Cah. Biol. Mar. (2019) 60 : 289-292
DOI: 10.21411/CBM.A.ECCF71A6

SHORT NOTE

On the presence of *Cantherhines macrocerus* (Hollard, 1853) in the Principe Island (Gulf of Guinea)

Aketza HERRERO-BARRENCUA[1], Jose Raduan JABER[2], António Domingos ABREU[3], Ricardo HAROUN[1], and José Juan CASTRO[1]

(1) *BIOCON Research Group, IU-ECOAQUA, Scientific & Technological Marine Park, Universidad de Las Palmas de Gran Canaria, 35214 Telde, Spain*

(2) *Departamento de Morfologia, Universidad de Las Palmas de Gran Canaria, Las Palmas, Spain*

(3) *Instituto Português de Malacologia, Funchal, Madeira, Portugal*

Corresponding author: aketzah@gmail.com

Abstract: This paper reports the presence of *Cantherhines macrocerus* (Hollard, 1853) in shallow waters of Principe Island (São Tomé e Príncipe, Gulf of Guinea). This sighting represents the first time that the Whitespotted filefish is collected in the tropical waters of the Gulf of Guinea (Western Equatorial Africa).

Résumé : *Sur la présence de* Cantherhines macrocerus *(Hollard, 1853) dans l'île de Principe (Golfe de Guinée).* Cet article rapporte la présence de *Cantherhines macrocerus* (Hollard, 1853) dans les eaux peu profondes de l'île Principe (São Tomé e Príncipe, Golfe de Guinée). Cette observation représente la première fois que le poisson bourse cabri est collecté dans les eaux tropicales du golfe de Guinée (Afrique équatoriale occidentale).

Keywords: *Cantherhines macrocerus* ● Whitespotted filefish ● Principe Island ● Gulf of Guinea

Introduction

Several reports have studied the geographical distribution of the whitespotted filefish from Florida (USA) and Bermuda to Brazil (Lubbock & Edwards, 1981, Luiz et al., 2008; Anderson et al., 2015; Pinheiro et al., 2015), demonstrating that whitespotted filefish is part of the ichthyofauna of Brazil (north of São Paulo and including the St. Paul's Rocks and Trindade Island), Tobago, Jamaica, Cuba, Florida, Bahamas, Curaçao, Virgin Islands and Puerto Rico Archipelago (Randall, 1996; *C. macrocerus* Gasparini & Floeter, 2001; Smith-Vaniz & Jelks, 2014; Pinheiro et al., 2015), as well as Ascension island (Wirtz et al., 2014) (Fig. 1).

Deep water habitats show strong patterns in the diversity, assemblage structure and composition of reef fish (Wirtz et al., 2007; Smith-Vaniz & Jelks, 2014; Pinheiro et al., 2015; Vasco-Rodriguez et al., 2016; Tuya et al., 2018). Is a reef-associated tropical fish that is commonly seen in depths between 2 and 40 m (Feitoza et al., 2003). This species had already been identified in the Cape Verde Archipelago by Reiner & Martins (1995), and more rencently in Canary Islands waters (Brito et al., 2017).

Reçu le 6 mars 2018 ; accepté après révision le 29 octobre 2018.
Received 6 March 2018; accepted in revised form 29 October 2018.

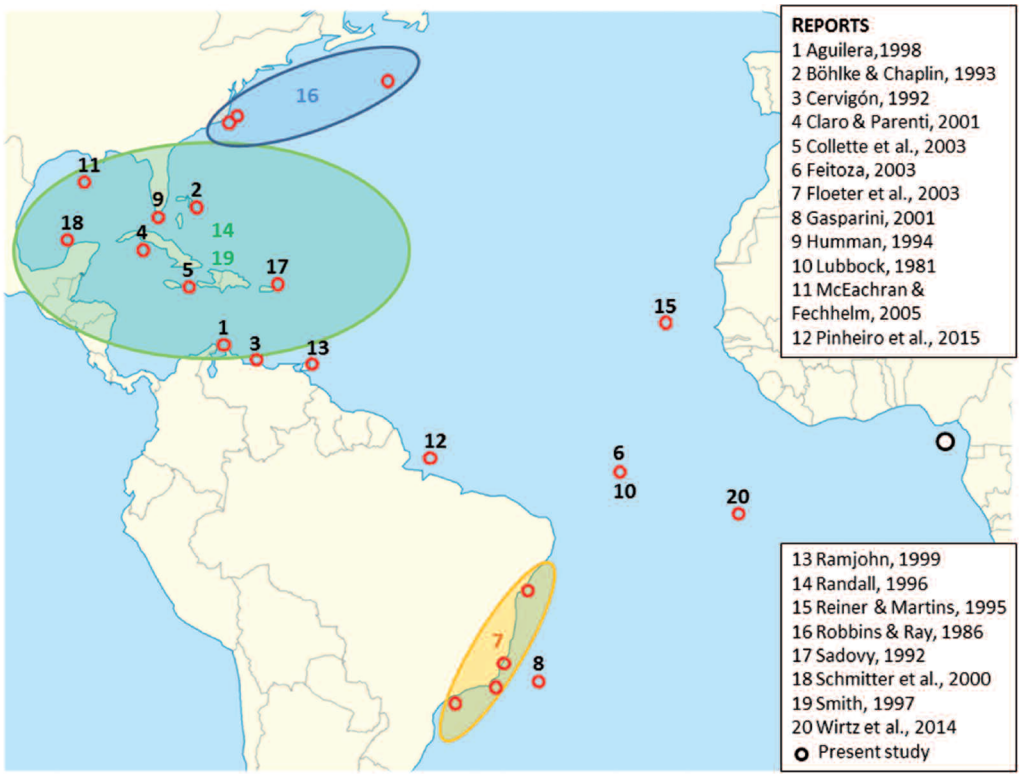

Figure 1. *Cantherhines macrocerus* distribution. Western Atlantic along the coast of USA and Canada (blue ellipse), Caribbean (green ellipse), Brazilian waters in the South-west Atlantic (orange ellipse), records for islands south of the Central-east Atlantic (numbered red circles).

Therefore, the aim of the present paper was to report the presence of three pairs of *Cantherines macrocerus* (Hollard, 1853) that were photographed underwater during the Marine Expedition BIO-Principe 2016 at the north coast of Principe Island (São Tomé e Príncipe Archipelago, Gulf of Guinea). Thus, three individuals were captured with a speargun in shallow waters (8-10 m depth) of Pedra Galé (1º43'33.46''N-7º22'50.39''E). After collection, fishes were measured to obtain morphometric and meristic data, including total, fork and standard length, among other biometrical parameters (Table 1). The total eviscerated and gonads weights were also recorded to the nearest 0.01 g. Sexes were also determined by macroscopic observation of the gonads. Fish presents body compressed, deep, and abdomen more or less extensible, as well as 2 pairs of antrorse spines. These spines were better observed in larger specimens, and arranged in 2 rows that were placed laterally on the caudal peduncle. A general morphological description following the criteria provided by Randall (1996) was performed, showing similar results. Previous records of others congeneric species such as *Cantherhines pullus* (Ranzani, 1842) from the same region or *Cantherhines pardalis* (Rüppell, 1837) from the Gulf of Guinea (Harmelin-Vivien & Quéro, 1990) have already been reported. Nonetheless, some morphological features identified in these species such as colour patterns, size and body shape showed slight differences.with *C. macrocerus* (Dooley, 1968; Matsuura, 2003 & 2016; Randall, 2011).

Colour in life of the larger individual caught (35.7 cm TL) was brown in the anterior half of the body, and along the base of dorsal and anal fins. The posterior part of body was of bright orange-yellow colour. There were many prominent and homogeneously distributed white spots on body and head (Fig. 2). Lips were greyish coloured. The edge of eye was yellow. The first dorsal spine was dull orange, and the soft dorsal and anal fins showed clear yellowish membranes and orange-yellow rays. The caudal fin was black with a faint whitish median bar which parallels rounded posterior edge of fin. It showed two yellow lines (the pairs of antrose spines) laterally on the caudal peduncle (Fig. 2). This pattern of colour was lost after death, and the previous orange-yellow areas became in pink pale tones to brownish-green. Interestingly, males were readily distinguished from females of about same size by the larger spines on caudal peduncle and the orange colour of patch of setae anterior to the peduncle spines on males (Randall, 1996).

The fishes observed in the present study were always in pair, as has been previously reported by Böhlke & Chaplin (1993). Surprisingly, they showed territorial behaviour since they were not moving far from those rocks that they used as



Figure 2. *Cantherhines macrocerus.* Male and female in waters of the Principe Island. (Gulf of Guinea).

Table 1. *Cantherhines macrocerus*. Morphometric and meristic data for specimens caught off Principe Island (Gulf of Guinea).

	Individual 1	Individual 2	Individual 3
Total length	35.7	27.0	26.6
Standard length	30.3	23.6	22.3
Opercle length	7.9	6.3	5.9
Length to the eye	7.0	5.7	5.2
Dorsal ray length	8.6	5.7	4.3
Pectoral-fin length	7.7	6.1	6.4
Dorsal-fin length	16.8	13.9	12.7
Anal-fin length	20.0	15.0	15.2
Eye diameter	1.6	1.2	1.1
Gill rakers	35	35	35
Base of the dorsal-fin	11.1	8.2	7.3
Base of anal-fin	9.2	6.8	6.4
Length of pectoral-fin	3.4	2.8	2.6
Length of pelvic-fin	0.8	0.9	0.9
Length of the dorsal ray	6.8	4.9	5.3
Body width (at dorsal ray)	13.4	10.0	10.9
Maximal body depth	17.4	13.8	13.4
Body width at anal fin origin	12.2	9.5	9.3
Caudal peduncle width	3.2	2.5	2.7
Total wet weight (g)	860	373	330
Gonads weight	42	22	12
Eviscerate weight	663	301	271
Dorsal spines and soft rays	I+34	I+34	I+34
Pectoral-fin rays	14	14	14
Anal-fin rays	31	31	31
Sex	Male	Female	Male

refuge. The reasons for this species' occurrence in coastal waters of Principe Island is not yet clear, although some studies have suggested that seaweed and other floating object can acting as rafts (Luiz et al., 2015). Other reports point to the oil-platforms, since these structures can be used for many species as drifting floating devices (Pajuelo et al., 2016). This pathway has already been reported for some new species of tropical fishes identified in the Canary Islands (Triay-Portella et al., 2015).

Therefore, the Whitespotted filefiish could be transported towards the Gulf of Guinea by oil-platforms coming from Brazil or the Caribbean. Nonetheless, the natural dispersal observed in other western Atlantic congeneric (*C. pullus*) into the Gulf of Guinea (Afonso et al., 1999), could suggest similar scenario to *C. macrocerus*. Due to its rarity in the eastern Atlantic, and the scarcity of ichthyological surveys in the region, this species may have previously escaped detection. Comparative genetic analysis of diverse Whitespotted filefish populations could contribute to the knowledge of this new population in Principe Island.

Acknowledgements

We want to thank to Luz María Gonzalez Abraham for her constructive comments and to the Regional Government of Príncipe Island and all team of the UNESCO Biosphere Reserve of Príncipe Island for the support and logistics during the Marine Expedition BIO-Principe 2016.

References

Afonso P., Porteiro F.M., Santos R.S., Barreiros J.P., Worms J. & Wirtz P. 1999. Coastal marine fishes of São Tomé Island (Gulf of Guinea). *Arquipélago. Life and Marine Sciences,* **17A**: 65-92.

Aguilera O. 1998. Los peces marinos del occidente de Venezuela. *Acta Biologica Venezuelica,* **18:** 43-57.

Anderson A.B., Carvalho-Filho A., Morais R.A., Nunes L.T., Quimbayo J.P. & Floeter S.R. 2015. Brazilian tropical fishes in their southern limit of distribution: checklist of Santa Catarina's rocky reef ichthyofauna, remarks and new records. *Check List,* **11**: 1688.

Böhlke J.E. & Chaplin C.C.G. 1993. *Fishes of the Bahamas and adjacent tropical waters. 2nd ed.* University of Texas Press: Austin. 771 pp.

Brito A., Moreno-Borges S., Escánez A., Falcón J.M. & Herrera R. 2017. New records of Actinopterygian fishes from the Canary Islands: tropicalization as the most important driving force increasing fish diversity. *Revista de la Academia Canaria de Ciencias*, **29**: 31-44.

Cervigón F. 1992. Tiburones, Peces batoideos y Peces óseos. In: *Fichas FAO de identificatión de especies para los fines de la pesca. Guía de campo de las especies comerciales marinas y de aguas salobres de la costa septentrional de Sur América*

(Cervigón, F. et al. eds), pp. 163-456, pls. 3-40. FAO: Rome.

Claro R. & L.R. Parenti 2001. The marine ichthyofauna of Cuba. In: *Ecology of the marine fishes of Cuba* (R. Claro, K.C. Lindeman & Parenti L.R. eds), pp. 21-57. Smithsonian Institution Press: Washington & London.

Collette B.B., Williams J.T., Thacker C.E. & Smith M.L. 2003. Shore fishes of Navassa Island, West Indies: a case study on the need for rotenone sampling in reef fish biodiversity studies. *Aqua Journal of Ichthyology and Aquatic Biology,* **6**: 89-131.

Dooley J.K. 1968. Young filefishes, *Cantherhines macrocerus* and *C. pullus*. *Copeia,* **1968**: 863-867.

Feitoza B.M., Rocha L.A., Luiz-Júnior O.J., Floeter S.R. & Gasparini J.L. 2003. Reef fishes of St. Paul's Rocks: New records and notes on biology and zoogeography. *Aqua Journal of Ichthyology and Aquatic Biology*, **7**: 61-82.

Floeter S.R., Guimaraes R.Z.P., Rocha L.A., Ferreira C.E.L., Range C.A. & Gasparini J.L. 2001. Geographic variation in reef-fish assemblages along the Brazilian coast. *Global Ecology and Biogeography,* **10**: 423-433. Doi: 10.1046/j.1466-822X.2001.00245.x

Gasparini J.L. & Floeter S.R. 2001. The shore fishes of Trindade Island, western south Atlantic. *Journal of Natural History*, **35**: 1639-1656. Doi: 10.1080/002229301317092379

Harmelin-Vivien M.L. & Quéro J.C. 1990. Monacanthidae. In: *Checklist of the fishes of the eastern tropical Atlantic. Vol. II* (J.C. Quéro, J.C. Hureau, C. Karrer, A. Post & Saldanha L. eds), pp. 1055-1066. JNICT: Lisboa.

Humann P. 1994. *Reef fish identification: Florida, Caribbean, Bahamas.* New World Publications: Jacksonville, Florida. 426 pp.

Lubbock R. & Edwards A. 1981. The fishes of Saint Paul's Rocks. *Journal of Fish Biology*, **18**: 135-157. Doi: 10.1111/j.1095-8649.1981.tb02810.x

Luiz O.J., Carvalho-Filho A., Ferreira C.E.L., Floeter S.R., Gasparini J.L. & Sazima I. 2008. The reef fish assemblage of the Laje de Santos Marine State Park, Southwestern Atlantic: annotated checklist with comments on abundance, distribution, trophic structure, symbiotic association, and conservation. *Zootaxa*, **1807**: 1-25.

Luiz O.J., Allen A.P., Robertson D.R., Floeter S.R. & Madin J.S. 2015. Seafarers or castaways: ecological traits associated with rafting dispersal in tropical reef fishes. *Journal of Biogeography*, **42**: 2323-2333. Doi: 10.1111/jbi.12574

Matsuura K. 2003. Monacanthidae. In: *The living marine resources of the Western Central Atlantic. Volume 3: Bony fishes part 2 (Opistognathidae to Molidae)* (K.E. Carpenter ed), pp. 1970-1979. FAO: Rome.

Matsuura K. 2016. Monacanthidae. Filefishes (leatherjackets). In: *The living marine resources of the Eastern Central Atlantic. Volume 4. Bony fishes part 2 (Perciformes to Tetradontiformes) and Sea turtles* (K.E. Carpenter & De Angelis N. eds), pp. 3056-3062. FAO: Rome.

McEachran J.D. & Fechhelm J.D. 2005. *Fishes of the Gulf of Mexico. Vol. 2: Scorpaeniformes to Tetraodontiformes*. University of Texas Press: Austin. 1004 pp.

Pajuelo J.G., González J.A., Triay-Portella R., Martín J.A., Ruiz-Díaz R., Lorenzo J.M. & Luque A. 2016. Introduction of non-native marine fish species to the Canary Islands waters through oil platforms as vectors. *Journal of Marine Systems*, **163**: 23-30. DOI: 10.1016/j.jmarsys.2016.06.008

Pinheiro H.T., Mazzei E., Moura R.L., Amado-Filho G.M., Carvalho-Filho A., Braga A.C., Costa P.A.S. et al. 2015. Fish biodiversity of the Vitória-Trindade seamount chain, southwestern Atlantic: an updated database. Supporting information. *PLoS ONE,* **10**: UNSP e0118180. Doi: 10.1371/journal.pone.0118180

Ramjohn D.D. 1999. *Checklist of coastal and marine fishes of Trinidad and Tobago.* Marine Fishery Analysis Unit, Fisheries Division, Ministry of Agriculture, Land and Marine Resources: Trinidad and Tobago. 151 pp.

Randall J.E. 1996. *Caribbean reef fishes. 3rd edition -Revised and enlarged.* T.F.H. Publications, Inc Ltd.: Hong Kong. 368 pp.

Randall J.E. 2011. Review of the circumtropical monacanthid fish genus *Cantherhines*, with descriptions of two new species. *Indo-Pacific Fishes*, **40**: 1-30, pls. 1-7.

Reiner F. & Martins P. 1995. First record of *Cantherines macrocerus* (Pisces: Monocanthidae) from Cape Verde Archipelago, West Africa. *Museo Municipal do Funchal (Historia Natural)*, **177**: 1-4.

Robins C & Ray G. 1986. *A field guide to Atlantic coast fishes of North America.* Houghton Mifflin Company: Boston. 354 pp.

Sadovy Y. 1992. A preliminary assessment of the marine aquarium export trade in Puerto Rico. In: *Proceedings of the Seventh International Coral Reef Symposium, Guam, Vol. 2*, pp. 1014-1021.

Schmitter-Soto J.J., Vásquez-Yeomans L., Aguilar-Perera A., Curiel-Mondragón C. et al. 2000. Lista de peces marinos del Caribe mexicano. *Anales del Instituto de Biología*, *Serie Zoología,* **71**: 143-177.

Smith C.L. 1997. *National Audubon Society field guide to tropical marine fishes of the Caribbean, the Gulf of Mexico, Florida, the Bahamas, and Bermuda.* Alfred A. Knopf, Inc.: New York. 720 pp.

Smith-Vaniz W. & Jelks H.L. 2014. Marine and inland fishes of St. Croix, U. S. Virgin Islands: an annotated checklist. *Zootaxa,* **3803**: 1-120. Doi: 10.11646/zootaxa.3803.1.1

Triay-Portella R., Pajuelo J.G., Manent P., Espino F., Ruiz-Díaz R., Lorenzo J.M. & González J.A., 2015. New records of non-indigenous fishes (Perciformes and Tetradontiformes) from the Canary Islands (north-eartern Atlantic). *Cybium*, **39**: 163-174.

Tuya F., Herrero-Barrencua A., Bosch N.E., Abreu A.D. & Haroun R. 2018. Reef fish at a remote tropical island (Principe Island, Gulf of Guinea): disentangling taxonomic, functional and phylogenetic diversity patterns with depth. *Marine and Freshwater Research*, **69**: 395-402. Doi: 10.1071/MF17233

Vasco-Rodrigues N., Fontes J., Bertoncini Á.A. 2016. Ten new records of marine fishes for São Tomé, West Africa. *Acta Ichthyologica Piscatoria*, **46**: 123-129. Doi: 10.3750/AIP2016.46.2.09

Wirtz P. et al. 2007. Coastal fishes of São Tomé and Principe islands, Gulf of Guinea (Eastern Atlantic Ocean) - an update, *Zootaxa* **1523**: 1-48. Doi: 10.5281/zenodo.177470

Wirtz P., Bingeman J., Bingeman J., Fricke R., Hook T.J. & Young J. 2014. The fishes of Ascension Island, Central Atlantic Ocean - new records and an annotated checklist. *Journal of the Marine Biological Association of the United Kingdom*, **97 (sp. issue)**: 783-798. Doi: 10.1017/S0025315414001301