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Validating the presence of Spanish Flag, *Gonioplectrus hispanus* (Cuvier, 1828) (Perciformes, Serranidae), from the south-western Gulf of Mexico

Luis Fernando Del Moral-Flores[1], Eduardo López-Segovia[1,2], Viridiana R. Escartín-Alpizar[1, 2], María de Lourdes Jiménez-Badillo[3]

1 Laboratorio de Zoología, Facultad de Estudios Superiores Iztacala, Universidad Nacional Autónoma de México, Mexico City, Mexico • LFDMF: delmoralfer@gmail.com https://orcid.org/0000-0002-7804-2716 • VREA: viridianaescartin11d@gmail.com, https://orcid.org/0000-00018524-3850

2 Posgrado en Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, Mexico City, Mexico • ELS: eduardosegovia@comunidad.unam.mx https://orcid.org/0000-0001-8065-1521

3 Instituto de Ciencias Marinas y Pesquerías, Universidad Veracruzana, Veracruz, Mexico • MLJB: ljimenez@uv.mx https://orcid.org/0000-0002-0324-433X

* Corresponding author

Abstract

We report the presence of *Gonioplectrus hispanus* (Cuvier, 1828) in Mexican waters of the Gulf of Mexico. Four specimens (198–224 mm standard length) were caught at two locations south of Veracruz. These records increases the number of species in the family Serranidae for Mexico to 113. We include morphometry and meristic data of our specimens.

Keywords

Chernas, Epinephelinidae, grouper, range extension, species distribution

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Introduction

The family Serranidae Swainson, 1839 is a monophyletic group and includes six subfamilies, 72 genera, and between 579 and 583 species (Fricke et al. 2020; Parenti and Randall 2020). This family has significant economic importance, as it supports commercial fisheries and sport fishing activities (Bullock and Smith 1991). In Mexico, it supports one of the main fisheries in the Western Atlantic (Colás-Marrufo et al. 1998), and it is also important in coastal, tropical and subtropical ecosystems, including mesophotic and rariphotic environments (Bullock and Smith 1991; Baldwin et al. 2018). One of the genera within the family is *Gonioplectrus* Gill, 1862, which is monotypic, with *Gonioplectrus hispanus* (Cuvier, 1828), Spanish Flag, restricted to Western Atlantic (Parenti and Randall 2020).

Gonioplectrus hispanus has a wide distribution from

North Carolina (USA) to south-eastern Brazil. However, the records of this species are scarce because it inhabits rocky areas and deep coral from 60 to 365 m (McEachran and Fechhelm 2005). The north-western distribution of this species includes the Gulf of Mexico, Texas, and other parts of the United States (Briggs, 1958; Briggs et al. 1964; Moore 1975; Smith 1976; Bullock and Smith 1991; Hoese and Moore 1998). There are no confirmed records based on deposited specimens in reference collections from Gulf of Mexico and the Mexican Caribbean, although it is mentioned in the faunistic lists of Mexican Atlantic coasts (Lara-Domínguez et al. 1993; Baqueiro and Mendez 1994), including the coast at Los Tuxtlas (Schaldach et al. 1997) and as larvae on Campeche Bank (Flores-Coto et al. 2009). The only evidence of its presence in Mexican Atlantic coasts is a photograph of a single specimen in the Instituto Nacional de Pesca (1976). The geographic coordinates of the collection site of this specimen are unknown. With the new records presented here, we confirm the presence of *G. hispanus* in the south-western Gulf of Mexico.

Methods

Four specimens of *Gonioplectrus hispanus* were caught accidentally by the artisanal fishery, using a bottom-longline made with nylon monofilament and 60 to 150 hooks (size 6) at depths of 180–300 m (Fig. 1). The specimens were deposited in the Ichthyological Collection of the Facultad de Estudios Superiores Iztacala (CIFI), Universidad Nacional Autónoma de México. The taxonomic determination was made with specialized keys by Bullock and Smith (1991), McEachran and Fechhelman (2005), and Heemstra et al. (2002). Electronic calipers (0.01 mm) were used for morphological measurements, and the meristic data were counted according to Hubbs and Lagler (1958) with modifications for the group (Betancur-R. et al. 2001; Oliveira and Barbosa 2010; Sampaio et al. 2017).

Results

Family Serranidae Swainson 1839
Genus *Gonioplectrus* Gill, 1862

***Gonioplectrus hispanus* (Cuvier, 1828)**
Figure 2; Table 1

Common names. Spanish Flag; mero payaso, payasín (Spanish).

New records. MEXICO – **Veracruz** • Gulf of Mexico; ca. 11.8 km from Punta Puntilla, municipality of Ángel R. Cabada; 18°46′56.7″N, 095°09′40.2″W; 280 m depth; 12.XI.2020; A. Campos-Pérez and E. Campos-Vicente leg.; fishing line; 2 specimens, CIFI-1715 (192 and 208 mm SL) • same locality, 300 m depth; 09.I.2021; A. Campos-Pérez leg.; fishing line; 1 specimen, CIFI-1801 (224 mm SL) • Gulf of Mexico; ca. 9 km from Playa Hermosa, municipality of Ángel R. Cabada; 18°44′28.8″N, 095°04′52.0″W; 180 m depth; 24.VI.2021; A. Campos-Pérez and E. Campos-Vicente leg.; fishing line; 1 specimen, CIFI-1820 (208 mm SL).

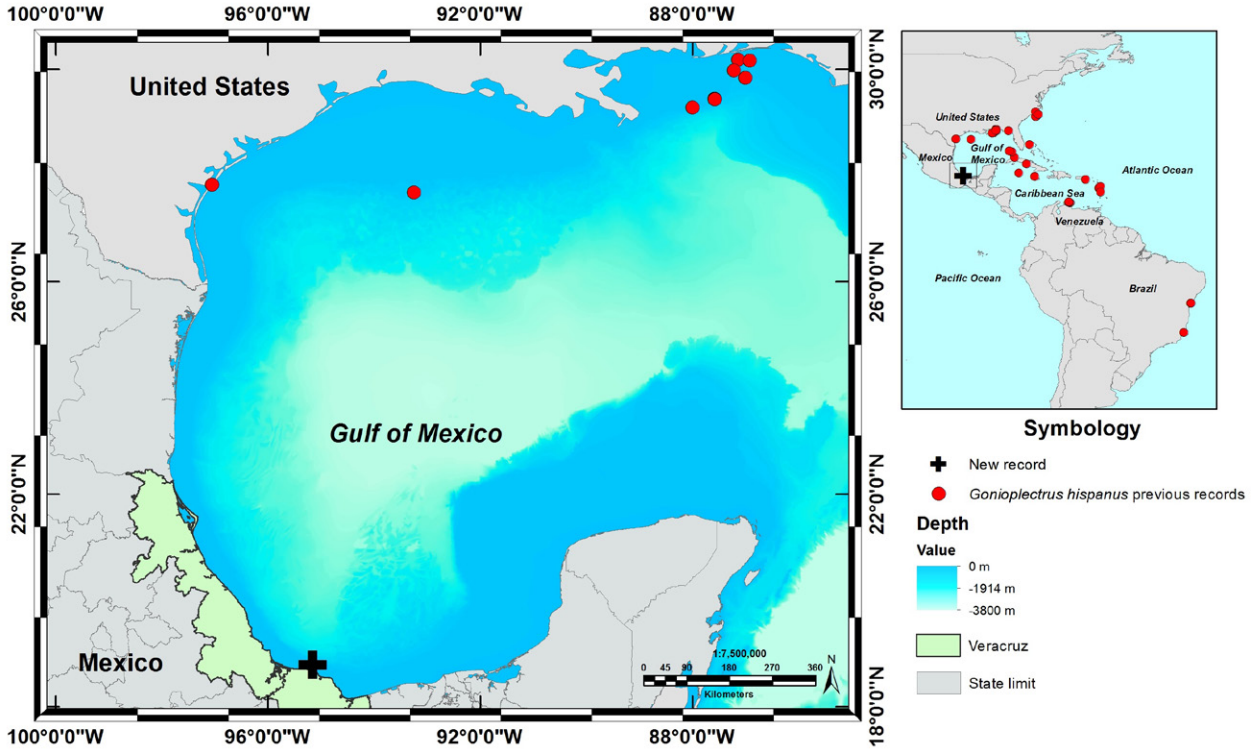

Figure 1. Sampling station of *Gonioplectrus hispanus* (black cross), ca. 11.8 km from Punta Puntilla, municipality of Ángel R. Cabada, Veracruz, south-western Gulf of Mexico (18°46′56.7″N, 095°09′40.2″W). Previous records of *G. hispanus* in the western Atlantic (red dots).

Figure 2. *Gonioplectrus hispanus* (CIFI-1715, 208 mm SL) collected in the south-western Gulf of Mexico, showing typical coloration for the species. The species was determined prior to the preservation of the specimen. Scale bar = 25 mm.

Identification. *Gonioplectrus hispanus* is recognised by its a serrated preopercle with a large spine on the ventral edge directed forward. The opercle has three spines, and the second spine is most elongated. The dorsal fin has 8 spines and 11–13 rays, and the anal fin has 3 spines and 7 rays. The lateral line has 47–49 scales. The bases of the dorsal, anal, and pectoral fins are covered with scales. Gill rakers number 21–23. In addition, in vivo, *G. hispanus* shows a striking pink coloration, with seven bright yellow stripes on the sides from the head to the base of the tail fin. A diagonal yellow stripe runs from the snout through the eye and upper opercle to the back of the body. There are yellow patches in the interorbital region and cheek. The pelvic fins are violet, and the anal fin has a crimson spot from the second anal spine as far as the first anal ray. There is a conspicuous, white, ventral blotch, which is much larger than the eye-diameter.

Discussion

Gonioplectrus hispanus occurs in moderately deep waters down to depths of 460 m (Oliveira and Barbosa 2010; Baldwin et al. 2018) and co-exists with other serranids, usually at the periphery of tropical reefs (Bullock and Smith 1991). Specifically, it lives in coral reefs of the rariphotic zone (139–309 m; Baldwin et al. 2018). This species has no value as human food due to its small size, but it is often used as ornamental fish in the aquarium trade (Oliveira and Barbosa 2010). Its capture is difficult below 100 m, and barriers, such as thermoclines at these depths, function as biological boundaries (Heemstra and Randall 1993; Oliveira and Barbosa 2010).

The species has been recorded sporadically along

Table 1. Morphometric and meristic data of specimens of *Gonioplectrus hispanus* from the south-western Gulf of Mexico.

Morphometrics (mm)	CIFI 1715	CIFI 1715	CIFI 1801	CIFI 1820
Total length	251	230	278	271
Standard length	208	192	224	222
Head length	88.66	82.21	96.06	93.82
Upper jaw length	39.47	37.06	42.25	43.97
Orbit diameter	15.78	15.35	16.03	16.24
Postorbital length	48.54	45.47	56.19	52.47
Interorbital width	14.70	12.62	16.13	15.84
Snout length	22.42	21.01	25.81	26.95
Suborbital length	9.53	8.55	11.20	11.48
Body depth	81.91	74.97	96.90	87.30
Caudal peduncule length	33.07	28.96	31.29	28.65
Caudal peduncule depth	32.58	30.70	33.78	34.92
Caudal fin base length	40.32	36.95	38.26	36.42
Dorsal fin base length	94.08	87.82	97.99	98.45
Anal fin base length	34.79	31.08	37.55	36.39
Predorsal length	84.15	81.70	93.45	96.12
Preanal length	144	134	156	15
Prepectoral length	84.11	74.2	87.96	85.13
Pectoral fin length	52.60	51.01	64.61	59.72
Prepelvic length	89.18	79.97	96.93	89.92
Pelvic fin length	42.61	41.66	46.10	46.51
Meristics				
Dorsal fin spines	VIII	VIII	VIII	VII
Dorsal fin rays	11	13	13	13
Anal fin spines	III	III	III	III
Anal fin rays	7	7	7	7
Pectoral fin rays	16	15	16	17
Caudal fin rays	16	17	17	17
Pored scales lateral line	49	48	48	50
Lateral line scales	85	81	79	83
Scales around the caudal peduncle	47	45	45	48
Upper gill rakers	6	7	6	5
Lower gill rakers	15	15	15	15

the Caribbean coasts of Colombia and Venezuela, as well as in the Caribbean Islands (Cervigón 1971; Guitart 1977; Thompson and Munro 1978; Betancur-R. et al. 2001; Baldwin et al. 2018). It has been recently recorded in Brazilian waters as a result of deep-sea fishing and mesophotic exploration (Oliveira and Barbosa 2010; Garcia-Júnior et al. 2015; Sampaio et al. 2017). Bullock and Smith (1991) reported this species in the north-western Atlantic, and in Mexico, it has been detected in the southern Gulf of Mexico, between Laguna de Términos and the Yucatán Peninsula, although the location was not specified (Lara-Domínguez et al. 1993). Despite recent ichthyofaunal surveys in reef areas in the south-eastern Gulf of Mexico and on the Yucatán continental shelf, *G. hispanus* has not been detected (Colás-Marrufo et al. 1998; Robertson et al. 2019; González-Gandara 2020).

Its occurrence in Punta Puntilla is probably due to the dispersal of larvae, which influences the presence of adults on coral reefs. Kendall and Fahay (1979) captured larvae of *G. hispanus* in North Carolina, which represents the northernmost record. However, in Mexico, there is a gap in the knowledge of deep communities compared to other countries where this species occurs (Simon et al. 2016; Baldwin et al. 2018; Chasqui-Velasco and González-Corredor 2019) due to poor sampling efforts and the difficulty sampling mesophotic and rariphotic environments. Our new data of *G. hispanus* are an important contribution to understanding Mexico's mesophotic and rariphotic ichthyofauna, and confirm the presence of this species in the southwestern Gulf of Mexico.

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Authors' Contributions

Conceptualization: LFDM. Data curation: VREA. Formal analysis: LFDM, ELS, MLJB, VREA. Visualization: ELS, VREA. Writing – original draft: LFDM, ELS. Writing – review and editing: LFDM, MLJB, VREA.

References

Baldwin CC, Tornabene L, Roberston DR (2018) Below the mesophotic. Scientific Report 8: 4920. https://doi.org/10.1038/s41598-018-23067-1

Baqueiro CE, Mendez RL (1994) Artificial reefs: an alternative to enhance Mexican littoral commercial fisheries. Bulletin of Marine Science 55 (2–3): 1014–1020.

Betancur-R R, Acero PA, Mejía-Ladino LM (2001) El pez serránido *Gonioplectrus hispanus* (Epinephelinae: Epinephelini) en Colombia: primer registro para las costas continentales caribeñas. Boletín Ecotrópica 35: 25–30.

Briggs, J.C. 1958. A list of Florida fishes and their distribution. Bulletin of the Florida State Museum, Biological Sciences Series 2 (8): 223–318.

Briggs JC, Hoese HD, Hadley WF, Jones RS (1964) Twenty-two new fish records for the north–western Gulf of Mexico. Texas Journal of Science 16 (1): 113–116.

Bullock LH, Smith GB (1991) Seabasses (Pisces: Serranidae). Memoirs of the Hourglass Cruises 8 (2): 1–243.

Cervigón F (1971) Los peces marinos de Venezuela. Complemento II. Contribuciones Científicas Universidad de Oriente Porlamar 1: 5–36.

Chasqui-Velasco LH, González-Corredor, JD (2019) Peces registrados en ambientes mesofóticos de Bajo Frijol, la porción más somera del Parque Nacional Natural Corales de Profundidad, usando buceo técnico CCR. Boletín de Investigaciones Marinas y Costeras 48 (1): 89–101. https://doi.org/10.25268/bimc.invemar.2019.48.1.759

Colás-Marrufo T, Brulé T, Déniel C (1998) Análisis preliminar de las capturas de meros realizados a través de unidades de la flota mayor en el sureste del Golfo de México. Proceedings of the Gulf and Caribbean Fisheries Institute 50: 780–803.

Flores–Coto C, Espinosa–Fuentes ML, Zavala García F, Sanvicente Añorve L (2009) Ictioplancton del sur del Golfo de México: un compendio. Hidrobiológica 19 (1): 49–76.

Fricke R, Eschmeyer WN, Fong JD (2020) Species by family/subfamily. Version 2020. http://researcharchive.calacademy.org/research/ichthyology/catalog/SpeciesByFamily.asp. Accessed on: 2021-1-28.

Garcia-Júnior J, Nóbrega MF, Lins-Oliveira JE (2015) Coastal fishes of Rio Grande do Norte, north-eastern Brazil, with new records. Check List 11 (3): 1659. https://doi.org/10.15560/11.3.1659

González-Gándara C (2020) Composition, distribution and relative abundance of fishes linked to fringing reefs of southern Veracruz, Gulf of Mexico. GSC Biological and Pharmaceutical Sciences 12 (2): 217–228. https://doi.org/10.30574/gscbps.2020.12.2.0268

Guitart DJ (1977) Sinopsis de los peces marinos de Cuba. Tomo III. Academia de Ciencias de Cuba, Instituto de Oceanología, Havana, Cuba, 325–608.

Heemstra PC, Anderson WD, Lobel PS (2002) Serranidae. Groupers (seabasses, creolefish, coney, hinds, hamlets, anthiines, and soapfishes). In: Carpenter KE (Ed.) The living marine resources of the Western Central Atlantic. Vol. 2: bony fishes, part 1 (Acipenseridae to Grammatidae). FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologist and Herpetologists Special Publication, Rome, Italy, 601–1374.

Heemstra PC, Randall JE (1993) FAO species catalogue. Vol. 16. Groupers of the world (family Serranidae, subfamily Epinephelinae). An annotated and illustrated catalogue of the grouper, rockcod, hind, coral grouper and lyretail species known to date. FAO Fisheries Synopsis 125 (16): 1–382.

Hoese HD, Moore RH (1998) Fishes of the Gulf of Mexico, Texas, Louisiana, and adjacent waters. Texas A&M University Press, College Station, USA, 416 pp.

Hubbs CL, Lagler KF (1958) Fishes of the Great Lakes region. University of Michigan Press, Ann Arbor, USA, 213 pp.

Instituto Nacional de Pesca (1976) Catálogo de peces marinos mexicanos. Secretaría de industria y comercio, Instituto Nacional de Pesca. Mexico City, Mexico, 462 pp.

Kendall AW Jr., Fahay MP (1979) Larva of the serranid fish *Gonioplectrus hispanus* with comments on its relationships. Bulletin of Marine Science 29 (1): 117–121.

Lara–Domínguez AL, Arreguín–Sánchez F, Alvarez–Guillen H (1993) Biodiversidad y el uso de recursos naturales: las comunidades de peces en el sur del Golfo de México. Revista de la Sociedad Mexicana de Historia Natural 44: 345–385.

McEachran JD, Fechhelm JD (2005) Fishes of the Gulf of Mexico. Vol. 2: Scorpaeniformes to Tetraodontiformes. University of Texas, Austin, USA, 1004 pp.

Moore RH (1975) New records of three marine fish from Texas waters with notes on some additional species. The Texas Journal of Sci-

ence 26 (1–2): 155–163.

Oliveira VS, Barbosa JM (2010) Ocorrência do "Spanish flag" *Gonioplectrus hispanus* (Cuvieri, 1828) na costa de Pernambuco, Brasil. Revista Brasileira de Engenharia de Pesca 5 (1): 93–97. https://doi.org/10.18817/repesca.v5i1.276

Parenti P, Randall JE (2020) An annotated checklist of the fishes of the family Serranidae of the world with description of two new related families of fishes. FishTaxa 15 (1): 1–170.

Robertson DR, Pérez-España H, Domínguez-Domínguez O, Estapé CJ, Estapé AM (2019) An update to the inventory of shore–fishes from the Parque Nacional Sistema Arrecifal Veracruzano, Veracruz, México. ZooKeys 882: 127–157. https://doi.org/10.3897/zookeys.882.38449

Sampaio CLS, Lopes PRD, Oliveira-Silvia JT, Malafaia P, Olavo G (2017) Registros de *Gonioplectrus hispanus* (Cuvier, 1828) (Actinopterygii: Epinephelidae) no estado da Bahia (nordeste do Brasil), océano Atlantico occidental. Arquivos de Ciencias do Mar 50 (2): 12–17. https://doi.org/10.32360/acmar.v50i2.31142

Schaldach WJ Jr, Huidobro Campos L, Espinosa Pérez H (1997) Peces marinos. In: González Soriano E, Dirzo R, Vogt RC (Eds.) Historia natural de los Tuxtlas. Instituto de Biología, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Universidad Nacional Autónoma de México, Mexico, 571–588.

Simon T, Pinheiro HT, Moura RL, Carvalho-Filho A, Rocha LA, Martins AS, Mazzei E, Francini-Filho RB, Amado-Filho GM, Joyeux J-C (2016) Mesophotic fishes of the Abrolhos Shelf, the largest reef ecosystem in the South Atlantic. Journal of Fish Biology 89 (1): 990–1001. https://doi.org/10.1111/jfb.12967

Smith GB (1976) Ecology and distribution of eastern Gulf of Mexico reef fishes. Florida Marine Research Publications 19: 1–178.

Thompson R, Munro J (1978) Aspects of the biology and ecology of Caribbean reef fishes: Serranidae (hinds and groupers). Journal of Fish Biology 12 (2): 115–146. https://doi.org/10.1111/j.1095-8649.1978.tb04158.x