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NEW EVIDENCE OF THE OCCURRENCE OF *KNOUTSODONTA PICTONI* (NUDIBRANCHIA, ONCHIDORIDIDAE) IN THE NORTHERN ADRIATIC

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ABSTRACT

The authors present new data on the recently described nudibranch Knoutsodonta pictoni *Furfaro & Trainito, 2017 in the Gulf of Trieste (northern Adriatic Sea). We hereby present the first record of this species in Slovenian territorial waters. A total of 22 specimens of* K. pictoni *were recorded by diving in the period from 2017 to 2021 at five localities in the Gulf of Trieste. All specimens were found in precoralligenous habitats in the depth range of 5 to 9 m, feeding on the encrusting bryozoan* Reptadeonella violacea *(Johnston, 1847). Numerous finds indicate that this only recently described and therefore little known nudibranch is much less rare than previously thought.*

Key words: *Knoutsodonta pictoni*, Gulf of Trieste, sea slug, precoralligenous, cryptic species

NUOVE PROVE DELLA PRESENZA DI *KNOUTSODONTA PICTONI* (NUDIBRANCHIA, ONCHIDORIDIDAE) NELL'ADRIATICO SETTENTRIONALE

SINTESI

Gli autori presentano nuovi dati su una specie di nudibranco descritta recentemente, Knoutsodonta pictoni *Furfaro & Trainito, 2017, nel Golfo di Trieste (Adriatico settentrionale). L'articolo fornisce il primo ritrovamento della specie nelle acque territoriali slovene. Un totale di 22 esemplari di* K. pictoni *sono stati trovati durante le immersioni effettuate nel periodo dal 2017 al 2021, in cinque località del Golfo di Trieste. Tutti gli esemplari sono stati rinvenuti in habitat precoralligeni, nell'intervallo di profondità da 5 a 9 m, mentre si nutrivano del briozoo incrostante* Reptadeonella violacea *(Johnston, 1847). I numerosi ritrovamenti indicano che questo nudibranco, descritto solo recentemente e quindi poco conosciuto, è molto meno raro di quanto si pensasse.*

Parole chiave: *Knoutsodonta pictoni*, Golfo di Trieste, lumaca di mare, precoralligeno, specie criptica

INTRODUCTION

Knoutsodonta pictoni Furfaro & Trainito, 2017 (Fig. 1) is a recently described nudibranch of the family Onchidorididae Gray, 1827. It is distributed in the western Mediterranean Sea in Spain (Ballesteros *et al.*, 2016; OPK Opistobranquis, 2020), in the Tyrrhenian and Ligurian Seas in Italy (Betti *et al.*, 2017; Furfaro & Trainito, 2017), and in the northeast Atlantic Ocean in Ireland and Scotland (Hallas & Gosliner, 2015; Furfaro & Trainito, 2017 and references therein; nudibranch.org, 2021). The first record of the species in the Adriatic Sea was reported by Furfaro & Trainito (2017) in Sistiana, Gulf of Trieste. Morphological features characteristic of the species are: elliptical and dorsally flattened body with bristly appearance; base colour dark brown with blue and white speckles on the mantle; rhinophores white with 9 to 11 lamellae; gills dark brown with 9 to 10 bipinnate branchial leaves (Furfaro & Trainito, 2017).

The aim of this short note is to provide new data on the occurrence of this species in the Gulf of Trieste and on the ecology of this nudibranch, as well as reporting the first record of this species for the Slovenian coasts.

MATERIAL AND METHODS

Observations and sampling were carried out by scuba diving in the Italian and Slovenian parts of the Gulf of Trieste between 2017 and 2021, more specifically in Sistiana and Sistiana Castelreggio in the northern part of the Gulf of Trieste, in Barcola near the town of Trieste, and in the southern part of the gulf, Piranček and Fiesa near the town of Portorož.

In Italy, the nudibranchs were observed from 2017 to 2020. Specimens were photographed with a Sea & Sea 2G camera with a Sea & Sea DS1 strobe using Nauticam CMC1 macro lens, and identified *in situ*. Depth and temperature were recorded at all sites.

In Slovenia, several bryozoan species were collected during a marine biodiversity survey in Natura 2000 sites in summer 2021. Depth and temperature were recorded. Nudibranchs and the bryozoan colonies on which they were found were identified in the laboratory and photographed under a stereomicroscope (Olympus SZX16) with a digital camera (Olympus DP25), with the nudibranchs subsequently deposited in the malacological collection.

Specimens were identified using the diagnostic features described by Furfaro & Trainito (2017). Systematics and validity of names were checked using the World Register of Marine Species [WoRMS].

RESULTS AND DISCUSSION

A total of 22 specimens (20 of which found in Italy and 2 in Slovenia) and 6 egg masses (found only in Italy) were photographed over a five-year period (from 2017 to 2021; see Tab. 1 for details). All specimens displayed the same colour pattern with little chromatic variability. In general, this species was found in winter and summer on precoralligenous rocky bottoms 5 to 9 m deep and in a temperature zone ranging from 7 to 26°C. The habitats where the specimens were observed were located under

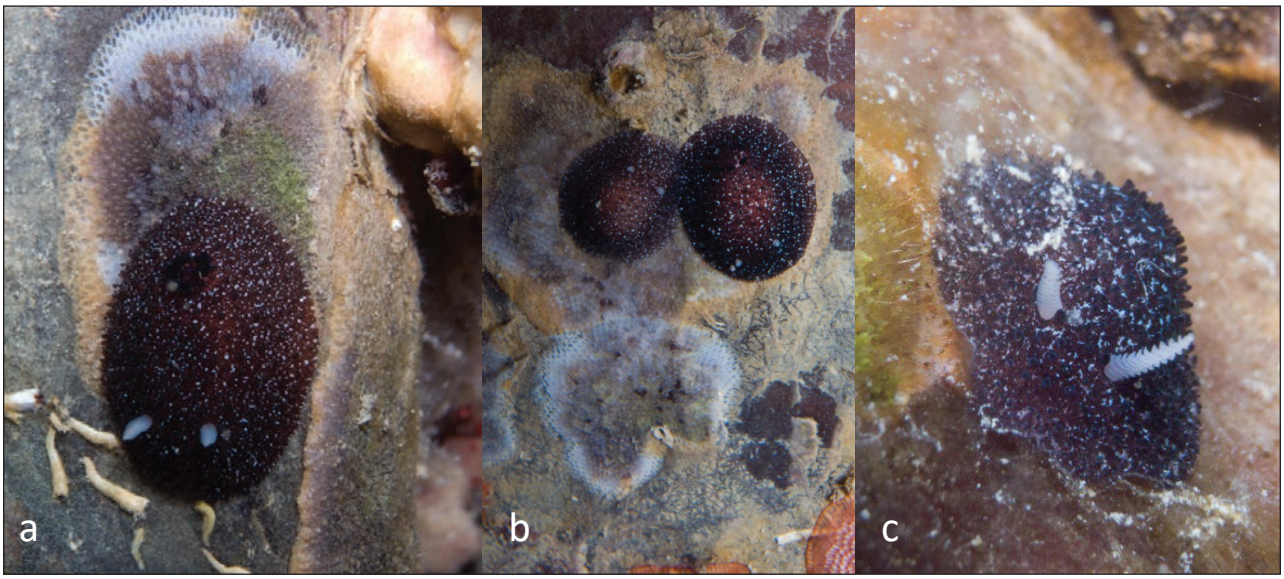

Fig. 1: *Knoutsodonta pictoni****; a – specimen feeding on the bryozoan*** *Reptadeonella violacea****, b – two specimens, and c – close-up of a specimen with visible white lamellate rhinophores (Photo: M. Fantin).***
Sl. 1: *Knoutsodonta pictoni****; a – primerek se prehranjuje na mahovnjaku*** *Reptadeonella violacea****, b – dva primerka, in c – bližinski posnetek primerka z vidnima lamelastima rinoforjema (Foto: M. Fantin).***

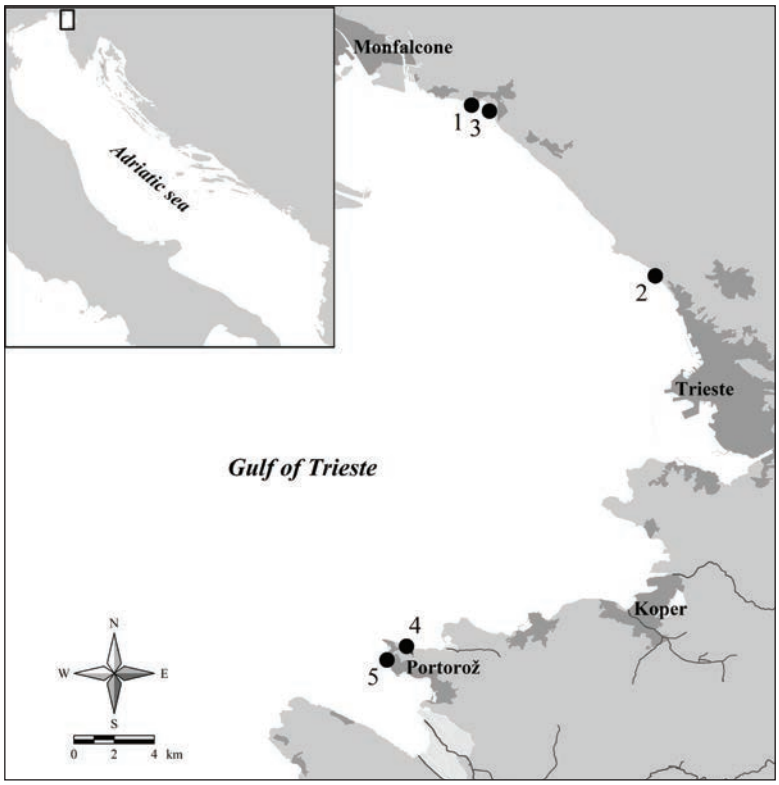

Fig. 2: Map of the Gulf of Trieste with five localities where the specimens of *Knoutsodonta pictoni* ***were found (black dots). The numbers next to the black dots represent the localities listed in Tab. 1.***
Sl. 2: Zemljevid Tržaškega zaliva s petimi lokalitetami, kjer so bili najdeni primerki vrste *Knoutsodonta pictoni* ***(črni krogci). Številke poleg krogcev označujejo lokalitete, ki so navedene v Tab. 1.***

Tab. 1: Data on the occurrence of *Knoutsodonta pictoni* ***in the Gulf of Trieste in the period 2017–2021.***
Tab. 1: Podatki o pojavljanju vrste *Knoutsodonta pictoni* ***v Tržaškem zalivu v obdobju med 2017 in 2021.***

date	locality number	locality	GPS N	GPS E	n	egg mass	depth (m)	T (°C)
14.1.2017	1	Sistiana	45°46′7.88″	13°37′21.19″	2	1	7	7
21.1.2017	2	Barcola	45°41′30.53″	13°44′20.26″	2	1	4	7
29.1.2017	1	Sistiana	45°46′7.88″	13°37′21.19″	2		8	8
30.1.2017	3	Sistiana Castelreggio	45°45′58.21″	13°38′2.04″	2		8	8
4.2.2017	3	Sistiana Castelreggio	45°45′58.21″	13°38′2.04″	2	1	9	9
5.2.2017	3	Sistiana Castelreggio	45°45′58.21″	13°38′2.04″	2		8	9
18.2.2017	1	Sistiana	45°46′7.88″	13°37′21.19″	2	1	9	9
10.2.2018	3	Sistiana Castelreggio	45°45′58.21″	13°38′2.04″	2	1	7	10
24.2.2018	3	Sistiana Castelreggio	45°45′58.21″	13°38′2.04″	2	1	8	10
10.3.2018	1	Sistiana	45°46′7.88″	13°37′21.19″	1		9	11
2.6.2020	1	Sistiana	45°46′7.88″	13°37′21.19″	1		8,5	16
20.7.2021	4	Fiesa	45°31′38.4″	13°34′42.54″	1		7	21
29.7.2021	5	Piranček	45°31′16.75″	13°33′57.45″	1		5	26

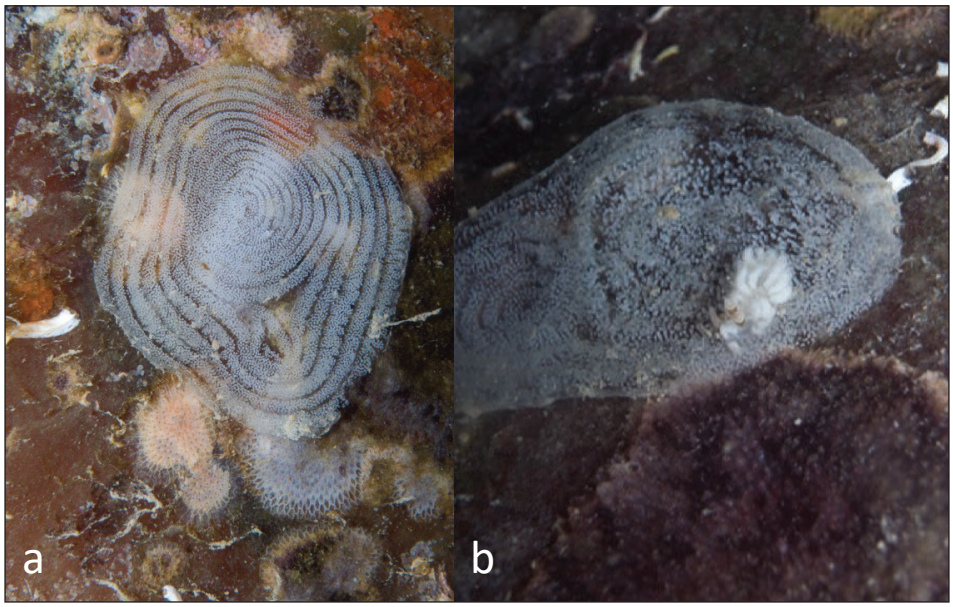

Fig. 3: Spawn of** Knoutsodonta pictoni**; a – white ribbon with eggs on the bryozoan** Reptadeonella violacea**, b – oviphagous nudibranch** Favorinus branchialis **feeding with the eggs of** K. pictoni **(Photo: M. Fantin).
Sl. 3: Mrest vrste** Knoutsodonta pictoni**; a – beli svitek z jajci na mahovnjaku vrste** Reptadeonella violacea**, b – ovifagni gološkrgar vrste** Favorinus branchialis **se hrani z jajci vrste** K. pictoni **(Foto: M. Fantin).

stones, on molluscan shells, and on rocks. In Sistiana the nudibranch was regularly observed in 2017, 2018, and 2020, in Sistiana Castelreggio it was recorded in the winters of 2017 and 2018, and in Barcola only once, in winter 2017. The spawning activities were observed from late January to May. The egg masses were white, concentrically folded and ribbon-shaped (Fig. 3a). On one occasion, an oviphagous nudibranch, *Favorinus branchialis* (Rathke, 1806), was photographed devouring an egg mass of *K. pictoni* (Fig. 3b). With regard to findings along the Slovenian coast, only two specimens were found in summer 2021, both small-sized (between 3 and 4 mm), probably juveniles.

The ecology of *K. pictoni,* being this nudibranch a recently described species, is poorly known. However, the numerous findings reported in this study indicate that it is far less rare than previously thought. All the specimens collected were found feeding on the encrusting cheilostomatid bryozoan *Reptadeonella violacea* (Johnston, 1847). The same was observed by Furfaro & Trainito (2017), suggesting a preferential predatory relationship. In fact, it is not uncommon for nudibranchs to feed on one prey species only (Todd & Havenhand, 1989). *R. violacea* is a common bryozoan species in the shallow waters of the Mediterranean Sea, living as an epiphyte in *Posidonia* meadows, on algae (Novosel, 2005), on the underside of stones, and on molluscan shells. Nudibranchs are mostly known as vividly coloured heterobranchs, while species with cryptic colouration are less well known. They use various camouflage strategies such as homochromy, countershading, and cryptic or disruptive colouration (Todd, 1981). These cryptic species, such as *K. pictoni*, were often overlooked in the past, due to their excellent camouflage. In fact, to date, only three species of the family Onchidoridae [*K. pictoni*; *K. neapolitana* (Delle Chiaje, 1841) and *K. depressa* (Alder & Hancock, 1842)] have been recorded in the Gulf of Trieste and throughout the northern Adriatic Sea (Ciriaco & Poloniato, 2016; Zenetos *et al.*, 2016; Furfaro & Trainito, 2017; Lipej *et al.*, 2018; present study). Therefore, continuous monitoring is necessary to extend our knowledge of these particular species, which often go unnoticed.

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NOVI PODATKI O POJAVLJANJU VRSTE *KNOUTSODONTA PICTONI* (NUDIBRANCHIA, ONCHIDORIDIDAE) V SEVERNEM JADRANU

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POVZETEK

Avtorji poročajo o novih najdbah pred kratkim opisanega polža gološkrgarja vrste Knoutsodonta pictoni *Furfaro & Trainito, 2017 v Tržaškem zalivu (severni Jadran). Navajajo prvi zapis o pojavljanju te vrste za slovenske vode. V obdobju med 2017 in 2021 je bilo na potapljaških vzorčenjih popisanih skupno 22 primerkov vrste* K. pictoni *na petih lokalitetah v Tržaškem zalivu. Vsi primerki so bili najdeni v prekoraligenu v globinskem pasu med 5 in 9 m, kjer so se prehranjevali s skorjastim mahovnjakom vrste* Reptadeonella violacea *(Johnston, 1847). Številne najdbe kažejo, da je ta pred kratkim opisana in slabo poznana vrsta pogostejša, kot so domnevali doslej.*

Ključne besede: *Knoutsodonta pictoni*, Tržaški zaliv, gološkrgarji, prekoraligen, kriptična vrsta

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