1939). Polychaeten Studies V-X. Zur Kenntnis einiger wenig bekannter oder neuer Polchaeten aus der westlichen Ostsee. Kieler Meeresforschungen 3: 362-373.

GIANGRANDE, A., GAMBI, M.C. & FRESI, E. (1981). Two species of polychaetes new to the Mediteranean fauna. Boll. Zool. 48: 311-317.

GILLANDT, L. (1979). Zoo-systematick, Autökologie und biologie der Polychaeten des Helgoländer Felslitorals. Mitt. hamb. zool. mus. inst. 76: 19-73.

GUILLE, A. & LAUBIER, L. (1966). Additions à la fauna des Annelides Polychétes de Banyuls-sur-Mer. Vie et Milieu, 17 (1B): 259-282.

HAMOND, R. (1972). The non-polychaetous annelids of Norfolk, England with additional notes on polychaetes. Cahiers de Biologie Marine, 13: 341-350.

HARRIS, T. (1972). The Marine Flora and Fauna of the Scilly Isles: Polychaeta. Journal of Natural History, 6: 93-117.

HARTMANN-SCHRODER, G. (1974). Polychaeten von Expeditionen der 'Anton Dohrn' in Nordsee und Skagerrak. Veröffentlichungen des Instituts für Meeresforschung in Bremerhaven 14: 169-274.

HARTMANN-SCHRODER, G. (1975). Polychaeten der Iberischen Tiefsee, gesammelt auf der 3. Reise der meteor im Jahre 1966. Mitteilungen des Hamburger Zoologisches Museums und Instituts, 72: 47-73.

HARTMANN-SCHRÖDER, G. (1979). Die Polychaeten der "Atlantischen Kuppenfahrt" von F.S. "Meteor" (Fahrt 9c, 1969). 1. Proben aus Schleppgeräten. "Meteor" Forsch.-Ergebnisse. Reihe D., 31: 63-90.

HARTMANN-SCHRÖDER, G. (1977). Polychaeten aus dem sublitoral und Bathyal vor der portugiesischen und marokkamschen küste Answertung der Fabot 8 (1967) von F.S. "Meteor". - "Meteor" Forsch. - Ergebnisse, Reihe, D, 26: 65-99.

HARTMANN-SCHRODER, G. and STRIPP, K. (1968). Beitrage zur polychaetenfauna der Deutschen Bucht. Veröffentlichungendes Instituts für Meeresforschung in Bremerhaven 11: 1-24.

HOWSON, C. (ed.) (1987). Species directory to British marine fauna and flora. Marine Conservation Society, Ross on Wye, Herts, U.K. Contains lists of all marine invertebrates and vertebrates recorded from the area.

KEEGAN, B.F. and MERCER, J.P. (1986). An Oceanographical Survey of Killary Harbour on the West Coast of Ireland. Proceedings of the Royal Irish Academy, 86B: 1-70.

KEEGAN, B., O'CONNOR, B., McGRATH, D., KONNECKER, G. and O'FOIGHIL, D. (1986). The macrofaunal benthic assemblages of Carnsore Point, Co. Wexford. Proceedings of the Royal Irish Academy, 87: 1-14.

KIRKEGAARD, J.B. (1969). A quantitative investigation of the central North Sea Polychaeta. Spolia Zool. Mus. haun., 29: 1-285.

KIRKEGAARD, J.B. (1980). Abyssal benthic polychaetes from the northeast Atlantic Ocean, southwest of the British Isles. Steenstrupia, 6(8): 81-98.

KIRKEGAARD, J. (1983). Bathyal benthic polychaetes from the N.E. Atlantic Ocean, S.W. of the British Isles. Journal of the Marine Biological Association U.K., 63: 593-608.

LAUBIER, L. and PARIS, J. (1962). Faune marin des Pyrénées-Orientales. IV. Annélides Polychètes. Laboratoire Arago, Banyuls-sur-Mer.

McINTYRE, A.D. (1961). New records of Polychaetes from Scottish coastal and offshore waters. Proceedings of the Royal Society of Edinburgh, 67(B): 351-362.

MICHAELSEN, W. (1897). Die polychaetenfauna der deutschen meere emschliesslich der benachbarten und berbindenden Gabiete. Wissenschaftliche Meeres untersuchungen der deutschen Meere, Kiel und Leipzig, n. folge. 2(1): 1-216 & pl.1.

O'CONNOR, B., (1980). Marine Fauna of Co. Wexford. 2. Littoral and brackish water Polychaeta. Irish Naturalists Journal, 20: 85-92.

O'CONNOR, B. (1981). Polychaeta (Annelida) from Galway Bay, west coast of Ireland, new to the fauna. Irish Naturalists Journal, 20: 324-327.

PLYMOUTH MARINE fAUNA (1957). Marine Biolological Association U.K.

POLYCHAETE NEWSLETTER Check Lists. Available from C. Mettam, University of Swansea, Dept. Zoology, Swansea, Wales.

POZAR-DOMAC, A. (1978). Catalogue of the Polychaetous Annelids of the Adriatic Sea. Acta Adriatica, 13: 1-59.

RASMUSSEN, E. (1973). Systematics and ecology of the Isefjord Marine Fauna. Ophelia, 11: 1-495.

RIEDL, R. (1970). Fauna und Flora der Adria Hamburg (Paul Parey), 702 pp.

RIOJA, E. (1917). Datos para el concimiento de la fauna de anélidos poliquetos del Cantabrico. Trab. Mus. nac. Cienc. nat. Madr. (Zool), 29: 1-111.

RIOJA, E. (1918). Datos pára el conociermiento de la fauna de anélidos poliquetos del Cantabrico. (2a parte). Trab. Mus. nac. Cie. nat. Madr. (Zool.) 317: 1-99.

RULLIER, F. & AMOUREUX, L. (1968). Annélides Polychètes du Golfe de Tarente. Resultats des Campagnes de l'Albatross (1966-1967). Annali del Museo Cirico di Storia Naturela, Genova, 77: 386-407.

RULLIER, F. and AMOUREUX, L. (1970). Nouvelle contribution à l'étude de la faune des annélides polychètes du Maroc. Bull. Soc. Sci. nat. phys. Maroc. 49(1/2): 109-142.

SAN MARTIN, G., ACERO, M.I., CONTONENTE, M. & GOMEZ, J.J. (1982). Una colleccion de annélidos poliquetos de la costa mediterraneas andaluzas. Actas II Simp. Ibér. Estud. Benthos. Mar., 3: 161-182.

SHIN, P.K.S., CONNEELY, M.E. and KEEGAN, B.F. (1982). Littoral and Benthic Investigations on the West Coast of the Ireland XV. The Macrobenthic Communities of North Bay (Galway Bay). Proceedings of the Royal Irish Academy, 82B: 133-152.

SOUTHERN, R. (1914). Clare Island Survey. Part 47. Archiannelida and Polychaeta. Proceedings of the Royal Irish Academy, 31 (47): 1-160.

SOUTHWARD, E.D. (1956). Polychaeta of the Isle of Man. Annals and Magazine of Natural History, 9 (2): 257-279.

STOP-BOWITZ, C. (1948). Polychaeta from the "Michael Sars" North Atlantic Deep-Sea Expedition 1910. Report on the scientific results of the "Michael Sars" North Atlant. Deep-Sea Exped. 1910. 5(9): 1-91.

TEBBLE, N. (1959). On a collection of polychaetes from the Mediterranean coast of Israel. Bull.Res. Comm. Israel, B8(1): 9-30.

WALKER, A.J.M. and REES, E.I.S. (1980). Benthic ecology of Dublin Bay in relation to sludge dumping: Fauna. Irish Fisheries Investigations, Series B, 2: 1-59.

WESENBERG-LUND, E. (1951). Polychaeta. Zoology Iceland. 2(19): 1-182.

WIKTOR, J. (1974). Type specimens of Annelida Polychaeta in the Museum of Natural History of the Wroclaw University. Annales Zoologici, Polska Academia Nauk Institut Zoologia, 35(20): 267-283.

ZETTERBERG, G. (ed.) (1982). Code List ör Baltic Invertebrates. Riksmuseet S-104 05, Stockholm. Lists the known polychaete species from the Baltic and Kattegat.

NORTH WESTERN ATLANTIC OCEAN

BAILEY, J.H. (1970). Spirobinae (Polychaeta) from the West Indies. Stud. Fauna Curacao. 32: 58-81.

DAY, J.H. (1973). New Polychaeta from Beaufort with a key to all species recorded from North Carolina. NOAA Tech. Rep. nmfs circ. 375: 1-140.

EBBS, N.K. (1966). The coral-inhabiting polychaetes of the Northern Florida reef tract. Part 1. Aphroditidae, Polynoidae, Amphinomidae, Eunicidae and Lysaretidae. Bull. mar. Sci. 16 (3): 485-555.

GARDINER, S.L. (1975, 1976). Errant polychaete annelids from North Carolina. Journal of the Elisha Mitchell Scientific Society 91 (3): 77-220.

GOSNER, K.L. (1971). Guide to identification of marine and estuarine invertebrates. Cape Hatteras to the Bay of Fundy. New York (Wiley-Interscience): 327-380.

HARTMAN, O. (1951). The littoral marine annelids of the Gulf of Mexico. Publs. Inst. mar. Sci. Univ. Tex. 2(1): 7-124.

HARTMAN, O. and FAUCHALD, K. (1971). Deep-water benthic polychaetous

NOTES ON SOME PROBLEMS IN THE DETERMINATION OF PHYLLODOCIDAE (POLYCHAETA) FROM THE NORTH SEA

31291

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During the course of the workshop held by the Benthos Ecology Working Group of ICES on Helgoland 8-12 February 1988, several problems in the determination of the phyllodocids have become apparent. Given the present status of the literature, several of these could be anticipated, while others were somewhat unexpected. Here, an attempt will be made to give some simple guidelines on what, in my opinion, are the solutions to these problems.

Eteone:

In most of the relevant literature, the species E. lactea and E. spetsbergensis are reported from North Sea waters. E. lactea seems to be a Mediterranean species that does not occur at our latitudes. Likewise, E. spetsbergensis is an Arctic species, that also does not appear to be present in the North Sea area. What we in fact have is, in my opinion, following the suggestion made by Eliason (1962), E. foliosa, originally described from the Atlantic coast of France. This conclusion is based primarly on details of the proboscis. E. foliosa differs from all other species of Eteone present in the North Sea in the relative length of the tentacular cirri (ventral cirri clearly longest) and in the usual absence of setae on segment 2 (one or two setae may be present on small animals, while other species of Eteone from this area have at least four per parapodium on this segment).

Eteone flava and E. longa are easily confused, as current keys primarily use the relative length of the dorsal cirri and of the prostomium for distinction. In my experience, the prostomium is quite contractile, and the latter character seems to be without importance. Regarding the dorsal cirri, one may encounter specimens in wich the length of these organs is equal to the width. I have found that the most reliable character is the size of the dorsal cirrus relative to that of the neuropodium. In E. flava it is much larger than the neuropodium (about four times), while it is only somewhat larger in E. longa (up to about twice as large).

Eulalia:

The existence of the newly described species E. mustela Pleijel, 1987 is not generally known. It has, however, on several occasions turned up in the North Sea material. This species belong to the E. bilineata-group (reduced median antenna and oval dorsal cirri), but is primarly characteristic in the extremely reduced median antenna, while resembles only a slightly elongated papilla and may easily be overlooked. If this antenna is not perceived, the specimen will probably key out as Pseudeulalia or Protomystides, both of which appear to be extremely rare in the northeast Atlantic area.

Eumida:

Distinguishing E. sanguinea from E. bahusiensis may be very difficult using the literature presently at our disposal. However, E. bahusiensis appears to be a rather seldom species, which is quite distinct from E. sanguinea (at least when living adults are studied). The key character seems to be the same as that indicated in the Eteone flava/longa controversy. In E. sanguinea the dorsal cirri may, in extreme cases, be slightly broader than long, but they are never more than about twice as large as the neuropodium (while they are at least four times larger in adults of E. bahusiensis).

The largest contemporary problem in this genus (in our area) seems to be the report of Eumida (Pirakia) punctifera from the German Bight (Hartmann-Schröder & Stripp, 1968; Hartmann-Schröder, 1971; Gillandt, 1979). The specimens upon which these reports have been based differ greatly from E. punctifera from, for example, the southern coast of England. As has earlier been pointed out (Eibye-Jacobsen, 1987), the animals from the North Sea lack the characteristic pigmentation of E. punctifera and, most importantly, do not have the distinctively shaped presetal lobes on the neuropodia of this species. The reports from North Sea waters seem to be based on young animals, which, in my opinion, most likely belong to E. sanguinea. To my knowledge, genuine E. punctifera has yet to be found in the North Sea.

Phyllodoce:

The greatest problem in this genus is the distinction between P. maculata and P. mucosa. Following Gillandt (1979) there has in recent years, especially among German workers, been a tendency to regard these species as synonymous (under the name of P. maculata). Material from the North Sea

clearly confirms my experience with specimens from inner Danish waters: the two species are clearly separate. There are important differences in pigmentation: 1) the prostomium is anteriorly dark brown in P. mucosa, only slightly pigmented in P. maculata; 2) segments 3 and 4 bear obvious, dark brown, transverse dorsal bands in P. maculata, while in P. mucosa they are marked only by the mediodorsal and two laterodorsal spots on each segment typical of the dorsum of both species; and 3) the ventral, anterior border of segment 1 is darkly pigmented in P. mucosa, while it is more or less unpigmented in P. maculata. These differences in pigmentation correlate with the only consistent morphological difference between the two species, which is the shape of the ventral cirri. The ventral cirrus is more or less pointed in P. mucosa, while it is rounded in P. maculata. It is, however, necessary to point out that the ventral cirri are usually longer than the neuropodium in both species. There are other, more sublte differences between the two species in the relative length of the tentacular cirri and the number of papillae in the lateral, longitudinal rows on the proximal part of the proboscis, but in these cases the ranges overlap.

The distinction between P. maculata and P. mucosa made by Hartmann-Schröder (1971), regarding the presence or absence of a ciliated ridge on the dorsal cirrus, seems to be based on preserved material. On live animals it is easily apparent that all species of Phyllodoce possess these ridges, this thus being a diagnostic character for the genus as a whole.

This workshop has brought to light several specimens of Phyllodoce longipes, a species which should be easily recognizable by the prolonged, digitiform supracircular lip of the presetal lobe on the neuropodium. The pigmentation of the anterior end has a superficial resemblance to that of P. maculata, in that two segments have dark, dorsal, transverse bands. However, in P. longipes these bands are on segments 4 and 5, not 3 and 4 as in P. maculata. Phyllodoce longipes is synonymous with P. jeffreysii (McIntosh, 1908) (see Parker, 1987), but is not mentioned in Hartmann-Schröder, 1971 under either name.

Several specimens of Phyllodoce rosea were also seen at this workshop. They were, however, usually labeled as P. subulifera, which has been shown to be synonymous with P. rosea (see O'Connor, 1987).

Sige:

Sige fusigera is treated in Hartmann-Schröder, 1971 under the name of Eumida (Sige) fusigera. *Her description is confused, and obviously largely*

follows that of Bergström, 1914 (under the name of Sige macroceros). As was indicated by Uschakov (1972) and later confirmed by Eibye-Jacobsen (1987), the following characters are, among others, to be found in S. fusigera: proboscis smooth (i.e. provided only with micropapillae), all tentacular cirri cylindrical or somewhat flattened (as in often seen in Eulalia viridis and Eumida sanguinea), segment 1 partially reduced dorsally, and the supraacicular lip of the presetal lobe on the neuropodium prolonged and digitiform.

Some additional points:

In closely related species (for example, Eteone longa/flava, Eumida bahusiensis/sanguinea and Phyllodoce maculata/mucosa), it may be expected that specific differences will not appear until at a later stage in the ontogeny of the animals. It is therefore in most cases meaningless to determine the specific identity of very small juveniles (as a rule smaller than 5 mm in length, and certainly less than 3 mm). This is not to be interpreted as ignorance on our part, but simply a reflection of developmental reality. We must in such cases be satisfied only to indicate the generic name unless exceptional information is available.

It is important, when comparing the parapodia of different species, that they be taken from approximately the same region of the body. As a rule, median parapodia should be used. Animals without a prostomium should not, of course, be determined.

Among the phyllodocids, as in many other polychaetes, pigmentation patterns may greatly facilitate specific determination. In my experience, the following procedure best preserves these patterns: narcotization in $MgCl_2$ (usually impracticable in ecological work), fixation in 2% neutralized formaldehyde in seawater for 2-3 days, and preservation in 70% alcohol, which should be changed after about a week.

Finally, a list and a key will be given for those species of Phyllodocidae which are known to occur in Danish and Swedish waters, and which should also be present in the North Sea. Besides these, there are a number of species, known from in or near the English Channel or from along the east coast of Great Britain, which may be expected to appear in material from the ICES sampling stations, especially in the southern and western regions of the North Sea: Eteone picta, Eulalia aurea, E. expusilla, E. ornata, E. tripunctata, Eumida punctifera, Hesionura elongata, Nereiphylla paretti, N. rubiginosa, Phyllodoce laminosa, P. lineata and Pterocirrus macroceros.

List of the Danish Phyllodocidae

Chaetoparia nilssoni Malmgren, 1867
Eteone barbata (Malmgren, 1865)
E. flava (Fabricius, 1780)
E. foliosa Quatrefages, 1866
E. longa (Fabricius, 1780)
E.suecica Bergström, 1914
Eulalia bilineata (Johnston, 1840)
E. mustela Pleijel, 1987
E. viridis (Linné, 1767)
Eumida bahusiensis Bergström, 1914
E. minuta (Ditlevsen, 1917)
E. ockelmanni Eibye-Jacobsen, 1987
E. sanguinea (Oersted, 1843)
Hesionura augeneri (Friedrich, 1937)
Mystides caeca Langerhans, 1880
Nereiphylla lutea (Malmgren, 1865)
Notophyllum foliosum (M. Sars, 1835)
Paranaitis kosteriensis (Malmgren, 1867)
P. wahlbergi (Malmgren, 1865)
Phyllodoce citrina Malmgren,1865
P. groenlandica Oersted, 1843
P.longipes Kinberg, 1866
P. maculata (Linné, 1767)
P. mucosa Oersted, 1843
P. rosea (McIntosh, 1877)
Pseudeulalia exigua Eliason, 1962
Pseudomystides limbata (Saint-Joseph, 1888)
P.sp. (presently being worked on by Mary E. Petersen, Zool. Mus., Copenhagen)
Sige fusigera Malmgren, 1865

Key to the Danish Phyllodocidae

1: Two or three pairs of tentacular cirri, arranged on one or two segments...2
1: Four pairs of tentacular cirri, arranged on three segments

(ventral cirri og segment 2 may be short)...10

2: Two pairs of tentacular cirri, on one segment. Segment 2 without dorsal cirri. Four antennae. Nuchal papilla present...(Eteone)...3

2: Two or three pairs of tentacular cirri, arranged on two segments. Segment 3 without dorsal cirri. Four or five antennae. Nuchal papilla absent...7

3: One pair of tentacular cirri (the dorsal or the ventral) considerably longer than the other (about 1½ times). Number of setae on segment 2 variable...4

3: Dorsal and ventral pairs of tentacular cirri subequal. At least four setae per parapodium on segment 2...5

4: Dorsal pair of tentacular cirri longer than ventral pair. Segment 2 with well developed neuropodia, each with at least 4 setae. Dorsum with three dark, longitudinal bands of pigment...Eteone barbata

4: Ventral pair of tentacular cirri longer than dorsal pair. Segment 2 without setae, or with 1-2 setae at the most. Preserved animals without extensive dark markings on the dorsum...Eteone foliosa

5: Ventral cirri awl-shaped, acuminate, much longer than neuropodium. Animals stout. (Rare species)...Eteone suecica

5: Ventral cirri more or less oval, slightly longer than neuropodium at the most. Animals usually quite thin...6

6: Dorsal cirri somewhat longer than broad, only about twice as large as neuropodium. Living animals usually white, light grey or light brown, often with a green tinge...Eteone longa

6: Dorsal cirri broader than long, about four times as large as neuropodium. Living animals usually pink, sometimes red or yellowish brown...Eteone flava

7: Prostomium broadly rounded. Four filiform antennae present. Tentacular cirri fusiform (bottle-shaped) with long, thin tips. Eyes absent...Mystides caeca

7: Prostomium more or less cone-shaped. Tentacular cirri subulate or cirriform. Eyes normally present...8

8: Dorsal and ventral cirri cirriform (not flattened). Each neuropodium with four or five setae, their shafts distally bifid or trifid. Four antennae present. Interstitial species...Hesionura augeneri

8: Dorsal and ventral cirri flattened, lamelliform. More than five setae on each neuropodium, their shafts distally otherwise. Five antennae present (the median antenna very small, difficult to detect)...(Pseudomystides)...9

9: Ventral cirri of segment 2 elongate, tentacular (although flattened). Median dorsal cirri about twice as long as broad. Uniform in colouration...Pseudomystides limbata

9: Ventral cirri of segment 2 enlarged (up to three times as large as normal ventral cirri), but not tentacular. Median dorsal cirri only 1½ times as long as broad. Living animals with dark green spots spread over most of body...Pseudomystides sp.

10: Four antennae present (NB: Chaetoparia nilssoni included here). Nuchal papilla may or may not be present...11

10: Five antennae present (median antenna may be strongly reduced and very difficult to detect)...21

11: Dorsal cirrophores poorly developed. All tentacular segments separate and fully developed...Pseudeulalia exigua

11: Dorsal cirrophores well developed. Segment 1 fused to segment 2, at least dorsally...12

12: Ventral cirri very large, reniform, posteriorly attached to the neuropodium. Nuchal papilla absent...Nereiphylla lutea

12: Ventral cirri of normal size, more or less ventrally attached to the neuropodium. Nuchal papilla present...13

13: Dorsal cirri quite small, not imbricate. Prostomium dorsally fused to segment 1. Nuchal papilla antenna-like. Segments 2 to 4 with large, acicular setae...Chaetoparia nilssoni

13: Dorsal cirri imbricate. Prostomium separate from segment 1. Nuchal papilla normal. Segments 2 to 4 without acicular setae...14

14: Segment 1 dorsally developed as a collar, encompassing posterior portion of prostomium...(Paranaitis)...15

14: Segment 1 dorsally completely reduced...(Phyllodoce)...16

15: Nuchal papilla visible, on posterior ligula of prostomium ...Paranaitis kosteriensis

15: Nuchal papilla not visible. Ligula of prostomium very weakly developed or absent...Paranaitis wahlbergi

16: Supraacicular lip of presetal lobe on neuropodium prolonged, digitiform. Distal part of proboscis with large papillae... Phyllodoce longipes

16: Lips of presetal lobe on neuropodium subequal. Distal part of proboscis tuberculate or smooth...17

17: Ventral cirri awl-shaped, very long and thin, acuminate. Proximal part of proboscis with 12 longitudinal rows of papillae and 4 rows of large,drop-shaped papillae...Phyllodoce rosea

17: Ventral cirri oval or lanceolate, blunt or acuminate. Proximal part of proboscis with 8 or 12 longitudinal rows of papillae...18

18: Proboscis proximally with 8 rows of papillae. Prostomium usually broader than long. Dorsum irridescent with a mediodorsal, longitudinal band of pigment...Phyllodoce citrina

18: Proboscis proximally with 12 rows of papillae. Prostomium variable. Pigmentation on dorsum otherwise...19

19: Prostomium usually broader than long. Median dorsal cirri at least twice as high as broad. Acuminate tip of median ventral cirri points downwards. Dorsum without spots of pigment, but with transverse, green or brown bands...Phyllodoce groenlandica

19: Prostomium longer than broad.Median dorsal cirri 1½ times as high as broad. Median ventral cirri, if acuminate, then with tip pointing horisontally. Dorsum with 3 longitudinal rows of brown, red or green spots (lateral rows may coalesce as longitudinal bands)...20

20: Longest rows on proximal part of proboscis with 9 or less papillae. Median ventral cirri oval, rounded or bluntly pointed

(NB: longer than neuropodium). Segments 3 and 4 dorsally darkly pigmented. Longest tentacular cirri extend no further than to segment 9...Phyllodoce maculata

20: Longest rows on proximal part of proboscis with 9 or more papillae. Median ventral cirri oval, acuminate, with a horisontally pointing tip, longer than the neuropodium. Anterodorsal portion of prostomium and ventral surface of segment 1 very darkly pigmented. Longest tentacular cirri extend at least as far as segment 9...Phyllodoce mucosa

21: Proboscis covered with diffusely arranged papillae. Segment 1 dorsally well developed...(Eulalia)...22

21: Proboscis variable. Segment 1 at least partially reduced dorsally...24

22: Median antenna not conspicuously smaller than frontal antennae. Dorsal cirri lanceolate, much longer than broad. Anal papilla absent...Eulalia viridis

22: Median antenna markedly smaller than frontal antennae. Dorsal cirri oval, less than twice as long as broad. Anal papilla present...23

23: Median antenna about half as long as frontal ones. Papillae on proboscis become gradually larger distally. Anal cirri oval, distally rounded. Dorsum with two dark, longitudinal bands of pigment...Eulalia bilineata

23: Median antenna very short, only about twice as long as it's own width.

Proboscis covered with papillae of uniform size. Anal cirri with thin, draw-out tips. More or less uniformly green...Eulalia mustela

24: Prostomium more or less rounded, greatest width at middle. Large, paired nuchal epaulettes present. Proboscis diffusely covered with papillaeexceptfor lateral, longitudinal rows ofpapillae. Dorsal cirri large, imbricate. Parapodia biacicular. Ventral cirri large, reniform, attached to posterior surface of neuropodium...Notophyllum foliosum

24: Prostomium more or less cordiform, greatest width at posterior half (exception: prostomium oval in Eumida minuta). Nuchal

epaulletes absent. Proboscis moreor less smooth (with micropapillae), at least in adults. Dorsal cirri of normal size, only slightly imbricate. Parapodia uniacicular. Ventral cirri normal, more or less ventrally attached to neuropodium...25

25: Neuropodium with a prolonged, digitiform supraacicular lip. Segment 1 partially reduced dorsally...Sige fusigera

25: Neuropodium with the supra- and subacicular lips more or less equal. Segment 1 completely reduced dorsally...(Eumida)...26

26: Prostomium rounded, more or less oval, not cordiform. Antennae distally very thin. Tentacular cirri more or less fusiform (bottle-shaped). Dorsal cirri thick, oval, blunt. Living animals with three longitudinal rows of dark green pigment spots on dorsum...Eumida minuta

26: Prostomium more or less cordiform or triangular. Antennae subulate. Tentacular cirri cirriform (cirri of segment 1 and ventral cirri of segment 2 may be slightly fusiform or somewhat flattened). Dorsal cirri cordiform or almost lanceolate. Pigmentation otherwise...27

27: Small species (up to about 8 mm at maturity). Dorsal cirrophores weakly developed. Dorsal cirri almost lanceolate. Anal papilla present. More or less uniformly green coloured...Eumida ockelmanni

27: Larger at maturity (at least 20 mm long). Dorsal cirriophores well developed. Median dorsal cirri cordiform, no more than about 1½ times as long as broad. Anal papilla absent. Usually with a dark, transverse band across dorsum of each segment...28

28: Median dorsal cirri about as long as broad or longer, more or less symmetrical, evenly narrowed distally, only up to about twice as large as neuropodium. Median ventral cirri longer than broad, distally bluntly pointed...Eumida sanguinea

28: Median dorsal cirri consicuously broader than long, somewhat asymmetrical, with a somewhat drawn-out, blunt point, about four times as large as neuropodium. Median ventral cirri broad, asymmetrical, with a somewhat drawn-out, acuminate point...Eumida bahusiensis

Literature

Eibye-Jacobsen, D., 1987. Eumida ockelmanni sp.n. (Polychaeta: Phyllodocidae) from the Northern part of the Oeresund. Ophelia 27 (1): 43-52.

Eliason, A., 1962. Die Polychaeten der Skagerak-Expedition 1933. Zool. Bidr. ifrån Uppsala 33: 207-293.

Gillandt, L., 1979. Zur Systematik, Autökologie und Biologie der Polychaeten des Helgoländer Felslitorals. Mitt. hamb. zool. Mus. Inst. 76: 19-73.

Hartmann-Schröder, G., 1971. Annelida; Borstenwurmer, Polychaeten. Tierw. Deutschl. 58: 1-594.

Hartmann-Schröder, G. & K. Stripp, 1968. Beiträge zur Polychaetenfauna der Deutschen Bucht. Aus dem zool. Staatsinst. Hamburg und dem Inst. für Meeresforsch. Bremerhaven 11: 1-24.

McIntosh, W.C., 1908. A monograph of the British Annelids. Vol. II. Part 1. Polychaeta. Nephthydidae to Syllidae. The Ray Society. 232 pp.

O'Connor, B.D.S., 1987. Redescription of Anaitides rosea (McIntosh, 1877) (Polychaeta: Phyllodocidae) with notes on nomenclature, ecology and distribution and a key to the genera of Phyllodocinae from the NE Atlantic. Ir. Nat. J. 22 (7): 310-314.

Parker, M., 1987. Anaitides longipes Kinberg, 1866 (Polychaeta; Phyllodocidae): Notes on nomenclature, identification, habitat and distribution. Ir. Nat. J. 22 (5): 193-194.

Pleijel, F., 1987. Two new European species of Eulalia (Polychaeta: Phyllodocidae). J. Mar. Biol. Ass. U.K. 67: 399-405.

Uschakov, P.V., 1972. Polychaetes. Vol. 1: Polychaetes of the suborder Phyllodociformia of the Polar Basin and the northwestern part of the Pacific. (Families Phyllodocidae, Alciopidae, Tomopteridae, Typhloscolecidae and Lacydoniidae). Fauna of the U.S.S.R., N.S., 102: 271 pp. (In Russian: Translated by the Israel Program for Scientific Translations. Jerusalem 1974).

DISCUSSION ON "RARE SPECIES IN BENTHIC SAMPLES"

31293

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When analyzing the total macrofauna from sediment samples, the amount of time devoted to individuals of rare species is disproportionately high because these often present problems of identification. Ecologists being concerned with quantitative comparisons might like to disregard this fraction from analysis to save time.

(2) For rare species to be of interest in ecological considerations we need to find out whether there are ecological processes or environmental factors which primarily affect the rare species, and remain unnoticed once we confine our anlaysis to the common species.

(3) There is a conceptual difficulty to define "rare species". What is rare from the human point of view may not be rare for a specialized predator or parasite. Large sized individuals always tend be rarer than small sized individuals. One may find an index by multiplying abundance with logarithm of size. There may be species which are permanently and everywhere rare. Others exploit patchy and rare resources and thus show up rarely in samples but may be numerous nevertheless.

(4) Certain trophic groups (predators, parasites, commensals) are disproportionalety represendet in the fraction of rare species. Some species may be always rarebut still have a marked impact on the environment like those who make spaceous burrows. Species which are always rare may be most liable to extinciton. Excluding all these rare species from analysis will result in a biased perception of benthic ecology.

(5) Quantitative ecology has dominated the work of benthologists in the past decades. This resulted in a neglect of rare species. We conclude that qualitative approaches to benthic ecology ought to be strengthened, otherwise a rich source of information remains hidden in the "tail" of species lists.

41524

REPORT ON THE RESULTS OF THE POLYCHAETA SUBGROUP, HELGOLAND, 8TH-10TH FEBRUARY, 1988.

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Introduction

During the course of the work on the Polychaeta, a large number of families (31) and species (113) were examined (see Appendix 1). This first section deals with all families except the Phyllodocidae which are covered in section 2 by the third author.

Some families with only one or two species e.g. Pisionidae, Onuphidae, are treated no further than listing the material seen, while others, due to specific points of interest or serious taxonomic difficulties are treated more fully.

This report is accompanied by a partial bibliography compiled by the first author with help from Andy Mackie, Heye Rumhor, Peter Garwood and Susan Howson.

Systematic section

Ariciidae

Orbinia sertulata, specimens were noted to be missing interramal cirri in midthoracic chaetigers.

Spionidae

A full review of the genus Spio is needed before accurate identification of the species found during this work shop can be made.

Magelonidae

Juvenile M. filiformis can be separated from small M. mirabilis (=M. papillicornis) in that they have a square tip to the prostomium while the latter species have a rounded prostomium.

Cirratulidae

A review of the genera Chaetozone, Caulleriella and Tharyx is needed before accurate identification of these taxa can be made.

Capitellidae

Many specimens of Mediomastus were seen during the workhop. A description of this can be found in Rassmussen's Ecology of the Isefiord and in Warren (1978).

Peresiella was noted in northern North Sea samples.

Maldanidae

Generic diagnoses for some genera e.g. Euclymene and Praxillella are at variance in some texts making identification difficult. Shapes of cephalic and anal plates are frequently distorted due to regeneration.

Hesionidae

Gyptis capensis/helgolandica. Separation of these two close species was found to be difficult as eye shape varied between specimens. Specimens of North Sea material have been taken by the first author and are being compared with Atlantic G. capensis.

Glyceridae

The difficulties of distinguishing G. alba from G. tridactyla were experienced by a number of participants. All material was shown to be G. alba based on the podial and proboscideal papillar morphology.

Amphinomidae

Specimens of Paramphinome jeffreysii were shown to have two pairs of posteriorly pointing hooks on the first chaetiger.

Lumbrineridae

Lumbrinerid material attributable to L. latreillii was found to vary from species diagnoses of serveral authors in that the composite chaetae only reached as far back as the 12th chaetiger in some specimens. As the terminal portion of these chaetae was clearly longer than in L. gracilis, it was identified as L. latreillii. Some L. hibernica material specimens were seen. This taxon is not a synonym of L. tetraura and can be distinguished by its long, pointed prostomium and a type of chaeta which in the first chaetigers look like slightly truncated capilliaries but which

gradually change into simple crochets over the first ca. 10 segments.

Oweniidae

Observations on the tubes of Myriochele species are helpful in separating the species. Due to cropping by bottom feeding fish, many specimens will have the anterior end regenerating and it it therefore difficult to get an accurate description of the prosomium.

Ampharetidae

Certain difficulties were encountered when trying to identify specimens of Ampharete due to differences in the length of the dorsal cirri in abdominal segments. It should be noted that the segment which bears the paleae is the first chaetiger.

Terebellidae

Specimens of a Streblosoma species were found in northern North Sea material which have three branchial bearing segments, the first of which has approx. 30 filaments, the second approx 10 and the third 3-4.

Sabellidae

This family is presently under review by Dr. Phyllis Knight-Jones, University of Swansea.

SECTION III. DISCUSSIONS

Appendix I

LIST OF SPECIES SEEN DURING THE WORKSHOP

Orbinia sertulata
Scoloplos armiger
Paraonis fulgens
Aricidea minuta
Aricidea catharinae
Aricidea simonae
Polydora sp.
Pseudopolydora pauchibracnhiata
Spiophanes kroyeri
Spio filicornis
Spio martinensis
Spio goniocephela
Scolelepis bonnieri
Pseudomalacoceros tridentata
Laonice sp.
Aonides sp.
Magelona mirabilis
Magelona filiformis
Magelona alleni
Chaetozone sp.
Caulleriella sp.
Peresiella clymenoides
Capitella capitata
Mediomastus fragilis
Notomastus latericeus
Heteromastus filiformis
Arenicola sp.
Praxillura longissima
Clymenura sp.
Praxillella/Euclymene
Ophelia cylindricaudata
Ophelia modesta
Polyophthalmus pictus
Travisia forbesi
Phyllodocidae (see report by D. Eibye-Jacobsen)

Harmothoe frazer-thompsoni
Harmothoe glabra
Harmothoe extenuata
Enipo kinbergii
Pholoe sp.
Sigalion mathildae
Pisione remota
Kefersteinia cirrata
Hesiospina similis
Gyptis sp.
Nereimyra armata
Microphthalmus similis
Autolytus sp.
Eusyllis blomstrandi
Exogone sp.
Nereis coccinea
Nereis zonata
Nereis pelagica
Eunereis longissima
Glycera alba
Glycera rouxi
Glycera celtica
Glycera "lapidum"
Goniada maculata
Glycine nordmanni
Goniadella bobretzki
Nepthys hombergii
Nephtys longosetosa
Nephthys cirrosa
Paramphinome jeffreysii
Onuphis conchilega
Hyalinoecia tubicola
Eunice pennata
Lumbrineris fragilis
Lumbrineris gracilis
Lumbrineris latreilli
Lumbrineris hibernica
Protodorvillea kefersteinia
Owenia fusiformis

Myriochele sp.
Melinna cristata
Mugga wahlbergi
Amphaerete sp.
Sosane sulcata
Eclysippe vanelli
Streblosoma intestinale
Streblosoma sp.
Thelepus cinncinnatus
Lysilla loveni
Polycirrus sp.
Amaeana trilobata
Parathelepus collaris
Pista mirabilis
Lanice conchilega
Nicolea zostericola
Paramphitrite tetrabrachia
Trichobranchus rosea
Terebellides stroemi
Octobrachus floriceps
Sabella sp.
Pseudosabella sp.
Chone filicaudata
Euchone rubrocincta
Jasmineira elegans
Jasmineira caudata
Serpula vermicularis

REPORT ON THE EXAMINATION OF CRUSTACEA AT THE TAXONOMY WORKSHOP (HELGOLAND, FEBRUARY 1988) AND RELATED PROBLEMS.

31294

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The Crustacea presented for an identification check during the workshop belonged to a number of groups: Decapoda, Mysidacea, Isopoda, Amphipoda, Cumacea.

By far the most specimens belonged to the Amphipoda, which are rather abundant in grab samples. Here again, some genera present particular problems due to the species numbers and/or delicate characters. These are mainly: Corophium, Bathyporeia and Gammarus. The remaining genera could be identified easily using the monograph of Lincoln (1979, British marine Amphipoda: Gammaridea). However, in some cases expert confirmation was necessary to get sure about the identification. The afore mentioned three problematic genera can also be identified by LINCOLN's monograph and this was done successfully for Bathyporeia and Gammarus. Some unclear specimens, however, and some Corophium had to be sent to a specialist (Dr. H.G. Andres, Zoologisches Institut und Museum Hamburg).

In the Isopoda only very few specimens were presented, mainly Munna, all other genera being rare in grab-samples. Generally North Sea Isopoda do not have many problems concerning identification.

The Mysidacea can readily be identified with TATTERSAL's monograph (1951. The British Mysidacea). Most species are unproblematic, only in Schistomysis identification can be complicated and even impossible without comparative material. Thus, some specimens of this genus had to be checked. Probably this genus is in need of revision, so that the present identification can only refer to current knowledge.

The Cumacea are not easy to identify, as the females (often met in samples) do not differ from each other as the males do. Presently I consider the identification of this group a task for specialists, and thus did not try to put definitive names on any specimen.

In the Decapoda a few genera are problematic. In the adults this mainly applies to Processa in which the characters presented in the key of SMALDON (1979, British coastal shrimps and prawns) are not always sufficient. Some specimens of this genus had thus to be checked. Another problem is the identification of juveniles. In Crangon the two North Sea species do not differ in the first bottoms stages, so that identification

of very young specimens is impossible. For the Portunids there is a good publication on the first crab stages reared in the laboratory (INGLE & RICE, 1984, Bull. brit. Mus. nat. Hist., Zool., 46: 345-354). However, the characters of the following juvenile stages are not known until now, so that an identification of such material is impossible to date. An investigation of this question is currently in progress.