

CHEILOSTOME BRYOZOA FROM THE DANIAN DEPOSITS AT VALLENSBÆK, DENMARK

By

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Abstract

The fauna of Cheilostome Bryozoa from the Upper Danien at Vallensbæk is described. Two new species are erected: **Membranipora berthelseni* and *Aechmella lena*. It is tried to group the Danien forms of *Floridina gothica* (D'ORBIGNY) into two subspecies; *Fl. g. ramosa* n. subsp. and *Fl. g. vallensbaeki* n. subsp. The fauna of Cheilostome Bryozoa at Vallensbæk is compared with those of other Danish localities.

Mr. BENT KJÆR kindly has drawn my attention to a newly opened chalk pit at Vallensbæk, 15 km SW of the center of Copenhagen (12° 21' E, 55° 37' N), in which bryozoan limestone from the Danien is exposed. I think that a brief account of my findings here may be of interest, especially since some of the specimens found seem to represent subspecies and species so far undescribed.

In the locality in question the upper surface of the limestone is situated 2,0 m below the sea level and immediately below quaternary deposits. The uppermost one metre consists of hardened limestone, but below that the limestone is of the usual consistency. I have taken two samples (Val. I and Val. II), 3,4 m and 5,8 m below sea level resp.

First a survey of the species found is given (in this the cipher mean the numbers of specimens), then remarks on some of the species, and finally a comparison between the Vallensbæk Bryozoan fauna and those of other Danish localities.

Abbreviations: :

ac: average number of coccinopores.	lo: width of opesium
ap: number of spines.	Lon: length of onychoecellarium.
da: diametre of aperture.	lon: width of onychoecellarium.
Db: vertical distance between apertures.	lov: width of ovicell.
dba: horisontal distance between apertures.	Lp: length of peristomice.
ha: length of aperture.	Lp: width of peristomice.
ho: length of opesium.	lr: width of orifice.
hov: length of ovicell.	Lv: length of vibraculum.
hr: length of orifice.	lv: width of vibraculum.
la: width of aperture.	Lz: length of zoecium.
Lav: length of avicularium.	lz: width of zoecium.
lav: width of avicularium.	Woz: width of zoarium.
	X: numbers of colonies.

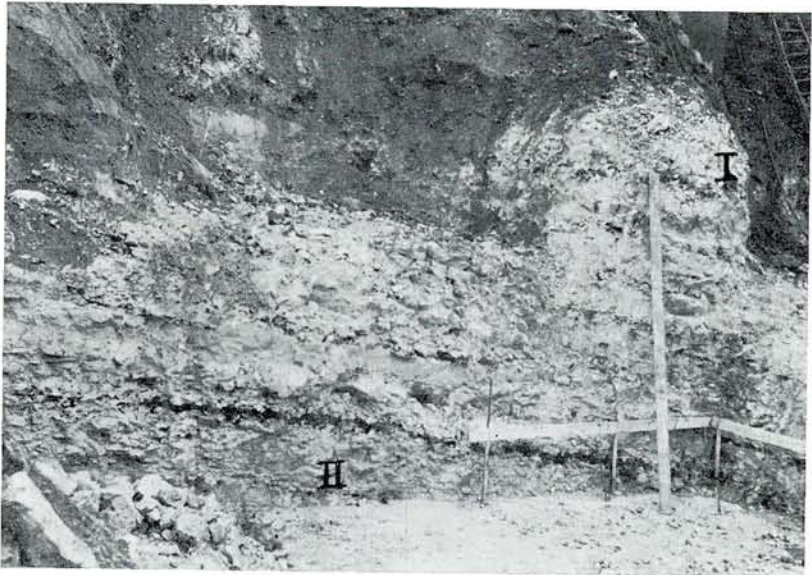


Fig. 1. The chalk pit at Vallensbæk. The location of two samples are given with I and II resp.

THE SPECIES

In table I a survey of the species collected from Vallensbæk is given, with measurements of the species and numbers of colonies.

The measurements in this paper are in mm, where nothing else is mentioned.

REMARKS ON SOME OF THE SPECIES

In this aberrations of the species *Amphiblestrum elegans* (v. HAGENOW), *Membraniporidra huckeana* VOIGT, *Pithodella cincta* MARSSON, *Coscino-pleura angusta angusta* BERTHELSEN, and *Beisselina nobilis* (LEVINSEN) are discussed.

17. *Amphiblestrum elegans* (v. HAGENOW): As mentioned by VOIGT (1930) and BERTHELSEN (1962) this »species« must comprise several species or subspecies, but my collection from Vallensbæk are not great enough to elucidate thus problem. In the material both stems (*A. elegans* cf. *faxensis* (LEVINSEN)) and plates are found.

18. *Membraniporidra huckeana* VOIGT: BERTHELSEN (1962) found in his collections from Faxe a colony with the zooecia differing from the original description, the zooecia are larger and have 6 traces of spines. The specimens from Val. I seem to be agree with the latter, but only 2 of the colonies have about 6 traces of spines, however the measurements are given separately. The material is too small to set up a new species but on the other hand the likeness to *M. huckeana* VOIGT seems conspicuous.

Table I. Genus: *Membranipora* BLAINVILLE, 1830

	Sample	Woz	Lz	lz	ho	lo	Lav	lav	X
1. <i>M. cf. angulata</i> MARSSON, 1887	Val. I		0,73-0,82	0,29-0,30	0,39-0,44	0,16-0,18			1
2. <i>M. berthelseni</i> n. sp.	Val. I	0,41-0,54	0,45-0,57	0,28-0,38	0,31-0,40	0,15-0,20			24
3. <i>M. diluvii</i> VOIGT, 1924.	Val. I	0,43-0,78	0,42-0,83	0,26-0,33	0,28-0,36	0,14-0,23	0,53	0,27	2
4. <i>M. hexagona</i> (v. HAGENOW), 1839	Val. I		0,52-0,54	0,43-0,46	0,27-0,32	0,26			1
	Val. II		0,61-0,69	0,50-0,69	0,28-0,31	0,26-0,28			4
5. <i>M. marssoniana</i> VOIGT, 1924.	Val. I	0,57-0,97	0,62-0,94	0,42-0,54	0,37-0,55	0,17-0,27	0,67	0,48	5
	Val. II	0,64-1,04	0,67-0,84	0,42-0,47	0,36-0,49	0,16-0,31			2
6. <i>M. maxima</i> LEVINSEN, 1925.	Val. II		0,82-0,95	0,56-0,78	0,42-0,54	0,35-0,44			1
7. <i>M. cf. munda</i> MARSSON, 1887.	Val. I	0,43-0,54	0,48-0,84	0,27-0,30	0,30-0,40	0,14-0,22	0,23	0,10	4
8. <i>M. munita</i> MARSSON, 1887	Val. I	0,48-0,56	0,46-0,77	0,28-0,37	0,33-0,44	0,16-0,24	0,63	0,31	8
9. <i>M. cf. pellicula</i> BRYDONE, 1912	Val. I		0,50-0,56	0,26-0,28	0,33-0,39	0,15-0,19	0,49	0,23	4
10. <i>M. plicatelloides</i> BERTHELSEN, 1962	Val. I		0,50-0,68	0,35-0,44	0,26-0,31	0,17-0,21			6
	Val. II		0,58-0,73	0,37-0,42	0,25-0,29	0,20-0,25			5
11. <i>M. prüsipua herfolgensis</i> BERTHELSEN, 1962	Val. II		0,54-0,69	0,41-0,46	0,46-0,61	0,26-0,31			1
12. <i>M. sparsispina</i> VOIGT, 1930.	Val. I	0,33-0,87	0,43-0,61	0,25-0,34	0,16-0,27	0,09-0,17			152
	Val. II	0,57-0,66	0,49-0,55	0,31-0,38	0,17-0,22	0,10-0,16			50

Genus: *Vincularia* DEFRANCE, 1829

	Sample	Woz	Lz	lz	ho	lo	X
13. <i>V. prismatica</i> (v. HAGENOW), 1839.	Val. I	0,54-0,56	0,44-0,52	0,23-0,28	0,14-0,18	0,10-0,14	2
	Val. II	0,52-0,61	0,55-0,56	0,27-0,29	0,08-0,15	0,06-0,09	7

Genus: *Callopora* GRAY, 1848

Sample	Lz	lz	ho	lo	hov	lov	X
Val. I	0,52-0,67	0,31-0,42	0,34-0,39	0,17-0,26			8
Val. I	0,71-0,83	0,32-0,40	0,33-0,42	0,21-0,26			7
Val. II	0,78	0,41	0,42	0,24	0,17	0,15	1
Val. I	0,43-0,55	0,28-0,32	0,32-0,49	0,23-0,26			1

Genus: *Amphiblestrum* GRAY, 1848

Sample	Woz	Lz	lz	ho	lo	Lav	lav
Val. I		0,56-0,81	0,32-0,48	0,21-0,34	0,14-0,24	0,22	0,13
Val. II		0,58-0,62	0,36-0,47	0,21-0,23	0,11-0,15		
Val. I	0,44-1,24	0,51-0,79	0,28-0,41	0,17-0,26	0,09-0,17	0,11-0,27	0,10-0,13
Val. II	0,78	0,63-0,73	0,36-0,42	0,22-0,28	0,09-0,11		

Genus: *Membraniporida* CANU and BASSLER, 1917

Sample	Lz	lz	ho	lo	X
Val. I	0,39-0,50	0,32-0,44	0,14-0,26	0,14-0,27	9
Val. I	0,46-0,52	0,34-0,43	0,14-0,22	0,14-0,21	2
Val. I	0,44-0,73	0,25-0,29	0,23-0,29	0,14-0,17	2

Genus: *Pithodella* MARSSON, 1887

Sample	Woz	Lz	lz	ho	lo	Lav	lav	X
Val. II	0,90	0,78-0,83	0,32-0,35	0,36-0,39	0,17-0,19	0,62	0,31	1
Val. I	0,52-1,63	0,57-0,86	0,30-0,44	0,32-0,45	0,14-0,25	0,15-0,23	0,16-0,22	16
Val. II	0,66-0,91	0,53-0,78	0,31-0,46	0,28-0,34	0,14-0,22	0,18	0,15	13
Val. I	0,53-0,81	0,53-0,92	0,31-0,44	0,30-0,39	0,16-0,18	0,24	0,16	5

Genus: *Stamenocella* CANU and BASSLER, 1917

Sample	Woz	Lz	lz	ho	lo	Lav	lav	X
22. <i>S. pristin</i> (LEVINSEN), 1925	0,34-0,51	0,45-0,56	0,22-0,27	0,24-0,29	0,11-0,14	0,08-0,11	0,10-0,14	5

Genus: *Onychocella* JULLIEN, 1882

Sample	Woz	Lz	lz	ho	lo	Lon	lon	X
23. <i>O. columella</i> BERTHELSEN, 1962	0,61-1,07	0,41-0,53	0,37-0,45	0,10-0,13	0,10-0,11	0,31-0,39	0,18-0,26	11
	0,72-1,28	0,39-0,53	0,38-0,43	0,09-0,15	0,09-0,11	0,28	0,11	14
24. <i>O. elongata</i> LEVINSEN, 1925		0,51-0,59	0,34-0,46	0,17-0,20	0,16-0,20	0,66	0,26	2
		0,54-0,60	0,37-0,46	0,19-0,21	0,17-0,20			1

Genus: *Floridina* JULLIEN, 1881

Sample	Woz	Lz	lz	ho	lo	Lon	lon	X
25. <i>F. gothica ramosa</i> n. subsp.	0,39-0,59	0,45-0,63	0,23-0,31	0,13-0,19	0,09-0,14	0,46-0,56	0,31-0,46	84
	0,44-0,56	0,43-0,56	0,26-0,33	0,12-0,17	0,10-0,14			39
26. <i>F. gothica vallsenbaeki</i> n. subsp.	0,37-0,51	0,44-0,56	0,24-0,28	0,13-0,15	0,10-0,14	0,13-0,15	0,08-0,10	15
	0,39-0,47	0,45-0,52	0,24-0,27	0,13-0,16	0,10-0,13			7
27. <i>F. impar</i> VOIGT, 1923		0,44-0,61	0,36-0,54	0,14-0,23	0,13-0,24			5

Genus: *Micropora* GRAY, 1848

Sample	Lz	lz	ha	la	Lav	lav	X
28. <i>M. amphora</i> (v. HAGENOW), 1839	0,72-0,97	0,29-0,34	0,10-0,12	0,13-0,19	0,06-0,08	0,14-0,18	4
29. <i>M. erratica</i> (VOIGT), 1924	0,41-0,55	0,24-0,29	0,04-0,06	0,09-0,11			8
	0,43	0,25	0,07	0,11			1

Genus: *Semiescharinella* d'ORBIGNY, 1852

Sample	Lz	lz	ha	la	X
30. <i>S. complanata</i> D'ORBIGNY, 1852.....	0,81-0,88	0,29-0,30	0,19	0,17	1

Genus: *Aechmella* CANU and BASSLER, 1917

Sample	Woz	Lz	lz	ho	lo	Lav	lav	X
31. <i>A. latistoma</i> BERTHELSEN, 1962.....		0,33-0,46	0,24-0,33	0,05-0,07	0,11-0,14	0,19-0,21	0,12-0,13	2
32. <i>A. lena</i> n. sp.....	0,24-0,34	0,38-0,56	0,23-0,29	0,05-0,07	0,09-0,11	0,17-0,24	0,09-0,11	63
	0,26-0,30	0,39-0,54	0,24-0,29	0,05-0,07	0,09-0,11			6
33. <i>A. microstoma</i> (MARSSON), 1887.....	0,49-0,77	0,34-0,55	0,26-0,33	0,05-0,09	0,10-0,14	0,21-0,29	0,10-0,16	10
34. <i>A. pindborgi</i> BERTHELSEN, 1962.....		0,36-0,53	0,26-0,36	0,05-0,08	0,12-0,14	0,20-0,28	0,15-0,19	5
		0,33-0,45	0,24-0,30	0,04-0,09	0,09-0,14	0,28-0,29	0,13-0,14	3
35. <i>A. tenuis</i> BERTHELSEN, 1962.....	0,34-0,55	0,41-0,58	0,22-0,28	0,08-0,11	0,07-0,11	0,28-0,34	0,14-0,24	46
	0,43	0,37-0,51	0,23-0,29	0,08-0,10	0,08-0,10	0,23-0,31	0,13-0,17	1

Genus: *Gargantua* JULLIEN, 1888

Sample	Lz	lz	ho	lo	X
36. <i>G. parvicella</i> (VOIGT), 1924.....	0,24-0,37	0,19-0,30	0,04-0,05	0,09-0,13	6

Genus: *Lunulites* LAMARCK, 1816

Sample	Lz	lz	ho	lo	Lv	lv
37. <i>L. saltholmensis</i> BERTHELSEN, 1962.....	0,24-0,35	0,26-0,40	0,08-0,14	0,08-0,14	0,09-0,16	0,07-0,12
	0,25-0,32	0,21-0,29	0,08-0,12	0,08-0,11	0,10-0,16	0,06-0,10

Genus: *Puncturiella* LEVINSEN, 1925

Sample	Woz	Lz	lz	ha	la	Lav	lav	X
38. <i>P. sculpta</i> (D'ORBIGNY), 1851.....	Val. I 0,36-0,78 0,47-0,98 0,16-0,31 0,06-0,10 0,09-0,14 0,04-0,05 0,04-0,07							14
	Val. II 0,34-0,83 0,56-0,84 0,18-0,34 0,07-0,09 0,10-0,12							4

Genus: *Coscinopleura* MARSSON, 1887

Sample	Woz	Lz	lz	ha	la	ac		X
39. <i>C. angusta angusta</i> BERTHELSEN, 1962.....	Val. I 0,82-1,41 0,51-0,69 0,27-0,36 0,08-0,11 0,09-0,12 9,33							257

Genus: *Tricephalopora* LANG, 1916

Sample	Lz	lz	Lp	lp	Lav	lav	X
40. <i>T. cf. cerberus</i> LANG, 1916	Val. I 0,43-0,60 0,31-0,36 0,16						1

Genus: *Anornithopora* LANG, 1916

Sample	Lz	lz	hv	lv		X
41. <i>A. isolata</i> BERTHELSEN, 1962.....	Val. I 1,13	0,66	0,23	0,22		1
	Val. II 1,36	0,71	0,24	0,24		1

Genus: *Porina* D'ORBIGNY, 1852

Sample	Woz	Dba	dba	ha	la	Lav	lav	X
42. <i>P. cylindrica</i> VOIGT, 1924	Val. I 0,87-0,96 0,44-0,51 0,30-0,46 0,16-0,24 0,11-0,16 0,09-0,16 0,07-0,10							9
	Val. I 0,43-0,76	0,41-0,57	0,27-0,48	0,08-0,14	0,08-0,14	0,21	0,12	27
43. <i>P. salebroza</i> MARSSON, 1887.....	Val. II 0,53-0,79	0,50-0,58	0,33-0,69	0,09-0,10	0,09-0,10			5

Genus: *Beisselina* CANU, 1913

Sample	Woz	ha	la	X
Val. II	0,92	0,08-0,13	0,09-0,12	1

Genus: *Beisselinopsis* VOIGT, 1951

Sample	Woz	Db	dba	ha	la	Lav	lav	X
Val. I	0,29-0,35	0,35-0,38	0,13-0,16	0,11-0,15	0,06-0,10	0,05-0,08	1	
Val. II	0,88-1,01	0,56-0,63	0,49	0,07-0,08	0,09		2	

Genus: *Pachytheccella* BASSLER, 1934

Sample	Woz	ha	la	Db	Lav	lav	X
Val. I	0,52-0,89	0,14-0,22	0,09-0,15	0,48-0,87	0,08-0,14	0,09-0,13	18
Val. II	0,64-0,69	0,14-0,19	0,09-0,11		0,07-0,08		1
Val. I	0,62-0,83	0,11-0,16	0,09-0,14	0,31-0,68			8
Val. I	0,41-0,82	0,09-0,18	0,11-0,19		0,09-0,10	0,06-0,08	60
Val. II	0,42-0,83	0,08-0,16	0,08-0,22		0,05-0,07	0,05-0,10	5

Genus: *Columnotheca* MARSSON, 1887

Sample	Woz	da	Db	X
Val. I	0,64-0,73	0,08-0,09	0,61-0,66	2

Genus: *Cryptostomella* BASSLER, 1953

Sample	Lz	lz	ha	la	Lav	lav	X
Val. I	0,43-0,56	0,45-0,52	0,19-0,34	0,21-0,29	0,17-0,20	0,14	2

21. *Pithodella cincta* MARSSON: Two types have been observed, 1) spines missing or traces of 2 spines on the upper part of the mural rim, and 2) traces of 6–10 spines distributed over the whole mural rim. These two types are treated separately.

37. *Lunulites saltholmensis* BERTHELSEN: Two types have been observed in Val. I, clearly differing in the thickness of the zoarium. They are treated together.

39. *Coscinopleura angusta angusta* BERTHELSEN: A basal fragment has been observed in Val. I with Woz, Lz and ac smaller than by the other colonies, however the measurements are given separately:

Woz: 0,62–0,94, Lz: 0,41–0,63, lz: 0,28–0,37, ha: 0,09–0,11, la: 0,08–0,10, ac: 8,2.

44. *Beisellina nobilis* (LEVINSEN): The specimens from Val. II belong to BERTHELSEN'S type 2.

DESCRIPTIONS OF THE NEW SUBSPECIES AND SPECIES

The holotypes are in the Mineralogical Museum, Copenhagen.

2. »*Membranipora*« *berthelseni* n. sp.

Plate 1, fig. 1–2; Fig. 4.

1930. ?*Membranipora* (*Membraniporida*) cf. *navicularis* MARSSON. VOIGT, Leopoldina. VI, p. 429, Pl. 10, fig. 17.

Description: The zoarium forms free, solid, triangular, slender, usually twisted stems.

The zooecium is nearly oval, through sometimes pear-formed. The single zooecium is much detached from the zoarium. The opesium terminal, oblong-oval, or now and then inverted drop-like, covering more than half the length of the zooecium and surrounded by a smooth, ascending, wide mural rim, which now and then constitute the whole visible part of the frontal wall of the zooecium.

Ovicells are hyperstomial and sparse.

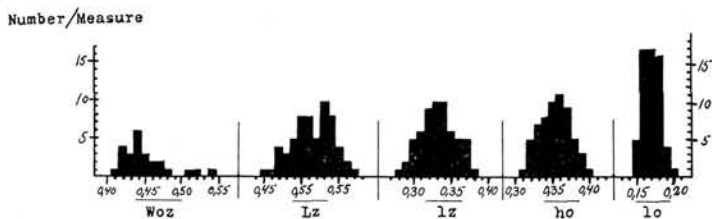
Only a fragment of an avicularium has been observed; it is indescribable.

Holotype: Plate 1, Fig. 2, sample Val. I, Vallensbæk.

Type locality: Vallensbæk at the sample Val. I (3,4 m below the Sea level).

Measurements from the type locality:

Woz: 0,41–0,54	$0,451 \pm \frac{0,032}{\sqrt{25}}$
Lz: 0,45–0,57	$0,516 \pm \frac{0,028}{\sqrt{60}}$
lz: 0,28–0,38	$0,332 \pm \frac{0,030}{\sqrt{60}}$
ho: 0,31–0,40	$0,353 \pm \frac{0,021}{\sqrt{60}}$
lo: 0,15–0,20	$0,170 \pm \frac{0,011}{\sqrt{60}}$



Remarks: The new species is named in honour of Dr. phil. OLE BERTHELSEN, Director of the Geological Survey of Denmark.

The species differ from *Membranipora marssoniana* VOIGT by its triangular, slender zoarium and by its much smaller zoecia. *Membranipora munda* MARSSON differs from »*Membranipora*« *berthelseni* n. sp. i. a. by its granulated mural rim. *Membranipora navicularis* MARSSON differs from the new species by its nearly twice as large zoecium, and by its mural rim which seems low and not ascending. I think that VOIGT's *Membranipora* (*Membraniporida*) cf. *navicularis* MARSSON is identical with the new species.

Distribution:

Upper Danien: Vallensbæk (sample Val. I).

Danien: ?Germany: erratic blocks at Köthen.

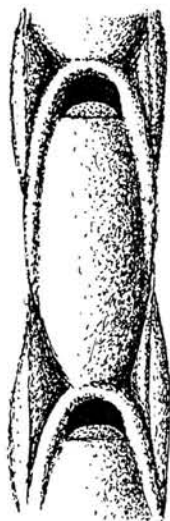


Fig. 2



Fig. 3

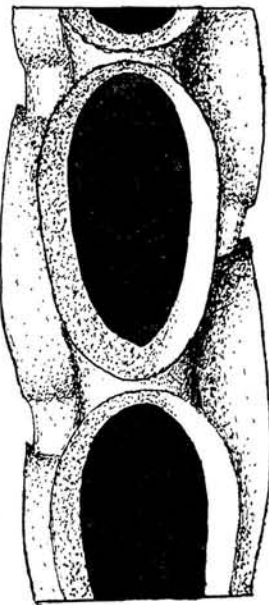


Fig. 4

Fig. 2-3. *Aechmella lena* n. sp. 3 shown an onychocellarium.

Fig. 4. »*Membranipora*« *berthelseni* n. sp.

Remarks on Floridina gothica (D'ORBIGNY):

VOIGT (1930) and BERTHELSEN (1962) have mentioned that the species *Floridina gothica* (D'ORBIGNY) covers several species or subspecies, but previously the species have not been separated.

I should think that VOIGT is right when he suggested that his photo in Pl. 21, fig. 9 (1930) is closest to the lost original specimen from the collection of D'ORBIGNY. VOIGT mentioned that the stratigraphical distribution of *Floridina gothica* (D'ORBIGNY) in his Pl. 21, fig. 9 is upper Senonian.

In Vallensbæk I have found two types, which both differ from VOIGT's fig. 9, and which I feel justified to consider as two new subspecies.

25. *Floridina gothica ramosa* n. subsp.

Plate 1, fig. 3.

1930. *Floridina gothica* (D'ORB.). (partim). VOIGT. Leopoldina. VI. p. 468.

1962. *Floridina gothica* (D'ORB.). (partim). BERTHELSEN. Danm. Geol. Unders. II. Ser., No. 83, p. 115.

Description: A *Floridina gothica* (D'ORBIGNY) subspecies with the zoaria shaped as slender, solid and branched stems and with the zooecia in not quite regularly alternating longitudinal rows.

The zooecia, which distinctly are separated from each other, are chubby, rounded-hexagonal with a rectangular opesium. In undeveloped zooecia two lateral dentiforms exist in the opesium, and the proximal edge has a broad, low lip. In old individuals the opesium is closed but at as just above the proximal lip an opening often occurs. In the few well developed zooecia the opercular portion of the opesium is small and rounded-rectangular. Two large opesiules exist in the opesular region, separated from the opercular portion by an union of the opesial processes. The cryptocyst is rather vaulted.

Ovicells have not been observed.

Onychocellaria are about one and a half to twice as large as the zooecia and almost of the same size.

Holotype: Plate 1, Fig. 3, Sample Val. I, Vallensbæk.

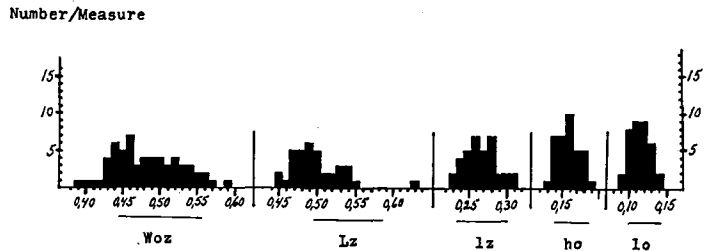
Type locality: Vallensbæk, 3,4 m below the Sea level (Sample Val. I).

Measurements from the locality:

Woz: 0,39-0,59	0,486 ± $\frac{0,045}{\sqrt{60}}$
Lz: 0,45-0,63	0,500 ± $\frac{0,034}{\sqrt{36}}$
lz: 0,23-0,31	0,261 ± $\frac{0,021}{\sqrt{36}}$
ho: 0,13-0,19	0,158 ± $\frac{0,015}{\sqrt{36}}$
lo: 0,09-0,14	0,114 ± $\frac{0,013}{\sqrt{36}}$
Lon: 0,46-0,56	0,52
lon: 0,31-0,46	0,36

length of aperture at the onychocellarium: 0,16-0,27/0,21.

width of aperture at the onychocellarium: 0,15-0,21/0,19.



Remarks: The name refers to the branched zoarium.

Besides the stratigraphical separation *Floridina gothica ramosa* n. subsp. differs from *Floridina gothica* cf. *gothica* (D'ORBIGNY) by having a smaller zoarium, by the chubby, hexagonal zooecium, by its rather vaulted cryptocyst, by its rectangular opesium and by having a relative shorter and wider onychocellularian opesium.

The difference between *Floridina gothica ramosa* n. subsp. and *Floridina gothica vallensbaeki* n. subsp. has been mentioned above in *Fl. gothica vallensbaeki* n. subsp.

Distribution:

Danien: Germany: ?erratic blocks. Denmark: Vallensbæk (sample Val. I and Val. II).

26. *Floridina gothica vallensbaeki* n. subsp.

Plate 1, fig. 4.

1923. *Floridina gothica* (D'ORB.). (partim). VOIGT. Medd. Dansk Geol. Foren. Vol. 6, Heft 3, No. 20, p. 7.

1962. *Floridina gothica* (D'ORB.). (partim). BERTHELSEN. Danm. Geol. Unders. II. Ser., No. 83, p. 115.

Description: A *Floridina gothica* (D'ORBIGNY) subspecies with the zoaria shaped as prismatic, angular, slender, solid stems and with the zooecia in regularly alternating, longitudinal rows.

The zooecium is almost rectangular with slightly concave, vertical sides and the upper and lower edges almost straight. The cryptocyst is plane, depressed and surrounded by a distinct mural rim. The angular shape form of the zoarium is a result of the shape of the cryptocyst and the mural rim. In the majority of the zooecia the opercular portion of the opesium is well preserved. The opercular portion is rounded-trapezoidal with the broadest side foremost. In the opesiular region there are two large oval opesiules, separated from the opercular portion by a union of the opesia processes. In some zooecia these are broken off and a trifoliated opesium with two lateral teeth and a proximal broad lip then arises.

Ovicells occurs.

Onychocellaria have not been observed.

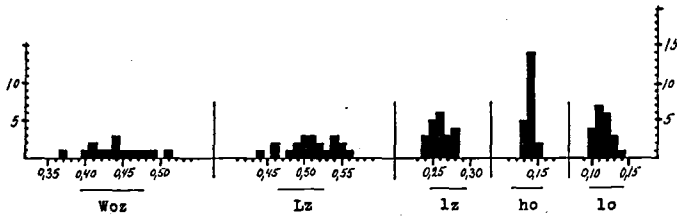
Holotype: Plate 1, Fig. 3, sample Val. I, Vallensbæk.

Type locality: Vallensbæk, 3,4 m below the Sea level (sample Val. I).

Measurements from the type locality:

	average
Woz: 0,37–0,51	$0,441 \pm \frac{0,038}{\sqrt{15}}$
Lz: 0,44–0,56	$0,510 \pm \frac{0,031}{\sqrt{21}}$
lz: 0,24–0,28	$0,260 \pm \frac{0,013}{\sqrt{21}}$
ho: 0,13–0,15	$0,139 \pm \frac{0,006}{\sqrt{21}}$
lo: 0,10–0,14	$0,115 \pm \frac{0,011}{\sqrt{21}}$
hov: 0,13–0,15	0,139
lov: 0,08–0,10	0,090

Number/Measure



Remarks: The subspecific name refers to the locality, Vallensbæk.

Floridina gothica vallensbaeki n. subsp. differs from *Floridina gothica* cf. *gothica* (D'ORBIGNY) by its more slender zoarium, by the form of the zooecium, by having a depressed plane cryptocyst and a mural rim, and by its smaller opercular portion.

Floridina gothica ramosa n. subsp. differ from *Floridina gothica vallensbaeki* n. subsp. by its a little thicker zoarium, by the form of the zooecium, by its vaulted cryptocyst and lack of mural rim.

Distribution:

Upper Danien: Vallensbæk (sample Val. I and Val. II) and Faxø.

32. *Aechmella lena* n. sp.

Plate 1, Fig. 5–6; Fig. 2–3.

Description: The zoarium consist of slender, branched, quadrangular stems with the zooecia in alternating, longitudinal rows.

The zooecium is oblong hexagonal with the posterior part terminated by an almost straight margin and the anterior part crescentic. The mural rim is distinct and mainly situated in the anterior part of the zooecium. The ope-

sium is terminal and semi-elliptical, the posterior margin is provided with a low, smooth, semi-elliptical lip. The cryptocyst is fairly vaulted and slopes down in the anterior part.

Ovicells have not been observed.

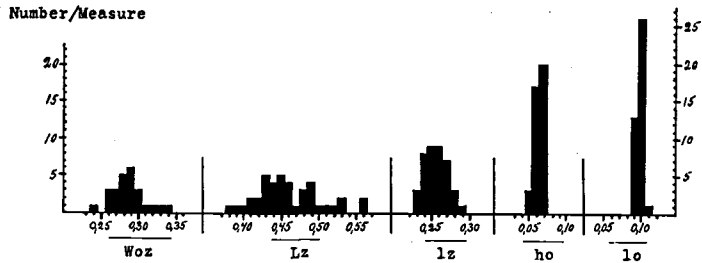
The avicularium is interzoecial and seems detached from the colony. The form is lanceolate with the spearhead in the anterior part. The opesium is inverted drop-like.

Holotype: Plate 1, Fig. 6, sample Val. I, Vallensbæk.

Type locality: Vallensbæk, 3,4 m below the Sea level (sample Val. I)

Measurements from the type locality:

Woz: 0,24–0,34	0,287 ± $\frac{0,025}{\sqrt{25}}$
Lz: 0,38–0,56	0,451 ± $\frac{0,043}{\sqrt{40}}$
lz: 0,23–0,29	0,256 ± $\frac{0,015}{\sqrt{40}}$
hc: 0,05–0,07	0,054 ± $\frac{0,006}{\sqrt{40}}$
lo: 0,09–0,11	0,097 ± $\frac{0,007}{\sqrt{40}}$
Lav: 0,17–0,24	0,200
lav: 0,09–0,11	0,096



Remarks: The new species is named in honour of Miss LENA REDDER WILKEN, who has been of great help in preparation of this paper.

Aechmella lena n. sp. habitually bears great resemblance to *A. microstoma* (MARSSON), *A. tenuis* BERTHELSEN and *A. pentapora* (D'ORBIGNY), but those species have clearly thicker zoaria, and furthermore *A. tenuis* BERTHELSEN has no lip at the posterior edge of the opesium. The cryptocyst in *A. pentapora* (D'ORBIGNY) is not so much vaulted as in *A. lena* n. sp. and the avicularia are almost of the same size as the zooecia. The cryptocyst of *A. microstoma* (MARSSON) is plane and the opesium of the avicularium is oval with a slit in the posterior part; often this slit is damaged and the opesium then is twice the size of that in *A. lena* n. sp.

Distribution:

Upper Danien: Vallensbæk (sample Val. I).

Table II

		Vallensbæk	Vallensbæk
Danian	The zone of <i>Tyl. vexillifera</i> :		
	Klintholm.....	32	22
	Herfølge.....	33	23
	Copenhagen.....	9	8
	Saltholm.....	33	20
	The zone of <i>Tyl. brünnichi</i> :		
	Saltholm.....		
	Faxe.....	39	25
	Thorslunde.....	22	13
	Kagstrup.....	27	18
	The zone of <i>Tyl. abildgaardii</i> :		
	Kagstrup.....		
	Stevns.....	24	15
The zone of <i>Tyl. ødumi</i> :	13	12	
Kagstrup.....			
Germany.....	19	8	
Sweden.....	8	4	
Senonian.....	19	11	

Table III

Vallensbæk II	Danien							
	zone with <i>Tylocidaris vexillifera</i>			zone with <i>Tylocidaris brünnichi</i>			<i>Tyl. abildgaardii</i>	<i>Tyl. ødumi</i>
	Klintholm	Herfølge	Copenhagen	Saltholm	Faxe	Thorslunde	Kagstrup	Stevns
10. <i>Membranipora plicatelloides</i> BERTH.....	+	+		+	+	+	+	+
47. <i>Pachythecella anhaltina</i> VOIGT.....	+	+		+	+	+	+	+
37. <i>Lunulites saltholmensis</i> BERTHELSEN.....			+	+	+	+	+	
24. <i>Onychocella elongata</i> LEVINSEN.....	+	+		+	+	+	+	
35. <i>Aechmella tenuis</i> BERTHELSEN.....	+	+		+	+	+	+	
44. <i>Beisselina nobilis</i> (LEVINSEN).....	+	+	+	+	+	+	+	
6. <i>Membranipora maxima</i> LEVINSEN.....				+	+	+	+	
20. <i>Pithodella bifoliata</i> BERTHELSEN.....	+	+	+	+	+	+	+	
41. <i>Anornithopora isolata</i> BERTHELSEN.....	+	+		+	+	+	+	
46. <i>Beisselinopsis tubulifera</i> BERTHELSEN.....	+	+		+	+	+	+	
11. <i>Membr. præcipua herfolgensis</i> BERTH....		+						

BIOSTRATIGRAPHICAL EVALUATION

In table II the Cheilostome bryozoan fauna of Vallensbæk is compared with those of other localities from the Danien of East Denmark. It will be seen that there is an especially great similarity with the locality Faxø, though there is also some similarity with other localities from the upper Danien.

Table III and IV are concerned only those species which are stratigraphical useful i. e. those which occur only in the Danien, whereas those occurring in all *Tylocidaris* zones have been omitted. If, moreover, those species which are represented by less than five species in each sample are omitted*) only species no. 10, 14, 18, 22, 27, 35, 37, 39 and 47 from Val. I and the species no. 10 and 37 from Val. II are of any use. All these species occur chiefly in the upper Danien, but *Lunulites saltholmensis* BERTHELSEN (no. 37) alone can be used for a more exact stratigraphical determination, since this species is known only from the *Tylocidaris brünnichi* zone and the lower part of the *Tylocidaris vexillifera* zone.

According to the data given above the bryozoan limestone at Vallensbæk must belong to the upper part of the *Tylocidaris brünnichi* zone (upper Danien).

Table IV

	Danien								
	zone with <i>Tylocidaris</i> <i>vexillifera</i>			zone with <i>Tylocidaris</i> <i>brünnichi</i>			<i>Tyl.</i> <i>abilsgaardi</i>	<i>Tyl.</i> <i>ødumi</i>	
	Klintholm	Herfølge	Copenhagen	Saltholm	Faxe	Thorslunde	Kagstrup	Stevns	Kagstrup
Vallensbæk I									
51. <i>Cryptostomella pectinata</i> BERTHELSEN . . .									
40. <i>Tricephalopora cerberus</i> LANG.		+							
22. <i>Stammenocella pristin</i> (LEVINSEN).	+	+	+	+	+	+	+	+	+
39. <i>Coscinopleura angusta angusta</i> BERTH. . .	+	+	+	+	+	+	+	+	+
45. <i>Beisselinopsis oblita</i> (KADE).	+	+	+	+	+	+	+	+	+
10. <i>Membranipora plicatelloides</i> BERTHELSEN	+	+	+	+	+	+	+	+	+
47. <i>Pachytheccella anhaltina</i> VOIGT	+	+		+	+	+	+	+	+
14. <i>Callopora acuminella</i> BERTHELSEN	+	+		+	+	+	+	+	+
27. <i>Floridina impar</i> VOIGT	+	+		+	+	+	+	+	+
37. <i>Lunulites saltholmensis</i> BERTHELSEN.			+	+	+	+	+	+	+
24. <i>Onychoecella elongata</i> LEVINSEN	+	+		+	+	+	+	+	+
35. <i>Aechmella tenuis</i> BERTHELSEN	+	+		+	+	+	+	+	+
31. <i>Aechmella latistoma</i> BERTHELSEN	+	+		+	+	+	+	+	+
16. <i>Callopora rosenkrantzi</i> BERTHELSEN.				+	+	+	+	+	+
3. <i>Membranipora diluvii</i> VOIGT		+		+	+	+	+	+	+
18. <i>Membraniporida huckeana</i> VOIGT.	+	+		+	+	+	+	+	+
19. <i>Membraniporida inermis</i> (LEVINSEN).	+	+		+	+	+	+	+	+
41. <i>Anornithopora isolata</i> BERTHELSEN.	+	+		+	+	+	+	+	+
20. <i>Pithodella bifoliata</i> BERTHELSEN	+	+	+	+	+				

*) Mainly BERTHELSEN (1962).

PALEO-ECOLOGICAL EVALUATION

In the table V and VI the 10 most common species from the two samples are enumerated.

The interval of 2,4 m between the two samples means a great difference in the fauna. Of the species from Val. II *Membranipora sparsispina* VOIGT, *Floridina gothica ramosa* n. subsp., *Pithodella cincta* (MARSSON), *Onychocella columella* BERTHELSEN and *Vincularia prismatica* (v. HAGENOW) are much more sparsely represented in Val. I, whereas *Lunulites saltholmensis* BERTHELSEN and *Floridina gothica vallensbaeki* n. subsp. show only a small decline (about 1,5 % in Val. I). On the other hand, the species *Aechmella lena* n. sp. and *Pachythecella lundgreni* (PERGENS and MEUNIER) have doubled their representation in the upper sample, Val. I. Only *Porina salebroso* MARSSON occur with the same frequency in both samples.

It is remarkable that the absolutely dominant species *Coscinopleura angusta angusta* BERTHELSEN in Val. I only has been observed in this sample. Besides, the dominance of this species seems to be on the expense of *Membranipora sparsispina* VOIGT and *Floridina gothica ramosa* n. subsp. and the same tendency seems to be prevalent through the whole Danien. Whether this relations between those 3 species are due to some special ecological factors I cannot say; further studies must decide that. »*Membranipora*« *berthelsenii* n. sp., too, occurs only in the sample Val. I. Finally, it may be mentioned that also *Amphiblestrum elegans* (v. HAGENOW) and *Aechmella tenuis* BERTHELSEN are much increased in this sample.

The width of the zoarium and the dimensions of the zoecium in the stem-forms Cheilostome Bryozoa in the samples from Vallensbæk usually are smaller than in other East Danish Danien deposits. On the other hand, the species which is non-stem-forms and with a rather low growth show a tendency to have a longer zoecium than in other localities. The reason probably is not that they leave grown on the North wall of a bryozoan bank, but rather because the Sea have been of great depth. The slender stems of the bryozoan colonies also indicate that there must have been a great depth in the place, since this character probably is conditioned by a weak current and lack of wave movements.

Table V.

The 10 most common species from the sample Val. II:

No.	species	%
12.	<i>Membranipora sparsispina</i> VOIGT	27,0
25.	<i>Floridina gothica ramosa</i> n. subsp.	21,1
23.	<i>Onychocella columella</i> BERTHELSEN	7,6
21.	<i>Pithodella cincta</i> (MARSSON)	7,0
13.	<i>Vincularia prismatica</i> (v. HAGENOW)	3,8
26.	<i>Floridina gothica vallensbaeki</i> n. subsp.	3,8
32.	<i>Aechmella lena</i> n. sp.	3,2
37.	<i>Lunulites saltholmensis</i> BERTHELSEN	2,7
43.	<i>Porina salebroso</i> MARSSON	2,7
49.	<i>Pachythecella lundgreni</i> (PERGENS and MEUNIER)	2,7
Total		81,6

Table VI.

The 10 most common species from the sample Val. I:

No.	species	%
39.	<i>Coscinopleura angusta angusta</i> BERTHELSEN	25,2
12.	<i>Membranipora sparsispina</i> VOIGT	14,9
25.	<i>Floridina gothica ramosa</i> n. subsp.	8,2
17.	<i>Amphiblestrum elegans</i> (v. HAGENOW) (stems + plates)	8,1
32.	<i>Aechmella lena</i> n. sp.	6,2
49.	<i>Pachythecella lundgreni</i> (PERGENS and MEUNIER)	5,9
35.	<i>Aechmella tenuis</i> BERTHELSEN	4,5
43.	<i>Porina salebrosa</i> MARSSON	2,6
2.	» <i>Membranipora berthelseni</i> n. sp.	2,3
21.	<i>Pithodella cincta</i> (MARSSON) (Types 1 and 2)	2,1
Total		80,0

DANSK RESUMÉ

I 1966 blev der i en udgravning på Vallensbæk kommunes grund nær St. Vejleå (ca. 15 km SW for København) gravet ned i bryozokalk. Bryozokalkens overflade blev truffet ca. 2 m under havoverfladen. Medens den øverste meter var hærdnet, forekom det underliggende af nogenlunde samme fasthed som bryozokalken på Stevns klint. Der udtoges to prøver, h. h. 3,4 m (Val. I) og 5,8 m (Val. II) under havets overflade; fra disse prøver er de cheilostome bryozøer blevet underkastet en nøjere undersøgelse, for ud fra dette at bedømme kalkens stratigrafiske placering.

Der blev fundet ialt 47 arter og 4 underarter i de to prøver (table I), hvoraf to arter er nye, nemlig »*Membranipora berthelseni* og *Aechmella lena*. Desuden er Danien-formerne af *Floridina gothica* (D'ORBIGNY) søgt grupperet i to nye underarter: *Fl. g. ramosa* og *Fl. g. vallensbaeki*.

Lokalitetens stratigrafiske placering i den øverste del af zonen med *Tylocidaris brinnichi* (øvre danien) er diskuteret på grundlag af tavlerne II-IV.

Tavlerne V og VI viser de 10 hyppigst forekommende arter i hver af de to prøver, og ud fra tavlerne omtales arternes dominanstendenser i intervallet mellem prøverne. En speciel interesse synes *Coscinopleura angusta angusta* BERTHELSEN at have, idet den ikke er påvist i den nedre prøve (Val. II), men dominerer fuldstændigt den øvre (Val. I), hvorimod *Membranipora sparsispina* VOIGT og *Floridina gothica ramosa* n. subsp. begge er dominerende i Val. II, mens de er trængt stærkt tilbage i den øvre prøve (Val. I).

Endeligt påpeges det, at de stamme-dannede bryozøer fra Vallensbæk gennemgående har tyndere kolonier end bryozøer fra andre tidligere undersøgte danske lokaliteter. Derimod har de bryozøer, som ikke er stamme-dannede eller som har en lav vækst, en tendens til at udvikle et længere zoecium. Ud fra dette konkluderes det, at bryozøerne i prøverne ikke nødvendigvis har levet på nordsiden af en bryozobanke, men mere sandsynligt på en større havdybde.

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Fig. 1. »*Membranipora*« *berthelseni* n. sp. 20 \times .
Fig. 2. »*Membranipora*« *berthelseni* n. sp. 30 \times .
Fig. 3. *Floridina gothica ramosa* n. subsp. 20 \times .
Fig. 4. *Floridina gothica vallensbaeki* n. subsp. 28 \times .
Fig. 5. *Aechmella lena* n. sp. 30 \times .
Fig. 6. *Aechmella lena* n. sp. 30 \times .