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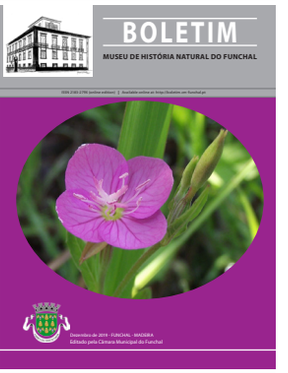

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On the status of some nominal species of fishes described by Sarah Lee Bowdich in the account "Excursions in Madeira and Porto Santo during the autumn of 1823"

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With 1 table

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ABSTRACT: The status of seven nominal species of fishes described by Bowdich in 1825 during a famous trip to Madeira and Cape Verde Islands is determined. Three nominal species have been discovered to represent senior synonyms of well-established taxa. They are: *Dentex diplodon*, *Dentex unispinosus*, and *Tetraodon laevissimus*. The Zoological Code of Nomenclature allows to maintain prevailing usage of the junior synonym by applying reversal of precedence. Therefore, a statement declaring the three Bowdich's nominal species as *nomina oblita* is included. The corresponding younger valid names, *Pomadasys perotaei* (Cuvier, 1830), *Lethrinus atlanticus* Valenciennes, 1830, and *Sphoeroides marmoratus* (Lowe, 1838) respectively, are here qualified as *nomina protecta*.

Keywords: senior synonyms, *nomina oblita*, reversal of precedence, fishes of Madeira, Bowdich.

RESUMO: O estatuto de sete espécies nominais de peixes descritas por Bowdich em 1825, no decurso da famosa expedição à Madeira e a Cabo Verde, é avaliado. Três espécies nominais representam sinónimos seniores de taxa bem estabelecidos. São elas: *Dentex diplodon*, *Dentex unispinosus*, e *Tetraodon laevissimus*. O Código Internacional de Nomenclatura Zoológica permite manter o uso prevalecente de sinónimos juniores, aplicando o princípio de precedência inversa. Em consequência, é apresentada uma declaração considerando estas três espécies como *nomina oblita*. Os correspondentes nomes válidos, mais novos, são: *Pomadasys perotaei* (Cuvier, 1830), *Lethrinus atlanticus* Valenciennes, 1830 e *Sphoeroides marmoratus* (Lowe, 1838), respectivamente e são aqui qualificados como *nomina protecta*.

Palavras-chave: sinónimos seniores, *nomina oblita*, precedência inversa, peixes da Madeira, Bowdich.

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INTRODUCTION

Sarah Lee Bowdich (née Wallis) (b. Colchester 1791-1866) was a British author, illustrator, zoologist, and botanist amongst the first European women to visit West Africa (Watkins, 1892). At the age of twenty-one she married the English explorer Thomas Edward Bowdich (1791-1823) and in 1822 she accompanied her husband in a travel to Madeira and Cape Verde Islands where they spent some months observing and describing the landscape and the creatures living on the islands and in the sea around them. Unfortunately, when they arrived at the mouth of River Gambia intending to explore the adjacent countries, Thomas caught malaria and died on 10 January 1824, leaving Sarah with three children. One year later Sarah decided to publish an account of the trip to Madeira and Cape Verde, which resulted in description of many animal and plant species (Beaver, 1999). Among fishes Sarah Bowdich is the authorship of 27 nominal species including eight species currently recognized as valid, 12 known to be junior synonyms, and seven currently unplaced (Fricke *et al*., 2019). A careful examination of the text and the illustrations, when present, of these unplaced species revealed that they represent senior and junior synonyms of well-known fish species. In case older names predate long-established ones, the International Code of Zoological Nomenclature through the principle of priority promotes stability in order not to upset long-established names (Art. 23.9).

MATERIALS AND METHODS

All species described by Bowdich as new are not accompanied by type material (Fricke *et al*., 2019). Therefore, conclusions about their positive identification are based on the original description and the illustration produced by the author, which are presented for all but one of the species discussed therein. On p. 121 of the book Sarah Lee wrote: "I had frequent occasion to lament the necessity of throwing away new and interesting objects, especially fishes, because no museum had furnished me with spirits and case to preserve them in.".

RESULTS

In the account on the fishes recorded by Sarah Lee Bowdich in the *Excursions in Madeira and Porto Santo* thirty-six species were mentioned. Among these eight correspond to well-known species [*Esox sphyraena*, p. 124: *Sphyraena sphyraena* (Linnaeus, 1758); *Squalus carcharias*, p. 233: *Carcharodon carcharias* (Linnaeus, 1758); *Esox belone*, p. 234: *Belone belone* (Linnaeus, 1760); *Coryphaena novacula*, p. 235: *Xyrichtys novacula* (Linnaeus, 1758); *Sparus sargus*, p. 235: *Diplodus sargus* (Linnaeus, 1758); *Sparus chromis*, p. 235: *Chromis chromis* (Linnaeus, 1758); *Balistes punctatus*, p. 236: *Balistes punctatus* Gmelin 1789; *Vomer brownii* p. 237: *Selene brownii* (Cuvier, 1816)], one was not identified at the species level (*Hippocampus* sp., p. 233) and 27 were described as new species. Table 1 shows the present allocation of all these nominal species described as new. Seven nominal species are the object of the present study as they are currently unplaced in the Eschmeyer's Catalog of Fishes on line (Fricke *et al*., 2019). The positive identification of these nominal species lead to give status as junior or senior synonyms of well-established fish taxa. In particular, four nominal species are here recognized as junior synonyms: *Seleima aurata*, *Zeus childrenii*, *Labeo sparoides*, and *Chromis triacantha*, whereas three nominal species (*Dentex diplodon*, *Tetraodon laevissimus*, and *Dentex unispinosus*) are here regarded as senior synonyms of three well known marine fish species. The consequence of the discovery that nominal species predates well established names requires nomenclatural actions which are validated by the rules of the International Code of Zoological Nomenclature (Art. 23.9). In particular, in accordance with the principle of priority to promote stability of names in zoology, the application of reversal of precedence of two names allows to maintain the prevailing usage of a younger synonym over a senior synonym if two conditions are met. The first condition is that a name (senior synonym) has not been used as valid since 1899 and the second condition that a name (junior synonym) has been used as valid in at least 25 works, published by at least 10 authors during the past 50 years, encompassing a span of not less than 10 years. As both conditions are met, we can regard *Dentex diplodon*, *Dentex unispinosus* and *Tetraodon laevissimus* as invalid and *nomina oblita*, whereas the respective junior synonyms *Pomadasys perotaei* (Cuvier, 1830), *Lethrinus atlanticus* Valenciennes, 1830, and *Sphoeroides marmoratus* (Lowe, 1838) as *nomina protecta* and valid. In the following paragraphs information of the status of the aforementioned species is given in details.

Labeo sparoides Bowdich, 1825: 122, Fig. 29 (type locality, Madeira). This nominal species is another junior synonym of *Sarpa salpa* (Linnaeus, 1758) mainly on the

Table 1 – Fishes described as new species by Sarah Lee Bowdich and their present allocation.

Bowdich's nominal species	Page number, illustration and type locality	Present allocation	Reference
Amorphocephalus granulatus	238, Fig. 36, Boa Vista, Cape Verde Is.	*Xyrichtys novacula* (Linnaeus, 1758)	Parenti & Randall, 2000
Anomalodon incisus	237, Fig. 51, Gambia	*Pomadasys incisus* (Bowdich, 1825)	Roux, 1990
Balistes radiata	233, Fig. 45, St. Jago, Cape Verde Is.	*Balistes punctatus* Gmelin, 1789	Harmelin-Vivien & Quero, 1990
Bodianus maculatus	236, Fig. 39, Boa Vista, Cape Verde Is.	*Cephalopholis taeniops* (Valenciennes, 1828)	Smith, 1990
Chaetodon leachii	124, Madeira	*Pomacanthus paru* (Bloch, 1787)	Maugé, 1990
Chromis triacantha	235, Fig. 52, Gambia River	*Oreochromis niloticus* (Linnaeus, 1758)	this paper
Clupea fimbriata	234, Fig. 44, St. Jago, Cape Verde Is.	*Ethmalosa fimbriata* (Bowdich, 1825)	Whitehead, 1967
Dentex diplodon	235, Fig. 46, St. Jago, Cape Verde Is.	*Pomadasys perotaei* (Cuvier, 1830)	this paper
Dentex unispinosus	235, Fig. 42, St. Jago, Cape Verde Is.	*Lethrinus atlanticus* Valenciennes, 1830	this paper
Diastodon speciosus	238, Fig. 41, St. Jago, Cape Verde Is.	*Bodianus speciosus* (Bowdich, 1825)	Parenti & Randall, 2000
Julis squamimarginatus	234, Fig. 53, Gambia River	*Thalassoma pavo* (Linnaeus, 1758)	Parenti & Randall, 2000
Labeo sparoides	122, Fig. 29, Madeira	*Sarpa salpa* (Linnaeus, 1758)	this paper
Labrus iagonensis	234, Fig. 47, St. Jago and Gambia River	*Bodianus speciosus* (Bowdich, 1825)	Parenti & Randall, 2000
Lichia tetracantha	237, Fig. 49, St. Jago and Gambia River	*Trachinotus ovatus* (Linnaeus, 1758)	Daget & Smith-Vaniz, 1986
Mugil bispinosus	236, Fig. 38, Boa Vista, Cape Verde Is.	*Chelon bispinosus* (Bowdich, 1825)	Thomson, 1990
Phycis furcatus	122, Fig. 28, Madeira	*Phycis phycis* (Linnaeus, 1766)	Svetovidov, 1973
Pimelodus gambensis	234, Fig. 50, Gambia River	*Carlarius latiscutatus* (Günther, 1864)	Marceniuk & Menez, 2007
Pristipoma humilis	236, Fig. 40, St. Jago and Boa Vista	*Parapristipoma humile* (Bowdich, 1825)	Roux, 1973
Sciaena dux	236, Fig. 54, Gambia River	*Pseudotolithus typus* Bleeker, 1863	Trewavas, 1973
Sciaena elongata	236, Fig. 43, St. Jago, Cape Verde Is.	*Pseudotolithus elongates* (Bowdich, 1825)	Daget & Trewavas, 1986
Scorpaena kuhlii	123, Madeira	*Pontinus kuhlii* (Bowdich, 1825)	Eschmeyer, 1969
Seleima aurata	238, Fig. 37, Boa Vista, Cape Verde Is.	*Sarpa salpa* (Linnaeus, 1758)	this paper
Seriola picturata	123, Fig. 27, Madeira	*Trachurus picturatus* (Bowdich, 1825)	Hureau & Tortonese, 1973
Serranus rufus	122, Madeira	*Heteropriacanthus cruentatus* (Lacepède, 1801)	Hureau, 1973
Smaris royerii	123, Fig. 26, Madeira	*Centracanthus cirrus* Rafinesque, 1810	Tortonese *et al.*, 1973
Tetraodon laevissimus	233, Fig. 48 [a], St. Jago, Cape Verde Is.	*Sphoeroides marmoratus* (Lowe, 1838)	this paper
Zeus childrenii	124, Madeira	*Capros aper* (Linnaeus, 1758)	this paper

[a] Misprinted as fig.18 on p. 233

ground that the fish is described having the body light silvery grey with ten golden stripes and all the fins are of a golden hue. The author mentions that the anal fin has 14 spines and 3 branching rays, but we assume she inverted the fin rays count.

Zeus childrenii Bowdich, 1825: 124. This species is described in Chapter 5 of the book, entitled *Zoological, Meteorological, and Barometrical Observations – Flood of Madeira*. In the main text Bowdich mentions the presence of a *Zeus* among the fish specimens brought to her by fishermen and peasantries. The fish is said to be lacking the long filaments typical of *Zeus faber* and having a brilliant red colour. The scientific name is given in the footnote. Lowe (1838) regarded this nominal species as a synonym of the boarfish *Capros aper* (Linnaeus, 1758). A similar species occurring in the area is *Antigonia capros* Lowe, 1843, but this species has an extremely deep body (0.8–1.2 SL vs 1.7–1.9 of *C. aper* or *Z. faber*). The generic name *Zeus* has been erected by Linnaeus (1758) to accommodate *Z. aper* and three additional species (*vomer*, *gallus*, and *faber*) and *Z. aper* was diagnosed as *Z. cauda equali*, *corpore rubente* (caudal fin truncated, body reddish). Next the generic name *Zeus* was used by early ichthyologists for different kind of fishes other than *Z. aper* and eight nominal species of the family Zeidae. In particular it has been used for several species of Carangidae and for three Lampridae, two Leiognathidae, one Menidae, one Kurtidae, one Cichlidae and one Cyttidae (Fricke *et al.*, 2019). Based on these considerations and the short description of *Z. childrenii* the identity with *Capros aper* (Linnaeus, 1758) is confirmed.

Tetraodon laevissimus Bowdich, 1825: 233, Fig. 48 misprinted 18 (see p. xii) (type locality, Port Praya, St. Jago Island, Cape Verde Islands). The fish is described having "the back and the sides of a beautiful rose colour irregularly marked with deep black; the pectoral fin has 13 rays and the anal, dorsal and caudal fins, each with 7 rays". A good illustration is provided by Bowdich misprinted on p. 223 as Fig. 18 instead of Fig. 48. Based on the description and illustration, this species is clearly identified as a senior synonym of *Sphoeroides marmoratus* (Lowe, 1838). *Tetraodon laevissimus* has never been used in ichthyological literature and conditions exist to allow prevailing usage of *Sphoeroides marmoratus* as claimed in the previous paragraph. *Sphoeroides marmoratus* (Lowe, 1838) is thus regarded as valid, qualifying as a *nomen protectum*, while the name *Tetraodon laevissimus* Bowdich, 1825 is recognized as invalid, qualifying as a *nomen oblitum*.

As evidence that the conditions of Article 23.9.1.2 have been met the following list of publications is included: Lowe-McConnell, 1962; Arnoult *et al*., 1966; Almeida, 1986; Schneider, 1990; Shipp, 1990; Hureau, 1991; Wirtz, 1994; Galeote & Otero, 1996; Reiner, 1996; Arruda, 1997; Santos *et al*., 1997; Afonso *et al*., 1999; Wu *et al*., 1999; Morato *et al*., 2000; Ebert, 2001; Galeote, 2001; Louisy, 2001; Mendiola, 2005; Vacchi *et al*., 2007; Wirtz *et al*., 2008; Bañón & Santás, 2011; Psomadakis *et al*., 2012; Brito *et al*., 2013; Wirtz *et al*., 2013; Matsuura, 2016; Guedes-Alonso *et al*., 2017.

Chromis triacantha Bowdich, 1825: 235, Fig. 52 (type locality, Gambia). Briefly described in the zoological section of the appendix of the book, this species is named on the basis of the presence of three spines in the ventral fins. No fish species is known having this feature, confirming that fin rays count made by Bowdich are quite unreliable, as already noticed by Valenciennes in the Histoire naturelle des Poissons (1830: 275). The fish is described as silvery grey, except the fins which are orange. Dorsal fin XV, 11 and anal fin III, 9 complete the description. It is concluded that *C. triacantha* is a junior synonym of *Oreochromis niloticus* (Linnaeus, 1758).

Dentex unispinosus Bowdich, 1825: 235, Fig. 42 (type locality Port Praya, St. Jago Island, Cape Verde Islands). Valenciennes (1830: 275) was the first to recognize *D. unispinosus* as a junior synonym of his *Lethrinus atlanticus* even though fin ray count reported by Bowdich contains several errors such as a single free spine in the dorsal fin followed by 21 soft rays and the anal fin with 4 spines and 8 soft rays. The fish is reported as silvery, slightly tinged with red. *Dentex unispinosus* is here regarded as a senior synonym of *L. atlanticus*; however, conditions exist to allow "prevailing usage" of *Lethrinus atlanticus* Valenciennes, 1830, as provided by Article 23.9.1 of the International Code of Zoological Nomenclature (ICZN, 1999): (1) *Dentex unispinosus* has not been used as valid since 1899 (Article 23.9.1.1) and (2) *Lethrinus atlanticus* has been used as valid name in at least 25 works, published by at least 10 authors during the past 50 years, and encompassing a span of not less than ten years (Article 23.9.1.2). *Lethrinus atlanticus* Valenciennes, 1830 is thus regarded as valid, qualifying as a *nomen protectum*, while the name *Dentex unispinosus* Bowdich, 1825 is recognized as invalid, qualifying as a *nomen oblitum*. As evidence that the conditions of Article 23.9.1.2 have been met the following list of publications is included: Bauchot & Blanc, 1961; Ricker, 1973; Beck, 1976; Sato, 1978; Maigret & Ly, 1986; Ofori-adu, 1988; Carpenter & Allen, 1989; Roux, 1990; Schneider, 1990; Grabda & Heese, 1991; Hureau, 1991; Sanches, 1991; Coppola *et al*., 1994; Vakily, 1994; Diouf, 1996; Reiner, 1996; da Silva Monteiro, 1998; Afonso *et al*., 1999; Wu *et al*., 1999; Zuev & Boltachev, 2000; Sédzro, 2003; Wirtz *et al*., 2007; Cheung *et al*., 2013; Wirtz *et al*., 2013; Oliveira *et al*., 2015.

Dentex diplodon Bowdich, 1825: 235, Fig. 46 (type locality Port Praya, St. Jago Island, Cape Verde Islands). This fish is briefly described in the zoological section of the appendix of the book: it is characterized by small teeth set in a double row, dorsal fin with 10 spines and 16 soft rays, anal fin with 3 spines and 10 soft rays, body silvery grey with a yellow spot on the opercle; fins yellow tinged with red. *Dentex diplodon* is here regarded as a senior synonym of *Pomadasys perotaei* (Cuvier, 1830) often misspelled as *peroteti* in literature (*e.g*. Roux, 1986; Diouf & Toguebaye, 1993; Bandowe *et al*., 2014). However the combination *Dentex diplodon* has never been used in literature and conditions exist to allow "prevailing usage" of *Pomadasys perotaei*, as provided by Article 23.9.1 of the International Code of Zoological Nomenclature (ICZN, 1999): (1) *Dentex diplodon* has not been used as valid since 1899 (Article 23.9.1.1) and (2) *Pomadasys perotaei* has been used as valid name in at least 25 works, published by at least 10 authors during the past 50 years, and encompassing a span of not less than ten years (Article 23.9.1.2). *Pomadasys perotaei* (Cuvier, 1830) is thus regarded as valid, qualifying as a *nomen protectum*, while the name *Dentex diplodon* Bowdich, 1825 is recognized as invalid, qualifying as a *nomen oblitum*. As evidence that the conditions of Article 23.9.1.2 have been met the following list of publications is included: Osório, 1898; Breder & Rosen, 1966; Maigret & Ly, 1983; Bellemans *et al*., 1988; Roux, 1986, 1990; Negedly, 1990; Schneider, 1990; Grabda & Heese, 1991; Hureau, 1991; Sanches, 1991; Vivien, 1991; Lesnoff & Damiano, 1993; Diouf, 1996; Reiner, 1996; Caverivière & Andriamirado, 1997; Afonso *et al*., 1999; Wu *et al*., 1999; Bauchot, 2003; Albaret *et al*., 2004; Wirtz *et al*., 2007, 2013; Snoeks & Vreven, 2008; Bandowe *et al*., 2014; Carpenter & de Angelis, 2016.

Seleima aurata Bowdich, 1825: 238, Fig. 37. This fish is described in the zoological section of the appendix of the book. The name is based on a specimen that has been collected at Boa Vista, Cape Verde Islands and the vernacular name *Seleima* used by Portuguese fishermen for the sea bream *Sarpa salpa* (Linnaeus, 1758) has been taken by Bowdich as genus name for her specimen. The description of the specimen, in particular fin ray count and the presence of eight orange longitudinal stripes, together with the illustration given by the author leaves no doubt that *Seleima aurata* is a junior synonym of the sparid *Sarpa salpa*.

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