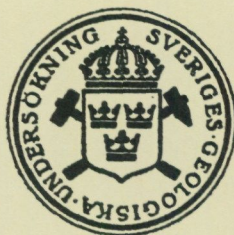


CHRISTER PERSSON

INDICATIONS OF A LITORINA
TRANSGRESSION
IN THE NYKÖPING AREA



STOCKHOLM 1973

SVERIGES GEOLOGISKA UNDERSÖKNING

SER C NR 680

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ABSTRACT

While carrying out a geological survey in the Nyköping area, gyttja clay from the Litorina period, covered by about 5 m of sand, was found at one locality (Listorp). In an investigated bog (Malins mosse) NW of Nyköping, the diatom flora of the clayey gyttja suggests a transgression between 4 500 B.C. and 4 300 B.C.

LISTORP

In a boring 100 m ESE of Listorp, 10.5 km WNW of Nyköping, gyttja clay covered by 4.8 m of sand and fine sand was found. The area is a rather flat plain, about 600 m wide and situated between 39 m and 42 m above sea-level. The plain lies close to and NNE of a large glaciofluvial deposit named Stigtomtamalmen, which rises to plus 58 m at its highest point. In the area near Listorp the plain ends with a steep slope down to the valley (Fig. 1). The plain is built up of beach deposits, fine sand, sand and sandy gravel. At Listorp the sequence of strata was:

0– 200 cm	Fine sand
200– 483 cm	Sand with a fine layer of silty clay
483– 491 cm	Gyttja clay, greenish grey, organic content about 2.6 per cent
491– 492 cm	Sand
492– 525 cm	Gyttja clay, greenish grey with remnants of plants
525– 540 cm	Fine sand
540– 750 cm	Varved clay with layers of silt
750–1150 cm	Silt
1150–1350 cm	Fine sand
1350–1800 cm +	Silt

The surface at the boring point was levelled at plus 39.3 m. The gyttja clay is thus situated between plus 34.1 m and plus 34.5 m. From the gyttja clay samples were taken and subjected to pollen and diatom analyses. The results show that the gyttja clay was deposited in brackish water during the Litorina period (Fig. 2). The diatoms found are listed in Table 1. The gyttja clay is a shallow water sediment and the overlying sandy material might possibly have been deposited during a transgression of the Litorina sea. From the morphology of the area it can be assumed that the sea during the maximum of the transgression reached an altitude of about plus 42 m.

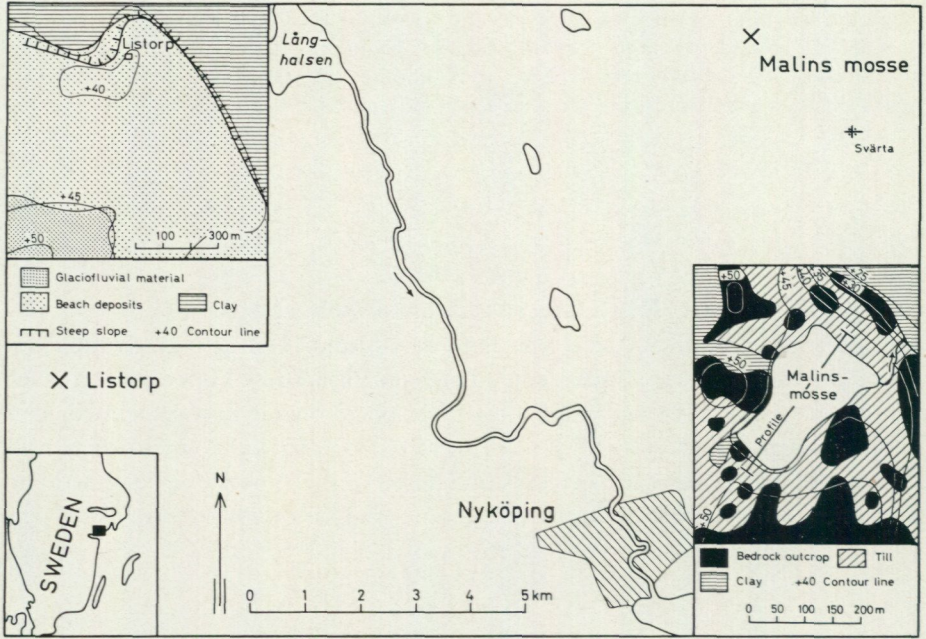


Fig. 1. Map showing the localities investigated.

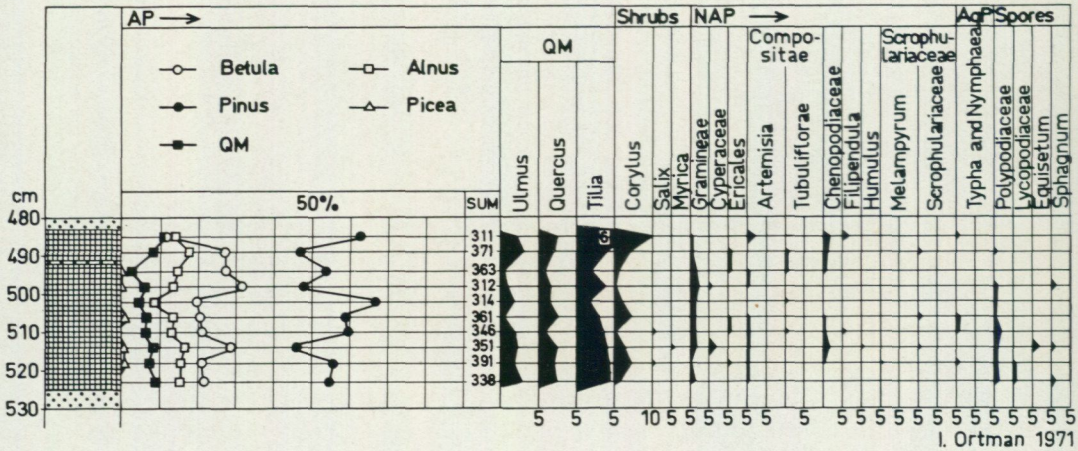
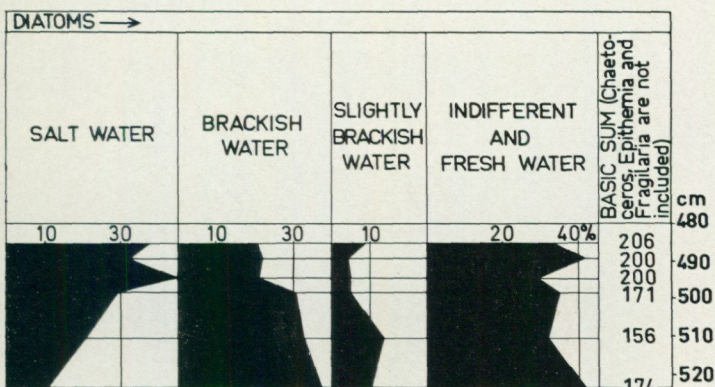


Fig. 2. Pollen and diatom diagram from Listorp. Only the analyses of the gyttja clay between 483 and 525 cm below surface are presented. For explanations of the symbols, see Fig. 5.

MALINS MOSSE

The bog is situated 10 km NNE of Nyköping and 14 km NE of Listorp. It is located in an isolated basin and surrounded by bedrock outcrops and till (Fig. 1). The threshold of the basin was levelled at plus 40.6 m. A section through the basin is showed in Fig. 4. The lowermost organic part of the sequence of strata is mainly built up of clayey gyttja. The organic content varies between 10 and 18 per cent, except in the lowermost part where the content is lower. The clayey gyttja is covered by fen peat, birch and alder fen peat and *Sphagnum* peat. Samples were taken from the strata in Bp 1 and investigated for pollen and diatoms. The samples were taken with a Hiller auger. Certain levels were dated by the radiocarbon method. The determinations given are calculated with oxalic acid as standard and a C 14 half-life $5\,568 \pm 30$ years. The ages are given with an accuracy of $\pm 1\sigma$. The results of the investigations are shown in Fig. 5. The diatoms found are listed in Table 1. The rather rapid rise of the curve of salt water diatoms between 270 and 250 cm below surface might indicate a transgression of the Litorina sea. According to the radiocarbon age determinations the transgression took place between 4 500 and 4 300 B.C. It can be assumed that during the maximum of the transgression the sea level reached at least half a meter above the threshold, i. e. an altitude of at least plus 41 m. The basin became isolated from the Litorina sea about 3 900 B.C.

Besides the radiocarbon ages given in Fig. 5 a sample from 265 to 275 cm was dated at $3\,715 \pm 200$ B.C. This age is evidently much too young. Most probably this is due to the very low content of organic material making the age determination extremely uncertain.



A-M. Robertsson 1971



Fig. 3. Malins mosse. The bog is partly covered with various shrubs and trees, mainly pine and birch. — Photo Ch. Persson 1968.

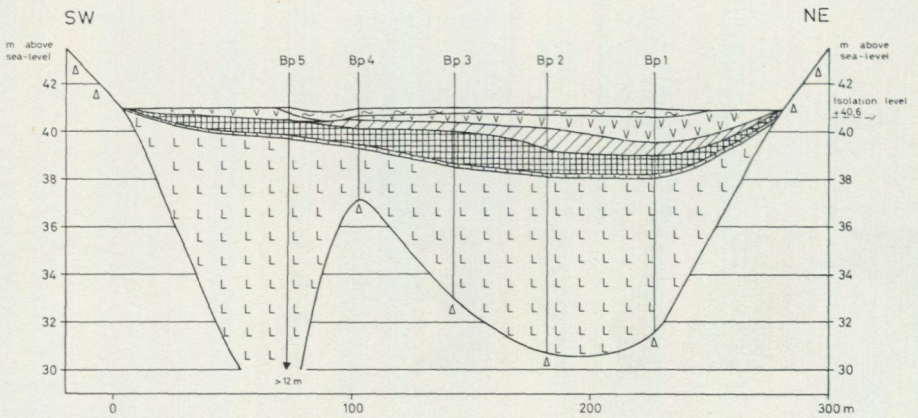


Fig. 4. Section through Malins mosse. Δ = till. For further explanations of the symbols, see Fig. 5.

The sand layer at 285 cm can most probably be regarded as a beach sediment emanating from wave washing of the adjoining till.

The clay beneath the sand layer is heavy and shows alternating grey and greyish brown varves. From the very beginning the clay strata were assumed to be of glacial origin throughout. The fossil content makes it probable, however, that the upper part of the clay strata, between 285 and 330 cm, is built up of postglacial clay deposited during the Litorina period. The regular lines of greyish brown, interpreted as annual varves, might be due to rust spots in the clay. Such rust spots are rather common in the postglacial clay within the region. To the naked eye there is, however, no difference between this and the underlying clay, which is evidently a glacial clay. The content of pollen grains and diatoms in the clay beneath 330 cm is very low and also somewhat different from that in the clay above. The number of tree pollen per preparation for the investigated deeper part of the clay strata is shown in the following table:

Depth in cm	400	420	440	460	480	520	560
Pinus	—	2	4	4	3	3	7
Betula	1	3	2	—	1	3	4
Alnus	—	—	—	—	—	1	5
Quercus	—	—	—	—	—	1	—
AP	1	5	6	4	4	8	16

Besides these tree pollen grains there occur a small number of pollen grains of *Gramineae*, *Artemisia*, *Chenopodiaceae* and *Filipendula*. Beneath the level 330 cm the fossil content of the clay must be regarded as redeposited.

The rise of the *Picea* curve at 80 cm has been dated at 800 ± 100 B.C.

Table of the radiocarbon age determinations

Locality	Depth below surface	Lab. number	Age
Malins mosse (58°50'.2 N 17°30'.5 E)	75–80 cm	St 3230	2750 ± 100 BP (800 B.C.)
	190–195 cm	St 3229	5845 ± 100 BP (3895 B.C.)
	205–215 cm	St 3423	5830 ± 140 BP (3880 B.C.)
	230–235 cm	St 3228	5980 ± 140 BP (4030 B.C.)
	250–260 cm	St 3424	6325 ± 120 BP (4375 B.C.)
	265–275 cm	St 3227	5665 ± 200 BP (3715 B.C.)

The radiocarbon age determinations were carried out at the Radioactive Dating Laboratory of Stockholm. The pollen and diatom analyses were carried out at the Micropaleontological Laboratory of SGU.

ACKNOWLEDGEMENTS

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Tab. 1. List of diatoms occurring in the localities investigated

Depth in cm	Malins mosse										
	‰										
	185- 190	190- 195	200- 205	210- 215	225- 230	235- 240	240- 245	250- 255	260- 265	270- 275	
A. SALT WATER											
Achnanthes brevipes	-	-	5.9	2.5	11.4	0.4	7.0	3.3	0.6	0.5	
Amphora acutiuscula	-	-	2.0	-	-	0.4	-	-	-	-	
macilenta	-	1.0	-	-	-	-	-	-	0.6	-	
terroris	-	-	-	-	-	-	-	-	-	-	
Cocconeis costata	-	-	-	-	-	-	-	-	-	-	
peltoides	-	-	-	-	-	-	-	-	-	-	
scutellum	-	-	1.3	1.2	6.3	14.6	8.0	15.2	7.3	0.5	
Coscinodiscus spp.	-	-	-	-	+	-	-	-	0.6	0.5	
Diploneis bombus	-	-	-	-	-	-	-	-	-	-	
didyma	-	-	-	-	0.6	-	-	-	-	-	
interrupta	-	-	-	-	0.6	-	-	-	-	-	
smithi	-	-	1.3	0.6	-	0.8	1.0	-	1.8	0.5	
Grammatophora marina	-	-	-	-	-	-	-	-	-	-	
oceanica v. macilenta	-	-	0.6	0.6	8.0	0.4	1.0	1.6	1.8	-	
Hyalodiscus scoticus	-	-	-	0.6	-	-	-	-	-	-	
Mastogloia aquilegiae	-	-	-	0.6	-	-	-	-	-	-	
pumila	-	-	1.3	1.8	-	2.5	3.0	1.2	-	-	
pusilla	-	-	-	0.6	-	-	-	-	-	-	
Melosira moniliformis	-	-	+	0.6	-	-	-	-	-	-	
Navicula ammophila	-	-	-	0.6	0.6	7.5	5.0	8.2	2.4	-	
crucicula	-	-	-	-	-	-	-	-	-	-	
cruciculoides	-	-	0.6	0.6	-	1.2	-	-	-	-	
digitoradiata	-	-	-	0.6	0.6	-	-	-	1.8	-	
hyalina	-	-	0.6	-	-	-	-	-	-	-	
cf. lyratae	-	-	-	-	1.1	0.4	-	-	-	-	
plicata	-	-	-	-	-	0.4	-	-	-	-	
rhombica	-	-	-	-	0.6	-	-	-	-	-	
Nitzschia obtusa	-	-	1.3	-	-	-	2.0	-	-	-	
punctata	-	-	-	-	-	-	-	-	-	-	
sigma + varr.	-	-	-	1.8	-	-	-	-	-	-	

Malins mosse														Listorp								
‰							number							‰								
280- 282	290- 292	300- 305	305- 310	315- 320	330	340	350	360	370	380	400	420	440	460	480	520	483- 487	487- 491	492- 496	496- 500	508- 512	520- 525
-	1.0	10.0	12.0	7.0	3.0	-	-	-	-	-	-	-	-	-	-	-	1.4	7.5	10.0	2.3	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-
-	3.0	8.0	4.0	8.0	2.0	-	-	-	1	-	-	-	-	-	-	-	0.5	-	-	-	-	-
0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.8	5.0	9.5	7.6	2.6	4.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-
-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	0.6	-	-
-	1.0	2.0	-	1.0	2.0	+	-	-	-	-	-	-	-	-	-	-	1.0	1.0	0.5	1.1	-	0.6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-
-	-	3.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	5.8	8.5	12.0	7.0	14.1	2.3
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	4.0	-	1.0	2.0	-	-	-	-	-	-	-	-	-	-	-	1.0	2.0	3.0	1.8	0.6	0.6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	-	-
-	2.0	1.0	3.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	5.0	2.3	3.2	2.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-
-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	3.0	-	3.0	1.0	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
-	-	3.0	4.0	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.0	2.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-
-	-	-	-	-	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-

Depth in cm	Malins mosse										
	‰										
	185- 190	190- 195	200- 205	210- 215	225- 230	235- 240	240- 245	250- 255	260- 265	270- 275	
<i>Rhabdonema arcuatum</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Rhopalodia gibberula musculus</i>	-	-	0.6	1.2	-	-	-	-	-	-	-
<i>Synedra crystallina</i>	-	-	1.3	-	1.7	0.8	1.0	0.5	1.2	-	
ΣA	-	1.0	16.8	14.5	31.5	29.4	29.0	30.0	18.1	2.0	
B. BRACKISH WATER											
<i>Achnanthes delicatula hauckiana</i>	-	-	-	0.6	-	-	-	-	-	-	-
<i>Achnanthes hauckiana</i>	0.6	12.0	2.0	4.9	2.3	5.4	1.0	-	1.2	2.5	
<i>Amphora coffaeiformis</i>	-	1.0	-	-	1.1	0.4	1.0	-	-	-	
<i>Amphora commutata</i>	-	1.0	0.6	-	1.7	-	-	-	-	1.5	
<i>Amphora holsatica</i>	-	-	-	-	-	0.4	-	-	1.2	1.5	
<i>Amphora proteus</i>	-	-	-	-	-	-	-	-	-	-	
<i>Amphora cf. staurophora</i>	-	-	-	-	-	-	-	-	-	-	
<i>Bacillaria paradoxa</i>	-	1.0	-	0.6	1.1	0.4	1.0	-	-	3.0	
<i>Campylodiscus echeneis</i>	-	-	-	-	-	-	-	-	-	-	
<i>Cocconeis diminuta</i>	-	-	-	-	-	-	-	-	-	-	
<i>Coscinodiscus lacustris v. septentrionalis</i>	-	-	-	-	-	0.4	-	-	-	-	
<i>Cyclotella caspia</i>	-	-	-	-	-	-	-	-	-	0.5	
<i>Fragilaria schulzi</i>	-	-	-	0.6	-	0.8	-	1.6	1.2	-	
<i>Gomphonema cf. exiguum</i>	-	-	-	-	-	3.3	2.0	4.4	2.4	16.7	
<i>Mastogloia baltica</i>	-	-	1.3	-	-	-	-	-	-	-	
<i>Mastogloia brauni</i>	-	-	-	0.6	2.8	-	-	2.2	0.6	-	
<i>Mastogloia elliptica</i>	-	-	0.6	0.6	1.7	1.7	1.0	0.6	1.2	0.5	

Malins mosse													Listorp										
‰							number						‰										
280-282	290-292	300-305	305-310	315-320	330	340	350	360	370	380	400	420	440	460	480	520	483-487	487-491	492-496	496-500	508-512	520-525	
-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	1.0	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	0.6	0.6	-	-
-	-	-	2.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	
-	-	3.0	2.0	3.0	2.0	-	-	-	-	-	-	-	-	-	-	-	0.5	4.5	3.0	4.1	-	1.1	
0.5	8.0	41.0	29.0	30.0	25.0	-	-	-	-	-	-	-	-	-	-	-	37.9	33.0	45.0	29.2	21.5	11.5	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-	
1.7	3.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4	4.0	1.0	5.3	3.2	9.2	
-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.6	2.0	2.0	1.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.5	1.0	5.8	3.2	6.9	
1.1	1.0	-	-	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	
-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	1.0	0.6	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.4	3.5	1.5	4.1	6.4	4.0	
4.4	5.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.0	1.0	2.9	2.6	8.1	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6.7	3.0	3.0	-	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	1.0	1.5	-	0.6	-	-	
1.1	7.0	5.0	3.0	8.0	3.0	-	-	-	-	-	-	-	-	-	-	-	1.0	3.0	9.0	1.1	-	1.7	

Depth in cm	Malins mosse											
	‰											
	185- 190	190- 195	200- 205	210- 215	225- 230	235- 240	240- 245	250- 255	260- 265	270- 275		
Melosira												
<i>caspia</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>jürgensi</i>	-	-	-	-	-	-	-	-	-	-	-	-
Navicula												
<i>avenaceae</i>	-	-	-	-	-	0.4	-	-	-	-	-	-
<i>dulcis</i>	-	-	1.3	-	-	-	4.0	-	1.2	1.0	-	-
<i>halofila</i>	-	-	-	0.6	-	-	-	-	-	-	-	-
<i>peregrina</i>	-	-	1.3	-	2.8	-	-	-	1.2	4.0	-	-
<i>rhyncocephala</i> v. <i>amphiceros</i>	-	-	0.6	-	1.2	-	-	-	-	-	-	-
<i>salinarum</i>	-	-	-	2.5	-	-	-	-	-	-	-	-
Nitzschia												
<i>amphibia</i> v. <i>subsalina</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>apiculata</i>	-	-	-	-	-	-	-	-	-	-	-	-
Surirella												
<i>ovalis</i>	-	-	-	-	-	-	-	0.5	-	-	-	-
Synedra												
<i>pulchella</i>	1.1	-	0.6	-	0.6	0.4	1.0	0.5	0.6	2.5	-	-
<i>tabulata</i>	1.1	-	3.9	-	1.7	5.8	10.0	3.3	3.6	1.0	-	-
Thalassiosira												
<i>baltica</i>	-	-	-	-	-	-	-	-	0.6	-	-	-
<i>levanderi</i>	-	-	-	-	-	-	-	-	-	-	-	-
Σ B	2.8	15.0	12.2	11.0	17.0	19.4	21.0	13.1	15.0	34.7		
C. BRACKISH LAGOON												
Amphora												
<i>mexicana</i>	-	-	-	0.6	-	-	-	-	-	-	-	-
Anomoeoneis												
<i>sphaerophora</i>	-	1.0	-	-	1.1	-	-	-	-	-	-	-
<i>sphaerophora</i> v. <i>polygramma</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>sphaerophora</i> v. <i>sculpta</i>	-	-	-	-	0.6	-	-	-	-	-	-	-
Campylodiscus												
<i>clypeus</i>	-	2.0	0.6	3.7	0.6	-	-	-	-	-	-	-
Nitzschia												
<i>scalaris</i>	-	-	-	1.8	-	-	-	-	-	-	-	-
<i>tryblionella</i>	-	-	-	0.6	-	-	-	-	-	-	-	-
Surirella												
<i>striatula</i>	-	-	-	0.6	-	-	-	-	0.6	-	-	-
Σ C	-	3.0	0.6	7.3	2.3	-	-	-	0.6	-		

Malins mosse											Listorp											
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280- 282	290- 292	300- 305	305- 310	315- 320	330	340	350	360	370	380	400	420	440	460	480	520	483- 487	487- 491	492- 496	496- 500	508- 512	520- 525
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	0.6	-
-	1.0	-	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	0.5	-	-	3.8	-
4.4	-	1.0	4.0	1.0	3.0	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-
-	1.0	1.0	5.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.7
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1.7	2.0	4.0	3.0	6.0	8.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.1	1.0	5.0	2.0	2.0	14.0	-	-	-	-	-	-	-	-	-	-	-	4.4	5.0	3.5	8.8	9.6	2.9
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22.8	29.0	26.0	23.0	23.0	30.0						20.0 21.5 20.5 30.4 32.5 36.8											
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-	1.0	2.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.4	8.0	2.0	5.0	8.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.8	-	1.0	2.0	-	2.0	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	0.6	-	1.1	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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34.5	17.0	12.0	17.0	15.0	6.0	-	-	-	-	-	-	-	-	-	-	-	8.3	4.0	5.0	4.1	12.8	9.2	-
46.7	26.0	17.0	25.0	27.0	11.0	-	-	-	-	-	-	-	-	-	-	-	8.8	4.0	5.0	4.7	14.1	10.3	-
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Malins mosse											Listorp												
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280- 282	290- 292	300- 305	305- 310	315- 320	330	340	350	360	370	380	400	420	440	460	480	520	483- 487	487- 491	492- 496	496- 500	508- 512	520- 525	
-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.2	36.0	16.0	23.0	20.0	31.0												33.6	41.5	29.5	35.6	31.9	41.4	
4.4	4.0	5.0	6.0	4.0	6.0	-	-	-	-	-	-	-	-	-	-	-	7.3	1.5	-	3.5	15.4	4.0	
-	-	2.7	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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13.9	50.0	24.0	33.0	34.0	10.0	-	-	-	-	-	-	-	-	-	-	-	1.9	4.0	24.5	11.7	7.7	3.4	
12.2	25.0	73.4	31.0	41.0	8.0	+	-	-	-	+	-	-	-	-	-	-	25.3	36.5	53.0	49.1	25.6	21.2	
-	-	-	-	-	-	-	1	1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.7	15.0	20.0	6.0	18.0	2.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	
27.8	90.0	120.1	70.0	93.0	28.0												27.2	40.5	77.5	60.8	33.3	25.2	
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