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## THE SUDDEN APPEARANCE OF *AEOLIDIELLA GLAUCA* (GASTROPODA: OPISTHOBRANCHIA) IN LAKE GREVELINGEN (S.W. NETHERLANDS) IN 1983 AND 1984\*

by

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In 1983 and 1984 a population of the nudibranch *Aeolidiella glauca* (Alder & Hancock, 1845) was found in the saline Lake Grevelingen (S.W. Netherlands). The number of specimens observed exceeds by far the total number previously recorded from the Dutch coast. Field observations on food intake suggest that the sea anemone *Diadumene cincta* was given preference to the abundant *Sagartiogeton undatus*, considered by Tardy to be the favorite food of *A. glauca*.

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## SAMENVATTING

In 1983 en 1984 werden op diverse plaatsen in de Grevelingen verschillende exemplaren van de zeenaaktslak *Aeolidiella glauca* (Alder & Hancock, 1845) waargenomen en verzameld. Het totale aantal aangetroffen exemplaren overtrof het aantal vermeldingen van de Nederlandse kust tot nu toe. Enkele waarnemingen naar de voedselkeuze brachten een voorkeur voor de zee-anemoon *Diadumene cincta* aan het licht, ondanks het algemene voorkomen van *Sagartiogeton undatus*, welke soort door Tardy als voorkeursvoedsel wordt aanmerkt.

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## INTRODUCTION

After the closure from the North Sea in 1971 a very characteristic marine fauna has developed in the saline Lake Grevelingen in the southwest of the Netherlands. The main difference with open coastal waters is the absence of tidal currents, resulting in low turbulence, clear water and stratification of the water column especially during summer. In this environment several species, rarely found alive in the surrounding tidal waters, have developed high abundances (Vaas, 1975; Lambeck, 1982). Other species show a distribution which is different from tidal waters: the anthozoan *Sagartiogeton undatus* (Muller, 1788) is abundant in Lake Grevelingen down to 22 m, but in the tidal Eastern Scheldt this sea anemone is only numerous in the low intertidal and the shallow subtidal (-2 m under LTL) and scarce on deeper substrata (Waardenburg, 1982).

In 1983 and 1984 several specimens of the nudibranch genus *Aeolidiella* Bergh, 1867, have been observed and photographed by SCUBA-divers. Identification of animals and spawn from photographs was not possible, as animals and spawn of two of the three European species of the genus *Aeolidiella*, have a quite similar external appearance (Tardy, 1969).

Of these two species only one, *Aeolidiella glauca* (Alder & Hancock, 1845), has previously been found in very low numbers in Dutch waters (Swennen, 1961: 223). The other species, *Aeolidiella sanguinea* (Norman, 1877) has a more southern and western distribution. Its closest occurrences are on the Atlantic coasts of Ireland and France (Bouchet & Tardy, 1976: 210).

At the collection locality, a former tidal channel, the bottom slopes down from 2 m depth with an angle of about 45° and is reinforced with basalt and limestone boulders (Waardenburg, 1982). These boulders are covered with sea anemones, tunicates, oysters, sponges, red algae and other organisms. The sea anemones are mainly the Acontiarans *Sagartiogeton undatus*, *Diadumene cincta* Stephenson, 1920 and occasionally *Metridium senile* (Linnaeus, 1761).

## OBSERVATIONS OF ANIMALS AND SPAWN

First specimens were observed on 28.ix.1983 at Hompelvoet and on 6.x.1983 at Archipel (fig. 1). In 1984 slugs were found in January and February at 2 locations at Geul van Bommenede, and on 23.vi.1984, 1.ix.1984 and 27.xi.1984 near Dreischor pumping engine. Spawn (fig. 2) was observed on 27.v.1984 and 23.vi.1984 near Dreischor.

On 1.ix.1984, eight specimens were observed and five of them collected for

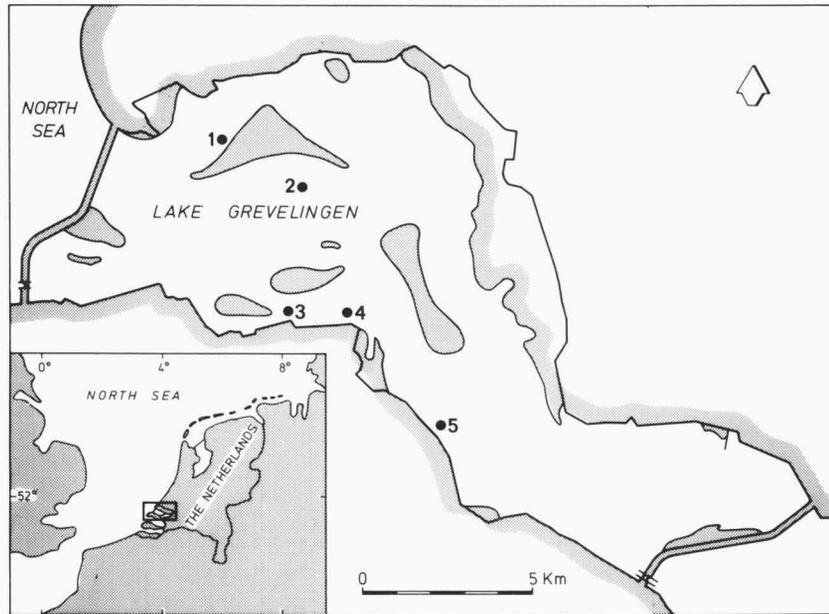


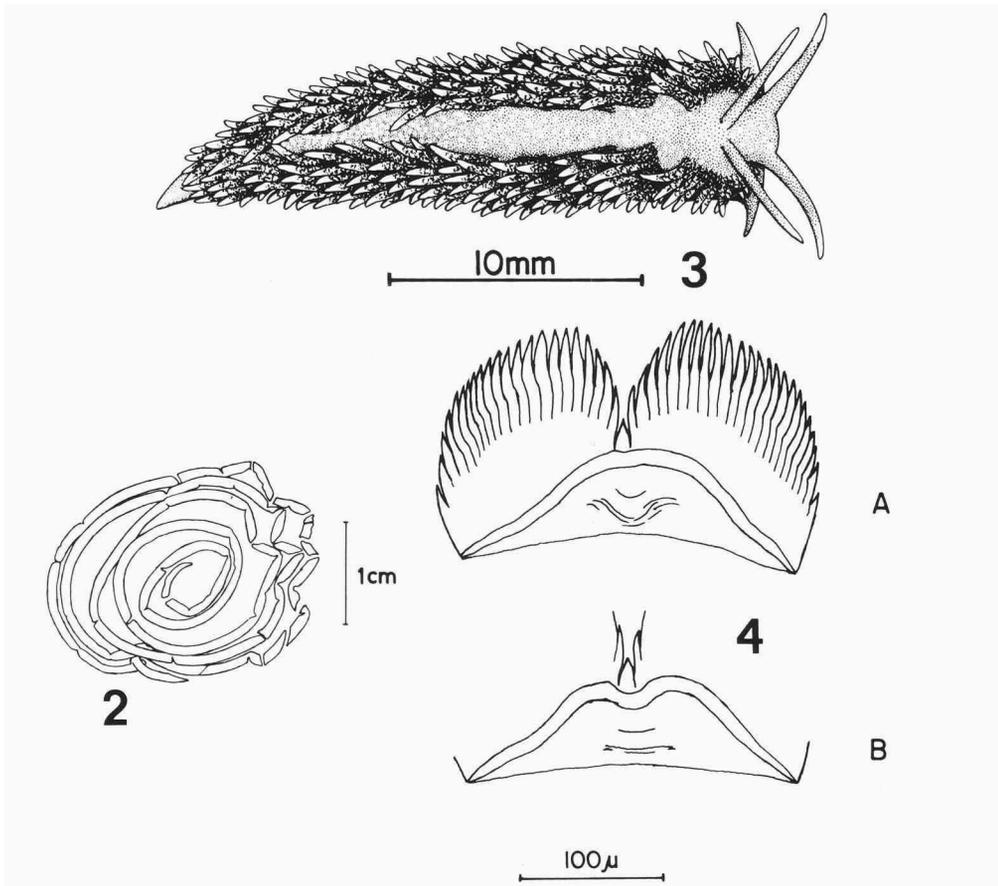
Fig. 1. Map of Lake Grevelingen, showing the localities where *Aeolidiella glauca* has been observed. 1. Hompelvoet; 2. Archipel; 3 and 4. Geul van Bommenede; 5. Dreischor.

description, dissection and identification. Slugs were anaesthetized in a  $MgSO_4$ /seawater solution and preserved in a 10% formalin/seawater solution. Determination indicated the presence of *Aeolidiella glauca*. Two of these collected specimens have been added to the RMNH collection, but not yet registered.

Habitus (fig. 3). — The length of the live animals collected ranged from 25 to 28 mm. Tentacles were 8 mm long, the rhinophores were shorter, about 6 mm. Body colour was creamy, with some orange in the cephalic and pericardial region. Tentacles and rhinophores were orange too, the latter with a lighter tip. Cerata were transparant, with a grey to brown coloured content which was clearly visible. Cnidosacs were generally transparant, but the central cerata had very light orange near the tip.

Radula (fig. 4). — Variation between radular teeth within one specimen is quite considerable. The teeth have a central denticle and on both sides a row of 22-24 lateral denticles. The basal line is regularly curved in most teeth, but in some teeth the part of the basal line near the central denticle is slightly curved downward.

Food. — On 1.ix.1984 attention was paid to the food of the slugs. Their



Figs. 2-4. *Aeolidiella glauca*. 2. Spawn after an in situ photograph by G.W.N.M. van Moorsel on 23.vi.1984 near Dreischor; 3. Habitus (after Thompson & Brown, 1984); 4. Radular teeth of a single individual, A. basal line regularly curved, B. basal line partly curved downward.

normal prey consists of sea anemones (Tardy, 1969) and in four cases slugs were found to eat sea anemones. Although *Sagartiogeton undatus* and *Diadumene cincta* were equally common, all slugs observed feeding preyed upon *Diadumene cincta*.

#### DISCUSSION

Tardy (1969) was able to feed *Aeolidiella glauca* on the sea anemones *Sagartiogeton undatus*, *Sagartia troglodytes* (Price, 1847) and *Diadumene cincta*, but found a strong preference for *Sagartiogeton undatus*. Brown and Picton

(1979) found *A. glauca* feeding on *Sagartiogeton laceratus* (Dalyell, 1848), a species not present in Dutch coastal waters. During the limited observations in Lake Grevelingen *A. glauca* only preyed upon *Diadumene cincta*, obviously neglecting the common *Sagartiogeton undatus*.

Up to 1983 only four individuals of *Aeolidiella glauca* had been found autochthonous along the Dutch coast, all in tidal waters on stones near the low water level. Two more specimens were found cast ashore on floating material on Dutch sandy beaches (Swennen, 1961: 223; pers. comm.). In 1983 and 1984 over 15 individuals were observed in Lake Grevelingen, suggesting a sudden development of this species. During the first six months of 1985, however, no more animals have been found in Lake Grevelingen.

Lake Grevelingen, in its present state as a salt lake, is a relatively young and unstabilized ecosystem. In many cases such young systems give opportunity to explosive development of many species. Nearly always such developments have a relatively short duration, ending in a decrease of numbers or even extinction from the system. At present it is not yet possible to foresee, what will happen with this small population of *A. glauca*, but the absence of reports of the species during the first half of 1985 may indicate an only short lasting presence of the species in Lake Grevelingen.

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