THE SYNGNATHID SPECIES FROM TUNISIAN WATERS (CENTRAL MEDITERRANEAN): A SURVEY

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ABSTRACT

Seven syngnathid species have been recorded to date in Tunisian waters: the short-nosed seahorse Hippocampus hippocampus (Linnaeus 1758), the long-nosed seahorse H. ramulosus Leach, 1814; the straight-nosed pipefish Nerophis ophidion (Linnaeus 1758), the black-striped pipefish Syngnathus acus Linnaeus 1758, the deep-snouted pipefish S. typhle Linnaeus 1758 and Nilsson’s pipefish S. rostellatus Nilsson 1865. Description, main morphometric measurements, counts, habitat and distribution are presented and commented for each species. They have been found mainly in estuarine and brackish waters, such as Bizerte Lagoon, Tunis Southern Lagoon and in the Bahiret El Bih. Both seahorses seem to be more frequent in the Tunisian waters that the 5 other syngnathid species, probably due to fact that the former constitute the focus of intense fishery, while the latter are generally discarded at sea by fishermen.

Key words: Osteichthyes, Syngnathidae, Tunisian waters, Central Mediterranean

INDAGINE SULLE SPECIE DI SIGNATIDI IN ACQUE TUNISINE (MEDITERRANEO CENTRALE)

SINTESI

Sette specie di signatidi sono state confermate per le acque tunisine: il cavaluccio marino Hippocampus hippocampus (Linnaeus 1758), il cavaluccio camuso H. ramulosus Leach, 1814; il pesce ago sottille Nerophis ophidion (Linnaeus 1758), il pesce ago di rio Syngnathus acus Linnaeus 1758, il pesce ago S. acus Linnaeus 1758, il pesce ago S. typhle Linnaeus 1758 ed il pesce ago di Nilsson S. rostellatus Nilsson 1865. L’articolo riporta la descrizione, le principali misure morfometriche, il numero di individui, l’habitat e la distribuzione per ogni singola specie. Gli esemplari sono stati raccolti principalmente negli estuari ed in acque salmastre, quali la Laguna di Bizerte, la Laguna meridionale di Tunis e il Bahiret El Bih. Entrambi le specie di cavalucci appaiono più frequenti in acque tunisine che non le cinque specie di pesce ago, probabilmente perché i cavalucci vengono intensamente pescati, mentre i pesci ago vengono rigettati in mare dai pescatori.

Parole chiave: Osteichthyes, Syngnathidae, acque tunisine, Mediterraneo centrale
INTRODUCTION

Syngnathid species, sea-horses and pipefishes are widely distributed and their occurrence has been reported in marine, brackish and freshwater areas. In all, 232 species have been recorded throughout the world (Dawson, 1982; Whitfield, 1995; Lourie et al., 1999). Of the 17 syngnathid species known from the Mediterranean (Dawson, 1985; Lourie et al., 1999), 7 have been recorded in Tunisian waters (Bradaï et al., 2004; Ben Amor et al., 2006, 2007a, b, 2008); the short snouted seahorse Hippocampus hippocampus (Linnaeus 1758), the long-snouted seahorse Hippocampus ramulosus Leach, 1814, the straight-nosed pipefish Neotopis ophiidion (Linnaeus 1758), the black-striped pipefish Syngnathus abaster Risso 1826, the greater pipefish Syngnathus acus Linnaeus 1758, the deep-snouted pipefish Syngnathus typhle Linnaeus 1758, and Nilsson’s pipefish Syngnathus rostellatus Nilsson 1855.

In the present article, 7 Tunisian syngnathid species are presented, including a description based on specimens collected during the investigations conducted in the area since 2000, and we comment on the local distribution of these species, compared and contrasted with other Mediterranean areas. Syngnathids are close to being threatened (Lourie et al., 1999), and as the species occurring in Tunisian waters have been poorly studied, we have attempted to assess the real status of these species in the region and, concomitantly, to establish a national plan for their protection in the same region as well.

![Map of Tunisia showing the capture sites of syngnathid species in Tunisian waters](image)

Fig. 1: Map of Tunisia showing the capture sites of syngnathid species in Tunisian waters: 1 – Bizerte Lagoon (BL); 2 – Gulf of Tunis; 3 – Tunis Northern Lagoon (TNL) and Tunis Southern Lagoon (TSL) separated by navigation channel (NC); 4 – Off Mahdia; 5 – Gulf of Gabes; 6 – Bahret El Bihan (BB).

Sl. 1: Zemljevid Tunizije in njenega teritorialnega morja z označenimi lokalitetami, na katerih so bile ulovljene različne vrste morskih konjičkov in šib: 1 – Laguna Bizerte (BL); 2 – Tunški zaliv; 3 – Tunška severna Laguna (TNL) in Tunška južna Laguna (TSL), ki ju loči kanal za ladijsko plovbo (NC); 4 – Mahdijske vode; 5 – Gabeški zaliv; 6 – Bahret El Bihan (BB).
MATERIAL AND METHODS

Investigations were conducted between 2000 and 2005 at fish landings located along the Tunisian coast and close to brackish areas such as Bizerte Lagoon, Tunis Southern Lagoon and the Bahrait El Bilban (Fig. 1). Observations were carried out at least three times per month. The observed specimens were caught by commercial gill-nets with 22 mm mesh size, off the Tunisian coast. Concomitantly, experimental samplings were carried out monthly to explore both shallow coastal and lagoon brackish waters, using landing net, with 2 mm mesh size, experimental mobile fishing gear (dredging) and SCUBA diving. All specimens are preserved in 5% buffered formalin solution and deposited in the Ichthyological Collection of the Faculté des Sciences of Tunis. We have also examined specimens preserved in the Ichthyological collection of the Museum National d’Histoire Naturelle (MNHN) of Paris and the British Natural History Museum (BMNH) in London. The specimens were measured and meristic counts carried out following the protocol defined for sea-horses by Lourie et al. (1999) and for pipefishes by Dawson (1982). Methods of measurements are plotted in Figure 2 for sea-horses, and in Figures 3 and 4 for pipefishes.

RESULTS AND DISCUSSION

Genus Hippocampus Rafinesque, 1810

Hippocampus hippocampus (Linnaeus, 1758) (Fig. 5A)

Material. A total of 236 examined specimens, 158 males and 78 females, were collected in the Lagoon of Bizerte. Males ranged between 83 mm and 156 mm in total length, females between 74 mm and 138 mm. In addition, 4 specimens from MNHN in Paris were also examined.

Description. Wedge-shaped coronet with five rounded knobs. Snout short with poor developed nose spine. Inconspicuous spines and tips. Cutaneous filaments rudimentary or lacking. Head-length 1.31–2.17 in pre-anal length, 4.69–6.71 in total-length; snout-length 1.65–4.28 in head-length; eye rounded 3.89–8.13 in head length; pre-orbital length 1.9–2.76 in head-length; post-orbital length 2.05–2.75 in head-length; pre-dorsal length 2.86–5.0 in total-length; dorsal length 0.58–0.77 in dorsal base; dorsal fin slender with 14–22 soft rays; pectoral with 12–17 soft rays; anal with 3–5 soft rays; 12–13 trunk rings before anus; 31–32 tail rings; 43–45 total rings. Colour brownish to darkish, white spots lacking, some specimens sometimes lighter or reddish. Dorsal greyish with large strip.

Distribution. Although H. hippocampus occurs in temperate and warm temperate waters, it has been reported from the North Sea, the Channel and from off the eastern Atlantic from the Bay of Biscay to the Gulf of Guinea. H. hippocampus occurs throughout the Mediterranean, in the Adriatic and Black Seas (Bauchot & Pias, 1980; Dawson, 1986; Fréj & Maurin, 1987). In Tunisian waters, H. hippocampus has been reported from their northern areas by Azzouz (1971, 1974) and
Bradai et al. (2004), and from the south of the Gulf of Gabes by Vinciguerra (1882-1883, 1884), Ben Othman (1971, 1973) and Bradai et al. (2004). We found *H. hippocampus* only in the northern Bizerte Lagoon.

Habitat. According to Tortonese (1970) and Bauchot & Pras (1980), *H. hippocampus* inhabits sandy bottoms between 0 and 30 m, rich in organic nutrients, as well as sea grass beds where it seeks for shelter and food.

While Bradai (2000) noted that the species was common in Tunisian waters, we have found rather uncommon in the region, possibly due both to over-fishing and pollution (Lourie et al., 1999). According to Tortonese (1970) and Lourie et al. (1999), a single population may occur in the Mediterranean and in the eastern Atlantic. In the Red Sea, *H. hippocampus* has been replaced by *H. tuscus*, which entered the Mediterranean Sea through the Suez Canal and has been recorded by Golani & Fine (2002) off the Mediterranean coast of Israel and by Gokoglu et al. (2004) off the Turkish coast. Additionally, a species closely related to *H. tuscus* has been recorded in Tunisian waters, but further identification is needed for confirmation.

**Hippocampus ramulosus Leach, 1814 (Fig. 5B)**

Material. A total of 1773 specimens, 897 males and 876 females, were collected in the northern areas, such as Bizerte Lagoon, in the Gulf of Tunis, and southward off Mahdia and in the Gulf of Gabes. Males ranged between 63 mm and 176 mm in total length, females between 70 mm and 170 mm. Additionally, 64 specimens from the MNHN in Paris were examined.

Description. Snout long, spines, knobs and tips well developed. Filaments thick and branched, mainly on head and coronet. Head-length 1.02–2.33 in pre-anal length, 4.27–7.31 in total length; snout-length 1.26–3.71 in head-length; eye rounded 3.69–8.16 in head-length; preorbital length 1.65–8.88 in head-length; postorbital length 2.06–3.13 head-length; pre-dorsal length 2.77–5.87 in total-length; dorsal length 0.51–0.93 in dorsal base; dorsal fin slender with 14–23 soft rays; pectoral with 12–19 soft rays; anal with 3–5 soft rays; 12–13 trunk rings before anus; 29–34 tail rings; 41–46 total rings. Brownish variable to greenish with white spots. Large brownish strip on dorsal.

Distribution. *H. ramulosus* occurs off the eastern Atlantic from the British Isles to Morocco and around Madeira and Azores (Dawson, 1986), throughout the Mediterranean and in the Black Sea. In Tunisian waters, *H. ramulosus* has previously been reported from the Gulf of Gabes (Ben Othman, 1973; Bradai et al., 2004). We have collected specimens from both northern and southern Tunisian coast, such as in the Gulf of Tunis, Gulf of Gabes, and off Mahdia. *H. ramulosus* successfully entered the Bizerte Lagoon.

Habitat. *H. ramulosus* inhabits shallow coastal and brackish waters (Bauchot & Pras, 1980; Lourie et al., 1999), sandy-muddy bottoms and/or sea grass beds covered by marine phanerogams and algae.

In Tunisian waters, *H. ramulosus* has been more frequently observed than its close relative species. The phenomenon could possibly be the result of interspecific competition between both species. *H. ramulosus* reaches a larger size and is consequently more abundant in reduced areas, while in larger areas, such as the Bizerte Lagoon, it coexists with it.

**Genus Nerophis Rafinesque, 1810**

**Nerophis ophiion (Linnaeus, 1758) (Fig. 5C)**

Material. We have examined 14 female specimens collected in the Bahret El Biban, ranging between 159 mm and 166 mm in total length. In addition, twenty-five specimens from the MNHN in Paris were also examined.

Description. Body elongate, rounded, smooth without spines; head slender rather prominent, head-length 4.8–7.5 in pre-anal fin length, 14.0–17.4 in total length; snout slightly stout rounded at distal end with a slight large coronet, snout-length 2.2–3.0 in head-length; eye rounded 4.5–7.2 in head-length; preorbital length 1.7–2.5 in head-length; postorbital length 1.7–2.7 in head-length; pre-dorsal fin length 2.4–3.4 in tail length; dorsal fin slender with 30–36 soft rays on 11–12 rings; dorsal fin length 7.9–10.1 in total length and 1.1 approximately in dorsal fin base; anus located at mid-part of dorsal fin base; 11–12 under dorsal rays, 28 trunk rings, 65–68 tail rings, 104–108 total rings. Colour greenish to brownish, with lateral edges rather darkish; black and white notches on head.

Distribution. According to Bauchot & Pras (1980), *N. ophiion* is widely distributed in the Eastern Atlantic from Norway to Morocco (excluding the region from Denmark to Netherlands), as well as throughout the Mediterranean and the Black Sea. Dieuzeide et al. (1954) reported *N. ophiion* off the Algerian coast. By contrast, *N. ophiion* has not been recorded off Libya (Al Hassan & El Silini, 1999) and off the Mediterranean coast of Egypt (El Sayed, 1994). Golani (2005), however, reported on *N. ophiion* from off the Mediterranean coast of Israel.

Habitat. According to Bauchot & Pras (1980), Péris & Picard (1964), *N. ophiion* is a sedentary species inhabiting sea-grass beds and herbaria at depths between 10 and 15 m, and is known to have entered various lagoons. The species has probably found favorable environmental conditions in the Bahret El Biban, which could explain its occurrence in the area.
Dawson (1986) wrongly noted the occurrence of *N. ophidion* in Tunisian waters, from where the species has never been reported according to Bradaï (2000) and Bradaï et al. (2004). The first findings of *N. ophidion* in the area were reported by Ben Amor et al. (2007a).

Genus *Syngnathus* Linnaeus, 1758

*Syngnathus abaster* Risso, 1810 (Fig. 5D)

**Material.** A total of 104 Tunisian specimens, 40 males and 64 females, have been examined. They were collected in the Tunis Southern Lagoon and in the Navigation Channel of Halq El Oued. Males ranged between 74 mm and 198 mm in total length, females between 70 mm and 174 mm. Twenty-seven specimens from MNHN in Paris have also been examined.

**Description.** Body elongate, rounded rather prominent, head-length 2.32–4.81 in pre-anal length, 5.35–12.80 in total-length; snout slightly rounded without knobs, but with an inconspicuous keel on upper surface, snout-length 1.50–5.67 in head-length; eye rounded and minute, 3.71–8.86 in head-length; pre-orbital length 1.22–2.75 in head-length; post-orbital length 1.59–3.31 in head-length; pre-dorsal length 2.20–2.96 in total-length; dorsal base 7.02–14.06 in total length, dorsal length 0.76–0.98 in dorsal base; pre-anal length 2.05–3.02 in total-length; dorsal fin slender with 16–35 soft rays on 5–7 rings; pectoral with 10–16 soft rays; anal with 3–4 soft rays; caudal with 9–13 soft rays; anus located under the beginning of the dorsal fin; 14–18 trunk rings before anus, 24–37 tail rings, 39–53 total anuses, 24–37 tail rings, 39–53 total rings. Colour greenish to brownish or reddish, body with white lines and spots, snout rather brownish, with a blackish spot before eyes, black spots arranged in a line under the dorsal base. Belly whitish or beige.

**Distribution.** *S. abaster* had previously been recorded throughout the southern coast of the Mediterranean: off Algeria (Dieuzeide et al., 1954), Libya (Al-Hassan & El Silini, 1999), Egypt (El Sayed, 1994) and Israel (Golani, 2005). Our investigations showed that the species was being caught mainly in the northern areas, such as Tunis Southern Lagoon, which is in agreement with Chauuchi & Ben Hassine (1998). Rare specimens had been caught southward (D’Ancona, 1934; Severat, 1934). Bradaï (2000), for instance, reported the capture of a single specimen in the Gulf of Gabes.

**Habitat.** Dawson (1982, 1986) noted that the straight-nosed pipefish inhabited shallow coastal waters and estuaries, usually at 4–20 m. The recent environmental restoration of the Tunis Southern Lagoon allowed a colonization of fish species previously unknown in the area, including *S. abaster*. In the area, the species found sufficient resources to live as well as to possibly develop and reproduce there.

The records of *S. abaster* in Tunisian waters have shown that it inhabits protected areas. Outside such areas, the species has been subjected to severe competition pressure, both inter and intra specific. Additionally, the specimens captured by craft fishery and/or by trawls were discarded at sea.
**Syngnathus acus** Linnaeus, 1758 (Fig. 5E)

Material. A total of 267 specimens have been examined: 92 males and 175 females. They were collected in the Tunis Southern Lagoon, in the Gulf of Tunis and in the Bahiret El Biban. Males ranged between 74 mm and 199 mm in total length, females between 71 mm and 207 mm. In addition, 30 specimens from MNHN in Paris have also been examined.

Description. Body elongate, snout slightly compressed with inconspicuous median ridge; eyes round. Head-length 2.32–4.74 in pre-anal length, 5.35–11.28 in total length; snout-length 1.70–3.41 in head-length; eye rounded and minute. 3.70–9.06 in head-length; pre-orbital length 1.42–2.94 in head-length; post-orbital length 1.59–3.34 in head-length; pre-dorsal length 2.20–2.79 in total length; dorsal base 7.78–14.54 in total length; dorsal length 0.86–0.99 in dorsal base; dorsal fin slender with 22–35 soft rays; pectoral with 11–16 soft rays; anal with 3–4 soft rays; caudal with 9–13 soft rays; 14–18 trunk rings before anus; 27–47 tail rings, 41–63 total rings. Colour greyish, brown, yellowish, marking variable. Belly whitish or beige.

Distribution. According to Bauchot & Pras (1980), *S. acus* is an Atlantic-Mediterranean species known from Morocco to Norway, in the Mediterranean, in the Adriatic and Black Seas (Tortone, 1970; Dawson, 1986; Fredj, & Maurin, 1987). The species is known from south of the Strait of Gibraltar to South Africa (Dawson, 1986). It has also been reported from off China and Indonesia, from off the northern Tunisian coast (Azzouz, 1971, 1974) and the Gulf of Gabès (Ben Othman, 1971, 1973; Bradai et al., 2004). We have recorded *S. acus* in the Gulf of Tunis, in the Tunis Southern Lagoon, and in the Bahiret El Biban.

Habitat. *S. acus* preferentially inhabits shallow coastal and estuarine waters, rarely brackish waters to 50 m depth and probably more (Bauchot & Pras, 1980; Nijssen & Buizer, 1983; Dawson, 1985). It is found on sandy and muddy as well as detritic bottoms. The Tunisian specimens were caught on sea grass beds, including Posidonia oceanica and some algae species such as Caulerpa prolifera, C. racemosa, Cystoseira stricta, C. crinita and Rythiplaera tincta.

*S. acus* is the most common synghathid species. It is probably able to develop and reproduce more easily than its congeneric species, possibly due to the fact that it prefers to inhabits detritic shallow coastal waters and sea grass beds, where it is able to avoid both fishing and competition pressures.

**Syngnathus rostellatus** Nilsson, 1855 (Fig. 5F)

Material. The single examined specimen was collected in the Gulf of Tunis. It has been deposited in the Ichthyological Collection of the Faculté des Sciences of Tunis (reference FST-SYN-rostellatus-01) and compared with seven specimens from the BMNH in London.

Description. Body elongate, rounded slightly compressed, head rather prominent, head-length 2.77 in pre-anal length, 6.72 in total length; snout elongate and compressed; mouth without true teeth, small, and terminal on a protruding cylindrical snout narrow and tubular and with a keel on upper surface, snout-length 1.9 in head-length; post-orbital length 3.02 in head-length; predorsal length 2.52 in total length; dorsal fin slender with 35 soft rays on 9 rings; dorsal base 9.95 in total length; 18 trunk rings; 39 tail rings; 57 total rings; pectoral with 12 soft rays; anal with 4 soft rays; caudal with 11 soft rays. Colour greyish to brownish, with darkish bars on
dorsal and flanks. Belly beige with silvery sheen on head and trunk. Dorsal fin hyaline. Its total length is 211 mm.

**Distribution.** *Syngnathus rostellatus* was reported from off the eastern Atlantic coast off Norway and the British Isles (Wheeler, 1969), from the Bay of Biscay (Baucourt & Pas, 1980) and from off the coast of Portugal (Albuquerque, 1954–1956). In contrast, the species has not been known to occur south of the Strait of Gibraltar (Dawson, 1986). *S. rostellatus* had previously been recorded three times only in the Mediterranean Sea, in the Alboran Sea (southern Spain) by Reina-Hervás et al. (1981–1982), off Banyuls (Gulf of Lions, southern France) by Louisy (2002), and off the Anatolian coast (southern Turkey) by Gokoglu et al. (2004).

**Habitat.** Vincent et al. (1995) noted that *S. rostellatus* occurs in 'sandy areas and shallow seagrass beds, lying on the bottom or aligned with the eelgrass'. They added that the specimens were 'cryptic in either case'.

The recovery of *S. rostellatus* is the first from Tunisian waters and the fourth from the Mediterranean Sea. Altogether, six specimens were recorded by Reina-Hervás (1989) in the Alboran Sea. The Spanish records of *S. rostellatus* could be explained by the vicinity of the Atlantic. The specimens easily entered the Alboran Sea through the Strait of Gibraltar. Off Banyuls, Louisy (2002) recorded a single female, while off Turkey, Gokoglu et al. (2004) observed 4 specimens. They occurred in waters warmer than those usually required by the species. The absence of *S. rostellatus* during more than twenty years in Mediterranean areas between Spain and other Mediterranean areas could be explained by misidentification with its close relative species. Additionally, the syngnathids have not been subjected to a thorough research and have been generally discarded at sea by fishermen due to their low economic value.

**Syngnathus typhle** Linnaeus, 1758 (Fig. 5G)

**Material.** Thirty female specimens, caught in the Baïreth El Bihan and ranging between 153 mm and 307 mm in total length were examined. In addition, we have examined 61 specimens from the MNHN in Paris.

**Description.** Body elongate, rounded; head rather prominent, head-length 2.3–4.8 in pre-anal length, 4.8–6.8 in total length; snout compressed rather straight and with a keel on upper surface, snout length 1.2–2.2 in head-length; eye rounded and minute 8.3–13.8 in head-length; pre-orbital 1.3–1.7 in head-length; post-orbital length 1.4–4.7 in head-length; pre-dorsal length 1.8–2.5 in total-length; dorsal fin slimmer with 29–39 soft rays on 8 rings; dorsal-base 5.8–12.6 in total-length; 18 trunk rings; 30–32 tail rings; 56–58 total rings, pectoral with 13–19 soft rays; anal with 3–4 soft rays; caudal with 8–13 soft rays. Colour greenish to olivaceous, snout with dark lines and spots. Belly whitish or argentous.

**Fig. 5: Syngnathid species found in Tunisian waters.** (A) *Hippocampus hippocampus* (Linnaeus, 1758); (B) *H. ramulosus* Leach, 1814; (C) *Nerophis ophidion* (Linnaeus, 1758); (D) *Syngnathus abaster* Risso, 1810; (E) *S. acus* Linnaeus, 1758; (F) *S. typhle* Linnaeus, 1758; (G) *S. rostellatus* Nilsson, 1855.

**Sl. 5: Vrste morskih konjičkov in sil, ki so jih avtorji zabeležili v tunizijskih vodah.** (A) *Hippocampus hippocampus* (Linnaeus, 1758); (B) *H. ramulosus* Leach, 1814; (C) *Nerophis ophidion* (Linnaeus, 1758); (D) *Syngnathus abaster* Risso, 1810; (E) *S. acus* Linnaeus, 1758; (F) *S. typhle* Linnaeus, 1758; (G) *S. rostellatus* Nilsson, 1855.
**Distribution.** *S. typhle* is known to occur off the eastern Atlantic coast from Scandinavia to Morocco (Baugeon & Pras, 1980; Dawson, 1986; Riedel, 1991), throughout the Mediterranean, in the Adriatic and Black Seas. From Tunisian waters, it had formerly been reported by D’Ancona (1934), Tortorese (1970), mainly from the Gulf of Gabes (Seurat, 1934), by Bradai (2003) and Bradai et al. (2004); unfortunately no specimen has been available for confirmation. The recent work by Ben Amor et al. (2007b) reports on captures in the Tunis Southern Lagoon and in the Baharet El Bihan, with these findings confirming the occurrence of *S. typhle* in Tunisian waters.

**Habitat.** According to Dawson (1986), *S. typhle* inhabits mainly shallow coastal and estuarine waters between 4 and 20 m depth. It occurs on sandy and muddy bottoms, as well as in sea grass beds.

Although *S. typhle* seems to be rather rare in the areas from which the species has been reported, Tortorese (1970) found changes in morphological characters between juveniles and adults, and males and females; consequently, the species diagnosis remains somewhat difficult. *S. typhle* is larger and lives at lower depths than its congeneric species, which makes it sensitive to fishing pressure. The species presents no economical interest and it is discarded at sea by fishermen soon after capture.

**CONCLUSIONS**

The seven syngnathid species are not equally distributed in Tunisian waters. The long-snouted sea-horse *Hippocampus ramulosus* was the most frequently observed species; in contrast, we have collected a single Nilsson’s pipefish *Syngnathus rostellatus*, locally recorded for the first time and for the fourth time in the entire Mediterranean area.

Globally, the two sea-horse species seemed to be more common than the five other pipefish species. The former are well known by fishermen and constitute the focus of intense fishery for medicines, aquarium fishes and curiosities for tourists as in other marine regions throughout the world. In northern Tunisian areas, for instance, they are targeted by fishermen throughout the year. The latter are by-catch species, without commercial value, and are generally discarded at sea by fishermen. Additionally, for a non-specialist it is not very easy to distinguish syngnathid species between them.

Of the 17 syngnathid species recorded in the Mediterranean, only 7 occur in Tunisian waters. Consequently, other recoveries of syngnathid species in the area could not be excluded due to migrations inside the Mediterranean Sea, but also outside the Red Sea through the Suez Canal and the eastern Atlantic through the Strait of Gibraltar.

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**PREGLED MORSKIH KONJIČKOV IN ŠIL (SYNGNATHIDAE) V TUNIZIJSKIH VODAH (OSREDNJE SREDOZEMLJE)**

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**POVZETEK**

V tunizijskih vodah je bilo doslej ugotovljenih sedem vrst iz družine morskih konjičkov in šil: kratkonosi morski konjiček *Hippocampus hippocampus* (Linnaeus 1758) in dolgonosi morski konjiček *H. ramulosus* Leach, 1814; kače šilo *Nerophis ophidian* (Linnaeus 1758), malo šilo *Syngnathus abaster* Risso 1826, veliko šilo *S. acus* Linnaeus...
1758, ploskonosno šilo S. typhle Linnaeus 1758 in šilo vrste S. rostellatus Nilsson 1855. Opisane so vse zabeležene vrste, skupaj z njihovimi glavnimi morfometričnimi dimenzijami, stevilom prešteli oseb, habitatom in razširjenostjo. Vrste so bile najdenes predvsem v obrežnih in brakinih vodah v območjih, kot so Laguna Bizerte, južna tunška laguna in Bahrej El Biban. Obe vrsti morskih konjčkov se v tunzijskih vodah zdaj pogostoče kot pot vrst morskih šil, bržkone zanadi dejstva, da konjčka tvorita zaživše intenzivnega riblja, medtem ko šila ribiči večinoma zavržejo že na morju.

**Kljucne besede:** Osteichthyes, Syngnathidae, tunizijske vode, osrednje Sredozemlje

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