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OBSERVATIONS ON THE BLACK-STRIPED PIPEFISH *SYNGNATHUS ABASTER,* RISSO 1826 (SYNGNATHIDAE) FROM TUNISIAN WATERS (CENTRAL MEDITERRANEAN)

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ABSTRACT

Morphometric measurements, counts and a short description of specimens of the black-striped pipefish Syngnathus abaster *Risso, 1810, caught in Tunisian waters, are presented. The occurrence of the species in the area is commented and discussed.*

Key words: Osteichthyes, Syngnathidae, *Syngnathus abaster*, morphometry, Tunisia, Mediterranean Sea

OSSERVAZIONI DI PESCE AGO CODAGROSSA *SYNGNATHUS ABASTER,* RISSO 1826 (SYNGNATHIDAE) IN ACQUE TUNISINE (MEDITERRANEO CENTRALE)

SINTESI

L'articolo presenta i dati morfometrici ed una breve descrizione degli esemplari di pesce ago codagrossa Syngnathus abaster *Risso, 1810, catturati in acque tunisine. La presenza della specie nell'area in questione viene commentata e discussa.*

Parole chiave: Osteichthyes, Syngnathidae, *Syngnathus abaster*, morfometria, Tunisia, mare Mediterraneo

INTRODUCTION

The black-striped pipefish *Syngnathus abaster* (Risso, 1810) was included by Bradaï (2000) and Bradaï *et al.* (2004) among the five syngnathid species reported in the Tunisian waters. *S. abaster* was first sighted by Seurat (1934) in estuarine waters running into the Gulf of Gabès (southern Tunisia) and eventually described by D'Ancona (1934) from specimens deposited in the Ichthyological Collection of the Station Océanographique of Salammbô, 15 km north of Tunis, at present known as Institut National des Sciences et Technologies de la Mer. Chaouachi & Ben Hassine (1998) mentioned *S. abaster* only in a check-list of fishes from the Ichkeul Lagoon (northern Tunisia). Unfortunately, the *S. abaster* specimens formerly preserved in the Ichthyological Collection of the Institut National des Sciences et Technologies de la Mer of Salammbô (see D'Ancona, 1934) do not exist at the Institute any more. Although previous reports on *S. abaster* are not doubtful, no specimens had been available until recently in Tunisia for confirmation. Investigations carried out during five years on syngnathids from Tunisian waters enabled us to find new specimens of *S. abaster*, to confirm the occurrence of the species in the area, and to provide additional data in order to expand the knowledge of the species.

MATERIAL AND METHODS

The syngnathid species constituted the focus of investigations conducted between 2001 and 2006 (Ben Amor *et al.*, *in press*), at least three times per week, in Tunisian waters (Fig. 1). One hundred and three *Syng-*

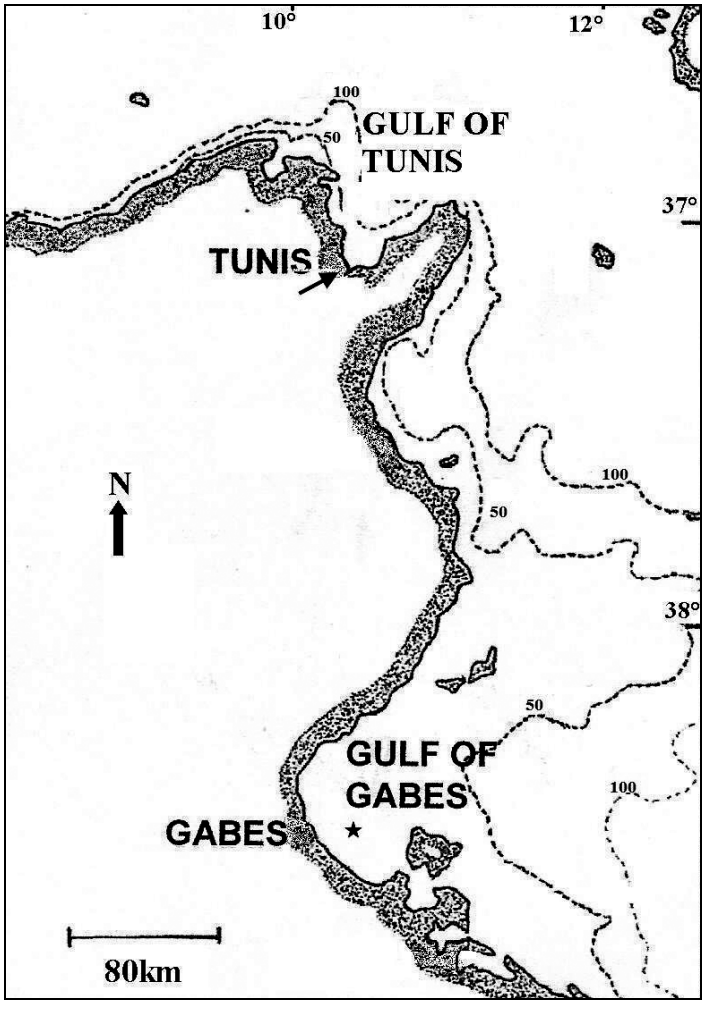

Fig. 1: Map of Tunisia showing the Tunis Southern Lagoon site (black arrow), and the fishing site of the specimen caught in the Gulf of Gabès (black star).
Sl. 1: Zemljevid Tunizije z lokaliteto v Tuniški južni laguni (črna puščica) in lokaliteto v Gabeškem zalivu (črna zvezdica), kjer so bili ujeti osebki malega šila.

nathus abaster individuals were collected from the Tunis Southern Lagoon using spoons, drags and SCUBA dive, and a single one in the Gulf of Gabès, by trawl, on 24 April 2005, at a depth between 25–30 m above the seagrass meadow overgrown particularly by *Cymodocea* sp. and *Caulerpa* sp.

Of the 104 collected Tunisian specimens, only 40 were subjected to morphometric measurements to the nearest millimetre and meristic counts plotted in Figure 2. The latter specimens were preserved in 5% buffered formalin and deposited in the Ichthyological Collection of the Faculté des Sciences of Tunis, catalogue number FST-SYN-Abaster-01 to FST-SYN-Abaster-40. Measurements and counts carried out on the Tunisian specimens are compared with those carried out on 27 black-striped pipefishes preserved in the Ichthyological Collection of the Muséum d'Histoire Naturelle of Paris (MNHN). Of the 27 MNHN specimens, 5 were from Algeria, 2 from Italy, 4 from France, 2 from the Adriatic Sea, 4 from the Aegean Sea and 3 from Romania.

Test for significance ($p < 0.05$) were performed using Student's t-test, Snedecor's F-test. Linear regression was performed following log transformation of data. Correlations were assessed by least-squares regression. Curves were compared by ANCOVA.

RESULTS

Description of the Tunisian specimens

Body elongate, rather rounded (Fig. 3), 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-orbitary length 1.22–2.75 in head-length; post-orbitary 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 rings before anus, 24–37 trunk 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.

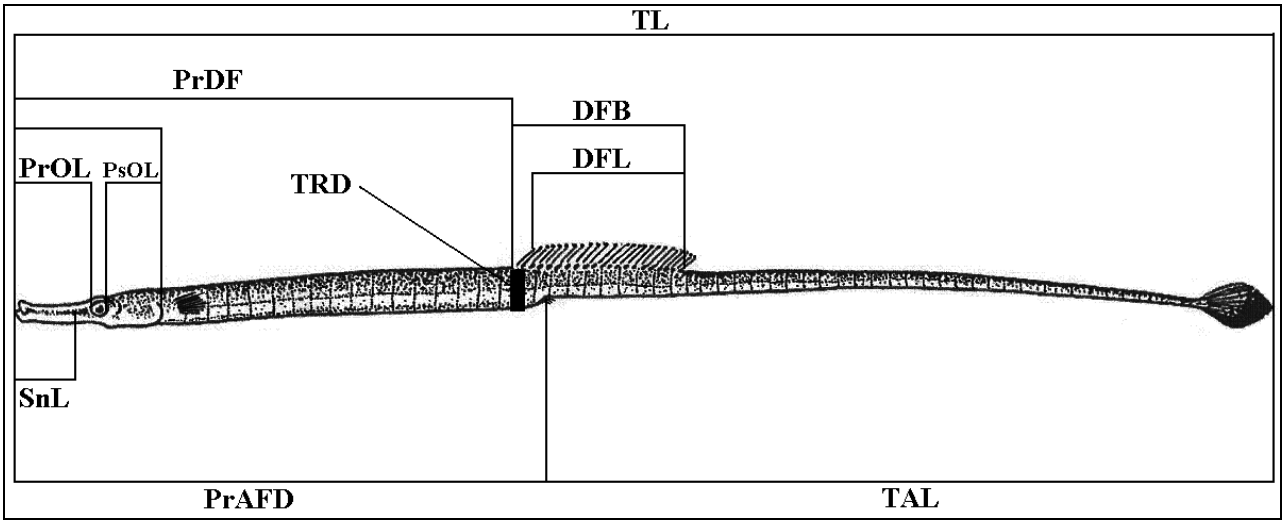

Fig. 2: Measurements carried out on** S. abaster **following Dawson (1982) for syngnathids. Specimen redrawn from Tortonese (1970). Legend: DFB – dorsal fin base; DFL – dorsal fin length; ED – eye diameter; HL – head length; Pr AFD – pre-anal fin distance; Pr DF – pre-dorsal fin distance; Pr OL – pre-orbitary length; Ps OL – post-orbitary length; SnL – snout length; TAL – tail length; TL – total length; TRD – trunk depth.
Sl. 2: Meritve, opravljene na malem šilu v skladu z Dawsonovo metodologijo (1982) za družino Syngnathidae. Primerki so narisani na novo po Tortoneseju (1970). Legenda: DFB – baza hrbtne plavuti; DFL – dolžina hrbtne plavuti; ED – premer očesa; HL – dolžina glave; Pr AFD – razdalja predanalne plavuti; Pr DF – razdalja predhrbtne plavuti; Pr OL – preorbitalna razdalja; Ps OL – postorbitalna razdalja; SnL – dolžina gobca; TAL – dolžina repa; TL – celotna dolžina; TRD – višina trupa.

There were positive relationships total length *versus* total mass (TM) and total length *versus* eviscerated mass (EVM); these relations did not significantly differ between them. The relationships were: Log TM = 2.622 Log TL – 12.59; r = 0.92; n = 104 and Log EVM = 2.737 Log TL –13.499; r = 0.89; n = 104.

Comparisons between Tunisian specimens and specimens from MNHN

Specimens from MNHN were from six different origins, but as they were not statistically supported by sufficient data to be compared with the Tunisian specimens, they were included in the same sample. Some relations were compared between Tunisian sample and MNHN sample, such as HL/PrAFD; HL/TL; SnL/HL; PrAFD/TL; PrDF/TL; PrOL/HL; PsOL/HL; DFL/DFB; DFB/TL; ED/HL, as well as all meristic counts (see Fig. 2).

HL/TL, PrAFD/TL, PrDF/TL, DFB/TL, dorsal fin soft rays and pectoral fin soft rays significantly differed between Tunisian and MNHN samples.

DISCUSSION

Description, morphometric measurements and meristic counts are in agreement with Tortonese (1970), Bauchot & Pras (1980) and Dawson (1982, 1986).

Although there were significant differences between specimens from Tunisian waters and those from MNHN of Paris, it is difficult to state that they belong to different populations: the second sample comprised specimens of six different origins. However, Cakic *et al.* (2002) showed significant differences in similar morphometric characters between specimens from the Black Sea and Ukrainian freshwaters.

Dawson (1982, 1986) noted that the straight-nosed pipefish inhabits shallow coastal waters, coasts and estuaries, usually at 4–20 m. The Tunis Southern Lagoon was recently subjected to environmental restoration that allowed colonization of fish species previously unknown in the area (Ben Souissi *et al.*, 2004, 2005; Mejri *et al.*, 2004). *S. abaster* must be included among them. In the area, the species found sufficient resources to subsist and probably to develop and reproduce in brackish areas, as shown by positive relationships total length *versus* total mass and total length *versus* eviscerated mass. Similar patterns were described by Tomasini *et al.* (1991) for specimens collected in the Lagoon of Mauguio (southern France), Koutrakis & Tsikiras (2003) from northern Aegean estuarine waters, and Verdiell-Cubedo *et al.* (2006) from Mar Menor coastal lagoon (western Mediterranean Sea).

S. abaster was previously reported throughout the southern coast of the Mediterranean, such as off Algeria (Dieuzeide *et al.*, 1954), Libya (Al Hassan & El Silini, 1999), Egypt (El Sayed, 1994) and Israel (Golani, 2005). Our investigations have shown that the species was caught predominantly in protected areas and only rarely outside them, as shown by a single specimen caught in the Gulf of Gabès (see above). This suggests that the species was probably sensitive to both interspecific and anthropic pressures. However, the species was generally discarded at sea by fishermen and probably escaped observations; this could also explain its scarcity in marine waters. Our observations allow us to confirm the occurrence of *S. abaster*, not only as a new teleost species found in the Tunis Southern Lagoon (see Ben Souissi *et al.*, 2005), but also in Tunisian waters, in agreement with D'Ancona (1934), Seurat (1934) and Chaouachi & Ben Hassine (1998).

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Fig. 3: *S. abaster* ***(FST-SYN-Abaster 06) collected in the Tunis Southern Lagoon.***
Sl. 3: *S. abaster* ***(FST-SYN-Abaster 06), ujet v Tuniški južni laguni.***

O POJAVLJANJU MALEGA ŠILA *SYNGNATHUS ABASTER*, RISSO 1826 (SYNGNATHIDAE) V TUNIZIJSKIH VODAH (SREDNJE SREDOZEMLJE)

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POVZETEK

Avtorji predstavljajo morfometrične meritve in kratek oris osebkov malega šila Syngnathus abaster *Risso, 1810, ujetih v tunizijskih vodah. Hkrati razpravljajo o pojavljanju vrste v tem območju.*

Ključne besede: Osteichthyes, Syngnathidae, *Syngnathus abaster*, morfometrija, Tunizija, Sredozemsko morje

REFERENCES

Al Hassan, L. A. J. & O. A. El Silini (1999): Check-list of bony fishes collected from the Mediterranean coast of Bengazi, Libya. Rev. Biol. Mar. Oceanogr., 34(2), 291–301.

Bauchot, M. L. & A. Pras (1980): Guide des poissons marins d'Europe. Delachaux & Niestlé, Lausanne-Paris, 427 pp.

Ben Amor, M. M., J. Ben Souissi, M. Ben Salem & C. Capapé (*in press*): Confirmed occurrence of the straight-nosed pipefish, *Nerophis ophidion* (Syngnathidae) in southern Tunisia (central Mediterranean). Cybium.

Ben Souissi, J., H. Mejri, J. Zaouali, A. El Abed, O. Guélorget & C. Capapé (2004): On the occurrence of John Dory *Zeus faber* Linnaeus, 1758 (Osteichthyes: Zeidae) in a perimediterranean lagoon: the Tunis Southern Lagoon (Northern Tunisia). Annales, Ser. Hist. Nat., 14(2), 219–224.

Ben Souissi, J., H. Mejri, J. Zaouali, A. El Abed, M. Ben Salem, O. Guélorget & C. Capapé (2005): Teleost species recorded in Tunis Southern Lagoon after its environmental restoration (northern Tunisia, central Mediterranean). Annales, Ser. Hist. Nat., 15(2), 157–164.

Bradaï, M. N. (2000): Diversité du peuplement ichtyque et contribution à la connaissance des sparidés du golfe de Gabès. Ph. D. Thesis. University of Sfax (Tunisia), 600 pp.

Bradaï, M. N., J. P. Quignard, A. Bouaïn, O. Jarboui, A. Ouannes-Ghorbel, L. Ben Abdallah, J. Zaouali & S. Ben Salem (2004): Ichtyofaune autochtone et exotique côtes tunisiennes: recensement et biogéographie. Cybium, 28(4), 315–328.

Cakic, P., M. Lenhardt, D. Mickovic, N. Sekulic & J. Budakov (2002): Biometric analysis of *Syngnathus abaster* populations. J. Fish Biol., 60(6), 1562–1569.

Chaouachi, B. & O. K. Ben Hassine (1998): The status of fish biodiversity in Ichkeul Lagoon, Tunisia. Ital. J. Zool., Suppl., 303–304.

D'Ancona, U. (1934): Le specie mediterranee del genere *Syngnathus*. Mem. R. Com. Talassogr. Ital., p. 1–79.

Dawson, C. E. (1982): Fishes of western north Atlantic. Part 8. Order Gasterosteiformes, Suborder Syngnthoidei, Syngnathidae. Sears Foundation for Marine Research Memoir, Yale University, 1, p. 1–197.

Dawson, C. E. (1986): Syngnathidae. In: Whitehead, J. P., M. L. Bauchot, J. C. Hureau, J. Nielsen & E. Tortonese (eds.): Fishes of the North-western Atlantic and the Mediterranean. Vol. I. UNESCO, Paris, pp. 628–639.

Dieuzeide, R., M. Novella & J. Roland (1954): Catalogue des poissons des côtes algériennes. Bull. Stn. Aquic. Pêche Castiglione, n. s., 6, 1–384.

El Sayed, R. S. (1994): Check-list of Egyptian Mediterranean fishes. Institute of Oceanography and Fisheries, Alexandria, Egypt, ix + 77 pp.

Golani, D. (2005): Checklist of the Mediterranean Fishes of Israel. Zootaxa, 947, 1–90.

Koutrakis, E. T. & A. C. Tsikliras (2003): Lenght-weight relationships of fishes from three northern Aegean estuarine systems (Greece). J. Appl. Ichthyol., 19(4), 258–260.

Mejri, H., J. Ben Souissi, J. Zaouali, A. El Abed, O. Guélorget & C. Capapé (2004): On the recent occurrence of elasmobranch species in a perimediterranean lagoon: the Tunis Southern Lagoon (Northern Tunisia). Annales, Ser. Hist. Nat., 14(2), 143–158.

Seurat, L. G. (1934): Formations littorales et estuaires de la Syrte Mineure (Golfe de Gabès). Bull. Stat. Océanogr. Salammbô, 32, 1–65.

Tomasini, J. A., J. P. Quignard, C. Capapé & J. L. Bouchereau (1991): Facteurs du succès reproductif de *Syngnathus abaster* Risso, 1826. Acta Oecol., 12(3), 331–355.

Tortonese, E. (1970): Osteichthyes (Pesci ossei). Parte prima. Fauna d'Italia. Edizione Calderini, Bologna, 565 pp.

Verdiell-Cubedo, D., F. J. Oliva-Paterna & M. Torralva (2006): Length-weight relationships for 22 fish species of the Mar Menor coastal lagoon (western Mediterranean Sea). J. Appl. Ichthyol., 22(4), 293–294.