

SHORT COMMUNICATION

Maximum size of reticulated leatherjacket, *Stephanolepis diaspros* Fraser-Brunner, 1940 (Tetraodontiformes: Monacanthidae), for the Turkish Seas

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Abstract

A specimen of Lessepsian migrant, *Stephanolepis diaspros*, 257 mm in total length, was caught on 10 January 2018 by a scoop net in Göltürkbükü fishing port, Güllük Bay, on the sandy bottom at a depth of 1 m. This record was the maximum size for both the Turkish seas and the Mediterranean.

Keywords: Lessepsian migrant, maximum size, Güllük Bay, Aegean Sea

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Reticulated leatherjacket, *Stephanolepis diaspros* Fraser-Brunner, 1940, lives inshore in sandy and rocky habitats with vegetation to a depth of 20 m. They feed on small rock-dwelling organisms, especially small invertebrates that are plucked from rocks (Golani *et al.* 2006; Froese and Pauly 2018). Its common size is 7-15 cm, with the maximum has been recorded as 20 cm (Golani *et al.* 2006) and 25 cm TL (Froese and Pauly 2018). *S. diaspros* entered through the Suez Canal into the eastern and central Mediterranean, reaching Tunis and southern Italy, although originally its distribution included the Red Sea and the Arabian Gulf (Tortonese 1986; Froese and Pauly 2018).

S. diaspros is one of the very first Lessepsian settlers in the Mediterranean, where it was recorded first in the Palestinian coast by Steinitz (1927). Since then it was recorded first from Iskenderun Bay in the 1950s (Kosswig 1950), the species is now well-known in the Turkish coasts. *S. diaspros* is especially well established in the eastern Mediterranean. In the Aegean Sea, *S. diaspros* was reported for the first time in 1943 (Tortonese 1947) and since then *S. diaspros* has been well established in the region, reaching as far as to the Sea of Marmara (Bilecenoglu

and Yokeş 2013). Additionally, it reached to the Adriatic Sea (Dulčić and Pallaoro 2003), Gulf of Palermo, Sicily (Catalano and Zava 1993), Tunisia (Ben Amor and Capapé 2008; Zouari-Ktari *et al.* 2008) and Maltese waters (Deidun *et al.* 2015).

On 10 January 2018, a specimen of *S. diaspros* (Figure 1) with 257 mm in total length (TL) was captured by a scoop net in Göltürkbükü fishing port (37°07'41''N-27°22'46''E), Güllük Bay on sandy bottom at a depth of 1 m (Figure 2). The specimen was measured to the nearest millimetre, fixed in 5 % formaldehyde solution and deposited in the Ichthyological Collection of Fisheries Faculty, Ege University, with the catalogue number: ESFM-PIS/2018-01. Description, measurements and percentage in total length (Table 1) of *S. diaspros* are in total accordance with those in Tortonese (1986), Golani *et al.* (2002 and 2006), Froese and Pauly (2018).



Figure 1. The specimen of *Stephanolepis diaspros* with 257 mm TL (ref. ESFM-PIS/2018-01), captured in the fishing port of Göltürkbükü, Güllük Bay. Scale bar: 50 mm (Photo: Tevfik Ceyhan)

S. diaspros exhibits sexual dimorphism. Male adults have the second spine of the second dorsal fin being prolonged and the caudal peduncle consisting of a series of horny patches in several rows (Zouari-Ktari and Bradai 2011). Besides, El-Ganainy (2010) detected that the males reach larger sizes (16-26 cm), while the females were represented in small sizes (8-16 cm). Thus, the specimen in this study was obviously a male.

Table 1. Morphometric measurements as percentage of total length (%TL) and counts recorded in *Stephanolepis diaspros*, captured in Göltürbükü, SE Aegean Sea

Morphometric characteristic	Measurement (mm)	Proportion (%)
Total length (TL)	257	100.0 TL
Standard length (SL)	214	83.3 TL
Maximum body depth	131	51.0 TL
Pre-dorsal fin length	111	43.2 TL
Pre-anal fin length	134	52.1 TL
Head length (HL)	65	25.3 TL
Eye diameter	13	20.0 HL
Meristic counts		
Dorsal fin rays	I+30	
Anal fin rays	30	
Pectoral fin rays	13	
Weight (g)	252	

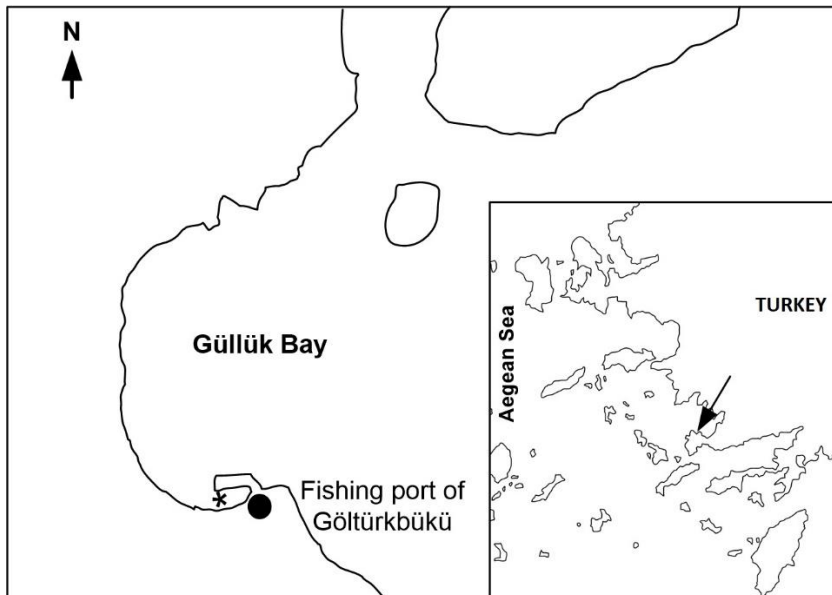


Figure 2. Sampling location (black star) of *Stephanolepis diaspros*

The one of the oldest catch records of *S. diaspros* in the Turkish waters belongs to Gücü *et al.* (1994) who reported eight specimens from Mersin and Iskenderun Bay, the northeastern Mediterranean coast of Turkey, during 1983, 1984 and 1989 intermittent trawl surveys. All successive catch records of *S. diaspros* are shown in Table 2.

Table 2. Capture records of *Stephanolepis diaspros* in the Turkish Seas

Location	Depth (m)	Record date	Number collected	Size TL (mm)	References
Anamur, Iskenderun	<100	1983/84-1989	8	77-206	Gücü <i>et al.</i> (1994)
Karataş, Iskenderun	40	1991-1994	3	100-145	Torcu and Mater (2000)
Karataş, Iskenderun	40	1994-1996	2	161-172	Başusta and Erdem (2000)
Mersin, Iskenderun	10-80	1997-1998	207	71-130	Taskavak and Bilecenoglu (2001)
NE Mediterranean	5-100	2001-2003	52	73-142	Sangun <i>et al.</i> (2007)
Yeşilova Bay	10-20	?	3	98-212	Oz <i>et al.</i> (2007)
Iskenderun Bay	12-120	2007-2008	56	80-135	Erguden <i>et al.</i> (2009)
Antalya, Iskenderun	?	?	2	215-220*	Bilecenoğlu (2010)
Iskenderun Bay	31-110	2010-2011	158	80-202	Yemiskan <i>et al.</i> (2014)
Sea of Marmara	10	28/29 Nov.2012	2	ca. 200	Bilecenoğlu and Yokeş (2013)
Off Urla, Izmir Bay	6	27 Oct.2014	1	177	Akyol and Özgül (2015)
Göltürkbükü, Güllük	1	10 Jan.2018	1	257	This study

*unpublished data

In the Mediterranean Sea, the maximum lengths of *S. diaspros* were reported as 237 mm TL (n=1124) from Gulf of Gabes (Tunisia) (Zouari-Ktari *et al.* 2008); 190 mm SL (n=16) from the southern Aegean Sea (Corsini-Foka *et al.* 2010); 130 mm TL (n=1) from off Piran, Slovenia (Lipej *et al.* 2014); 239 mm TL (n=3) from the Cypriot waters (Iglésias and Frotté 2015); 180-200 mm TL (n=1) from off Lampedusa Island in Maltese waters (Deidun *et al.* 2015). However, 261 mm TL (n=550) was recorded from the Gulf of Suez, Red Sea, Egypt by El-Ganainy and Sabra (2008). If it was the maximum size of fish, in that case, the size reported in this study might be the maximum both in the Turkish seas and the Mediterranean. Recently, *S. diaspros* was reported from Lipsi Island (southern Aegean Sea, Greece) and a total of 17 adult individuals, measuring 100-300 mm in length were observed during underwater visual census (Servonnat and Drakulic 2015). Such a report on maximum length needs further approval since it tends to produce less accurate estimates of fish length due to optical characteristics of water (*see*, Harvey *et al.* 2001a, b, 2002).

In conclusion, the present record was obtained through fishing and demonstrated maximum size of this species for both the Turkish marine waters and the Mediterranean.

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Türkiye denizleri için dikenli çütre balığının *Stephanolepis diaspros* Fraser-Brunner, 1940 (Tetraodontiformes: Monacanthidae) maksimum boyu

Öz

Göltürkbükü balıkçı limanında 10 Ocak 2018 tarihinde Lesepsiyen bir *Stephanolepis diaspros* bireyi (257 mm TL), 1 m derinlikte kumlu zeminden bir ağ kepçeyle yakalanmıştır. Bu boy kaydı hem Türkiye denizleri hem de Akdeniz için maksimumdur.

Anahtar kelimeler: Lesepsiyen, maksimum boy, Güllük Körfezi, Ege Denizi

References

Akyol, O., Özgül, A. (2015) Record of reticulated leatherjacket *Stephanolepis diaspros* Fraser-Brunner, 1940 (Tetraodontiformes: Monacanthidae) from Izmir Bay, Turkey. *J. Black Sea/Mediterranean Environ.* 21(3): 316-322.

Başusta, N., Erdem, Ü. (2000) A study on the pelagic and demersal fishes of Iskenderun Bay. *Tr. J. Zool.* 24(Suppl.): 1-19 (in Turkish).

Ben Amor, M.M., Capapé, C. (2008) Occurrence of a filefish closely related to *Stephanolepis diaspros* (Osteichthyes: Monacanthidae) off northern Tunisian coast (South-western Mediterranean). *Cah. Biol. Mar.* 49: 323-328.

Bilecenoğlu, M. (2010) Alien marine fishes of Turkey- an updated review. In: Fish Invasions of the Mediterranean Sea: Change and Renewal, (eds., Golani, D., Appelbaum-Golani, B.), Pensoft Publishers, Sofia-Moscow, pp. 189-217.

Bilecenoğlu, M., Yokeş, B. (2013) New Lessepsian fish records from the Aegean and Marmara Sea. In: (eds. Bilecenoğlu, M., Alfaya, J.E.F., Azzurro, E., Baldaconi, R., Boyacı, Y.Ö., Circosta, V., Compagno, L.J.V., Coppola, F., Deidun, A., Durgham, H., Durucan, F., Ergüden, D., Fernandez-Alvarez, F.A., Gianguzza, P., Giglio, G., Gököğlu, M., Gürlek, M., İkhtiyar, S., Kabasakal, H., Karachle, P.K., Katsanevakis, S., Koutsogiannopoulos, D., Lanfranco, E., Micarelli, P., Özvarol, Y., Pena-Rivas, L., Pousanidis, D., Saliba, J., Sperone, E., Tibullo, D., Tiralongo, F., Tripepi, S., Turan, C., Vella, P., Yokeş, M.B., Zava, B.), New Mediterranean marine biodiversity records (December 2013). *Med. Mar. Sci.* 14: 463-480.

Catalano, E., Zava, B. (1993) The presence of *Stephanolepis diaspros* Br. Brunn. Italian Waters (Osteichthyes, Filefish). *Supplemento alle Ricerche di Biologia della Selvaggina* 21: 379-382.

Corsini-Foka, M., Pancucci-Papadopoulou, M.A., Kalogirou, S. (2010) Is the Lessepsian province in expansion? The Aegean Sea experience. Sub-regional

Technical meeting on the Lessepsian migration and its impact on eastern Mediterranean fishery. Nicosia, 7-9 Dec. FAO East Med Tech. Document, pp. 50-59.

Deidun, A., Castriota, L., Falautano, M., Maraventano, G., Prazzi, E., Andaloro, F. (2015) Documenting the occurrence of the Lessepsian fish *Stephanolepis diaspros* within the Strait of Sicily, Central Mediterranean. *J. Black Sea/Mediterranean Environ.* 21(1): 1-11.

Dulčić, J., Pallaoro, A. (2003) First record of the filefish, *Stephanolepis diaspros* (Monacanthidae), in the Adriatic Sea. *Cybium* 27: 321-322.

El-Ganainy, A.A., Sabra, M.M.M. (2008) Age, growth, mortality and yield per recruit of the file fish *Stephanolepis diaspros* (Fraser-Brunner, 1940) (Pisces: Monacanthidae) in the Gulf of Suez, Egypt. *J. Fish. Aquat. Sci.* 3: 252-260.

El-Ganainy, A.A. (2010) Some biological aspects of the filefish *Stephanolepis diaspros* (Family: Monacanthidae) from the Gulf of Suez, Egypt. *Researcher* 2(10): 75-78.

Erguden, D., Turan, C., Gurlek, M. (2009) Weight-length relationships for 20 Lessepsian fish species caught by bottom trawl on the coast of Iskenderun Bay (NE Mediterranean Sea, Turkey). *J. Appl. Ichthyol.* 25:133-135.

Froese, R., Pauly, D. (2018) FishBase. World Wide Web electronic publication. www.fishbase.org, version (10/2017) (accessed date: 17 Jan. 2018).

Golani, D., Orsi-Relini, L., Massuti, E., Quignard, J.P. (2002) CIESM Atlas of 321 Exotic Species in the Mediterranean. Vol. 1 Fishes, 256 pp.

Golani, D., Öztürk, B., Başusta, N. (2006) The Fishes of the Eastern Mediterranean. Turkish Marine Research Foundation Publication No: 24 Istanbul, Turkey. 259 pp.

Gücü, A.C., Bingel, F., Avşar, D., Uysal, N. (1994) Distribution and occurrence of Red Sea fish at the Turkish coast-northern Cilician basin. *Acta Adriat.* 34:103-113.

Harvey, E., Fletcher, D., Shortis, M. (2001a) A comparison of the precision and accuracy of estimates of reef-fish lengths determined visually by divers with estimates produced by a stereo-video system. *Fisheries Bulletin* 99: 63-71.

Harvey, E., Fletcher, D., Shortis, M. (2001b) Improving the statistical power of length estimates of reef fish: a comparison of estimates determined visually by

divers with estimates produced by a stereo-video system. *Fisheries Bulletin* 99: 72-80.

Harvey, E., Fletcher, D., Shortis, M. (2002) Estimation of reef fish length by divers and by stereo-video: A first comparison of the accuracy and precision in the field on living fish under operational conditions. *Fisheries Research* 57: 255-265.

Iglésias, S.P., Frotté, L. (2015) Alien marine fishes in Cyprus: Update and new records. *Aquatic Invasions* 10: 425-438.

Kosswig, C. (1950) Erythraische fische im Mittelmeer und an der grenzeder Agais. *Syllegomena Biologica*, Festschrift Kleinschmidt, Leipzig: Akademie Verlag, pp. 203-212.

Lipej, L., Mavric, B., Dulcic, J. (2014) Northern most record of the reticulated leather-jacket *Stephanolepis diaspros* Brunner-Fraser, 1940 in the Mediterranean Sea. In: (eds., Kaporis, K., Apostolidis, C., Baldaconi, R., Baştusta, N., Bilecenoğlu, M., Bitar, G., Bobori, D. C., Boyacı, Y.Ö., Dimitriadis, C., Djurovic, M., Dulcic, J., Durucan, F., Gerovasileiou, V., Gökoğlu, M., Koutsoubas, D., Lefkaditou, E., Lipej, L., Markovic, O., Mavrici, B., Özvarol, Y., V. Pesc, V., O. Petriki, O., Siapatasi, A., Sinis, M., Tibullo, D., Tiralongo, F.), New Mediterranean Biodiversity Records (April, 2014). *Med. Mar. Sci.* 15: 198-212.

Oz, M.İ., Okuş, E., Yüksek, A. (2007) Notes on the Erythrean alien fishes of Dağca-Bozburun Peninsula- a specially protected area in the southeastern Aegean Sea (Turkey). *Rapp. Comm. int Mer Médit.*, 38: 563.

Sangun, L., Akamca, E., Akar, M. (2007) Weight-length relationships for 39 fish species from the north-eastern Mediterranean coasts of Turkey. *Tr. J. Fish. Aquat. Sci.* 7: 37-40.

Servonnat, M., Drakulic, M. (2015) New records of *Fistularia commersonii* and *Stephanolepis diaspros* around Lipsi Island, Dodacanese, Greece. In: Zenetos *et al.* New Mediterranean Biodiversity Records (April 2015). *Med. Mar. Sci.* 16: 266-284.

Steinitz, W. (1927) Beiträge zur Kenntnis der Küstenfauna Palästinas. *I. Pubblicazioni della Stazione Zoologica di Napoli* 8: 311-353.

Taskavak, E., Bileceoglu, M. (2001) Length-weight relationships for 18 Lessepsian (Red Sea) immigrant fish species from the eastern Mediterranean coast of Turkey. *J. Mar. Biol. Assoc. UK* 81: 895-896.

Torcu, H., Mater, S. (2000) Lessepsian fishes spreading along the coastsof the Mediterranean and the southern Aegean Sea of Turkey. *Tr. J. Zool.* 24: 139-148.

Tortonese, E. (1947) Zoological research in Rhodes Island (Aegean Sea) fish. *Bollatino di Pesca, Piscicoltura e Idrobiologia* 23:143-192.

Tortonese, E. (1986) Monacanthidae. In: Fishes of the North-eastern Atlantic and the Mediterranean, Vol. III (eds. P.J.P. Whitehead, M.-L.Bauchot, J.-C. Hureau, J. Nielsen, E. Tortonese). UNESCO, Paris, pp. 1338-1339.

Yemiskan, E., Dalyan, C., Eryılmaz, L. (2014) Catch and discard fishspecies of trawl fisheries in the Iskenderun Bay (North-eastern Mediterranean) with emphasis on lessepsian and chondrichthyan species. *Med. Mar. Sci.* 15: 380-389.

Zouari-Ktari, R., Bradai, M.N., Bouain, A. (2008) The feeding habits of the Lessepsian fish *Stephanolepis diaspros* (Fraser-Brunner, 1940) in the Gulf of Gabes (eastern Mediterranean Sea). *Cah. Biol. Mar.* 49: 329-335.

Zouari-Ktari, R., Bradai, M.N. (2011) Reproductive biology of the lessepsian Reticulated leatherjacket *Stephanolepis diaspros* (Fraser Brünner, 1940) in the Gulf of Gabes (Eastern Mediterranean Sea). *Rev. Fish Biol. Fisheries* 21: 641-648.