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# *CLINITRACHUS ARGENTATUS* (RISSO, 1810) (PERCIFORMES: CLINIDAE) – A LESS KNOWN FISH SPECIES IN SLOVENIAN COASTAL WATERS (ADRIATIC SEA)

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## *ABSTRACT*

*The data regarding the occurrence of the Cline (*Clinitrachus argentatus*) in the Adriatic Sea are scarce, limited and sporadic. In the Slovenian sea only three specimens were observed in the past decades. The paper presents new findings of the species from 2013 to 2016, when some specimens were occasionally manually collected in shallow waters. Data about habitat preferences, depth range, total lengths and meristic counts are reported. The aim of the study is also to discuss the reasons for the underestimation of the occurrence of* C. argentatus *in the area.*

**Key words:** *Clinitrachus argentatus,* shallow waters, overlooked species, habitat preferences, Adriatic Sea

# *CLINITRACHUS ARGENTATUS* (RISSO, 1810) (PERCIFORMES: CLINIDAE) – UNA SPECIE ITTICA MENO CONOSCIUTA IN ACQUE COSTIERE SLOVENE (MARE ADRIATICO)

*SINTESI*

*I dati riguardanti la presenza della bavosella d'alga (*Clinitrachus argentatus*) nel mare Adriatico sono scarsi, limitati e sporadici. Nel mare sloveno sono stati osservati solo tre esemplari negli ultimi decenni. L'articolo presenta nuovi ritrovamenti della specie nel periodo dal 2013 al 2016, quando alcuni esemplari sono stati raccolti per caso manualmente in acque poco profonde. Sono inoltre riportati i dati inerenti: preferenze di habitat, intervallo di profondità, lunghezze totali e conteggi meristici. Lo scopo dello studio è anche quello di discutere le ragioni della sottostima della presenza di* C. argentatus *nell'area.*

**Parole chiave:** *Clinitrachus argentatus,* acque poco profonde, specie trascurata, preferenze ambientali, mare Adriatico

## INTRODUCTION

*Clinitrachus argentatus* (Risso, 1810), commonly named the Cline, belongs to the family Clinidae and is the only known species of this genus. It is named after the shape of four apophyses of the sfenoid bone at the base of the skull (from Greek, *klinein, klines* = sloping and bed) (Froese & Pauly, 2016). The species is commonly found in shallow waters along the Atlantic coasts of Portugal and Marocco, and along Mediterranean coasts. Its habitat even extends into the Sea of Marmara and the Bosporus Strait (Wirtz & Zander, 1986). The species is included in the Checklist of the Adriatic Sea Fishes (Lipej & Dulčić, 2010). Although specific population data are not available, the population is considered as stable, and since there are no current known threats, the Cline is assessed as Least Concern (Yokes *et al*., 2016).

The body of this small fish is covered with cycloid scales embedded into skin, and can reach a maximum length of 10 cm (Wirtz & Zander, 1986). The head is more pointed than in fish from the family Blenniidae. The dorsal fin is divided into two parts, the first of which consists of three spines and is inserted immediately behind the eyes (Fig. 1). The body is flattened laterally and the caudal peduncle is thin. The second part of the dorsal fin has increasing height, similar to the anal fin, while the caudal fin is small and convex. There is a tiny tentacle above the eye. The fish coloration is dark green or brownish with a marbled pattern, and white or silver spots on the sides. The species is known to feed primarily on benthic invertebrates hiding among dense algal cover in rocky habitat types (Wirtz & Zander, 1986; Pallaoro & Števčić, 1989).

The data regarding the occurrence of *C. argentatus* in the Adriatic Sea are scarce, limited and sporadic. Patzner (1985) reported the finding of two specimens in the harbor of the Laboratory of Marine Biology in Aurisina (near Trieste). Pallaoro & Števčić (1989) and Pallaoro (1989) mentioned the presence of the species near Venice, Trieste, and islands Hvar, Korčula and Šolta. For Slovenian marine waters the first information was reported by Lipej & Richter (1999), who observed two specimens of *C. argentatus* in the mediolittoral belt near Piran. After that, in 2004, one specimen was captured in a breakwater area in Koper (Lipej *et al.,* 2005; 2008a).

From 2006 to 2016, specimens of *C. argentatus* were never found in any visual surveys of benthic habitat types and coastal fish assemblage regularly performed by SCUBA diving in Slovenian coastal waters (Lipej *et al.,* 2007, 2008b; Orlando-Bonaca *et al*., 2012; and *unpublished data*). However, some specimens were occasionally manually collected in recent years. The aim of the study is to present new data about the presence of *C. argentatus* in Slovenian coastal waters and to discuss the reasons for its underestimation of the occurrence in this area.

***Fig. 1: A specimen of** Clinitrachus argentatus **found in Slovenian coastal waters (Photo: Domen Trkov).***
***Sl. 1: Primerek vrste** Clinitrachus argentatus **najden v slovenskih obalnih vodah (Foto: Domen Trkov).***

## MATERIAL AND METHODS

The Slovenian coastal sea is a shallow semi-enclosed part of the Gulf of Trieste with a maximum depth of ca. 37 m. Its diverse coastline is approximately 46.7 km long. In recent decades the Slovenian natural shoreline has been modified by many human activities, like urbanisation, intensive hinterland farming and massive tourism. Nowadays, less than 18% of the coastline is in its natural state (Turk, 1999).

During occasional surveys of the Slovenian lower mediolittoral / upper infralittoral belt performed in the period 2013-2016, few specimens of *C. argentatus* were manually collected and taken alive to the Marine Biology Station of the National Institute of Biology in Piran. Total lengths ($L_T$) were measured to the nearest mm, while meristic counts for two specimens were verified in Marčeta (1999). One fish is kept in the aquarium of the institute.

## RESULTS AND DISCUSSION

All together, six specimens of *C. argentatus* were captured in Slovenian coastal waters in the period from July 2013 to August 2016 (Tab. 1). The first specimen was noticed while resting on a frond of a brown alga from the genus *Cystoseira* C. Agardh, in shallow waters near the lighthouse in Isola (Fig. 2). The second fish was observed in the same locality and at the same depth range, but resting on round stones, not covered by any vegetation. The third specimen was captured in the area of submerged breakwater of the main pier in Koper. These three fishes, captured in 2013, were found in the late afternoon. The fourth specimen, very small, was accidentally captured while collecting macroalgae with a small manual net, near the pier in the San Simon

***Tab. 1: Sampling date, hour, location, habitat, depth and total length ($L_T$) of the specimens of** Clinitrachus argentatus **found from 2013 to 2016 in Slovenian coastal waters.***
***Tab. 1: Datum vzorčenja, ura, lokacija, habitat, globina in celokupna dolžina ($L_T$) primerkov vrste** Clinitrachus argentatus **najdenih med 2013 in 2016 v slovenskih obalnih vodah.***

| Specimen | Date | Hour range | Location | Habitat | Depth (m) | LT (mm) |
|---|---|---|---|---|---|---|
| **1** | 15.7.2013 | 17:00-18:00 | lighthouse (Izola) | on *Cystoseira* sp. | 0.7 | 76 |
| **2** | 8.8.2013 | 17:00-18:00 | lighthouse (Izola) | on round stones | 0.5 | 61 |
| **3** | 9.8.2013 | 17:00-18:00 | breakwater of the main pier (Koper) | within the turf layer on a boulder | 0.5 | 78 |
| **4** | 17.6.2016 | 11:00-12:00 | near the pier in the San Simon Bay (Izola) | on *Dictyota dichotoma* | 0.5-0.7 | 14 |
| **5** | 30.7.2016 | 15:00-16:00 | Sv. Jernej Bay | on mixed benthic vegetation | 0.5-1.0 | 43 |
| **6** | 17.8.2016 | 11:00-12:00 | near the coastal road Koper-Izola | on *Halopithys incurva* | 0.5 | 29 |

Bay (Izola). It was hiding on a thallus of the brown alga *Dictyota dichotoma* (Hudson) J. V. Lamouroux. The fifth fish was also accidentally captured in the Sv. Jernej Bay near cape Debeli rtič, in a manual net that was dredged through mixed benthic vegetation. It is therefore impossible to determine if the specimen was hiding between *Cymodocea nodosa* (Ucria) Ascherson leaves or on a thallus of the red alga *Halopithys incurva* (Hudson) Batters. The sixth and the last specimen was found clinging on a frond of *H. incurva,* in shallow waters next to the coastal road between Koper and Izola.

It seems that the macroalgal assemblage play a major role in the habitat occupancy and distribution of this small benthic species. Especially *Cystoseira* spp. are known to have an important role as ecosystem-engineers (Cormaci 1995; Gianni *et al*., 2013). Their benthic communities display a three-dimensional structure that provides habitat and shelter for smaller algae and invertebrates (Ballesteros et al. 2009; Antit *et al*., 2013; Mačić & Svirčev 2014; Pitacco *et al*., 2014), but also to fish (Lipej *et al*., 2003, 2009; Orlando-Bonaca & Lipej 2005, 2007; Orlando-Bonaca *et al*., 2008b; Vergés *et al*., 2009; Cheminée *et al*., 2013). In the Gulf of Trieste associations with *Cystoseira* species are limited to the shallow coastal area (Orlando-Bonaca *et al.,* 2008a).

The meristic counts were done on two specimens. The first was the one captured on a breakwater in Koper in 2004, and kept in the fish collection of the Marine Biology Station in Piran. The meristic formula of the rays in fins was: D (dorsal) III+XXIX/3, A (anal) II/19, P (pectoral) 9, V (pelvic) 2. The counts of this specimen are not in total accordance with Marčeta (1999), since there is one extra ray in the second part of the dorsal fin (XXIX instead of XXVIII). The second meristic counts were done on the fish captured on the 30.7.2016, which is kept alive in the aquarium of the institute. The meristic formula is: D III+XXVIII/3, A II/20, P 9, V 2, and is in total accordance with Marčeta (1999).

Unfortunately, literature on the ecology and biology of *C. argentatus* is very scarce, therefore it was not possible to compare our data with other studies. Only two papers were found that specifically targeted *C. argentatus*. The first focused mostly on its reproductive

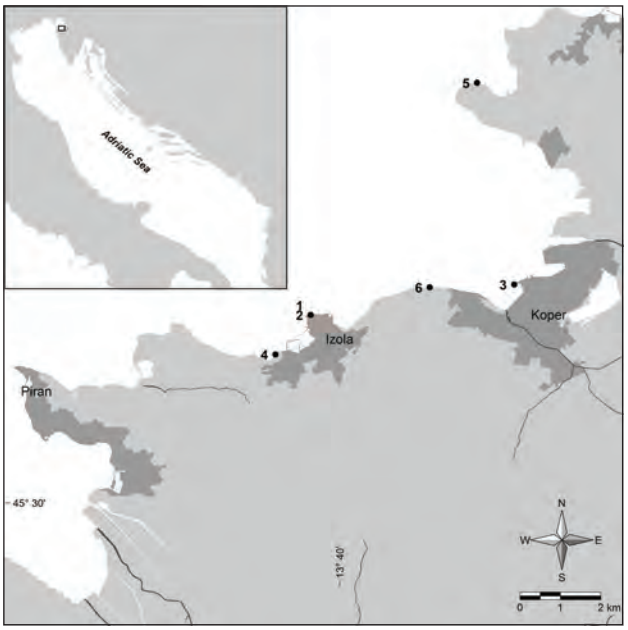


***Fig. 2: Sampling locations of the specimens of** Clinitrachus argentatus **from 2013 to 2016 in Slovenian coastal waters. For explanations see Tab. 1.***
***Sl. 2: Lokacije vzorčenj primerkov vrste** Clinitrachus argentatus **med 2013 in 2016 v slovenskih obalnih vodah. Za razlago glej Tab. 1.***

behaviour (Guitel, 1893), while the second on its diet (Ozen *et al*., 2010). The range of the total length of specimens in our study is comparable with the meristic data published in the study of Ozen *et al*. (2010). The length of the specimens from Slovenian waters varied between 14 mm and 78 mm, while between 28 mm and 57 mm for the specimens caught in the northern Aegean and Marmara Seas. Ozen *et al*. (2010) reported that the diet of *C. argentatus* consists mainly of amphipods, copepods, isopods and decapods in this marine area. We are also regularly observing how the specimen kept in the aquarium of the institute, feeds on amphipods, isopods and other small invertebrates collected among algal thalli.

The fact that in Slovenian coastal waters *C. argentatus* was not found between 2005 and 2012, and since it was reported only occasionally in not very recent reports for other Adriatic areas (Patzner, 1985; Pallaoro & Števčić, 1989; Pallaoro, 1989), could lead us to the conclusion that the species is very rare. However, the species is considered as widespread in Mediterranean inshore waters and the population is defined as not-fragmented (Yokes *et al*., 2016). The reason for its apparent scarcity or absence in our area is likely to be due to its cryptic way of life among the fronds of macroalgae. According to our observations, the species is able to cling on to the thallus by twisting the body and the use of fins. The most useful for this purpose are probably the ventral fins that the species uses also to walk on algae and on rocky substrata (*pers. obs*.), as already reported by Guitel (1893) for specimens found near Banyuls-sur-Mer. Even when vigorously shaking the seaweed, the fish does not lose its grip. Moreover, the color pattern of the fish is very variable. The ventral part is frequently tinted with green, but can vary according to the macroalgal species that the fish uses as a hiding place, and could be brown, reddish or purplish (*pers. obs*.). Therefore, we can conclude that the species is only seemingly rare, since, due to its cryptic coloration, relatively small size and hiding within the macroalgal vegetation, it remains mostly unnoticed.

Further work needs to be carried out to clarify the habitat occupancy, distribution, abundance and behaviour of *C. argentatus* in the Gulf of Trieste, as well as in the whole Adriatic area. The study of the predation pressure on this species and of its feeding habits would help us to identify feeding requirements in relation to the habitat choice in this shallow and unstable coastal environment. Moreover, special attention should be paid to the conservation of *Cystoseira* associations, since they are of primary importance for the survival of *C. argentatus*. Many authors have observed that coastal ecosystems are subjected to multiple anthropogenic stressors (like nutrient enrichment and urbanization), which can result in the loss of long-living genera of the order Fucales (Thibaut *et al*., 2005, 2015; Mangialajo *et al*., 2008; Airoldi & Bulleri, 2011; Iveša *et al*., 2016) that are often replaced by persistent, smaller and less complex turf-forming algae (Airoldi *et al*., 2008; Perkol-Finkel & Airoldi, 2010; Connell *et al*., 2014). Strain *et al*. (2014) concluded that, in order to prevent shifts from canopy to turf-forming taxa, priority should be given especially to the management of nutrients levels.

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# *CLINITRACHUS ARGENTATUS* (RISSO, 1810) (PERCIFORMES: CLINIDAE) – MANJ ZNANA VRSTA RIB V SLOVENSKIH OBALNIH VODAH (JADRANSKO MORJE)

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*POVZETEK*

*Podatki o pojavljanju srebrnice (*Clinitrachus argentatus*) v Jadranskem morju so redki, omejeni in občasni. V zadnjih desetletjih so bili v slovenskem morju opaženi le trije primerki. V prispevku predstavljamo nove najdbe te vrste med leti 2013 in 2016, ko smo posamezne primerke ročno ujeli v plitvem obalnem morju. Prav tako podajamo podatke o habitatnih preferencah, globinskem razponu, celotni dolžini telesa in merističnem štetju plavutnic. V razpravi podajamo tudi razloge za podcenjevanje prisotnosti vrste* C. argentatus *na območju Jadranskega morja.*

**Ključne besede:** *Clinitrachus argentatus*, plitke vode, spregledana vrsta, habitatne preference, Jadransko morje

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