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MOLLUSCAN FAUNA OF THE HOUTHALEN SANDS OF THE DEEPBORING HELCHTEREN (NE BELGIUM)

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Introduction

The first study on the molluscs of the Houthalen Sands was made by M. GLIBERT. Extensively he examinated the molluscan fauna and presented his findings in two publications (M. GLIBERT 1945 and 1952). His samples were taken in a mine-shaft in the locality of Houthalen [1]. The result of his investigation forms an excellent description of 29 Bivalvia and 30 Gastropoda.

Thanks to M. GULINCK, of the Geological Survey of Belgium, I could dispose of a complete run of 14 samples (from 95 m to 110 m) from a recent deepboring at Helchteren. A very rich molluscan fauna was present, which is the reason of this contribution. I was able to identify 68 Bivalvia and 94 Gastropoda.

About 5000 specimens of Bivalvia were counted and arranged in four classes of frequency:

rr = very rare ; 1-4 specimens
r = rare ; 5-49 specimens
c = common ; 50-249 specimens
a = abundant; more than 249 specimens.

About 3000 specimens of Gastropoda were counted and arranged in four classes of frequency:

rr = very rare ; 1-4 specimens
r = rare ; 5-29 specimens
c = common ; 29-149 specimens
a = abundant; more than 149 specimens.

[1] Coupe du puits nº 1 du charbonnage de Houthaelen, Horizon de Houthaelen, depth 80,25 m to 80,55 m.

I have arranged the quantitative data in the literature in four classes of frequency. For this purpose I screemed the following works:

Middle Miocene Netherlands
— C. IJSPEERT 1942
— J.H. VAN VOORTHUYSEN 1944
— C. BEETS 1950
— G. SPAINK
Hemmoor
— F. KAUTSKY 1925
— H.J. ANDERSON 1959
— E. DITTMER 1959
Reinbek-Dingden
— H.J. ANDERSON 1964
Middle Miocene Denmark
— T. SORGENFREI 1958
Middle Miocene Belgium
— M. GLIBERT 1945, 1952, 1958
— data of the author

For the systematics I refer to the publications of M. GLIBERT (1960-1963), and M. GLIBERT and L. VAN DE POEL (1965-1970).

A. Comparison of the entire faunas

Number of species common to

Houthalen and Edegem	= 100 (61,5%)
Houthalen and Antwerp.	= 81 (50%)
Houthalen and M.M. Neth.	= 125 (77%)
Houthalen and Hemmoor	= 116 (71,5%)
Houthalen and Reinb. Dingd.	= 123 (76%)
Houthalen and M.M. Denm.	= 101 (62,5%)

This comparison undoubtedly shows a very great resemblance between the whole of the molluscan faunas of the Middle Miocene deposits of the North Sea Basin (for the localities see map). Nevertheless it must be

noted that the fauna of the Houthalen Sands corresponds better with that of the Netherlands and of Northwestern Germany than with that of Belgium. This comparison, besides, clearly demonstrates a very great conformity between the Houthalen molluscs and the molluscan assemblages of the Netherlands and of Reinbek-Dingden.

In my opinion, however, such global thanathocoenoses are not very useful for wide-range correlations. Bearing this in mind, I mention 64 species occuring very rarely and 48 species rarely; together they represent 69% of the total number of species.

For that reason my conclusions are based principally on the 50 species occuring abundantly and commonly.

B. Comparison of the abundant species

Molluscs abundant in the Houthalen Sands (18)

Bivalvia	Gastropoda
Portlandia pygmaea	*Alvania pseudopartschi*
Hiatella arctica	*Tornus trigonostoma*
Corbula gibba gibba	*Turritella eryna*
Lutetia nitida	*Bittium tenuispina*
Astarte radiata	*Exilia contigua*
	Typhis fistulosus
	Hinia facki
	Hinia tenuistriata
	Ancilla obsoleta
	Strioterebrum hoernesi
	Ringicula ventricosa
	Cylichna cylindracea
	Retusa elongata

Among these species, some have a similar frequency in:

Hemmoor	:	12 species
M.M. Neth.	:	6 "
Antwerp.	:	6 "
Reinb. Dingd.	:	3 "
M.M. Denm.	:	2 "
Edegem	:	1 "

This table shows that 2/3 of the abundant species of the Houthalen Sands also occur abundant in Hemmoor.

C. Comparison of the common species

Molluscs common in the Houthalen Sands (32)

Bivalvia

Anadara diluvii
Limea strigilata
Heteranomia squamula
Modiolula phaseolina
Venus multilamella
Gouldia minima
Codakia jutensis
Lucinoma borealis
Cavilucina droueti
Ervilla pusilla *Astarte waeli*
Laevicardium sub.sub. Cyclocardia orbic. tuber

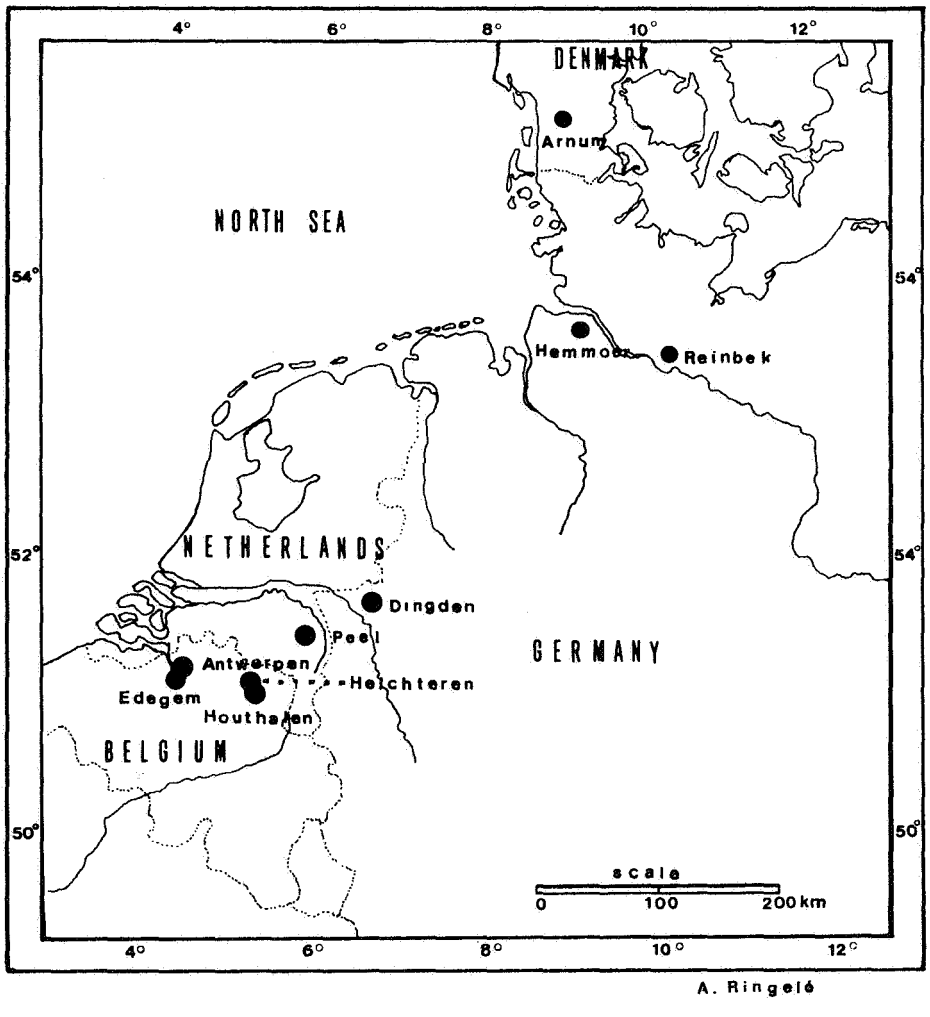
Gastropoda

Turritella subangul. spirata
Leiostraca taurinensis
Niso acarinataconica
Aporrhais alata
Euspira helicina
Hinia bocholtensis
Gemmula stoffelsi
Gemmula boreoturricula
Brachytoma obtusangula
Splendrillia selenkae
Neoguraleus kochi
Conus dujardini
Odostomia conoidea
Syrnola hoernesi
Eulimella neumayri
Turbonilla lactea
Pyramidella plicosa
Roxania utriculus subutric.
Rhizorus acuminatus

Among these species some have a similar frequency in:

Hemmoor	:	21 species
M.M. Neth.	:	18 "
Edegem	:	13 "
Antwerp.	:	9 "
Reinb. Dingd.	:	8 "
M.M. Denm.	:	6 "

Likewise these molluscs of Hemmoor show the greatest conformity with those of Houthalen.



Some localities with fossiliferous middle Miocene deposits

D. Comparison of the abundant and common species

Molluscs abundant and common in Houthalen: 50 species. Total number of these species with similar frequency in:

Hemmoor	: 33	species
M.M. Neth.	: 24	"
Edegem	: 14	"
Antwerp.	: 14	"
Reinb. Dingd.	: 12	"
M.M. Denm.	: 8	"

Conclusions

The molluscan assemblage of the Houthalen Sands seems to be easily comparable with that of Hemmoor. More than 66 % of the abundant and common species have the same occurence in both deposits. The conformity with the molluscan fauna of the Middle Miocene of the Netherlands is also clear.

In my opinion the faunas of Hemmoor, of the Middle Miocene of the Netherlands and of Houthalen are to be considered as a faunistic entity, with some local differences, probably due to ecological variations. On the other hand the molluscs of Edegem, Antwerp, Reinbek-Dingden and the Middle Miocene of Denmark represent another faunistic entity, slightly different from the former.

It seems to me most probable that the difference between these two faunistic groups could be due to a slight difference in age.

Molluscan species of the Houthalen Sands of deepboring Helchteren Bivalvia	Houthalen	Edegem	Antwerp.	M.M. Neth.	Hemmoor	Reinb.-Dingd.	M.M. Denm.
1. *Nuculoma haesendoncki hanseata* (KAUTSKY, 1925)	r			c	r	r	c
2. *Nuculoma laevigata* (SOWERBY, 1818)	rr	r	r	c	a	rr	
3. *Nucula nucleus nucleus* (LINNE, 1758)	rr	c	r	r	c	c	c
4. *Nucula jeffreysi* BELLARDI, 1875	r			c		c	c
5. *Nuculana westendorpi* (NYST, 1839)	r	c	r	c	a	c	a
6. *Lembulus emarginatus* (LAMARCK, 1819)	rr			a	rr		r
7. *Portlandia pygmaea* (MUNSTER, 1837)	a	c	c	c	a	a	a
8. *Yoldia glaberrima* (MUNSTER, 1837)	r	c	r	c	c	r	a
9. *Anadara diluvii* (LAMARCK, 1805)	c	c	c	a	c	c	r
10. *Limopsis aurita* (BROCCHI, 1814)	rr	c	c	a	a		rr
11. *Limopsis lamellata* LEHMANN, 1885	r			c	r	r	
12. *Limopsis retifera* SEMPER, 1861	r	c	r	c	rr	c	rr
13. *Glycymeris lunulata baldii* GLIBERT & VAN DE POEL, 1965	rr	c	a	a	rr	c	
14. *Pteria phalaenacea* (LAMARCK, 1819)	rr		r	r	rr	r	
15. *Pinna pectinata* LINNE, 1758	rr	r	r	r	rr	r	
16. *Amusium woodi* (NYST, 1861)	rr	c	r	c	r	c	
17. *Patinopecten brummeli* (NYST, 1864)	rr	r	r	r	r	rr	rr
18. *Lyropecten radians* (NYST, 1839)	rr	c	c	r	r		rr
19. *Pseudamussium lilli* (PUSCH, 1837)	rr	c	r	c	r		
20. *Pseudamussium tigerinum* (MÜLLER, 1776)	rr	a	c	r	r	a	rr
21. *Limea strigilata* (BROCCHI, 1814)	c			rr		rr	rr
22. *Limatula subauriculata* (MONTAGU, 1808)	rr	r	r	rr	rr	r	
23. *Heteranomia squamula* (LINNE, 1758)	c	c	c	c		r	r
24. *Modiolula phaseolina* (PHILIPPI, 1844)	c	r	r	rr	rr	r	
25. *Pandora copiosa* SORGENFREI, 1958	rr					rr	rr
26. *Hiatella arctica* (LINNE, 1758)	a	rr	a	a	c	rr	c

Molluscan species of the Houthalen Sands of deepboring Helchteren Bivalvia	Houthalen	Edegem	Antwerp.	M. M. Neth.	Hemmoor	Reinb.-Dingd.	M.M. Denm.
27. *Saxicavella pusilla* SORGENFREI, 1958	rr			rr		rr	rr
28. *Corbula gibba gibba* OLIVI, 1792	a	c	a	a	a	a	a
29. *Glossus lunulatus* (NYST, 1835)	r			r	r	r	
30. *Lutetia nitida* (REUSS, 1867)	a			c	a	rr	a
31. *Venus multilamella* LAMARCK, 1818	c	c	a	c	c	c	rr
32. *Gouldia minima* (MONTAGU, 1803)	c	r	r	r	c	rr	r
33. *Callista chione* (LINNE, 1758)	rr	r	r	r	rr	r	rr
34. *Sinodia westendorpi nysti* (ORBIGNY, 1852)	rr	c	c	c	rr	rr	rr?
35. *Diplodonta rotundata* (MONTAGU, 1803)	r	r	a	rr	rr		
36. *Thyasira flexuosa* (MONTAGU, 1803)	rr	r	r	r	r	rr	c
37. *Lucina nörregaardi* SORGENFREI, 1958	rr			rr			rr
38. *Godakia jutensis* SORGENFREI, 1958	c					rr	rr
39. *Loripes cf. niveus* (EICHWALD, 1830)	r			r			rr
40. *Lucinoma borealis* (LINNE, 1767)	c	a	a	c	r	rr	
41. *Gibbolucina transversa* (BRONN, 1831)	r	a		r			
42. *Cavilucina droueti* (NYST, 1861)	c	a	r	r	c	r	rr
43. *Spaniorinus cimbricus* (KAUTSKY, 1925)	rr	r	c	rı	r		rr
44. *Erycina striatissima* (CERULLI-IRELLI, 1908)	rr					rr	rr
45. *Erycina degrangei* COSSMANN et PEYROT, 1911	rr			c	r	rr	r
46. *Lepton nitidum* TURTON, 1822	rr			rr			rr
47. *Lepton transversarium* COSSMANN, 1896	rr	r		rr	rr	rr	
48. *Montacuta antwerpiensis* GLIBERT, 1945	rr	r				rr	
49. *Congeria basteroti* (SEMPER, 1836)	rr			rr		rr	
50. *Donax stoffelsi* NYST, 1845	rr				rr	rr	
51. *Abra bosqueti* (SEMPER, 1861)	rr			c?			
52. *Abra lehmanni* ANDERSON, 1964	rr			rr?		r	
53. *Abra antwerpiensis* GLIBERT, 1945	r	c	a	rr?	c?	c	
54. *Angulus compressus* (BROCCHI, 1814)	r					r?	
55. *Macoma elliptica* (BROCCHI, 1814)	rr	a	c	r		rr	
56. *Ervilla pusilla* (PHILIPPI, 1836)	c	r		rr	a		r
57. *Spisula trinacria* (SEMPER, 1861)	c	c	c	c	a	c	a
58. *Laevicardium subturgidum subturgidum* (ORBIGNY, 1852)	c	c	a	c?	c?	c?	r?
59. *Cerastodermi straeleni* (GLIBERT, 1945)	rr	r	r	a	a	a	r
60. *Astarte goldfussi goldfussi* HINSCH, 1952	r	a	r	c	c	r	
61. *Astarte radiata* NYST et WESTENDORP, 1839	a	c	a	c	a	r	
62. *Astarte waeli* GLIBERT, 1945	c			c	rr?		
63. *Astarte beyschlagi* KAUTSKY, 1925	r	r		r	c		
64. *Goodallia triangularis* (MONTAGU, 1803)	r		c	r	rr		rr
65. *Carditopsis chavani* GLIBERT, 1945	r	c	r	rr		rr	
66. *Cyclodardia orbicularis tuberculata* (MUNSTER, 1837)	c			c	c	c	rr
67. *Cuspidaria rostrata* (SPENGLER, 1793)	rr		r	r	c	rr	rr
68. *Cuspidaria costellata* (DESHAYES, 1832)	rr	r	r	rr	rr	rr	rr
GASTROPODA							
69. *Circulus hennei* GLIBERT, 1952	rr	r	r	rr	rr	r	
70. *Solariella miosuturalis* (KAUTSKY, 1925)	rr			rr	rr		
71. *Hydrobia antwerpiensis* GLIBERT, 1952	r	r			rr		

Molluscan species of the Houthalen Sands of deepbording Helchteren Bivalvia	Houthalen	Edegem	Antwerp.	M.M. Neth.	Hemmoor	Reimb.-Dingd.	M.M. Denm.
72. *Putilla gottscheana* (KOENEN, 1882)	rr			r		rr	
73. *Cingula proxima laevigata* (KOENEN, 1882)	r	r		rr	r	r	
74. *Alvania pseudopartschi* ANDERSON, 1960	a					r	rr ?
75. *Tornus trigonostoma* (BASTEROT, 1825)	a	r	r	a	a		
76. *Turritella eryna* ORBIGNY, 1852	a	r	r	a	a		
77. *Turritella subangulata spirata* (BROCCHI, 1814)	c	a	r	a	c		r?
78. *Architectonia berthae* (BOETRGER, 1915)	rr					r	
79. *Bittium spina* (HOERNES, 1855)	ı			r?	r	r	r
80. *Bittium tenuispina* SORGENFREI, 1958	a			r	a	rr	a
81. *Acirsa lanceolata* (BROCCHI, 1814)	r	r		c	r	rr	
82. *Amaea amoena subreticulata* (ORBIGNY, 1852)	r	c	r	c	c	r	r
83. *Scala frondicula* (WOOD, 1848)	rr	r	r	c	r	r	rr
84. *Scala weyersi* (NYST, 1871)	r	r		rr	r		
85. *Leiostraca taurinensis* (SACCO, 1892)	c	r	r	c	r	r	r
86. *Melanella eichwaldi* (HOERNES, 1856)	rr	r		rr		r	
87. *Niso acarinataconica* SACCO, 1892	c			c	c	r	r
88. *Calyptraea chinensis* (LINNE, 1766)	r	r	r	r	c	r	rr
89. *Xenophora deshayesi* (MICHELOTTI, 1847)	rr	r	r	c	c	r	r
90. *Aporrhais alata* (EICHWALD, 1830)	c	c	r	a	a	a	a
91. *Polinices submamillaris* (ORBIGNY, 1852)	rr	c	c	c	c	rr	rr
92. *Neverita josephina subglaucinoides* (ORBIGNY, 1852)	r	r	r	c	c	r	r
93. *Euspira helicina* (BROCCHI, 1814)	c		a	c	r	a	
94. *Euspira johannae* (MAYER, 1895)	rr	r	rr		a	r	
95. *Natica tigrina hörnesi* (FISCHER et TOURNOUËR, 1873)	r	c	c			c	
96. *Semicassis miolaevigata* (SACCO, 1890)	rr	r	r	r	r	r	
97. *Ficus conditus* (BRONGNIART, 1823)	rr	c	r	c	c	r	r
98. *Exilia contigua* (BEYRICH, 1856)	a			c	c	r	
99. *Typhis fistulosus* (BROCCHI, 1814)	a	r	r	c	c	c	c
100. *Typhis horridus* (BROCCHI, 1814)	rr	r	r	c		r	
101. *Mitrella nassoides* (GRATELOUP, 1827)	rr		r	a	c	r	rr
102. *Hinia bocholtensis* (BEYRICH, 1854)	c	r		c		c	rr
103. *Hinia facki* (HOERNES, 1872)	a	r	r	a	a	c	c
104. *Hinia turbinella* (BROCCHI, 1814)	r			r	a	rr	rr
105. *Hinia tenuistriata* (BEYRICH, 1854)	a	r		c	a	r	c
106. *Hinia schlotheimi* (BEYRICH, 1854)	r			r	a		c
107. *Hinia laevissima* (BRUSINA, 1877)	rr			rr			rr
108. *Streptochetus sexcostatus* (BEYRICH, 1856)	r	c	c	c	a	c	r
109. *Ancilla obsoleta* (BROCCHI, 1814)	a	a	c	a	c	r	r
110. *Trigonostoma acutangulum* (FAUJAS, 1817)	r						
111. *Narona varicosa var. paucicostata* (PEYROT, 1928)	rr	r	c	c	r	r	r
112. *Gemmula denticula borealis* GLIBERT, 1954	r	c			c	r	
113. *Gemmula zimmermanni* (PHILIPPI, 1846)	r	c		r	c	a	rr
114. *Gemmula stoffelsi* (NYST, 1843)	c	c	r		c	r	
115. *Gemmula boreoturricula* (KAUTSKY, 1925)	c	c		rr	c		c
116. *Turris aequensis* (GRATELOUP, 1832)	r	r		c		r	
117. *Turris woltrupensis* ANDERSON, 1964	rr					rr	
118. *Epalxis hinschi* ANDERSON, 1964	rr					r	

Molluscan species of the Houthalen Sands of deepbording Helchteren Bivalvia	Houthalen	Edegem	Antwerp.	M.M. Neth.	Hemmoor	Rein.-Dingd.	M.M. Denm.
119. *Epalxis cataphracta jugleri* (PHILIPPI, 1846)	r					c	rr ?
120. *Epalxis mioturbida* (KAUTSKY, 1925)	r	c	r	r			r
121. *Genota escheri* (MAYER, 1861)	r	r		rr	r	r	rr
122. *Crassispira borealis* (KAUTSKY, 1925)	rr	c			c		
123. *Crassispira cimbrica* (KAUTSKY, 1925)	rr					r	
124. *Brachytoma obtusangula* (BROCCHI, 1814)	c	r		c	r	r	c
125. *Microdrillia grippi* (ANDERSON, 1964)	r					rr	
126. *Splendrillia selenkae* (KOENEN, 1872)	c	r		c	c	c	rr
127. *Neogguraleus kochi* (KOENEN, 1872)	c						
128. *Pleurotomoides luisae* (SEMPER, 1872)	r			c	r	r	rr
129. *Conus dujardini* DESHAYES, 1845	c	c	r	c	c	r	r
130. *Philbertia praehispida* (ZILCH, 1934)	rr					rr	
131. *Philbertia scabra* (PHILIPPI, 1864)	r				rr		r
132. *Philbertia sinuosula* SORGENFREI, 1958	r					r	r
133. *Metucnella grippi* (KAUTSKY, 1925)	rr				r	r	rr
134. *Strioterebrum basteroti* (NYST, 1843)	r				a	r	
135. *Strioterebrum hoernesi* (BEYRICH, 1854)	a	r		c	a	r	c
136. *Terebra neglecta* MICHELOTTI, 1847	rr			rr	c	r	
137. *Chrysallida pygmaea* (GRATELOUP, 1838)	r		r	rr	r	rr	rr
138. *Chrysallida cimbrica* (KAUTSKY, 1925)	rr			rr	r		r
139. *Chrysallida semireticulata* SORGENFREI, 1958	rr						rr
140. *Odostomia conoidea* (BROCCHI, 1814)	c	r	rr		c	r	c
141. *Syrnola hoernesi* (KOENEN, 1882)	c	r			c		
142. *Syrnola subumbilicata* (GRATELOUP, 1838)	r			c			r
143. *Eulimella acicula* (PHILIPPI, 1836)	rr	r	r	rr	c	r	rr
144. *Eulimella neumayri* (KOENEN, 1882)	c	r	r	rr	r	r	
145. *Eulimella crassitesta* SORGENFREI, 1958	rr						rr
146. *Eulimella concinna* SORGENFREI, 1958	r						r
147. *Turbonilla lactea* (LINNE, 1758)	c	r	r		c	r	r
148. *Turbonilla pseudoterebralis* SACCO, 1892	r	r		r	rr	r	r
149. *Turbonilla undulata* (KOENEN, 1882)	r		r	r		r	
150. *Pyramidella plicosa* BRONN, 1838	c	r		r	a	r	c
151. *Actaeon semistriatus* (FERUSSAC, 1822)	r	r	r	c	a	rr	c
152. *Acteaon laevigatus* (GRATELOUP, 1827)	rr						r
153. *Actaeon sorgenfrei* GLIBERT, 1962	r	r	r	rr		r	r
154. *Crenilabium terebelloides* (PHILIPPI, 1843)	r	r	r	rr		r	
155. *Ringicula ventricosa* (SOWERBY, 1824)	a	c	c		a		rr
156. *Acteocina lajonkaireana* (BASTEROT, 1825)	rr			rr			r
157. *Cylichna cylindracea* (PENNANT, 1777)	a	c	c		a	a	r
158. *Roxania utriculus subutriculus* (ORBIGNY, 1852)	c	r	r	c	c	r	c
159. *Scaphander grateloupi* (MICHELOTTI, 1847)	rr	r	r	r	r	r	r
160. *Retusa elongata* (EICHWALD, 1830)	a	c	c		c	r	c
161. *Retusa cf. umbilicata* (MONTAGU, 1803)	rr						c
162. *Rhizorus acuminatus* (BRUGUIERE, 1789)	c	c	r	r	c	r	c

Legend : rr = very rare r = rare c = common a = abundant

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