Data in brief 25 (2019) 104068

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/dib

Data Article

Data on the diet composition of *Hippocampus guttulatus* cuvier, 1829: Different prey preferences among habitats

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ARTICLE INFO

Article history:
Received 19 April 2019
Received in revised form 13 May 2019
Accepted 21 May 2019
Available online 27 May 2019

Keywords:
Hippocampus guttulatus
Gut content
Prey availability
Habitat type

ABSTRACT

The data presented here support research article entitled 'Trophic flexibility and prey selection of the wild long-snouted seahorse *Hippocampus guttulatus* Cuvier, 1829 in three coastal habitats" Ape et al., 2019. Determinations of the dietary composition, differences in prey selection and potential prey abundance and availability among three habitats at Taranto Mar Piccolo were based on the analysis of gut contents of seahorses and sediment samples. Both highly (*Corallina elongata* and *Cladophora prolifera*) and low complex (sandy bottom) habitats were investigated. Prey items were divided into two size classes: <1 mm and >1mm. Data about the total abundance of each prey size class in gut contents and sediments in three different habitats and PERMANOVA comparisons are given.

1. Data

Data presented describe investigated habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera;* Table 1), total abundance of prey items found in seahorse gut contents and in sediments of each habitat (Table 2). In Tables 3 and 4, the results of PERMANOVA analyses, performed to establish

DOI of original article: https://doi.org/10.1016/j.ecss.2019.04.034.
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https://doi.org/10.1016/j.dib.2019.104068

Specifications table

Subject area	*Ecology*
More specific subject area	*Dietary and foraging ecology*
Type of data	*Tables*
How data was acquired	*Gut contents of seahorses were obtained by flushing method, while sediments used for the study of benthic fauna were manually sampled by three replicate cores. Organisms were counted and classified at the major taxa level of taxonomic discrimination using a stereomicroscope (after extraction from sediments and algal fragments in case of benthic organisms). Statistical analyses were performed using PRIMER v6 + software.*
Data format	*Raw and analyzed*
Experimental factors	*Gut contents of 83 individuals of Hippocampus guttulatus and samples of benthic fauna from three different habitats at Taranto Mar Piccolo were analyzed.*
Experimental features	*Taxonomical identification of the ingested prey from gut contents and potential prey from benthic faunal samples to determine diet of H. guttulatus and investigate the differences in the diet composition respect to the prey availability in different habitats.*
Data source location	*Taranto Mar Piccolo, Southern Italy*
Data accessibility	*Data are included in this article*
Related research article	*F. Ape, G. Corriero, S. Mirto, C. Pierri, T. Lazic, M. Gristina. Trophic flexibility and prey selection of the wild long-snouted seahorse Hippocampus guttulatus Cuvier, 1829 in three coastal habitats. Estuar. Coast. Shelf Sci., 224, 2019, 1–10.*

Value of the data

- The presented data show that gut content analysis is a valuable tool to determine the dietary composition of seahorses. Obtained dietary information can be used by other researchers.
- Data enabled the determination of the dietary composition of long-snouted seahorses as well as differences in the prey preferences among investigated habitats.
- Flushing method, adopted by this work and used to sample gut contents, allowed to appreciate the importance of prey without calcareous/chitinous exoskeleton, such as nematodes.
- Overall, collected data could help to understand the variability and consistency of ecological requests of this species and could help to comprehend better the patchy distribution of seahorses.

differences in the diet among three habitats in terms of total abundance, abundance of the different size classes (<1mm, > 1mm), taxa richness and composition of prey, are reported. Finally, PERMANOVA analyses, carried out to determine the differences in total abundance of benthic fauna, abundance of different size classes (<1mm, > 1mm), taxa richness and community composition among investigated habitats, are presented in Tables 5 and 6.

2. Experimental design, materials and methods

Data were gathered from 83 specimens of *Hippocampus guttulatus* collected at Taranto Mar Piccolo in Southern Italy from habitats of different complexity: two highly (*Corallina elongata* and *Cladophora*

Table 1
Descriptions, extensions (m^2) and depth ranges (m) of the sampled habitat types (*Corallina elongata*, sandy bottom and *Cladophora prolifera*).

Habitat	Description	Surface (m^2)	Depth range (m)
Corallina elongata	*Corallina elongata* forms a dense turf on the vertical side of the concrete wall. The algal turf, interrupted by brown algae (*Cystoseira* sp., *Dictyota dichotoma*) and filter feeders (large sabellids, both colonial and solitary ascidians, demosponges, bryozoans and hydrozoans), provides substratum and refuges for diverse epifaunal organisms.	5.504	0.4–0.7
Soft bottoms	Near the coastline, soft bottoms are mixed with a large amount of organogenous concretions (bivalve and gastropods shells), small stones and artificial hard substrates that are mainly colonized by sabellids and solitary ascidians.	4.419	1.6–2.2
Cladophora prolifera	Large beds interspersed with soft bottom. Sabellid polychaetes, solitary and colonial ascidians are scattered on the substrate. Ceriantharia *Pachycerianthus solitarius* may be locally abundant.	7.471	3.3–3.9

Table 2
Abundance (N = mean ± standard deviation) of each size class of organisms found in the guts of *H. guttulatus* and in the sediments in three different habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera*). Data on the total abundance (sum of organisms < 1mm and > 1mm) of organisms found in the guts and sediments in three habitats are published in Tables 1 and 3, respectively, of the article: Trophic flexibility and prey selection of the wild long-snouted seahorse *Hippocampus guttulatus* Cuvier, 1829 in three coastal habitats [1].

Taxa	*Corallina elongata*				Sandy bottom				*Cladophora prolifera*			
	Gut content		Sediment content		Gut content		Sediment content		Gut content		Sediment content	
	<1mm	>1mm	<1mm	>1mm	<1mm	>1mm	<1mm	>1mm	<1mm	>1mm	<1mm	>1mm
Nematoda	12.4 ± 8.9	0.0	790.0 ± 388.0	0.0	5.0 ± 8.0	0.0	122.0 ± 13.5	0.0	4.0 ± 3.5	0.0	92.3 ± 11.0	0.0
Copepoda	14.5 ± 10.0	0.0	398.5 ± 78.5	0.0	4.1 ± 3.3	0.0	403.0 ± 136.8	0.0	8.7 ± 5.8	0.0	262.0 ± 73.0	0.0
Harpacticoida	12.2 ± 8.4	0.0	322.0 ± 52.0	0.0	2.4 ± 2.3	0.0	244.0 ± 72.3	0.0	7.2 ± 5.9	0.0	226.0 ± 58.9	0.0
Calanoida	0.0	0.0	0.0	0.0	0.2 ± 0.5	0.0	0.0	0.0	0.1 ± 0.4	0.0		
Cyclopoida	0.2 ± 0.5	0.0	8.0 ± 4.0	0.0	0.1 ± 0.3	0.0	2.3 ± 0.6	0.0	0.8 ± 2.0	0.0	4.3 ± 1.5	0.0
Nauplia	2.1 ± 3.0	0.0	68.5 ± 29.5	0.0	1.4 ± 1.7	0.0	176.7 ± 65.6	0.0	0.7 ± 1.3	0.0	31.7 ± 14.5	0.0
Polychaeta	0.6 ± 0.8	0.0	378.0 ± 13.0	1.5 ± 0.5	0.0 ± 0.2	0.0	61.7 ± 20.1	4.7 ± 1.5	0.2 ± 0.4	0.0	45.3 ± 15.0	3.7 ± 2.9
Ostracoda	0.5 ± 0.8	0.0	22.0 ± 1.0	0.0	0.0 ± 0.2	0.0	0.0	0.0	0.0	0.0	7.0 ± 4.0	0.0
Amphipoda	5.7 ± 4.7	10.0 ± 7.8	67.5 ± 1.5	5.5 ± 0.5	0.1 ± 0.2	0.7 ± 1.1	11.7 ± 2.5	2.0 ± 1.0	0.8 ± 1.2	9.3 ± 9.2	19.3 ± 4.7	14.3 ± 9.3
Unidentified	5.7 ± 4.7	9.6 ± 7.9	67.5 ± 1.5	5.5 ± 0.5	0.1 ± 0.2	0.4 ± 0.8	11.7 ± 2.5	2.0 ± 1.0	0.8 ± 1.2	8.8 ± 9.2	19.3 ± 4.7	14.3 ± 9.3
Caprellidae	0.0	0.4 ± 0.7	0.0	0.0	0.0	0.3 ± 0.8	0.0	0.0	0.0	0.6 ± 0.9	0.0	0.0
Isopoda	2.6 ± 2.3	7.4 ± 5.1	29.0 ± 12.0	1.5 ± 1.5	0.3 ± 0.7	1.3 ± 2.0	0.7 ± 1.2	0.0	1.0 ± 2.6	1.3 ± 1.9	2.3 ± 1.5	1.3 ± 0.6
Unidentified	1.1 ± 1.9	7.4 ± 5.1	4.0 ± 3.0	1.5 ± 1.5	0.3 ± 0.7	1.3 ± 2.0	0.7 ± 1.2	0.0	0.2 ± 0.5	1.3 ± 1.9	0.7 ± 0.6	1.3 ± 0.6
Asellota	1.5 ± 2.0	0.0	25.0 ± 9.0	0.0	0.0 ± 0.2	0.0	0.0	0.0	0.7 ± 2.2	0.0	1.7 ± 1.2	0.0
Tanaidacea	0.1 ± 0.3	0.0	4.5 ± 3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Galatheoidea	0.0	1.0 ± 2.5	0.0	0.0	0.0	3.3 ± 4.7	0.0	0.0	0.0	1.8 ± 3.8	0.0	0.0
Paguroidea	0.0	0.0 ± 0.2	0.0	0.0	0.0	0.3 ± 0.5	0.0	0.0	0.0	0.0	0.0	0.0
Mysidacea	0.0	0.6 ± 2.7	0.0	0.0	0.0	0.1 ± 0.3	0.0	0.0	0.0	0.0 ± 0.2	0.0	0.0
Bivalvia	0.0	0.0	0.0	1.0 ± 0.0	0.0 ± 0.2	0.0	0.0	0.3 ± 0.6	0.0	0.0	1.0 ± 1.7	0.0
Gastropoda	0.0	0.0	0.0	3.5 ± 1.5	0.1 ± 0.6	0.0	0.3 ± 0.6	0.0	0.0	0.0	0.0	0.0
Acarina	0.1 ± 0.3	0.0	0.5 ± 0.5	0.0	0.1 ± 0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pycnogonida	0.0	0.0	0.0	0.0	0.0	0.0 ± 0.2	0.0	0.0	0.0	0.0 ± 0.2	0.0	0.0
Turbellaria	0.0	0.0	0.5 ± 1.5	0.0	0.0	0.0	0.7 ± 1.2	0.0	0.0	0.0	0.7 ± 1.2	0.0
Ophiuroidea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3 ± 0.6	0.0

Table 3
Results of PERMANOVA analysis carried out to ascertains the differences in gut contents of *H. guttulatus* among three habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera*) in terms of total abundance of prey items, preys < 1mm, preys > 1mm, number of higher taxa and community composition of prey items (df = degree of freedom, MS = mean square, Pseudo-F = F statistic, P(perm) = probability level; *** = P < 0.001; ** = P < 0.01; * = P < 0.05, n.s. = not significant).

PERMANOVA Main test					
Variable	Source	df	MS	Pseudo-F	P(perm)
Total abundance	Habitat	2	1703.4	40.8	***
	Residual	80	41.7		
	Total	82			
Prey < 1mm	Habitat	2	1965.5	25.5	***
	Residual	80	76.9		
	Total	82			
Prey > 1mm	Habitat	2	2235.6	6.5	***
	Residual	80	345.6		
	Total	82			
Taxa	Habitat	2	1153.5	7.2	**
	Residual	80	160.5		
	Total	82			
Community	Habitat	2	9061.1	14.0	***
	Residual	80	645.3		
	Total	82			

prolifera) and one low complex (sandy bottom) habitat. To investigate a spectrum of prey items present in the habitat so as to determine seahorse's prey preferences, benthic faunal samples were also collected.

Seahorses, selected according to their appearance, were hand-picked by SCUBA divers, morphometrically measured and then transferred to the containers containing filtered seawater (30 μm mesh) and clove oil (0.05%), a natural anesthetic [2,3]. To obtain gut contents, the technique of stomach

Table 4
Results of PERMANOVA pairwise analysis carried out to ascertains the differences in gut contents of *H. guttulatus* among three habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera*) in terms of total abundance of prey items, preys < 1mm, preys > 1mm, number of higher taxa and community composition of prey items (P(perm) = probability level; *** = P < 0.001; ** = P < 0.01; * = P < 0.05, n.s. = not significant).

PERMANOVA Pairwise			
Variable	Groups	t	P(perm)
Total abundance	*Corallina elongata*, Sandy bottom	8.7	***
	Corallina elongata, *Cladophora prolifera*	5.0	***
	Sandy bottom, *Cladophora prolifera*	4.0	***
Prey < 1mm	*Corallina elongata*, Sandy bottom	7.3	***
	Corallina elongata, *Cladophora prolifera*	4.6	***
	Sandy bottom, *Cladophora prolifera*	2.2	*
Prey > 1mm	*Corallina elongata*, Sandy bottom	3.8	***
	Corallina elongata, *Cladophora prolifera*	1.6	n.s.
	Sandy bottom, *Cladophora prolifera*	1.9	*
Taxa richness	*Corallina elongata*, Sandy bottom	3.7	***
	Corallina elongata, *Cladophora prolifera*	3.1	**
	Sandy bottom, *Cladophora prolifera*	0.6	n.s.
Community	*Corallina elongata*, Sandy bottom	4.6	***
	Corallina elongata, *Cladophora prolifera*	2.9	***
	Sandy bottom, *Cladophora prolifera*	3.1	***

Table 5
Results of PERMANOVA analysis carried out to ascertains the differences in sediment contents among three habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera*) in terms of total abundance of benthic fauna, organisms < 1mm, organisms > 1mm, number of higher taxa and community composition (df = degree of freedom, MS = mean square, Pseudo-F = F statistic, P(MC) = probability level; *** = P < 0.001; ** = P < 0.01; * = P < 0.05, n.s. = not significant).

PERMANOVA Main test					
Variable	Source	df	MS	Pseudo-F	P(MC)
Total abundance	Habitat	2	225.2	36.5	***
	Residual	6	6.2		
	Total	8			
Organisms < 1mm	Habitat	2	235.5	33.9	***
	Residual	6	6.9		
	Total	8			
Organisms > 1mm	Habitat	2	94.3	2.7	n.s.
	Residual	6	34.5		
	Total	8			
Taxa	Habitat	2	772.1	20.6	**
	Residual	6	37.4		
	Total	8			
Community	Habitat	2	951.8	13.5	***
	Residual	6	70.5		
	Total	8			

flushing was applied [1,3]. The water inside the container was sieved through 30 μm mesh. The fraction retained on the sieve was preserved in 50 ml tubes and in 4% buffered formalin and Rose Bengal (0.5 g l^{-1}). Benthic faunal samples were collected from the same habitats as seahorses. In each habitat, three replicate cores (with a diameter of 3.7 cm) were considered. Obtained samples were fixed in 4% buffered formaldehyde in filtered (0.3 μm mesh) seawater solution and in the laboratory, organisms were extracted from sediments by different techniques [4,5]. For both types of samples, the benthic faunal composition was assessed by visual identification under the stereomicroscope. Two size classes of organisms were identified: larger (>1mm) and smaller (i.e. meiofauna < 1mm). A detailed explanation of procedures is provided in [1]. Univariate and multivariate distance-based permutational nonparametric analyses of variance (PERMANOVA) [6,7] were performed including habitat (three levels: *Corallina elongata*, sandy bottom and *Cladophora prolifera*) as a fixed factor.

Table 6
Results of PERMANOVA pairwise analysis carried out to ascertains the differences in sediment contents among three habitats (*Corallina elongata*, sandy bottom and *Cladophora prolifera*) in terms of total abundance of benthic fauna, organisms < 1mm, number of higher taxa and community composition (P(MC) = probability level; *** = P < 0.001; ** = P < 0.01; * = P < 0.05, n.s. = not significant).

PERMANOVA Pairwise			
Variable	Groups	t	P(MC)
Total abundance	*Corallina elongata*, Sandy bottom	6.0	**
	Corallina elongata, *Cladophora prolifera*	9.0	***
	Sandy bottom, *Cladophora prolifera*	1.7	n.s.
Organisms < 1mm	*Corallina elongata*, Sandy bottom	6.0	**
	Corallina elongata, *Cladophora prolifera*	8.4	**
	Sandy bottom, *Cladophora prolifera*	1.8	n.s.
Taxa richness	*Corallina elongata*, Sandy bottom	7.0	**
	Corallina elongata, *Cladophora prolifera*	3.6	*
	Sandy bottom, *Cladophora prolifera*	2.6	n.s.
Community	*Corallina elongata*, Sandy bottom	4.7	**
	Corallina elongata, *Cladophora prolifera*	4.3	**
	Sandy bottom, *Cladophora prolifera*	2.1	*

Acknowledgements

Thanks to Carlo Pipitone for helping in identifying feeding items. A special thanks to Dr Fabio Lunetta for assisting in anesthetic and catheter procedures.

The authors received no specific funding for this work.

Transparency document

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2019.104068.

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