Lessepsian migration of fishes to the Aegean Sea: First record of *Tylerius spinosissimus* (Tetraodontidae) from the Mediterranean, and six more fish records from Rhodes

by

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ABSTRACT. - Lessepsian migrant fish species from the island of Rhodes (SE Aegean Sea, Greece), namely *Etrumeus teres, Upeneus pori, Sphyraena flavicauda, Petroscirtes ancylodon, Callionymus filamentosus, Lagocephalus suezensis*, are reported for the first time. The pufferfish *Tylerius spinosissimus* is recorded for the first time from the Mediterranean Sea. These records increase the number of the Erythrean fishes in the Eastern Mediterranean and extend their distributions. Way of dispersion and condition of local establishment are also discussed.

RÉSUMÉ. - Migration lessepsienne de poissons en mer Égée : première capture de *Tylerius spinosissimus* (Tetraodontidae) et de six autres espèces signalées pour la première fois de l'île de Rhodes.

Six espèces de poissons migrants lessepsiens, déjà signalées ailleurs en Méditerranée, sont mentionnées pour la première fois de la région de l'île de Rhodes (mer Égée Sud-Est). Ces espèces sont : *Etrumeus teres, Upeneus pori, Sphyraena flavicauda, Petroscirtes ancylodon, Callionymus filamentosus* et *Lagocephalus suezensis*. De plus, l'espèce *Tylerius spinosissimus* est mentionnée pour la première fois pour toute la Méditerranée. Ces signalements augmentent le nombre des espèces érythréennes en Méditerranée et élargissent leurs distributions. Le mode de dispersion et le mode d'installation dans la région sont aussi discutés.

Key words. - *Etrumeus teres - Upeneus pori - Sphyraena flavicauda - Petroscirtes ancylodon - Callionymus filamentosus -Lagocephalus suezensis - Tylerius spinosissimus* - Lessepsian migration - Aegean Sea - Rhodes Island - First records.

According to Golani *et al*. (2002), Golani (2002), Goren and Aronov (2002), Golani and Fine (2002) the number of Red Sea (Indo-Pacific origin) fish species, penetrated through the Suez Canal into the Mediterranean (Lessepsian migration), reaches to 59. Seventeen Lessepsian fish species were recorded from the Greek coastal waters up to now, mostly in the Dodecanese continental shelf (Bini, 1960, 1968; Economidis, 1973; Quignard and Pras, 1986; Papaconstantinou, 1990; Corsini and Economidis, 1999; Corsini *et al*., 2002; Corsini *et al*., 2003; Corsini *et al*., in press). This study shows other seven Erythrean fish species, recorded recently in the sea around the island of Rhodes. They are: *Etrumeus teres* (De Kay, 1842), *Upeneus pori* Ben-Tuvia & Golani 1989, *Sphyraena flavicauda* Rüppell, 1838, *Petroscirtes ancylodon* Rüppell, 1835, *Callionymus filamentosus* Valenciennes, 1837, *Lagocephalus suezensis* Clark & Gohar, 1953 and *Tylerius spinosissimus* (Regan, 1908), the last one being a new record for the Mediterranean. All these records provide more precisely the East-West gradient in the distribution of Lessepsian colonizers in the Mediterranean (Golani, 1998a, 1998b). Furthermore, the Red Sea origin fish species, having already reached the SE Aegean Sea waters, total 24.

MATERIALS AND METHODS

The majority of specimens were collected during 2003-2004, in two main localities (Fig. 1): one in the north shore of the island, off Ialissos-Trianda Bay (A), and another in the east shore, near the Lindos area (B). In the locality A depths range from 30 to 50 m and the sandy-muddy bottom is covered by well-developed algae and *Posidonia* beds. The locality B shows depth ranges of 30-50 m and the sandy-stony bottom is covered by well-developed algae. Fishes were collected by trawlers and several other coastal fishing gears.

Fishes were identified by using the following publications: De Silva and Williams (1986), Fricke (1986), Smith and Heemstra (1986a), Whitehead and Wongratana (1986), Bauchot (1987), Springer (2001), Matsuura (2001), Golani *et al*. (2002). Additional information has been also obtained from FishBase (Froese and Pauly, 2004).

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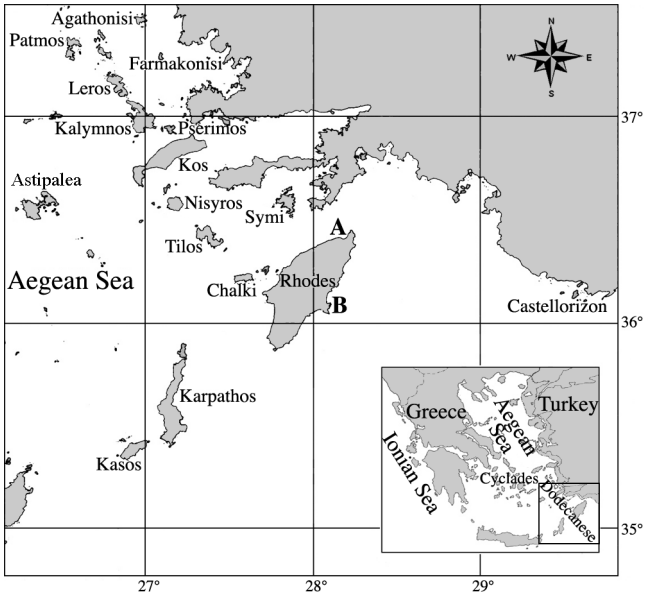

Figure 1. - Locations where fishes were collected around the island of Rhodes: (**A**) Trianda Gulf (*S. flavicauda, E. teres, L. suezensis, U. pori, C. filamentosus, P. ancylodon, T. spinosissimus*), (**B**) Lindos (*S. flavicauda*). *[Lieux de capture des divers spécimens.]*

Morphometric measurements and meristic counts were performed basically according to Smith and Heemstra (1986b) and Bauchot (1987), properly adapted and completed

The abbreviations of the morphometric measurements used for ratios in table and species description are as follows: total length (TL), standard length (SL), maximum body depth (H), minimum body depth or caudal peduncle depth (h), caudal peduncle length (lpc), head length (HL), eye diameter (Oh), preorbital distance (prO), postorbital distance (poO), predorsal length (pD), preventral or prepelvic length (pV), preanal length (pA). Meristic counts comprehended spines (Roman numerals) and soft rays (Arabic numerals) of dorsal (s) (D or D_1, D_2), anal (A), pectoral (P) and ventral or pelvic (V) fins.

ETRUMEUS TERES (DE KAY, 1842)

Fig. 2A

Material examined

Nineteen specimens, 135-170 mm SL, 26.9-63.7 g in weight, were caught on 27 December 2003. They were members of a school, which was observed off Ialissos-Trianda Bay (Fig. 1, locality A), at depths of 30-50 m.

Description

D: III+17; A: 10-13; P: 15-17; V: 8. Body is elongate, sub-cylindrical in section. There are no lateral lines and no scutes along the abdomen, except for one "W" shaped scute at the base of the pelvic fins (Fig. 2A). The rest of the body is covered with very deciduous cycloid scales. The dorsal fin originates before the mid-point, while the pelvic fin is situated behind the mid-point (Tab. I). The relatively large head has an almost terminal mouth without visible teeth, while the snout is pointed. The maxilla does not reach behind the eye. The eye is covered with an adipose eyelid, which reaches anteriorly just behind the snout. The back is blue-green to dark blue while the flanks are silvery.

Distribution

The species is pelagic, mainly inshore (Golani *et al.*, 2002), having a large but sporadical distribution (see map in FIGIS, 2003) along the southern African coasts, in the western Indian Ocean (including Red Sea), in Japan and southern coasts of Australia, in the western Atlantic and in the eastern Pacific.

In the Mediterranean it was first recorded in Israel (Whitehead, 1963) and it expanded its distribution to Egypt (El-Sayed, 1994), to Turkey (Basusta *et al.*, 1997) and to Cyprus (Golani, 2000a). It is regularly caught along the northeastern Mediterranean Turkish coasts (Cicek and Avsar, 2003). The species has been recorded in various areas of the eastern Mediterranean, suggesting the establishment of local populations.

The observed school of the species in Rhodes provides evidence for a successful adaptation in the local ecological conditions. The record of this species in the sea around Rhodes, demonstrates that it continuously expands its distribution along the southern coasts of Anatolia westward and it entered into the SE Aegean Sea shelf, where it has already formed fishable populations (unpubl. data).

UPENEUS PORI BEN-TUVIA & GOLANI, 1989

Fig. 2B

Material examined

Twelve specimens, 60.7-106.1 mm SL, 4.1-18.0 g in weight, were collected between January and February 2003 by different trawl nets, in Ialissos-Trianda Bay (Fig. 1, locality A) at the same depths and bottom as in *E. teres*.

Description

D_1: VII; D_2: 8-9; A: I+6-7; P: 13-14; V: I+5. The body is elongated, the pelvic fin originates before the first dorsal fin. The second dorsal is opposite to the anal fin, and the caudal is forked (Tab. I). The back and the sides are dappled brown-reddish, the last shading to a blue-violet colour, whitish belly. The upper lobe of the caudal fin is covered with 3-7 reddish-brown transverse bars with white inter-space, the ventral bor-

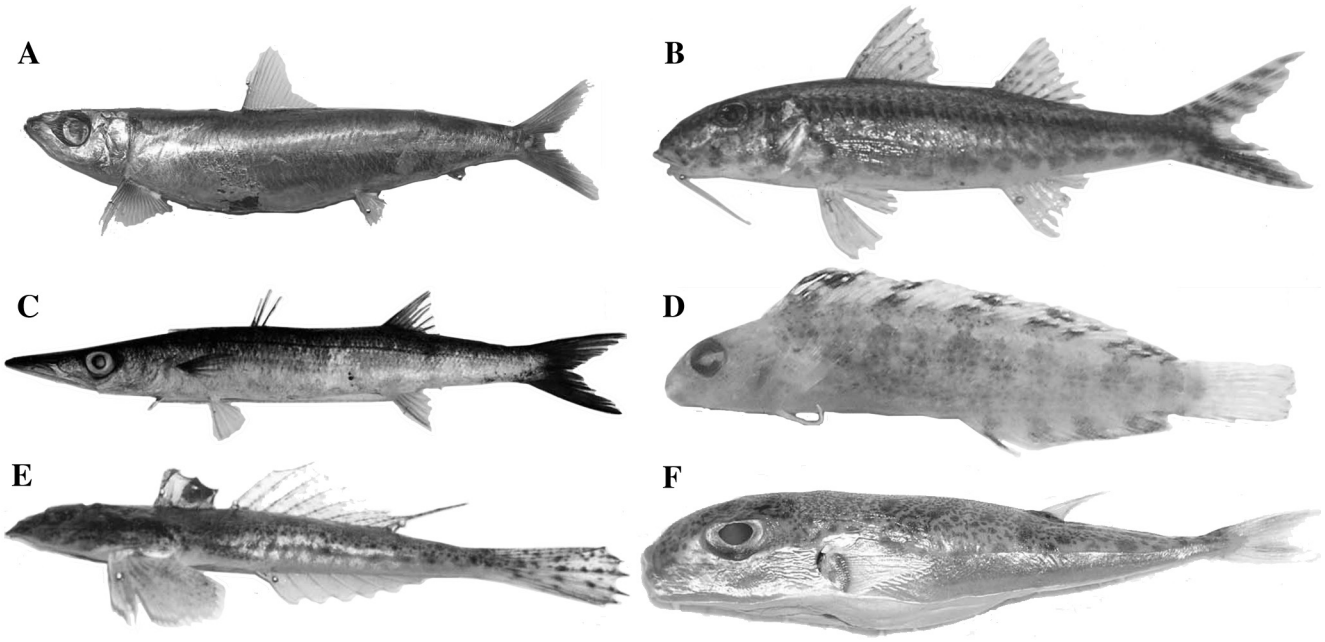

Figure 2. - **A**: Specimen of *Etrumeus teres* and the W shaped scute extracted at the base of pelvic fins; **B**: *Upeneus pori*; **C**: *Sphyraena flavicauda*; **D**: *Petroscirtes ancylodon*; **E**: *Callionymus filamentosus*; **F**: *Lagocephalus suezensis*. *[**A** : Spécimen de* Etrumeus teres *sur lequel la scutelle en forme de W à la base des nageoires pelviennes a été extraite.]*

	Etrumeus teres (n =19)		*Upeneus pori* (n = 12)		*Sphyraena flavicauda* (n = 5)	
Characters	Ranges	Means	Ranges	Means	Ranges	Means
TL/SL	1.14-1.18	1.16 ± 0.01	1.18-1.31	1.24 ±0.04	1.20-1.25	1.23 ± 0.01
TL/H	6.00-7.29	6.45 ± 0.39	4.78-5.68	5.25 ±0.27	8.65-10.00	9.45 ± 0.51
TL/HL	4.76-5.22	5.05 ± 0.13	4.11-4.88	4.57 ±0.23	3.7-3.86	3.76 ± 0.06
SL/H	5.17-6.27	5.54 ± 0.33	3.93-4.69	4.24 ±0.23	7.05-8.17	7.71 ± 0.41
SL/HL	4.16-4.49	4.34 ± 0.11	2.54-3.62	3.09 ±0.31	3.0-3.16	3.07 ± 0.07
SL/pD1	2.20-2.42	2.33 ± 0.06	3.17-3.80	3.45 ±0.21	2.08-2.25	2.18 ± 0.07
SL/pV	1.39-1.67	1.56 ± 0.07	1.56-1.73	1.62 ±0.06	2.49-2.57	2.53 ± 0.04
SL/pA	1.20-1.27	1.23 ± 0.02	2.46-3.14	2.83 ±0.21	1.31-1.35	1.34 ± 0.01
SL/D_1-D_2					3.59-4.0	3.77 ± 0.18
HL/h	3.24-4.11	3.62 ± 0.24	1.06-1.65	1.34 ±0.15	4.64-5.39	5.04 ± 0.28
HL/lpc	2.14-2.99	2.56 ± 0.23	3.27-4.03	3.69 ±0.22	1.72-2.06	1.85 ± 0.14
HL/Oh	3.47-4.78	4.00 ± 0.30	3.17-3.98	3.70 ±0.24	5.08-5.65	5.45 ± 0.22
HL/prO	2.77-3.37	3.03 ± 0.15	2.64-3.87	3.35 ±0.39	2.16-2.24	2.19 ± 0.03
HL/poO	2.13-2.63	2.34 ± 0.14	2.01-3.64	2.52 ±0.43	2.66-2.82	2.74 ± 0.06
H/HL	0.70-0.87	0.79 ± 0.05	0.80-0.93	0.87 ±0.04	0.39-0.43	0.40 ± 0.02

Table I. - Ranges, means and standard deviations of morphometric measurement ratios in *Etrumeus teres, Upeneus pori* and *Sphyraena flavicauda*. TL = Total length; SL = Standard length; H = Maximum body depth; h = Minimum body depth; lpc = Caudal peduncle length; HL = Head length; Oh = Eye diameter; prO = Preorbital distance; poO = Postorbital distance; pD = Predorsal; pV = Preventral; pA = Preanal. *[Variations, moyennes et écarts-types des rapports morphométriques de mesures chez* Etrumeus teres, Upeneus pori *et* Sphyraena flavicauda. *TL = Longueur totale ; SL = Longueur standard ; H = Hauteur maximale du corps ; h = Hauteur minimale du corps ; lpc = Longueur du pédoncule caudal ; HL : Longueur de la tête ; Oh = Diamètre de l'œil ; prO = Distance pré-orbitale ; poO = Distance postorbitale ; pD = Prédorsale ; pV = Préventrale ; pA = Préanale.]*

der of the lower lobe bears 7-10 short transverse reddish bars (Golani *et al*., 2002; Froese and Pauly, 2004) (Fig. 2B).

Distribution

The Por's goatfish was firstly recorded, under the name of *Upeneoides tragula* in Turkish coasts of Anatolia (Kosswig, 1950), and subsequently under other names (*Upeneus tragula, U. asymmetricus*) in Israel (Ben-Tuvia, 1953; Ben-Tuvia and Golani, 1989), Lebanon (George and Athanassiou, 1966, 1967; Hureau, 1986 as review records) and Egypt (El-Sayed, 1994). It is very common in the Eastern Levant (Golani *et al*., 2002), representing one of the most abundant Lessepsian fishes captured in the NE Mediterranean Sea (Cicek and Avsar, 2003). The present record in Rhodes area shows a gradual westward colonization. An eventual competition with the Erythrean *U. moluccensis*, and the native Mediterranean *Mullus barbatus* and *M. surmuletus*, is possible.

SPHYRAENA FLAVICAUDA RÜPPELL, 1838

Fig. 2C

Material examined

Five specimens were collected in 2003, in the sea around Rhodes Island. The first specimen, 334 mm SL, was caught by a fishing net in Lindos area (Fig. 1, locality B), at 30-50 m depth, and the rest four specimens, 224-264 mm SL, were caught with the same trawl-net catch in locality A.

Description

D_1: V; D_2: I+9; A: II+9; P: 13; V: I+5; C: 16-17; LL: 85-90. The tip of the pectoral fin does not reach the vertical through first dorsal fin origin. D_1 height is less than postorbital length and less than the distance between D_1 and D_2 origin. Snout to D_1 2.08-2.25; distance between the origin of D_1 and D_2 3.59-4.00, all in SL (Tab I). A single raw of 4-5 sharp teeth widely spaced is present on the palatine, a raw of small teeth on the premaxilla. The lower jaw bears a single canine at apex followed by a raw of sharp teeth. The back is grey, the belly white, and the caudal fin yellow with upper, lower and posterior margins black, the dorsal fins lightly yellow (Fig. 2C).

Distribution

This inshore-pelagic Indo-Pacific yellowtail barracuda was first recorded in Israel (Golani, 1992). Its distribution and abundance has been estimated as limited (Golani, 1998a; Golani *et al*., 2002), but it could be qualified rather as unknown, because the confusion with other barracudas species and the pelagic mode of life, which favours a more successful spreading. It has been appeared quite fast in the marine area of Rhodes, having been previously recorded to the Mediterranean coasts of Turkey, in Antalya Bay (Bilecenoglou *et al*., 2002). Including the present record of *S. flavicauda*, all the four species of the family Sphyraenidae, known in the Mediterranean, occur in the Rhodes inshore area: the well-known Atlantic-Mediterranean *Sphyraena sphyraena* (Economidis, 1973), as well as *S. viridensis* and *S. chrysotaenia* (Corsini and Economidis, 1999).

PETROSCIRTES ANCYLODON RÜPPELL, 1835

Fig. 2D

Material examined

A specimen, 42.8 mm SL, was collected in January 2004 by trawl-net, off Ialissos-Trianda Bay (Fig. 1, locality A).

Description

D: X+18; A: II+18; P: 14; V: I+3; C: 13. TL/SL: 1.21; SL/HL: 4.08, SL/pD: 4.55, SL/pA: 2.00, SL/H: 4.76, HL/h: 2.56, HL/lpc: 6.56, HL/Oh: 3.62, HL/prO: 3.62, HL/poO: 2.33. The scaleless body of this species is smooth, elongated and compressed. It has a continuous and long dorsal fin, originating in front of the pectoral fin base. The anal fin is also long and it originates at mid-point, while the pelvic fin originates before the base of the pectoral. The head is curved and the snout not pointed. The gill opening is very small, restricted to the side of the head, the lower margin just above pectoral fin base. In both jaws 28 incisor teeth are observed, very long in front of upper jaw, curved in lower jaw. A small canine on each side of the upper jaw is seen with difficulty, while a large canine on each size of the lower jaw is present. The body colour of the fresh specimen is yellow-brown with darker blotches; brown black blotches are present on the dorsal fin, while yellow brown blotches are on the anal. Pectoral, pelvic and caudal fins are not coloured (Fig. 2D). The body colour of the specimen preserved in formalin is brownish to light earth, dotted with small dark spots which gather to give some irregular longitudinal darker blotches on the sides. Dark blotches are even on the dorsal and anal fins.

Distribution

This tropical blenny was recorded first in Israel (Goren and Galil, 1989) and later in Iskenderun Bay (Taskavak *et al*., 2000). The species is considered rare in the Mediterranean (Golani *et al*., 2002), but the third specimen collected in Rhodes shows that its population has expanded its distribution following the Anatolian coasts, as other Lessepsian fishes.

CALLIONYMUS FILAMENTOSUS VALENCIENNES, 1837

Fig. 2E (female)

Material examined

Three specimens were collected from separate catches in January 2003 by trawl-nets (Fig. 1, locality A): a male 141.8 mm SL, 16.4 g in weight, two females, 96.0 mm SL, 12.6 g in weight and 95.1 mm SL and 13.6 g respectively.

Description

D_1: IV (female), I+III (male); D_2: 9; A: 9; P: 18-19; V: I+5; C: 10. TL/SL: 1.29-1.31, SL/HL: 3.31-3.51, SL/H: 8.41-9.90, SL/pD: 3.15-3.53, HL/h: 4.92-5.13, HL/Oh: 3.53-3.67, HL/prO: 2.74-3.05. The body is elongated missing of scales. The sexual dimorphism is expressed by having the male a filamentous first dorsal spine. Other spines are short in both sexes. The second dorsal fin has much longer rays with the last one even longer, as in the anal fin, which originates under the second to third dorsal ray. The pectoral and caudal fins have round edge, but in male two of the caudal

fin rays are filamentous. The pelvic fin is situated in front of the pectoral and has its middle rays longer than the outer. The eyes are placed high on the depressed and triangular head, which ends to a pointed snout. The relatively small mouth is directed downwards. The large preopercular spine is very distinctive, as it resembles to a double-edge spear. The lower side is sharp while the upper has left pointed teeth, ranging from 4 to 7. The dark to middle earth colours of the back diminish towards the light earth abdomen. Along the body there are lateral series of dark blotches and dots. In male the first dorsal fin is black while in female it only has a black dot on the rear (Fig. 2E).

Distribution

This species was first recorded in Israel (Ben-Tuvia, 1953; Tortonese, 1953) and then in Lebanon (George *et al*., 1964), and along the NE Mediterranean coasts of Turkey (Gucu *et al*., 1994), where it is regularly caught (Cicek and Avsar, 2003). The recent occurrence in Rhodes marine area could be considered as postponed, but must probably the species was established there long ago and his escape of recording is rather the result of a confusion with other Mediterranean dragonets. Anyhow, there is an obvious westward expansion of its distribution, following the Anatolian coasts.

LAGOCEPHALUS SUEZENSIS CLARK & GOHAR, 1953

Fig. 2F

Material examined

A specimen, 74.5 mm SL, was caught in the locality A (Fig. 1).

Description

D: 10, A: 9, P: 15, C: 12. TL/SL: 1.2, SL/HL: 3.2, SL/pD: 1.5, SL/pA: 1.6, SL/H: 3.2, HL/h: 7.8, HL/lpc: 1.2, HL/Oh: 2.7, HL/prO: 2.7, HL/poO: 3.3. There are not scales, but the skin is rough on dorsal and ventral surface, while completely smooth on the sides. The back is brown-olive with darker brown to grey irregular spots; the sides are silvery shiny, the belly white and the four central caudal rays yellow (Fig. 2F).

Distribution

This Red Sea pufferfish has been recorded first in Lebanon (Mouneimne, 1977, as *L. sceleratus*) and later in Israel (Golani, 1996). It has been recently observed in eastern Mediterranean coasts of Turkey, at Iskenderun bay, and in Gökova bay (in front of Cos Island), SE Aegean Sea (Bilecenoglou *et al*., 2002). This is a relatively quick expansion of the distribution after reaching the extended inshore waters of Aegean Sea.

TYLERIUS SPINOSISSIMUS (REGAN, 1908)

Fig. 3

Material examined

A very small specimen, 17.4 mm SL, was collected by the trawl-net (mesh size 10 mm) of the fishing boat "Pantelidis", in the bay of Trianda, approximately one mile off the NW coasts of Rhodes Island, on 10 February 2004, at about 90 m depth (Fig. 1, locality A).

Description

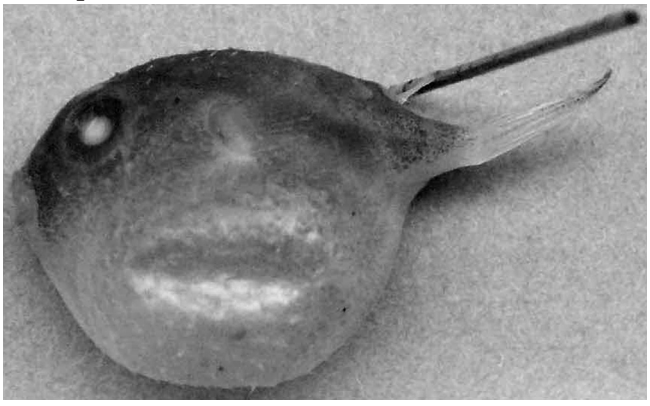

Figure 3. - *Tylerius spinosissimus*.

D: 8, A: 6, P: 14, C: 10. TL/SL: 1.36; SL/HL: 1.98; SL/pD: 1.22; SL/pA: 1.17; HL/h: 5.50; HL/lpc: 2.67; HL/Oh: 3.03; HL/prO: 3.83; HL/poO: 2.59. The specimen, preserved in formalin, has inflated belly (Fig. 3). The dorsal and the anal fins are posterior in position, the dorsal slightly in front of the anal. There are no pelvic fins. In all over the head and the body there are numerous spinules wide distributed except the caudal peduncle. The mouth is situated below the level of upper end of the pectoral base. A slight median suture in the upper beak-like teeth is present, while the lower is broken exactly in the middle, in the specimen examined. The back is dark brown and the belly whitish. In the body there are small black-brown spots, being more concentrated on the back and less on the belly. The distribution of the black specks continues along the middle caudal fin rays and at its rear margin, giving to it a darker colour. The dorsal, pectoral and anal fins are pale transparent.

Distribution

According to FishBase (Froese and Pauly, 2004) the spiny blaasop is a bathydemersal species widely distributed

in the Indo-West Pacific Ocean (recorded from South and East Africa, Mozambique, North-western Australia, Philippines, Taiwan, and South China). It is a small size species attaining up to 12 cm TL and living at depths ranging from 250 m to 435 m. The young specimen found in the marine area of Rhodes, was caught at a depth of about 90 m, sensibly lower than those in which the species occurs in tropical waters, but higher than the range depth at which Lessepsian migrant fish are usually recorded in the area. This occurrence is supposed to be the result of a migration from the Red Sea to the Eastern Mediterranean Sea via the Suez Canal, because the species is missing from the central eastern Atlantic and around the Gibraltar strait area (see Tortonese, 1986).

DISCUSSION

The marine waters of island of Rhodes, at the border between the Aegean and the Levantine Seas, are influenced significantly by the latter (Siokou-Frangou *et al*., 1997). Branches of the Asia Minor Current intrude into the SE Aegean and the Cretan Seas, through the eastern straits of the Cretan Arc (Pancucci-Papadopoulou *et al*., 1992). The coastal zone of Rhodes Island and adjacent region present the character of a sub-tropical open-sea (Siokou-Frangou and Papathanassiou, 1989; Pancucci-Papadopoulou *et al*., 1999), offering to the Erythrean migrants, a favoured path for colonizing this marine area and entering into the SE Aegean Sea.

Recent unpublished data on the benthic-pelagic fishery resources in the South Aegean Sea (Cyclades and Dodecanese islands) confirm this fact, although the great part of its fish fauna is mainly of Atlantic-Mediterranean character. However, the major part of thermophilous species, including the Lessepsian migrants, occurs in the Dodecanese region.

Concerning Lessepsian fishes especially, in most cases their advance along the Anatolian coasts is gradual, depending on biotic and abiotic factors (Golani, 1998b; Corsini and Economidis, 1999; Corsini *et al*., 2002) and their occurrence in Rhodes area generally followed this trend. It is also interesting that most Erythrean invertebrate invaders occupy at present the Mediterranean littoral and infralittoral zones to a depth of 50 m approximately, and are hardly found in deeper waters (Galil and Zenetos, 2002). This is also true for the Lessepsian fish species, which dwell in rather shallow sandy or muddy habitats (Golani, 1993). On the other hand, the present record of *Tylerius spinosissimus* collected at deeper water than usual depth of this species may show that there may be several unexplored niches in the region, suitable to new colonizers. The finding of this young pufferfish in Rhodes, far from the Suez Canal, probably indicates that a certain population of the species is already established in the eastern Mediterranean, especially in closer to Suez Canal areas, as observed in the case of *Tetrosomus gibbosus* (Linnaeus, 1758) (Spanier and Goren, 1988).

Since no dedicated studies have been carried out about fish fauna in the marine area of Rhodes and all over coastal waters of Dodecanese continental shelf, any new record of Lessepsian fish corresponds rather to species that have previously established there a population, large enough to be detectable and catchable. This is confirmed by the fact that various such species are normally present, more or less abundant, in fishery activities from their first recording in the region until today (Corsini *et al*., 2003, in press). Some species, as *Siganus luridus* and *Siganus rivulatus* continue to have commercial value, while *Sphyraena chrysotaenia* is normally confused with *S. sphyraena* and *S. viridensis*, the last two species coexisting in the same coastal area (Corsini and Economidis, 1999). Several of these Erythrean invaders have found vacant ecological niches and obviously did not develop any remarkable competition with local native species. Thus, *Upeneus moluccensis* is present but it does not prevail on *Mullus barbatus*. Also, *Apogon nigripinnis* (now *A. pharaonis*: see Golani *et al*., 2004) is regularly caught in trawl-nets together with its indigenous counterpart *Apogon imberbis*, while *Pteragogus pelycus* occurs with other same size labrid species (for example *Symphodus* sp., *Coris julis, Thalassoma pavo*). On the other hand, no local fish species disappeared in Rhodes marine area as assessed for the rest of the Eastern Mediterranean (Golani, 1998a). In other cases, however, as *Fistularia commersonii*, which has a fast expansion along the Anatolian coasts (Golani, 2000b; Corsini *et al*., 2002; Bilecenoglou *et al*., 2002) and recently up to the north Aegean Sea (Halkidiki peninsula) (Karachlé *et al*., 2004) and westward to the Central Mediterranean (Azzurro *et al*., 2004a, 2004b), the phenomenon is alarming because this fish reproduces and grows very rapidly. Additionally, the species is extremely voracious and aggressive when in schools, eating also fry of commercial native species (Corsini *et al*., 2002). Since its first appearance in 2001 in Rhodes marine area, *F. commersonii* is actually presenting at a number of 5 to 20 specimens occasionally in a catch of any trawl nets operation, mainly at 20-25 m depth. Apparently, this fish is exerting a predation pressure upon the local indigenous species and this fact presents the other side of the coin, maybe suggesting that more other invaders and native species are also implicating in competition. Consequently, the impact brought to the local fished populations by Lessepsian migrants seems to be serious and accelerated in some cases, thus a more attentive approach is needed.

New Lessepsian fishes species in the marine area of Rhodes have been recorded in relatively wide time intervals. In the last decade, an increase of the records density is observed, reaching a maximum in the present work, in which the seven species were newly recorded during twelve

months. It is to be noted that the recently appeared Erythrean fishes have been recorded along the NE Mediterranean coasts of Turkey and in the Dodecanese marine region with a small time interval. These results are similar to the case of Erythrean crustaceans, which suddenly appeared in the SE Aegean in the past decade. According to Galil *et al*. (2002) it may be due to the more extensive inflow of the Asia Minor Current in the area.

Taking into account the increased interest of the scientific community for the Lessepsian colonization, this event seems to show a higher rate of invasion of the Levantine coasts by tropical fish species and their successful implantation, confirming that "the littoral and infralittoral biota of the Levantine Sea is undergoing a profound change due to the influx of Erythrean invaders" (Galil and Zenetos, 2002), giving furthermore support to the indication of a tropicalization of the area. In long terms this phenomenon increases little by little the complexity of the entire eastern Mediterranean ecosystem, and it most probably leads to a new equilibrium, which would be characterising by a higher productivity and stability.

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