Polycera faeroensis Lemche, 1929, and Doto dunnei Lemche, 1976, new for the Dutch fauna and the central North Sea (Gastropoda, Nudibranchia)

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The nudibranchs *Polycera faeroensis* and *Doto dunnei* are reported for the first time from The Netherlands and the central North Sea. These two species were found during an expedition that focussed on identifying biodiversity in the Dutch part of North Sea, i.e. on the Cleaver Bank and the Dogger Bank. Directly after the expedition *Doto koenneckeri, Eubranchus tricolor* and *Tritonia hombergii* were mistakenly reported as being new to The Netherlands. The records of *D. koenneckeri* and *E. tricolor* concerned misidentifications whereas *Tritonia hombergii* was already known for The Netherlands. Additionally an updated list of the Dutch sea slugs, Sacoglossa and Nudibranchia (Gastropoda, Opisthobranchia) is given.

Key words: *Polycera, Doto,* Nudibranchia, Polyceridae, Dotidae, North Sea, Dutch fauna, Dogger Bank, Cleaver Bank.

INTRODUCTION

In 2004, a review was published by Van Bragt, listing the 49 nudibranch species that had been recorded in The Netherlands to that date, adding 11 species to an earlier overview (Swennen & Dekker, 1987). This review missed Doto millbayana Lemche, 1976, which was found in 1997, washed ashore on Ameland together with its egg-capsules on the bryozoan Plumularia setacea (Linnaeus, 1758) and was deposited in the Natural History Museum of Rotterdam (Moeliker, 1999). After 2004, one more record of a sea slug species new for The Netherlands was published (de Bruyne, 2007), i.e. Doto hydrallmaniae (Morrow, Thorpe & Picton, 1992). In June 2011 an expedition to the Dogger Bank and the Cleaver Bank took place, some results of which are reported here. This expedition concentrated on an understudied region of The Netherlands, i.e. the Dutch Continental Shelf, with a special focus on the Dogger Bank and the Cleaver Bank

(Schrieken et al., this issue: fig. 1). By scuba-diving, a rapid assessment was made of the species that live in hard substratum habitats, like wrecks and the rocky environment of the Cleaver Bank. Few prior studies focussed on these habitats (Van Moorsel, 2003) because scuba-diving, which is necessary to efficiently study hard substrata, is relatively difficult in the centre of the North Sea and can therefore only be done with a team of highly experienced divers and a well-equipped vessel.

Among the various species that were found to be new to The Netherlands, we here focus on only the nudibranchs. Directly after the expedition four nudibranch species were mentioned to the media as new to The Netherlands, i.e. *Polycera faeroensis, Doto koenneckeri, Eubranchus tricolor* and *Tritonia hombergii* (www.natuurbericht.nl/?id=6172&q= zeenaaktslak, June 23rd 2011). A more detailed study, however, showed that only *P. faeroensis* was correctly presented as such.

The specimens that were identified initially as *Doto koenneckeri* belong to *Doto dunnei*, which is also new to The Netherlands as is described below.

The specimen that was identified as *Eubranchus tricolor* appears to represent *E. farrani*, a species that was already recorded for The Netherlands in 2003 in both the Grevelingen en the Oosterschelde (Van Bragt, 2004). *Eubranchus tricolor* has many more cerata than *E. farrani*. This is a diagnostic character that can easily be used to distinguish the two species; it is clearly visible on the photographs of the specimen found during the Dogger Bank expedition (www.natuurbericht.nl/?id=6172&q=zeenaaktslak, June 23rd 2011). The misidentification of this specimen was based on the vague pigmentation of its rhinophores. In most specimens of *E. farrani* these rhinophores are strongly pigmented.

The fourth nudibranch species that was presented as new to The Netherlands immediately after the Dogger Bank expedition, i.e. *Tritonia hombergii*, was already observed along the Dutch coast in 1950, near IJmuiden, and in following years in limited populations in the southwestern part of The Netherlands (Van Bragt, 2004) and in the North Sea (Van Moorsel, 2003).

Here we describe the two species that are new for the Netherlands, especially their distribution and diagnostic characters. With these two, the total number of sea slug species recorded in the Netherlands has increased to 53. The most recent list of Dutch sea slug species (Gastropoda, Opisthobranchia, Sacoglossa and Nudibranchia) was presented almost 25 years ago by Swennen & Dekker (1987). More recently a review of all Dutch sea slugs was presented by Van Bragt (2004). Here we present an updated list of all the species recorded in the Netherlands (Table 1), indicating whether a particular species can or could occur autochthonously in The Netherlands. Some of the names in this list differ from the ones that are by Van Bragt (2004). Various names are synonymized (indicated in Table 1), following the world register of marine species (www.marinespecies.org) as the most recent source of accepted sea slug names.

Systematics

Polycera faeroensis Lemche, 1929 NL: Breedkop harlekijnslak

Differentiation. – Only one specimen of *Polycera faeroensis* was encountered on the Dogger Bank (Fig. 1). It was identi-

Figs 1-4. New nudibranchs for the Dutch fauna and the central North Sea. 1. Polycera faeroensis Lemche, 1929, on the wreck Jeanette Kristina in the Dutch part of the Dogger Bank (55 ° 17.116'N / 3° 26.972'E), 14.vi.2011. The white arrow indicates a lateral process (alongside the gills), which is flattened and has developed a number of yellow-tipped points along its edge. 2. Polycera quadrilineata (O.F. Müller, 1776), Oosterschelde, near Zierikzee, 1.x.2011. The white arrow indicates a lateral process (alongside the gills), which is single instead of flattened with a number of yellow-tipped points along its edge, as in P. faeroensis (Fig. 1). Polycera quadrilineata usually has four pigmented tentacles, but this specimen has six. 3. Detail of the tubercules in Doto dunnei Lemche, 1976, found on the hydroid Kirchenpaueria pinnata, 14.vi.2011, in the Dutch part of the Dogger Bank (55° 17.116'N / 3° 26.972'E). Multiple spots are visible on the surfaces of the cerata, in addition to the terminal spots on the tubercles. This is a diagnostic, distinguishing *D. dunnei* from various other Doto species. 4. Doto dunnei Lemche, 1976, specimens with their egg-capsules, on the about 10 cm long 'feathers' of the hydroid Kirchenpaueria pinnata, 16.vi.2011, in the Dutch part of the Cleaver Bank (54° 02.475'N / 3° 16.979'E).



fied on the basis of its 10 yellow tentacles and the flattened lateral processes (alongside the gills), which had developed several yellow-tipped points along their edges. Most similar to *P. faeroensis* is the species *P. quadrilineata* (O.F. Müller, 1776) (Fig. 2), which was already known from The Netherlands. The latter species differs from *P. faeroensis* in having less than 8, usually 4, but sometimes 6, yellow tentacles, as in a specimen from the Oosterschelde (Fig. 2). Another character that supports our identification concerns the lateral processes alongside the gills. In *P. quadrilineata* each of these have a single yellow-tip (Fig. 2), while in *P. faeroensis* these processes often flatten out and develop a number of yellowtipped points (Fig. 1; Rudman, 2006).

Distribution. — One specimen of *Polycera faeroensis* was observed 14.vi.2011 on the Dutch Dogger Bank (Fig. 3; 55° 17.116'N / 3° 26.972'E; Schrieken et al., this issue: loc. 1 in Fig. 1). This is the first published record of this species for The Netherlands, and probably for the central North Sea. *Polycera faeroensis* has previously been reported from Sweden, the Faeroe's and the western and southern coasts of the British Isles down to Spain (Picton & Morrow, 1994; Rudman, 2001a).

Habitat. — On the Dutch Dogger Bank *Polycera faeroensis* was seen on the wreck Jeanette Kristina at a depth of 30.2 meter. It was not found feeding. Picton & Morrow (1994) and Thompson & Brown (1984) indicate that this species feeds on erect bryozoans such as *Crisia denticulata, Cellepora pumicosa* and *Bugula plumosa*.

Doto dunnei Lemche, 1976 NL: Multistip kroonslak

Differentiation.- The specimens found on the Dogger Bank and Cleaver Bank were identified especially on the basis of their white body with red streaks of pigment, and the multiple spots on the surfaces of cerata in addition to the terminal spots on the tubercles, which are clearly visible in figure 3. This is diagnostic for the species according to Picton & Morrow (1994) although several other *Doto* species can have similar additional spots on the cerata. Also the fact that the specimens were found in June, on the hydroid *Kirchenpaueria pinnata* (Linnaeus, 1758), with their typical long concertina of white ribbon formed egg-capsules, supports this identification. Picton & Morrow (1994) also describe this egg-capsule form, indicating that the species feeds exclusively on the hydroid K. pinnata, whereas it is usually abundant in late spring. D. dunnei looks most similar to Doto millbayana Lemche, 1976, which is known to feed mainly on the hydroid Plumularia setacea. D. dunnei has egg-capsules of about 9 double bends (5-10 bends in the Dutch material), while the egg-capsules of *D. millbayana* have only 3-5 double bends (Lemche, 1976). Another diagnostic character, typical for D. dunnei egg-capsules, is the presence of a longitudinal almost egg-free zone in the middle of the egg band, which makes the whole spawn seems to be formed by two parallel, narrow bands (Lemche, 1976). This is visible in the egg-capsule top left of the nudibranch in Fig. 4. Other diagnostic characters of D. dunnei are the ground colour of the tubercles, which is much lighter than the brown coloration caused by the digestive gland in the ceras proper (Fig. 3), and the pigmentation that extends over the entire body except for the margin of the foot, the tip of the tail and a hyaline oblong area around the base of each ceras (Fig. 4; Lemche, 1976).

Distribution. - Doto dunnei was abundantly found, with egg-capsules, during a dive on 14.vi.2011 on the Dutch Dogger Bank (Fig. 3; 55° 17.116'N / 3° 26.972'E; Schrieken et al., this issue: loc. 1 in Fig. 1) and 16.vi.2011, during a dive on the Dutch Cleaver Bank (Fig. 4; 54° 02.475'N / 3° 16.979'E; Schrieken et al., this issue: loc. 3 in fig. 1). The maximum size of the individuals was about 13 mm. Six specimens were collected and preserved in ethanol, together with their host hydroids and numerous egg-capsules. The material will be deposited in the NCB Naturalis collection. These are the first published records of this species for The Netherlands, and probably for the central North Sea. Doto dunnei has previously been reported from the western seaboard of the British Isles, from Shetland and the Faroes, west Scotland and Ireland, southwards to the English Channel. Outside of Britain it was only known from off Galicia in Spain (Picton & Morrow, 1994; Rudman, 2001b) and from the coast of Portugal (Calado et al., 2003).

Habitat. — On the Dutch Dogger Bank and the Cleaver Bank, *D. dunnei* was found at depths of 30.8 and 33.8 meter. At both sites they were found together with their egg-cap-

#	Accepted species names	Dutch common name	Autochthonous
1	Acanthodoris pilosa (Abildgaard in Müller, 1789)	egelslak	Yes
2	Aeolidia vavillosa (Linnaeus, 1761)	grote vlokslak	Yes
3	Aeolidiella glauca (Alder & Hancock, 1845)	kleine vlokslak	Yes
4	Alderia modesta (Lovén, 1844)	gewone kwelderslak	Yes
5	Ancula gibbosa (Risso, 1818)	oranie plooislak	Yes
6	Cadlina laevis (Linnaeus, 1767)	gewone kaalslak	Probable
7	Corambe obscura (A. E. Verrill, 1870)	Zuiderzee-schiifslak	Yes
8	Cuthona amoena (Alder & Hancock, 1845)	gestippelde knotsslak	Yes
	* Van Bragt (2004): Trinchesia amoena	0 11	
0	Cuthong concines (Alder & Herzeck 1942)	rilvorblauvya knataalak	Vac
9	Cultonii concinnii (Alder & Hallcock, 1845)	ziiverbiauwe knoissiak	ies
	* Van Bragt (2004): Irinchesia concinna		
10	<i>Cuthona foliata</i> (Forbes & Goodsir, 1839)	gestreepte knotsslak	Yes
	* Van Bragt (2004): Trinchesia foliata		
11	Cuthong gummata (Couthoux 1838)	gorgolnijn knoteslak	Voc
11	* Mars Brasst (2004): Trivelacia annuala	gorgerpijp knotssiak	105
	" van Bragt (2004): Irinchesia gymnota		
12	Cuthona nana (Alder & Hancock, 1842)	zeerasp knotsslak	Yes
13	Cuthona rubescens Picton & Brown, 1978	karmozijnrode knotsslak	Yes
	* Van Bragt (2004): Trinchesia rubescens	,	
14	Dendronotus frondosus (Ascanius 1774)	boompiesslak	Yes
15	Doris nseudoarous Rapp 1827	citroenslak	Yes
	* Van Bragt (2004): Acanthadaria nagudagraya	chiotholux	100
1/	van bragt (2004). Acuninouoris pseudourgus	1 11, 1 11	
16	Doto coronata (Gmelin, 1/91)	roodgevlekte kroonslak	Yes
17	Doto dunnei Lemche, 1976	multistip kroonslak	Yes
18	Doto fragilis (Forbes, 1838)	trage kroonslak	Yes
19	Doto hydrallmaniae (Morrow, Thorpe & Picton, 1992)	zeeborstel kroonslak	Yes
20	Doto ct. maculata (Montagu, 1804)	kleine kroonslak	Unknown
21	Doto millbayana Lemche, 1976	millbayana kroonslak	Unknown
22	Doto ct. sarsiae Morrow, Thorpe & Picton, 1992	sarsia kroonslak	Unknown
23	Elysia viridis (Montagu, 1804)	groene wierslak	Yes
24	Eubranchus exiguus (Alder & Hancock, 1848)	plompe knuppelslak	Yes
25	Eubranchus farrani (Alder & Hancock, 1844)	gezwollen knuppelslak	Probable
26	Eubranchus pallidus (Alder & Hancock, 1842)	bleke knuppelslak	Yes
27	Eubranchus rupium (Møller, 1842)	noordelijke knuppelslak	Yes
28	Facelina auriculata (Muller, 1776)	gekroonde ringsprietslak	Yes
29	Facelina bostoniensis (Couthouy, 1838)	brede ringsprietslak	Yes
30	Flabellina gracilis (Alder & Hancock, 1844)	slanke waaierslak	Yes
31	Flabellina lineata (Loven, 1846)	witgestreepte waaierslak	Unknown
32	Flabellina pedata (Montagu, 1815)	paarse waaierslak	Probable
33	Geitodoris planata (Alder & Hancock, 1846)	millennium wratslak	res
34	Gonioaoris castanea Alder & Hancock, 1845	bruine piooisiak	res
35	Gonioaoris noaosa (Montagu, 1808)	bleke plooislak	res
27	International (Montagu, 1813)	statike roisprietstak	Ies Voc
20	Junous cristatus (dene Chiaje, 1841)	urattia tipio	Voc
20	Junious nyunnus (Ander & Fidilloock, 1004)	(gowono) aptimalal	Voc
39	Limacia alarrigora (O E Müller, 1776)	(gewone) saujnslak	Voc
40	Limmun chuolgern (O.F. Minller, 1774)	wrattige mosalerslak	165 Unknown
41	Limaponta capitala (O.F. Muller, 1774)	gewone schorreslak	Vac
42	Ouchidoric hilamallata (Lippeous, 1767)	rosso storslak	Voc
43	Onchidoris muricata (O E Millor 1776)	wrattige storslab	Voc
44	Palio nothus (Johnston 1828)	groene moediorelak	Voc
46	Placida dendritica (Alder & Hancock 1843)	groene rolenrietelak	Ves
47	Polycera faeroensis Lemche 1929	breedkon harlekiinslak	Unknown
48	Polycera auadrilineata (O F Miiller 1776)	harlekiinslak	Yes
49	Tenellia adspersa (Nordmann 1845)	brakwater knotsslak	Yes
50	Teroines teroines (Forskål 1775)	slanke knotsslak	Yes
51	Thecacera pennigera (Montagu 1815)	gestippelde mosdierslak	Yes
52	Tritonia homberoji Cuvier, 1803	grote tritonia	Yes
	* Van Bragt (2004). Tritonia hombergi	5.000 untoinu	
F 2			
53	1ritonia plebeia Johnston, 1828	kieine tritonia	res

Table 1. Sea slug species (Gastropoda, Opisthobranchia, Sacoglossa and Nudibranchia) reported for the Netherlands, with their Dutch common name. The prior list presented by Swennen & Dekker (1987) and the review presented by Van Bragt (2004) were used as a baseline for this table. The world register of marine species (www.marinespecies.org) is used as the source of the accepted names. In the column "Autochthonous" : "Yes" means that the species was found reproducing in the Dutch marine environment (e.g. spawn has been found); "Probable" refers to species of which specimens are repeatedly found, but no spawn was detected; "Unknown" stands for species that have only been found washed ashore and/or as single occurrences without spawn.

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sules, in high numbers on clumps of about 10 cm long
'feathers' of the hydroid species *Kirchenpaueria pinnata* (Fig.
4). Picton & Morrow (1994) and Lemche (1976) indicate that *D. dunnei* feeds exclusively on this hydroid.

Dutch common name etymology.— We here propose the Dutch common name "multistip kroonslak", which refers to the relatively high number of spots that this species has on its cerata in addition to the terminal spots on the tubercles.

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