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FIRST RECORD OF THE SCHINDLER'S FISH, *SCHINDLERIA PRAEMATURA* (ACTINOPTERYGII: PERCIFORMES: SCHINDLERIIDAE), FROM THE RED SEA

Mohamed A. ABU EL-REGAL[1, 2]* and Takeshi KON[3]

[1]*Marine Biology Department, Faculty of Marine Sciences, King Abdulaziz University, Jeddah, Saudi Arabia*

[2]*Marine Science Department, faculty of Science, Port Said University, Egypt*

[3]*University of the Ryukyus, Japan*

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Abstract. The paedomorphic gobioids of the family Schindleriidae, collectively known as infantfishes, live in shallow waters of the Indo-West Pacific. The extremely paedomorphic genus *Schindleria* is a taxon representing fishes of very small dimensions. Eight specimens of male and female *Schindleria praematura* (Schindler, 1930) were collected by a light trap in September 2015, from a reef lagoon in Magawish Island in Hurghada on the Egyptian coast of the northern Red Sea. This is the first record of the species in the Red Sea and adds to the high number of species of the family Schindleriidae in the area.

Keywords: *Schindleria praematura*, Red Sea, first record, paedomorphic fish, distribution

INTRODUCTION

The paedomorphic gobioids of the family Schindleriidae, collectively known as infantfishes, are an unusual group of small, planktonic fishes living in shallow waters of the Indo-West Pacific, usually close to coral reefs (Johnson and Brothers 1983, Watson and Walker 2004). The extremely paedomorphic genus *Schindleria* (Gobioidei, Schindleriidae) includes one of the shortest (8 mm long), lightest (2 mg), and youngest reproducing (23 days, 10 generations per year) vertebrates and is broadly distributed in the Indo-West Pacific, inhabiting coral reef lagoons (Watson and Walker 2004).

Extraordinary cryptic diversity of gobioid paedomorphic genus *Schindleria* has been evidenced revealed by molecular phylogenetic analysis (Kon et al. 2007). At least 21 cryptic species of *Schindleria* potentially exist around the Ryukyu and Ogasawara Islands (Japan), and the Palau Islands, based on a molecular phylogenetic analysis (Kon et al. 2011). The first species was described from the Hawaiian Islands as *Hemiramphus praematurus* by Schindler (1930), who assumed that the species was a larval hemiramphid. The second species was also described by Schindler (1931), also from the Hawaiian Islands, as *Hemiramphus pietschmanni*. Giltay (1934), who had found a single specimen of *H. praematurus* off New Guinea, concluded that there was no evidence of a close relation to other known hemiramphids, and therefore described a new genus *Schindleria* for inclusion of the two species, with *Schindleria praematura* (Schindler, 1930) as the type species by the original designation, within a new family Schindleriidae (see van der Laan et al. 2014: 124). Johnson and Brothers (1983) demonstrated that the family is a member of the suborder Gobioidei. Gill and Mooi (2010) found a close relation of schindleriids to microdesmids. The third species, *Schindleria brevipinguis* Watson et Walker, 2004, was described off north-eastern Australia (Watson and Walker 2004).

Abu El-Regal and Kon (2008) reported a specimen of *Schindleria* sp. off Hurghada, Egypt, which they found to be close to *Schindleria pietschmanni* (Schindler, 1931), thus documenting the presence of this genus in the Red Sea for the first time. The second and the third species of *Schindleria* described from the Red Sea were *Schindleria elongata* Fricke et Abu El-Regal, 2017 and *Schindleria nigropunctata* Fricke et Abu El-Regal, 2017 (Fricke and Abu El-Regal 2017a, 2017b). During his survey on the ichthyoplankton in Hurghada on the Egyptian Red Sea coast, the first author of the present paper collected many specimens representing the family Schindleriidae. Some of these specimens were identified as *Schindleria praematura*, based on morphological characteristics.

MATERIAL AND METHODS

Fish specimens were collected from a shallow reef lagoon around the Magawish Islands 27°10′02″N, 033°52′27″E, in Hurghada on the Egyptian Red Sea coast, by the first author, while fishing for larvae of reef fish. Samples were taken by a light trap in September 2016 at 22:00 h. The fish were

* Correspondence: Dr Mohamed Ahmed Abu El-Regal, *Marine Biology Department, Faculty of Marine Sciences, King Abdulaziz University, Jeddah 21589, Saudi Arabia,* phone: (+966) 126952383 fax: (+966) 122506087, e-mail: (MA) *m_abuelregal@yahoo.com*, (TA) *kontake@lab.u-ryukyu.ac.jp*.

preserved in 70% ethanol and brought to the laboratory of the Marine Science Department, Port Said University, for examination. Counts, measurements, and description of the body shape follow Leis and Carson-Ewart (2004). A stereomicroscope equipped with an ocular micrometre and camera was used to make counts and measurements and photograph the fish.

RESULTS

Eight specimens, five of which were female, two were recognized as male, and one which could not be sexed were identified as *Schindleria praematura* based on morphological characters (Table 1). The identification of the specimens as *Schindleria* sp. was based on the following combination of the observed characters: transparent and slender body, elongate and smooth gut, elongate urostyle, 13 principal caudal-fin rays, presence of urogenital papilla (Watson 2004). They then were identified as *S. praematura* based on the following criteria: Specimens were almost devoid of pigment except for the eyes and one melanophore on the gas bladder and were very elongate and slender with 39 (20 + 19) myomeres. Standard length (SL) varied from 10.5 mm to 16.6 mm. The morphometrics are given in Table 1. The head was small with a short, rounded snout. The mouth was of moderate size and reached the mideye. The teeth were small. The gut was straight, smooth, and elongate, extending to 53% of the standard length. The urostyle and caudal peduncle were elongate. The small but conspicuous gas bladder was situated within the second two-thirds of the body (66% of SL). The dorsal-fin origin was at myomere 20 and the first anal-fin ray lied under the fourth dorsal-fin ray. The dorsal and anal fins contained 16–17 and 10–11 rays, respectively. The pelvic fins were completely absent. The caudal fin had about five dorsal and five ventral procurrent rays (Fig. 1, Table 2).

Table 1

Morphometric characters of *Schindleria praematura* collected from the Red Sea

Spec. No.	SL	Fin ray No.		Sex
		Dorsal	Anal	
1	16.2	16	10	Female
2	14.3	17	11	Female
3	16.6	17	11	Male
4	13.3	17	11	Female
5	10.5	—	—	?
6	10.6	—	—	Female
7	12.6	17	11	Female
8	11	—	—	Male

Spec. No. = specimen number, SL = standard length.

DISCUSSION

Schindleria praematura is confined to Indo-West Pacific coral reefs and is distributed from southern Japan and the South China Sea, south to the Great Barrier Reef (Australia) and Papua New Guinea, and Palau and the Marshall Islands. It has also been reported from Sala y Gómez and Easter Island (Larson and Murdy 2010). The closest area where the species was recorded is Madagascar in the western Indian Ocean (Fig. 2). This is the first record of the species in the Red Sea. It significantly extends the known distribution of this species northward in the Indo-West Pacific.

Together with *S. elongata*, and the species reported by Abu El-Regal and Kon (2008), as well as *S. nigropunctata* (see Fricke and Abu El-Regal 2017b), there are now four

Table 2

Comparison between *Schindleria praematura* and other *Schindleria* species in the Red Sea

Character	Species and reference			
	S. elongata FA 2017a	*S. nigropunctata* FA 2017b	*Schindleria* sp. AK 2008	*S. praematura* PRS
Dorsal-fin rays	13–14	13	16	16–22
Anal-fin rays	10–11	11–12	15	10–14
Position of first anal-fin ray relative to dorsal-fin ray	2nd–4th	2nd	4th	7th–11th
Teeth	Small	Small	Absent	Small
Predorsal length [mm]	66–70	66–67	60	54
Preanal length [mm]	66–71	67–68	64	53
Head length [mm]	17–18	14–15	17	13–16
Eye diameter [mm]	28–32	14–18	26	25
Body depth at pectoral-fin base [mm]	4–5	5–6	8	6
Body depth at anal-fin origin [mm]	5–7	9	11	6
Position of gas bladder	56%–60% SL	47%–49% SL	46% SL	66% SL
Pigment	No	Yes	Yes	Yes
Distribution	Red Sea	Red Sea	Red Sea	Indo-West Pacific, Red Sea

FA 2017a = Fricke and Abu El-Regal 2017a, FA 2017b = Fricke and Abu El-Regal 2017b, AK 2008 = Abu El-Regal and Kon 2008, PRS = presently reported study.

Fig. 1. Male *Schindleria praematura* (16.6 mm SL), collected from the Red Sea

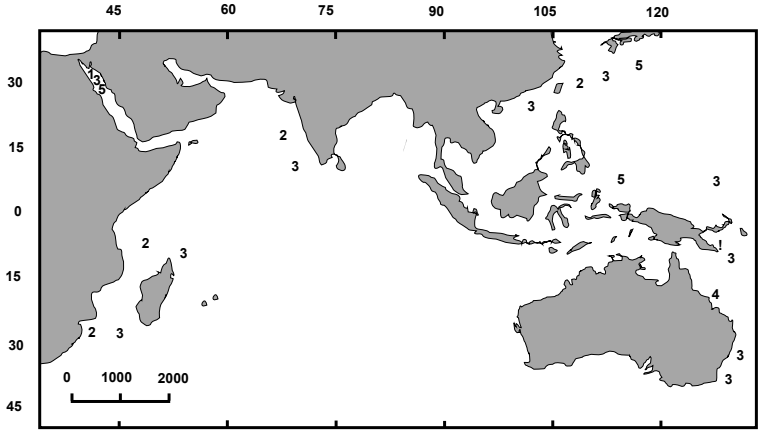

Fig. 2. Distribution of species in the genus *Schindleria* in the Indo-Pacific (After Fricke and Abu El-Regal 2017b.); **1** = *Schindleria elongata* and *S. nigropunctata*; **2** = *Schindleria pietschmanni*; **3** = *Schindleria praematura*; **4** = *Schindleria brevipinguis*; **5** = *Schindleria* spp. (not assigned to any nominal species)

species of schindleriids found sympatrically in the Red Sea near Hurghada, Egypt. The Red Sea is known for its richness in ichthyofauna with more than 1100 species in 154 families (Golani and Bogorodsky 2010). This report of *Schindleria praematura* increases the fish diversity in the Red Sea and raises the number of species in family Schindleriidae to four. This finding could also provide the basis for some interesting zoogeographic studies of the family.

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