

## Free-living Plathelminthes from the Belgian coast and adjacent areas

by Ernest R. SCHOCKAERT, Philippe E.H. JOUK and Paul M. MARTENS

### Abstract

From own observations and data from the literature, a species list is given of the free-living Plathelminthes which occur on the Belgian coast, in the Netherlands Delta area and some localities in Northern France. In the whole area considered over 250 species have been observed, more than 150 of them are from Belgian sandy beaches, some sublittoral stations and/or brackish water areas.

**Key-words** : Free-living Plathelminthes, Belgian coast, Netherlands Delta, Northern France.

### Samenvatting

Gebaseerd op eigen waarnemingen en literatuurgegevens werd een soortenlijst opgesteld van de vrijlevende Plathelminthes voorkomend aan de Belgische Kust, in het Nederlands Deltagebied en enkele localiteiten in Noord-Frankrijk. In het gehele gebied werden meer dan 250 soorten waargenomen, waarvan meer dan 150 aan de Belgische stranden, in brakwatergebieden en sublittoraal.

**Trefwoorden** : Vrijlevende Plathelminthes, Belgische Kust, Nederlandse Delta, Noord-Frankrijk.

### Introduction

Soft-bodied taxa as free-living Plathelminthes (Turbellaria) are mostly neglected in faunistic surveys or in ecological studies since they must be studied alive for a correct identification. It has however been shown that turbellarians may play a major role in the meiobenthic communities in sandy habitats. Their diversity may be of the same magnitude of that of e.g. nematodes and copepods, and they may constitute up to more than 25% of the meiofauna density (see MARTENS and SCHOCKAERT, 1986). In this paper we present a list of the species observed on the Belgian coast, some localities in northern France and in the Dutch Delta area. The list is completed by the compilation of the species lists presented by BOADEN (1976) and DEN HARTOG (1977) for the Delta region. In northern France and in the Delta some habitats have been investigated which have not yet been studied on the Belgian coast. It may be expected that a number of species encountered in these habitats also occur in Belgium.

### Origin of the data

The sandy beaches of the Belgian coast have occasio-

nally been sampled by the senior author (E.R.S.) since the late sixties; in ten localities the beaches have been investigated monthly over a period from april 1985 to june 1986 by the second author (P.E.H.J.). A number of sublittoral samples have been inventorised by D. DEGADT in 1973 (unpublished data), while occasional samples were studied later on by the third author (P.M.M.). From granulometric data it appears that the beaches from Ostend to the French border are different from those east of Ostend (JOUK, unpublished data). The main creek in the Zwin and its adjacent mudflats have been studied by N. REVIS in 1984 (unpublished data) while the senior author inventorised the turbellarians of the Dievangat, a shallow brackish water pond near the Zwin (SCHOCKAERT in HEIP, 1971).

Sandflats, creeks and salt marches of the Netherlands Delta area have been thoroughly investigated by DEN HARTOG over a period of several years (DEN HARTOG, 1963, 1964a and b, 1965, 1966a and b, 1977). BOADEN (1976) and MARTENS and SCHOCKAERT (1981) studied sandflats and sublittoral samples.

In Northern France some samples from the sandy beaches of Ambleteuse and Audresseles were taken. Also several samples were studied from the estuary of the river La Slack as well from mudflats as from the salt marshes. In Wimereux several samples from algae have been inventorised. It must be stressed that only occasional sampling was performed and that the knowledge of the plathelminth fauna from northern France must be considered fragmentary.

### Observations

Acoela were identified to the species level only by DEN HARTOG (1977 : 5 species). Neither nemertodermatids nor retronectids have been identified to the species level.

On the Belgian beaches the number of acoel species is estimated to be about 15 - not taken in consideration in the numbers given in table 1 -, while probably 3 retronectid species occur. From the sublittoral of the Eastern Scheldt one nemertodermatid and one retronectid have been recorded.

The list of the species observed in the considered area is given with indication of the area and the habitat where they have been found. The repartition over the major taxa is given in table I. For the Belgian coast the species found in sublitoral stations (BS), brackish water (BB), beaches from Ostend to the French border (B1) and from Bredene to the Dutch border (B2) are listed separately. The list contains almost 250 species of which about 25 are new for science and remain to be described.

At the Belgian coast 150 species (excl. acoels) have been observed, 115 in the sandy beaches (B1+B2), 57 in the brackish water area of the Zwin and the Dievangat and 22 from sublitoral samples. In the Delta area 136 species have been found : 77 from open beaches and sandflats (M), 78 from salt marches or creeks (N), 41 from the sublitoral (S). Of these species 67 have not been observed on the Belgian coast so far. In Northern France 53 species were found, 19 do not occur in Belgium, 9 of them were collected from algae (P).

	TOTAL	N. France			Belgium				Delta		
		P	M	B	B1	B2	BB	BS	M	B	S
ACOELA	5+15	-	-	-	>15	>15	-	-	3	3	-
NEMERTODERMATIDA	1	0	0	0	0	0	0	0	0	0	1
CATENULIDA	3	0	0	0	3	3	0	0	0	0	1
HAPLOPHARINGIDA	1	0	0	0	1	0	0	1	0	0	1
MACROSTOMIDA	10	0	0	2	5	5	4	0	3	6	2
POLYCLADIDA	2	1	1	0	0	0	0	0	1	1	0
PROLECITHOPHORA	5	2	0	0	1	1	1	1	2	1	0
PROSERIATA	42	1	9	4	18	24	13	9	7	7	11
TRICLADIDA	2	1	0	0	0	0	1	0	0	1	0
TYPHLOPLANOIDA	58	3	3	5	7	18	13	2	22	29	1
KALYPTORHYNCHIA	75	1	16	2	39	42	14	9	31	18	24
DALYELLOIDA	27	1	0	5	11	14	11	0	8	12	0
TOTAL		10	29	18	82	104	57	22	77	78	41
OVERALL TOTAL	231	53			150				136		

Number of species of the major taxa found in the various habitats. (abbreviations : see text and bottom of species list.)

## Conclusions

What the knowledge of the plathelminth fauna of the Belgian territory is considered, following conclusion can be made :

- It can safely be stated that the plathelminth fauna of the Belgian sandy beaches, of the main creek of the Zwin and of the Dievangat are very well known, taking in consideration the intensity with which these habitats have been studied.
- The salt marches of the Zwin have only occasionally been studied by DEN HARTOG, while the brackish water area at the IJzer mouth has never been sampled. These habitats certainly house many species which have been found in the Delta area.
- The Belgian sublitoral zone has been checked on turbellarians only very occasionally and needs further attention.
- Nothing is known from the fauna inhabiting the algae on piers and jetty's. Most probably the species observed on algae in northern France also occur on the Belgian coast.
- Finally nothing is known about the microturbellarians from fresh water habitats.

## Acknowledgments

The second author acknowledges a grant from the "Instituut ter Aanmoediging van Wetenschappelijk Onderzoek in Nijverheid en Landbouw (I.W.O.N.L.)". The authors thank Ms. N. REVIS and M. D. DEGADT for letting them use their data.

## Bibliography

- BOADEN, P.J.S., 1976. Soft meiofauna of sand from the Delta region of the Rhine, Meuse and Scheldt. *Netherlands Journal of Sea Research*, 10 : 461-471.
- DEN HARTOG, C., 1963. The distribution of the marine triclad *Uteriporus vulgaris* in the Netherlands. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 66(2) : 196-204.
- DEN HARTOG, C., 1964a. Proseriate flatworms from the Deltaic area of the rivers Rhine, Meuse and Scheldt. I and II. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 67(1) : 10-34.
- DEN HARTOG, C., 1964b. A preliminary revision of the *Proxenetes* group (Trigonostomidae, Turbellaria). I-III. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 67(5) : 371-407.
- DEN HARTOG, C., 1965. A preliminary revision of the *Proxenetes* group (Trigonostomidae, Turbellaria). IV-V. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 68(2) : 98-120.
- DEN HARTOG, C., 1966a. A preliminary revision of the *Proxenetes* group (Trigonostomidae, Turbellaria). VI-X. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 69(2) : 97-163.
- DEN HARTOG, C., 1966b. A preliminary revision of the *Proxenetes* group (Trigonostomidae, Turbellaria). Supplement. *Proceedings Koninklijke Nederlandse Akademie voor Wetenschappen*, Series C, 69(5) : 557-570.
- DEN HARTOG, C., 1977. Turbellaria from intertidal flats and salt-marshes in the estuaries of the south-western parts of the Netherlands. *Hydrobiologia*, 52(1) : 29-32.
- HEIP, C., 1971. The succession of benthic micrometazoans in a brackish water habitat. *Biologisch Jaarboek Dodonaea*, 39: 191-196.
- MARTENS, P.M. & SCHOCKAERT, E.R., 1981. Sand dwelling Turbellaria from the Netherlands Delta area. *Hydrobiologia*, 84 : 113-127.
- MARTENS, P.M. & SCHOCKAERT, E.R., 1986. The importance of turbellarians in the marine meiobenthos : a review. *Hydrobiologia*, 132 : 295-303.
- SCHOCKAERT, E.R.,  
 JOUK, P.E.H. &  
 MARTENS, P.M.  
 Research Group Zoology,  
 Dept. S.B.M.,  
 Limburgs Universitair  
 Centrum,  
 B-3610 Diepenbeek.

**LIST OF THE FREE-LIVING PLATHELMINTHES SPECIES OF THE BELGIAN COAST AND ADJACENT AREAS**

	Fr.	B1	B2	BB.	BS.	ND.
<b>ACOELA</b>						
<b>ANAPERIDAE</b>						
<i>Anaperus tvaerminnensis</i> (Luther, 1912)						M
<b>CHILDIIDAE</b>						
<i>Philactinoposthia saliens</i> (von Graff, 1882)						MB
<b>MECYNOSTOMIDAE</b>						
<i>Mecynostomum auritum</i> (Schultze, 1851)				X		MB
<b>OTOCELIDIDAE</b>						
<i>Philocelis karlingi</i> (Westblad, 1946)						B
<b>PARATOMELLIDAE</b>						
<i>Paratomella rubra</i> Rieger & Ott, 1971		X	X	X		
at least 15 other species, not identified to species level		X	X			MS
<b>NEMERTODERMATIDA</b>						
one species, not identified						S
<b>CATENULIDA</b>						
<b>RETRONECTIDAE</b>						
3 species, not identified		X	X			S
<b>HAPLOPHARYNGIDA</b>						
<b>HAPLOPHARYNGIDAE</b>						
<i>Haplopharynx rostratus</i> Meixner, 1938		X			X	S
<b>MACROSTOMIDA</b>						
<b>MACROSTOMIDAE</b>						
<i>Bradynectes sterreri</i> Rieger, 1971		X	X			S
<i>Macrostomum balticum</i> Luther, 1947	B			X		MB
<i>Macrostomum hamatum</i> Luther, 1949						B
<i>Macrostomum hystricinum</i> Beklemishev, 1951				X		B
<i>Macrostomum pusillum</i> Ax, 1951		X	X	X		MB
<i>Macrostomum spirale</i> Ax, 1956	B			X		MB
<i>Macrostomum tenuicauda</i> Luther, 1947						B
<i>Myozona stylifera</i> Ax, 1956		X	X			
<b>DOLICHOMACROSTOMIDAE</b>						
<i>Paromalostomum dubium</i> (De Beauchamp, 1927)		X	X			
<i>Paromalostomum fuscum</i> Ax, 1952		X	X			S
<b>POLYCLADIDA</b>						
<b>LEPTOPLANIDAE</b>						
<i>Notoplana atomata</i> (O. F. Muller, 1774)						MB
<i>Leptoplana tremellaris</i> (O. F. Muller, 1774)	PM					
<b>PROLECITHOPHORA</b>						
<b>CYLINDROSTOMIDAE</b>						
<i>Cylindrostoma fingalianum</i> Claparède, 1861	P					
<b>PLAGIOSTOMIDAE</b>						
<i>Plagiostomum vitatum</i> (Frey & Leuckart, 1847)	P					
<b>PSEUDOSTOMIDAE</b> Westblad, 1954						
<i>Pseudostomum gracilis</i> Westblad, 1954		X	X		X	
<i>Pseudostomum quadrioculatum</i> (Leuckart, 1847)						MB
<b>PROTOMONOTRESIDAE</b>						
<i>Archimonotresis limophila</i> Meixner, 1938				X		M
<b>PROSERIATA</b>						
<b>MONOCELIDIDAE</b>						
<i>Archiloa petiti</i> Ax, 1956				X		
<i>Archiloa westbladi</i> Ax, 1954	B					
<i>Archilopsis arenaria</i> Martens, Currini-Galletti & Puccinelli 1989		X	X	X		
<i>Archilopsis marifuga</i> Martens, Currini-Galletti & Puccinelli 1989	B			X		S

	Fr.	B1	B2	BB.	BS.	ND.
<i>Duplominona septentrionalis</i> Martens, 1983			X			
<i>Duploeraclistus circocirrus</i> Martens, 1983					X	
<i>Minona baltica</i> Karling & Kinnander, 1953						B
<i>Minona degadti</i> Martens, 1983					X	
<i>Monocelis fusca</i> Oerstedt, 1843	P					MB
<i>Monocelis lineata</i> O. F. Muller, 1774	M	X		X		MB
<i>Monocelopsis otoplanooides</i> Ax, 1951	M	X	X	X	X	M
<i>Paramonotus hamatus</i> (Jensen, 1878)						B
<i>Promonotus marci</i> Ax, 1954	M	X	X	X		S
<i>Promonotus schultzei</i> Meixner, 1943			X	X		MBS
<b>ARCHIMONOCELIDIDAE</b>						
<i>Archimonocelis oostendensis</i> Martens & Schockaert, 1981	M	X	X		X	S
<b>COELOGYNOPORIDAE</b>						
<i>Carenscoilia bidentata</i> Sopott, 1972		X	X		X	S
<i>Carenscoilia biforamen</i> Sopott, 1972	M	X	X			
<i>Cirrifera aculeata</i> (Ax, 1951)		X	X	X		MS
<i>Cirrifera dumosa</i> Sopott, 1972					X	S
<i>Cirrifera n. sp. 1</i>		X	X			
<i>Cirrifera n. sp. 2</i>			X		X	
<i>Coelogyndopora axi</i> Sopott, 1972		X		X	X	
<i>Coelogyndopora biarmata</i> Steinbock, 1924	B					B
<i>Coelogyndopora forcipes</i> Sopott, 1976		X	X			
<i>Coelogyndopora gynocotyla</i> Steinbock, 1924		X	X			
<i>Coelogyndopora schulzei</i> Meixner, 1938				X		MB
<i>Coelogyndopora solifer</i> Sopott, 1972			X			
<i>Coelogyndoporidae spec.</i>		X				
<b>NEMATOPLEANIDAE</b>						
<i>Nematoplana coelogyndoporoidea</i> Meixner, 1938		X	X			
<b>OTOPLANIDAE</b>						
<i>Bothriomolus balticus</i> Meixner, 1938	M					
<i>Kataplana germanica</i> (Meixner in Ax, 1951)		X	X			S
<i>Notocaryoplanella glandulosa</i> (Ax, 1951)	M					
<i>Otoplanella baltica</i> (Meixner, 1938)		X	X	X		
<i>Otoplanella schulzi</i> (Ax, 1951)	MB			X		
<i>Otoplanidia endocystis</i> Meixner, 1938			X			
<i>Paratoplana capitata</i> Meixner, 1938			X			S
<i>Paratoplana papii</i> Ax, 1956	M	X	X	X		S
<i>Philosyrtis coomansi</i> Martens & Schockaert, 1981						MS
<i>Praebursoplana reisingeri</i> Ax, 1956			X			
<i>Pseudosyrtis subterranea</i> (Ax, 1951)		X	X			
<i>Otoplanidarum spec 1</i>			X			
<i>Otoplanidarum spec 2</i>			X			
<b>TRICLADIDA</b>						
<b>PROCERODIDAE</b>						
<i>Procerodes litoralis</i> (Strom, 1768)	P					
<b>UTERIPORIDAE</b>						
<i>Uteriporus vulgaris</i> Bergendal, 1890				X		B
<b>TYPHLOPLANOIDA</b>						
<b>BYRSOPHLEBIDAE</b>						
<i>Maehrenthalia dubia</i> Ax, 1956	B					B
<b>CILIOPHARYNGIELLIDAE</b>						
<i>Ciliopharyngiella constricta</i> Martens & Schockaert, 1981			X			S
<b>SOLENOPHARYNGIDAE</b>						
<i>Anthopharynx vaginatus</i> Karling, 1940						MB
<i>Aulopharynx aestuarius</i> Ehlers, 1972		X			X	
<i>Doliopharynx geminocirrus</i> Ehlers, 1972		X	X			
<i>Proceropharynx litoralis</i> Ehlers, 1972			X			
<b>TRIGONOSTOMIDAE</b>						
<i>Astrotrorhynchus bifidus</i> (Mc Intosh, 1874)	P					
<i>Lonchoplanella axi</i> Ehlers, 1974		X	X	X		
<i>Lutheriella diplostyla</i> den Hartog, 1966						B
<i>Messoplana elegans</i> (Luther, 1948)						M
<i>Messoplana geminata</i> den Hartog, 1966						M
<i>Petaliella spiracauda</i> Ehlers, 1974		X	X			
<i>Proxenetes ampullatus</i> Ax, 1971				X		
<i>Proxenetes bilioi</i> den Hartog, 1966						MB
<i>Proxenetes britannicus</i> den Hartog, 1966						B

	Fr.	B1.	B2.	BB.	BS.	ND.
<i>Proxenetes cisorius</i> den Hartog, 1966	B			X		B
<i>Proxenetes deltoides</i> den Hartog, 1965	B					MB
<i>Proxenetes fasciger</i> Ehlers, 1974	M	X	X	X		
<i>Proxenetes flabellifer</i> Jensen, 1878						B
<i>Proxenetes intermedius</i> den Hartog, 1966						M
<i>Proxenetes karlingi</i> Luther, 1943						MB
<i>Proxenetes minimus</i> den Hartog, 1966						B
<i>Proxenetes monotubulus</i> den Hartog, 1966						B
<i>Proxenetes pratensis</i> Ax, 1960				X		B
<i>Proxenetes puccinellicola</i> Ax, 1960				X		B
<i>Proxenetes quadrispinosus</i> den Hartog, 1966						MB
<i>Proxenetes segmentatus</i> den Hartog, 1966						M
<i>Proxenetes simplex</i> Luther, 1948				X		MB
<i>Proxenetes tenuispinosus</i> Ehlers, 1974			X			
<i>Proxenetes trigonus</i> Ax, 1960						M
<i>Proxenetes unidentatus</i> den Hartog, 1965						B
<i>Ptychoptera hartogi</i> Ax, 1971						MB
<i>Ptychoptera spinifera</i> den Hartog, 1966						B
<i>Ptychoptera westbladi</i> (Luther, 1943)				X		MB
<b>PROMESOSTOMIDAE</b>						
<i>Adenorhynchus balticus</i> Meixner, 1938	M		X	X		
<i>Brinkmaniella macrostomoides</i> Luther, 1948				X		B
<i>Coronhelmis multispinosus</i> Luther, 1948			X	X		B
<i>Litucivis serpens</i> Ax & Heller, 1970			X			
<i>Listea simplex</i> Ax & Heller, 1970			X			
<i>Promesostoma caligulatum</i> Ax, 1952				X		MB
<i>Promesostoma gracilis</i> Ax, 1951						M
<i>Promesostoma karlingi</i> Ehlers, 1974	P					
<i>Promesostoma marmoratum</i> (M. Schultze, 1851)	PB			X		MB
<i>Promesostoma meixneri</i> Ax, 1951						MB
<i>Promesostoma rostratum</i> Ax, 1951						MB
<i>Promesostoma serpentistylum</i> Ax, 1952	M		X			
<i>Subulagera rubra</i> Martens & Schockaert, 1981		X	X		X	
<i>Westbladiella obliquepharynx</i> Luther, 1943						MB
<i>Promesostomidarum n. sp. 1</i>			X			
<i>Promesostomidarum n. sp. 2</i>		X	X			
<i>Promesostomidarum n. sp. 3</i>		X	X			
<i>Promesostomidarum n. sp. 4</i>			X			
<b>TYPHLOPLANIDAE</b>						
<i>Castrada subsalsa</i> Luther, 1946						B
<i>Dochmiotrema limicola</i> von Hofsten, 1907						B
<i>Haloplanella longatuba</i> Ax & Heller, 1970			X			
<i>Haloplanella minuta</i> Luther, 1946						M
<i>Haloplanella obtusituba</i> Luther, 1946	B					MB
<i>Thalassoplanella collaris</i> Luther, 1946						M
<b>KALYPTORHYNCHIA</b>						
<b>EUKALYPTORHYNCHIA</b>						
<b>GNATHORHYNCHIDAE</b>						
<i>Carcharodognathus stilofer</i> (Schilke, 1970)			X			
<i>Gnathorhynchus conocaudatus</i> Meixner, 1929		X	X			S
<i>Prognatorhynchus canaliculatus</i> Karling, 1947				X		MB
<i>Psittacorhynchus verweyi</i> den Hartog, 1968				X		M
<i>Uncinorhynchus flavidus</i> Karling, 1947		X				B
<b>PLACORHYNCHIDAE</b>						
<i>Placorhynchus octaculeatus octaculeatus</i> Karling, 1931	B			X		MB
<i>Placorhynchus octaculeatus dimorphis</i> Karling, 1947				X		B
<b>CICERINIDAE</b>						
<i>Cicerina brevicirrus</i> Meixner, 1928	MB		X	X		MB
<i>Cicerina remanei</i> Meixner, 1928	M	X	X	X		MS
<i>Cicerina tetradactyla</i> Giard, 1904	M	X	X	X		MBS
<i>Paracicerina deltoides</i> Martens & Schockaert, 1981	M	X	X			S
<i>Paracicerina maristoi</i> Karling, 1952						MS
<i>Ptyalorhynchus caecus</i> Meixner in Ax, 1951	M	X	X	X		
<i>Toia ycia</i> Marcus, 1952						S
<i>Zonorhynchus salinus</i> Karling, 1952						M
<i>Zonorhynchus semiascatus</i> Karling, 1956						MB



	Fr.	B1	B2	BB.	BS.	ND.
<b>DALYELLIIDA</b>						
<b>PROVORTICIDAE</b>						
<i>Baicalellia brevituba</i> (Luther, 1921)	B					B
<i>Baicalellia subsalina</i> Ax, 1954						B
<i>Hangethelia calceifera</i> Karling, 1940		X	X	X		
<i>Pogaina kinnei</i> Ax, 1970		X	X	X		
<i>Pogaina natans</i> (Ax, 1951)		X	X			
<i>Pogaina suecica</i> (Luther, 1948)						MB
<i>Provortex affinis</i> (Jensen, 1878)				X		M
<i>Provortex balticus</i> (M. Schultze, 1851)	B	X	X	X		MB
<i>Provortex karlingi</i> Ax, 1951	B			X		MB
<i>Provortex pallidus</i> Luther, 1948						B
<i>Provortex psammophilus</i> Ax, 1951				X		M
<i>Provortex cf. psammophilus</i>		X	X	X		
<i>Provortex tubiferus</i> Luther, 1948	B		X	X		MB
<i>Vejdovskya halileimonia</i> Ax, 1960	B			X		B
<i>Vejdovskya ignava</i> Ax, 1951						B
<i>Vejdovskya pellucida</i> (M. Schultze, 1851)				X		
<b>GRAFFILLIDAE</b>						
<i>Bresslauilla relictata</i> Reisinger, 1929		X	X	X		
<i>Pseudograffilla arenicola</i> Meixner, 1938						MB
<b>DALYELLIIDAE</b>						
<i>Halammovortex macropharynx</i> (Meixner, 1938)						MB
<i>Jensenia angulata</i> (Jensen, 1878)	P					B
<i>Dalyellioidarum spec 1</i>			X	X		
<i>Dalyellioidarum spec 2</i>			X			
<i>Dalyellioidarum spec 3</i>			X			
<i>Dalyellioidarum spec 4</i>		X	X			
<i>Dalyellioidarum spec 5</i>		X	X			
<i>Dalyellioidarum spec 6</i>		X	X			
<i>Dalyellioidarum spec 7</i>		X	X			

## Abbreviations used :

- Fr. : French North Sea coast (Ambleteuse and Wimereux).  
M : eulitoral marine sand, B : brackish water habitats, P : periphyton.  
B1. : Belgian west coast (French border-Costende).  
eulitoral marine habitat (sandy beach).  
B2. : Belgian east coast (Bredene-Dutch border).  
eulitoral marine habitat (sandy beach).  
BB. : Belgian brackish water habitats.  
(Zwin and Dievengat, eulitoral sand).  
BS. : Belgian North Sea : sublitoral.  
ND. : Netherlands Delta area.  
M : eulitoral marine, B : brackish water habitats, S : sublitoral.

