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On the occurrence of *Alderia modesta* (LOVÉN) and *Limapontia depressa* A. & H. on the salt marshes of the Dutch Waddenzee¹⁾

(gastropoda, Nudibranchia)

by

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The publication by ENGEL, GEERTS and VAN REGTEREN ALTENA (1940) on *Alderia modesta* (Loven, 1844) and *Limapontia depressa* Alder & Hancock, 1862, in the estuaries of southwestern Holland (provinces of Zuid-Holland and Zeeland) induced us to look for these animals on other Dutch mud-flats, viz. in the Waddenzee, where they had not been collected before.

First we inspected the gullies between the mud flats, which contain more than 1 metre of water at high tide and, in addition, the *Zostera nana*-zone, which is dry at low tide and about under 50 cm of water at high tide. Later on we searched for algae in the brackish inland waters, which will be mentioned below. In all these localities we did not find a single *Alderia modesta* or *Limapontia depressa*.

On June 30, 1951, the first author accidentally found a living *Limapontia depressa* var. *pellucida* among *Enteromorpha nana* (SOMMERFELT) SJÖSTEDT and *Rhizoclonium implexum* (DILLW.) BATT along a small creek in the salt marsh on the "Normer", on the northside of the former island of Wieringen.

The following day the entire region near Wieringen was inspected. As said before, neither *Limapontia depressa* nor *Alderia modesta* were found in the gullies, creeks or on the mud flats, but on the salt marshes proper, i.e. the region covered by a thick vegetation of Phanerogams, only flooded at spring tide or stormy weather, both species were numerous in sites where the soil was overgrown by a stiff darkgreen felty blanket of *Vaucheria*.

Once this biotope was ascertained we could recognize similar regions in the Waddenzee as prospective localities for the occurrence of the two Nudibranchs. A number of these sites were visited and, indeed, proved to be inhabited by *Alderia modesta* and *Limapontia depressa* (see list of localities on p. 2):

¹⁾ Received April 5, 1952.

Localities	<i>Alderia modesta</i>	<i>Limapontia depressa</i> var. <i>typica</i>	<i>Limapontia depressa</i> var. <i>pellucida</i>
Island of Wieringen, Normer 1-7-1951	+	-	+
Den Helder, Balgzand, Saltmarsh near „De Kool” 5-7-1951	+	+	+
Island of Texel, Slufter 3-8-1951	+	-	-
Saltmarsh near the polder Eendracht 23-9-1951	+	-	-
Island of Terschelling, Dellewal 19-7-1951	+	-	+
Bosplaat pl. 21 19-7-1951	-	-	+
Island of Schiermonnikoog, Oosterplaat 24-8-1951	+	-	-

On the "Normer", both *Limapontia* and *Alderia* were only found in a vegetation in which *Limonium vulgare* and *Obione portulacoides* are dominant. This vegetation (a paper concerning this plantcommunity by the first author is in the press) grows on very heavy clay. For about 80 % the soil is separated from the air by algae, principally consisting of small *Vaucheria*-cushions. On these cushions (size 10 cm square on an average) *Limapontia depressa* var. *pellucida* congregated in groups of about five at a time. In the same sites although less numerous, *Alderia modesta* occurred, the ratio being about 1 *Alderia modesta* to 30 *Limapontia depressa*. On the highest level, preferably on protruding objects or plants remains, the yellow sausage-shaped eggmasses of *Limapontia depressa* and *Alderia modesta* were numerous.

In spite of the hot sunshine, the animals actively moved about on *Vaucheria* and on surrounding mud; now and then they hid away in depressions among the *Vaucheria*.

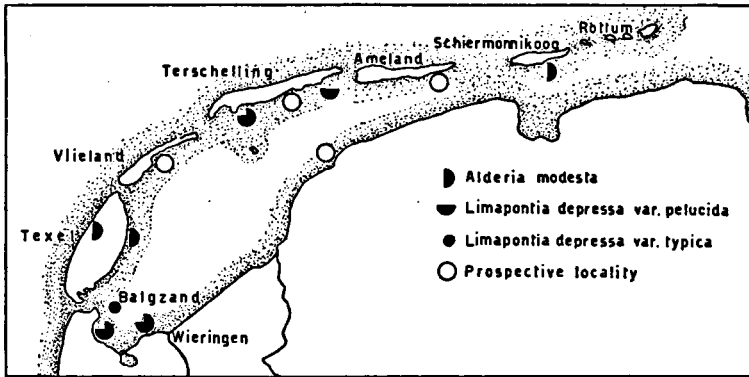
In addition to the two Nudibranchs numerous *Hydrobia ulvae* occurred. Their presence in this rather unusual biotope may be explained by transport during an exceptional high tide. Hence several *Hydrobia* were already dead, others were still moving about on the mud.

On the „Balgzand", *Alderia modesta* and both varieties of *Limapontia depressa* occurred in the *Puccinellietum maritimae typicum* (WESTHOFF, 1947). This plant association is generally characterized by *Puccinellia maritima* and a few rarer plants, but on the „Balgzand" the dominant species only was present.

All other observations on *Alderia modesta* and *Limapontia depressa* were made in this association.

The *Obione-Limonium*-vegetation as well as the *Puccinellia maritima*-association here are inundated during a short time at spring-tide only. Therefore both vegetation types are classified in the *Puccinellio-Salicornion*, an alliance which comprises all plant associations of the low salt marsh.

From the above it is evident that *Alderia modesta* and *Limapontia depressa* are typical for this alliance. The periodical flooding at spring high tide and during periods of storm-flooding is obviously an indispen-



sable condition for their mode of life, hence their being so strictly bound to this habitat.

On the contrary, in localities with a similar type of vegetation like the banks of the brackish inland ditches in the Wieringermeer polder, on the island of Texel, and along the little pools behind the Hondsbosse Zeewering, which are never periodically flooded, we never met with *Alderia modesta* or *Limapontia depressa* although we carefully scrutinized these sites.

On account of the absence of oogonia and antheridia the species of *Vaucheria* could not be identified. Therefore it is unknown if the Nudi-branchs frequent one or more species of *Vaucheria*. This identification may be reserved for future research.

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