

## Rapid Communication

## New record of the Seychelles dragonet *Synchiropus sechellensis* Regan, 1908 from the Mediterranean: accidental entrance or Lessepsian immigration?

Nikolas Michailidis<sup>1,\*</sup> and Niki Chartosia<sup>2,3</sup><sup>1</sup>Department of Fisheries and Marine Research (DFMR), 101 Vithleem Str., 1416 Strovolos, Nicosia, Cyprus<sup>2</sup>Department of Biological Sciences, University of Cyprus, P.O. Box 20537, 1678 Nicosia, Cyprus<sup>3</sup>Oceanography Centre, University of Cyprus, P.O. Box 20537 Nicosia 1678, CyprusE-mail addresses: [nmichailidis@dfmr.moa.gov.cy](mailto:nmichailidis@dfmr.moa.gov.cy) (NM), [nchartos@ucy.ac.cy](mailto:nchartos@ucy.ac.cy) (NC)

\*Corresponding author

Received: 18 May 2016 / Accepted: 8 July 2016 / Published online: 15 July 2016

Handling editor: Charles Martin

### Abstract

The Seychelles dragonet *Synchiropus sechellensis* Regan, 1908 is reported for the fourth time from the Mediterranean and for the first time from Cyprus. This addition expands its distribution in the Mediterranean further from the Gulf of Antalya on the Turkish coast and the islands of Rhodes and Kastellorizo in Southeastern Aegean, placing a question mark whether this species was accidentally introduced in the Mediterranean as initially hypothesized, or it actively entered from the Indo-Pacific through the Suez Canal (Lessepsian immigration) and may have been overlooked in areas closer to the Canal. The basic measurements of the specimen caught in Cyprus, as well as an updated list of all Lessepsian fish species reported from Cyprus are given.

**Key words:** Callionymidae, Lessepsian fish, Eastern Mediterranean, Cyprus

### Introduction

Due to its proximity to the Suez Canal, Cyprus is highly affected by Lessepsian immigration. An earlier estimate (Michailidis 2010) showed that Lessepsian fish constitute up to 10% of the biomass of the local artisanal landings in Cyprus, while more recent data (Cyprus Department of Fisheries and Marine Research 2016) raise this percentage to 20%. So far, 36 Lessepsian fish species are known from Cyprus, with the most recent studies being those of Iglesias and Frotté (2015) with 7 new species (*Parupeneus forsskali* was confirmed by Chartosia and Michailidis 2016) and Crocetta et al. (2015) who reported *Cheilodipterus novemstriatus* (Rüppell, 1838).

In this study, the occurrence of a new Red Sea fish species is reported from Cyprus: the Seychelles dragonet *Synchiropus sechellensis* Regan, 1908. This species is widely distributed in the Indo-West Pacific and the Red Sea (Fricke 2002). The first report of the species from the Mediterranean was for an individual caught in the Gulf of Antalya (Turkey)

in April 2014 (Gökoğlu et al. 2014). The species was then documented in the nearby Greek waters of Kastellorizo (September 2014) and Rhodes (February 2016) (Kondylatos et al. 2016). Dragonets of the family Callionymidae are benthic fishes occurring in the upper 900 meters of temperate, subtropical, and tropical oceans (Fricke 2002). Of the 42 species in the genus, only *Synchiropus phaeton* (Günther 1861) is common along the Mediterranean Sea coasts (including Cyprus), mainly on muddy bottoms at depths of 99–650 m (Froese and Pauly 2016). The present report of *Synchiropus sechellensis* raises the known number of Lessepsian fish species in Cyprus to 37 (Table 1).

### Methods

On 28 March 2016, a male *Synchiropus sechellensis* individual (Figure 1) was caught in a trammel net (36 mm inner mesh eye opening) set at a depth of 40 m in the area of Moni Cyprus (34.691°N 33.202°E) (Figure 2). The species and sex were identified

**Table 1.** Lessepsian fish species reported from Cyprus up to May 2016.

Species	First sighting	Success
<i>Alepes djedaba</i> (Forsskål, 1775)	1964 (Demetropoulos and Neocleous 1969)	established
<i>Apogonichthyoides pharaonis</i> (Bellotti, 1874)	1964 (Demetropoulos and Neocleous 1969)	established
<i>Atherinomorus forskalii</i> (Rüppell, 1838)	1929 (Norman 1929)	established
<i>Cheilodipterus novemstriatus</i> (Rüppell, 1838)	2015 (Crocetta et al. 2015)	established
<i>Dussumieria elopsooides</i> Bleeker, 1849	1985 (Whitehead 1985)	established
<i>Equulites klunzingeri</i> (Steindachner, 1898)	1961 (Fodera 1961)	established
<i>Etrumeus golanii</i> DiBatistta, Randall and Bowen, 2012	1999 (Golani 2000)	established
<i>Fistularia commersonii</i> Rüppell, 1838	1999 (Wirtz and Debelius 2003)	invasive
<i>Hemiramphus far</i> (Forsskål, 1775)	1964 (Demetropoulos and Neocleous 1969)	established
<i>Herklotsichthys punctatus</i> (Rüppell, 1837)	1985 (Whitehead 1985)	casual
<i>Hippocampus fuscus</i> Rüppell, 1838	2014 (Iglesias and Frotté 2015)	casual
<i>Lagocephalus guentheri</i> Miranda Ribeiro, 1915	2006 (Katsanevakis et al. 2009)	established
<i>Lagocephalus sceleratus</i> (Gmelin, 1789)	2004 (DFMR 2006)	invasive
<i>Lagocephalus suezensis</i> Clark and Gohar, 1953	2007 (Katsanevakis et al. 2009)	established
<i>Nemipterus randalli</i> Russell, 1986	2014 (Iglesias and Frotté 2015)	established
<i>Ostorhinchus fasciatus</i> (White, 1790)	2014 (Iglesias and Frotté 2015)	casual
<i>Parexocoetus mento</i> (Valenciennes, 1847)	≤2002 (Golani et al. 2002)	established
<i>Parupeneus forsskali</i> (Fourmanoir and Guézé, 1976)	2014 (Chartosia and Michailidis 2016)	established
<i>Pempheris rhomboidea</i> Kossmann and Räuber, 1877	1995-96 (Torcu et al. 2001)	established
<i>Pomadasys stridens</i> (Forsskål, 1775)	2014 (Iglesias and Frotté 2015)	casual
<i>Pteragogus trispilus</i> Randall, 2013	1997 (Kaya et al. 2000)	established
<i>Pterois miles</i> (Bennett, 1828)	2013 (Bariche et al. 2013)	established
<i>Sargocentron rubrum</i> (Forsskål, 1775)	1961 (Fodera 1961)	established
<i>Saurida lessepsianus</i> Russell, Golani and Tikochinski, 2015	1960 (Ben-Tuvia 1962)	established
<i>Scarus ghobban</i> Forsskål, 1775	2010 (Ioannou et al. 2010)	casual
<i>Scomberomorus commerson</i> (Lacepède, 1800)	2008 (Katsanevakis et al. 2009)	established
<i>Siganus luridus</i> (Rüppell, 1829)	1964 (Demetropoulos and Neocleous 1969)	invasive
<i>Siganus rivulatus</i> Forsskål and Niebuhr, 1775	1928 (Norman 1929)	invasive
<i>Sillago suezensis</i> Golani, Fricke and Tikochinski, 2013	2009 (Katsanevakis et al. 2009)	casual
<i>Sphyræna chrysoænia</i> Klunzinger, 1884	1964 (Demetropoulos and Neocleous 1969)	established
<i>Sphyræna obtusata</i> Cuvier, 1829	2014 (Iglesias and Frotté 2015)	established
<i>Spratelloides delicatulus</i> (Bennett, 1832)	2014 (Iglesias and Frotté 2015)	established
<i>Stephanolepis diaspros</i> Fraser-Brunner, 1940	1935 (Hornel 1935)	established
<i>Synchiropus sechellensis</i> Regan, 1908	2016 (present study)	casual
<i>Torquigener flavimaculosus</i> Hardy and Randall, 1983	2009 (Michailidis 2010)	established
<i>Upeneus moluccensis</i> (Bleeker, 1855)	1964 (Demetropoulos and Neocleous 1969)	established
<i>Upeneus pori</i> Ben-Tuvia and Golani, 1989	2004 (Tzomos et al. 2010)	established

according to Fricke (1983, 2006). Standard fin spine and fin rays counts were made. Morphometric measurements were taken using digital calipers. The specimen is preserved at the Department of Fisheries and Marine Research of Cyprus, in 90% ethanol solution.

## Results and discussion

The specimen of *Synchiropus sechellensis* matches the description given by Gökoğlu et al. (2014). The meristic counts for the fins (spines in Roman numerals, soft rays in Arabic numerals) were: first dorsal fin, IV; second dorsal fin, 8; Anal fin VI+1;

Pectoral fins, 19; Ventral fins, I+5; Caudal fin, I+7+II. The morphometric measurements were: wet weight 29.2 g, total length 131.2 mm, standard length 102.3 mm, preanal length 51.1 mm, predorsal length 26.9 mm, prepelvic length 20.7 mm, prepectoral length 31.9 mm, maximum body depth 21.1 mm, maximum body width 22.2 mm, caudal peduncle depth 9.2 mm, head length 29 mm, preorbital length 9.1 mm, eye diameter 3.8 mm, interorbital width 7.1 mm.

The specimen from Cyprus is larger than those previously reported from the Mediterranean and exceeds the maximum standard length of 90 mm reported by

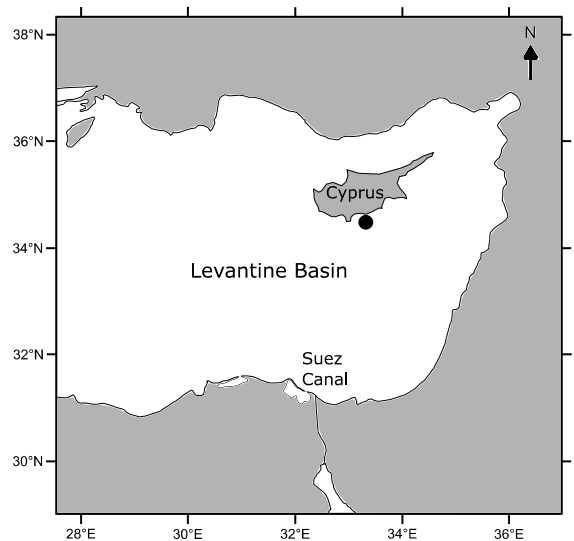


**Figure 1.** The specimen of Seychelles dragonet *Synchiropus sechellensis* collected on 28 March 2016 from Moni, Cyprus (photo: N. Michailidis).

Fricke (1981). The depth of collection in Cyprus (40 m) falls within the same range as in Gökoğlu et al. (2014) (30–50 m) and only slightly deeper than those (3 and 10–30 m) reported by Kondylatos et al. (2016).

The finding of *S. sechellensis* in Cyprus is the fourth record of the species in the Mediterranean, following those in Turkey and Greece hints at establishment of the species in the area. The new finding also challenges the view of Gökoğlu et al. (2014) that the species may have been accidentally introduced to the Mediterranean by marine traffic and shipping activities, a view that was logically based on the fact that only one specimen was found in the Mediterranean, and it was collected at a substantial distance from the Suez Canal. The distance between the new and the previous findings suggests that *S. sechellensis* may have entered the Mediterranean through the Suez Canal, and that its absence from locations closer to the entrance may be incidental and due to the species' rarity and small size.

As supported by previous studies for other marine regions (e.g. Karachle et al. 2016), there is no doubt that fish species diversity in the Eastern Mediterranean, and likewise that in Cyprus, is changing. The extent to which non-indigenous species may affect the ecological balance remains to be seen; thus, as suggested in the past, continuous monitoring is essential.



**Figure 2.** Map of the Eastern Mediterranean with the capture location of *Synchiropus sechellensis* (black dot).

### Acknowledgements

We thank the three anonymous reviewers for their useful comments that improved the manuscript, professional fisherman Mr. Solon Ioannidis for providing the *Synchiropus sechellensis* specimen to the DFMR and fisheries inspector Mr. Antonis Avgousti for forwarding it to the authors.

## References

- Bariche M, Torres M, Azzurro M (2013) The presence of the invasive Lionfish *Pterois miles* in the Mediterranean Sea. *Mediterranean Marine Science* 14: 292–294, <http://dx.doi.org/10.12681/mms.428>
- Ben-Tuvia A (1962) Collection of fishes from Cyprus. *The Bulletin of the Research Council of Israel* 11: 132–145
- Chartosia N, Michailidis N (2016) First confirmed presence of the Red Sea goatfish *Parupeneus forsskali* (Fourmanoir and Guézé, 1976) from Cyprus. *Marine Biodiversity Records* 9: 33, <http://dx.doi.org/10.1186/s41200-016-0032-7>
- Crocetta F, Agius D, Balistreri P, Bariche M, Bayhan YK, Cakir M, Ciriaco S, Corsini-Foka M, Deidun A, El Zrelli R, Erguden D, Evans J, Ghelia M, Giavasi M, Kleitou P, Kondylatos G, Lipej L, Mifsud C, Ozvarol Y, Pagano A, Portelli P, Poursanidis D, Rabaoui L, Schembri PJ, Taskin E, Tiralongo F, Zenetos A (2015) New Mediterranean Biodiversity Records (October 2015). *Mediterranean Marine Science* 16: 682–702, <http://dx.doi.org/10.12681/mms.1477>
- Demetropoulos A, Neocleous D (1969) The fishes and crustaceans of Cyprus. *Fisheries Bulletin, Ministry of Agriculture and Natural Resources, Fisheries Department* 1: 1–21
- DFMR (2006) Toxic Fish (Cyprus). Technical Report, Ministry of Agriculture, Natural Resources and Environment, Department of Fisheries and Marine Research 427/2006
- Fodera V (1961) Report to the government of Cyprus on fishery development possibilities. Expanded Program of Technical Assistance, FAO, Report No 1436
- Fricke R (1981) Revision of the genus *Synchiropus* (Teleostei: Callionymidae). *Theses Zoologicae* 1: 1–194
- Fricke R (1983) Revision of the Indo-Pacific genera and species of the dragonet family Callionymidae (Teleostei). *Theses zoologicae* 3: X+774 pp
- Fricke R (2002) Annotated checklist of the Dragonet Families Callionymidae and Draconettidae (Teleostei: Callionymoidei), with comments on Callionymid fish classification. *Stuttgarter Beiträge zur Naturkunde A (Biologie)* 645: 1–103
- Fricke R (2006) Two new species and a new record of dragonets from New Caledonia (Teleostei: Callionymidae). *Stuttgarter Beiträge zur Naturkunde A (Biologie)*, 696 14 S., 4 Abb., 1 Tab. Stuttgart, 10.XI
- Froese R, Pauly D (eds) (2016) FishBase. World Wide Web electronic publication. [www.fishbase.org](http://www.fishbase.org) (01/2016)
- Gökoğlu M, Özvarol Y, Fricke R (2014) *Synchiropus sechellensis* Regan, 1908 (Teleostei: Callionymidae), a new Lessepsian migrant in the Mediterranean Sea. *Mediterranean Marine Science* 15: 440–442, <http://dx.doi.org/10.12681/mms.906>
- Golani D (2000) The Lessepsian migrant, the Red-eye round herring *Etrumeus teres* (DeKay, 1842), a new record from Cyprus. *Zoology in the Middle East* 20: 61–64, <http://dx.doi.org/10.1080/09397140.2000.10637813>
- Golani D, Orsi-Relini L, Massuti E, Quingard JP (2002) CIESM Atlas of exotic species in the Mediterranean. Vol. 1 Fishes. Monaco, CIESM Publishers, 256 pp
- Hornel J (1935) Report on the fisheries of Palestine. Published on behalf of the Government of Palestine by the Crown Agents for the Colonies, Mill, London, 106 pp
- Iglesias S, Frotté L (2015) Alien marine fishes in Cyprus: update and new records. *Aquatic Invasions* 10: 425–438, <http://dx.doi.org/10.3391/ai.2015.10.4.06>
- Ioannou G, Michailidis N, Loucaides A, Manitaras I (2010) First occurrence of *Scarus ghobban* (Actinopterygii: Scaridae) in the coastal waters of Cyprus (Eastern Mediterranean Sea). *Mediterranean Marine Science* 11: 353–356, <http://dx.doi.org/10.12681/mms.82>
- Karachle PK, Angelidis A, Apostolopoulos G, Ayas D, Ballesteros M, Bonnici C, Brodersen MM, Castriota L, Chalari N, Cottalorda JM, Crocetta F, Deidun A, Dodo Ž, Dogrammatzi A, Dulčić J, Fiorentino F, Gönülal O, Harmelin JG, Insacco G, Izquierdo-Gómez D, Izquierdo-Mu-oz A, Joksimović A, Kavadas S, Malaquias MAE, Madrenas E, Massi D, Micarelli P, Minchin D, Önal U, Ovalis P, Poursanidis D, Siapatis A, Sperone E, Spinelli A, Stamouli C, Tiralongo F, Tunçer S, Yaglıoğlu D, Zava B, Zenetos A (2016) New Mediterranean Biodiversity Records (March 2016). *Mediterranean Marine Science* 17: 230–252, <http://dx.doi.org/10.12681/mms.1684>
- Katsanevakis S, Tsiamis K, Ioannou G, Michailidis N, Zenetos A (2009) Inventory of alien marine species of Cyprus (2009). *Mediterranean Marine Science* 10: 109–133, <http://dx.doi.org/10.12681/mms.113>
- Kaya M, Bilecenoglu M, Golani D (2000) New record of a Lessepsian migrant *Pteragogus pelycus* Randall, 1981 (Teleostei: Labridae) for northern Cyprus. *Zoology in the Middle East* 20: 65–68, <http://dx.doi.org/10.1080/09397140.2000.10637814>
- Kondylatos G, Corsini-Foka M, Apostolopoulos G, Zenetos A (2016) *Synchiropus sechellensis* (Actinopterygii: Perciformes: Callionymidae), a new alien in the Aegean Sea and Hellenic waters. *Acta Adriatica* 57(1): 187–191
- Michailidis N (2010) Study on the Lessepsian migrant *Lagocephalus sceleratus* in Cyprus. In: FAO EastMed (ed), Report of the Sub-Regional Technical meeting on the Lessepsian migration and its impact on Eastern Mediterranean fishery. Nicosia, Cyprus, December 5–7, 2010. Food and Agriculture Organisation of the United Nations (FAO). FAO EastMed Technical Documents 04, Nicosia, Cyprus, pp 74–87
- Norman JR (1929) Notes on the fishes of the Suez Canal. *Proceedings of the Zoological Society, London* 2: 616, <http://dx.doi.org/10.1111/j.1096-3642.1929.tb01445.x>
- Torcu H, Aka Z, Isbilir A (2001) An investigation on fishes of northern Cyprus. *Turkish Journal of Veterinary and Animal Sciences* 25: 155–159
- Tzomos T, Chartosia N, Christodoulou M, Kitsos MS (2010) New records and range expansion of Lessepsian migrants in the Levantine and Aegean Seas. *Marine Biodiversity Records* 3: 10, <http://dx.doi.org/10.1017/S1755267209991114>
- Whitehead PJP (1985) FAO species catalogue Vol. 7. Clupeoid fishes of the world (suborder Clupeoidei). An annotated and illustrated catalogue of the herrings, sardines, pilchards, sprats, shads, anchovies and wolf-herrings. Part 1 – Chirocentridae, Clupeidae and Pristigasteridae. *FAO Fish Synop* 125: 1–303
- Wirtz P, Debelius H (2003) Mediterranean and Atlantic invertebrate guide. Hackenheim, Conchbooks, 305 pp