

Incidental catch of goliath grouper *Epinephelus itajara* (Lichtenstein, 1822) e *Epinephelus* sp (Bloch, 1793) in industrial fisheries of Brazilian Northern coast: a critical endangered species

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ABSTRACT

Industrial trawling fisheries bycatch are diverse and abundant, catching a significant species richness. Inside captured endangered species like goliath grouper *Epinephelus itajara*. Five specimens were captured with bottom twin trawls, by shrimps industrial vessels, in Amazon continental shelf. Considering the novelty of the registry, the data reinforce the need for actions that minimize the catches of goliath grouper judges for their bioecological characteristics that classify it as critically endangered.

Keywords: Goliath grouper; industrial fishery; by catch; conservation status.

Captura acidental da garoupa golias *Epinephelus itajara* (Lichtenstein, 1822) e *Epinephelus* sp (Bloch, 1793) na pesca industrial da costa norte do Brasil: uma espécie criticamente ameaçada

RESUMO

A fauna acompanhante das pescarias de arrasto industriais é diversa e abundante, capturando uma significativa riqueza. Dentre estas algumas são ameaçadas de extinção, como o mero *Epinephelus itajara*. Foram capturados cinco espécimes com redes de arrasto de fundo individuais, através das embarcações de camarões industriais na plataforma continental amazônica. Considerando o ineditismo do registro, os dados reforçam a necessidade de ações que minimizem as capturas de meros a julgar por suas características bioecológicas que o classificam como criticamente ameaçada.

Palavras chave: mero, pesca industrial, pesca acessória, status de conservação.

Penaeidae Brazilian northern coast Industrial fishing is an important economic activity in Pará state. Industrial catches of pink shrimp are composed basically of *Farfantepenaeus subtilis* (PÉREZ FARFANTE, 1967) and a small occurrence of *Farfantepenaeus brasiliensis* (LATREILLE, 1817). These fisheries occur along much of the northern continental shelf between Parnaíba River (02°53'S), Piauí and Oiapoque river (04°23'N) on border French Guiana, comprising the coast of the states of Amapá, Pará and Maranhão. This fishing area is part of an extensive 'shrimping bank' that extends of the Orinoco River in Venezuela, covering about 223,000 km² (IBAMA, 1994). These industrial fisheries systems trawling the North Coast is diverse and abundant, capturing a significant number of species. These fisheries accidentally endangered species (sharks, turtles and fish), especially elasmobranchs and no fishing method comes close in terms of waste disposal of marine resources (SMITH, 1981). *E. itajara* lives in tropical and subtropical waters with salinity ranging from brackish to hypersaline (SMITH, 1976) characterized the species as euryhaline. Its distribution occurs from Florida, Gulf of Mexico, since Caribbean to southern Brazil (western Atlantic). In the eastern Atlantic is rarer (BRITO, 1991) and restricted, occurring from Senegal to the Congo, known as *E. esonue* (SERET, 1981; SMITH, 1981). In the eastern Pacific are distributed from the Gulf of California to Peru (FAO, 1993; SADOVY; EKLUND, 1999). Goliath grouper are territorial fish, considered a typical species ecologically K strategist with slow growth, high longevity and can weigh 400 kg, late maturing, making spawning aggregations and low recruitment rates, features that make the species highly vulnerable to fishing mortality (BULLOCK et al., 1992). Decline of *E. itajara* worldwide, a result of over-fishing, habitat scarcity and pollution of the marine environment has meant this species walked to the red list of endangered species IUCN (The International Union for the conservation of Nature and Natural Resources) as critically endangered. The decay of the population of Goliath grouper in various regions in Brazil caused the specimen received a moratorium in 2002 (IBAMA Ordinance No. 121 of September 20, 2002) that prohibited fishing for five years, from 2002 to 2007 (HOSTIM-SILVA et al., 2005), becoming the first species having a particular decree in Brazil. IBAMA in 2007 renewed the decree (n° 42/2007) prohibiting fishing for five years and currently fishing is closed until 2015 (Ordinance No.13/2012) and nowadays, until 2021 (Ordinance No.13/2012).

Specimens were captured with bottom twin trawls, used for pink

shrimps industrial fishing. After geographic position registered, deep, total length (cm) and photographic images, specimens were discarded overboard. In land, by images and videos, specimens were identified according specialized literature (FIGUEIREDO, 1977, FISCHER et al., 1990, CERVIGÓN et al., 1992; SZPILMAN, 2000).

Five specimens captured by industrial pink shrimp vessels were analysed (Fig. 1).



Figure 1. Specimens of goliath grouper - *Epinephelus itajara* (Lichtenstein 1822) and *Epinephelus* sp (Bloch, 1793), captured in Northern Brazilian continental shelf, Brazil. A (1st specimen - 148.3 cm), B (2nd specimen - 136.07 cm), C (3rd specimen - 205.39 cm), D (4th specimen - 127.91 cm) and E (5th specimen - 40 cm). Family Serranidae, Subfamily Epinephelinae, Genus *Epinephelus* Bloch, 1793, *Epinephelus itajara* (Lichtenstein 1822).

1. **Synonym:** *Epinephelus itajara* (Lichtenstein 1822); *Promicrops ditobo* Roux & Collignon 1954; *Promicrops esonue* Ehrenbaum 1915; *Serranus galeus* Müller & Troschel 1848; *Serranus guasa* Poey, 1860; *Serranus itajara* Lichtenstein 1822; *Serranus mentzelii* Valenciennes 1828.

2. **Common names:** Atlantic Goliath Grouper; Jewfish, Goliath Grouper (English); Guasa, Cherna, Cherne, Guato, Guaza, Mero, Mero Batata, Mero Guasa, Mero Gúasa, Mero Pintado, Mero Sapó (Spanish); Mérour, Méroú Géant, Têtard (French).

3. **Material analyzed and total length (cm):** Brazilian northern continental shelf: 3° 28' 84" N / 49° 55' 45" W (1° mero - 148,3 cm); 3° 43' 99" N / 50° 6' 49" W (2° mero - 136,07 cm); 3° 10' 54" N / 49° 40' 5" W (3° mero - 205,39 cm); 1° 06' 228" N / 47° 58' 472" W (4° mero - 127,91 cm); 02° 26' 779" N / 48° 40' 059" W (5° mero - 40 cm).

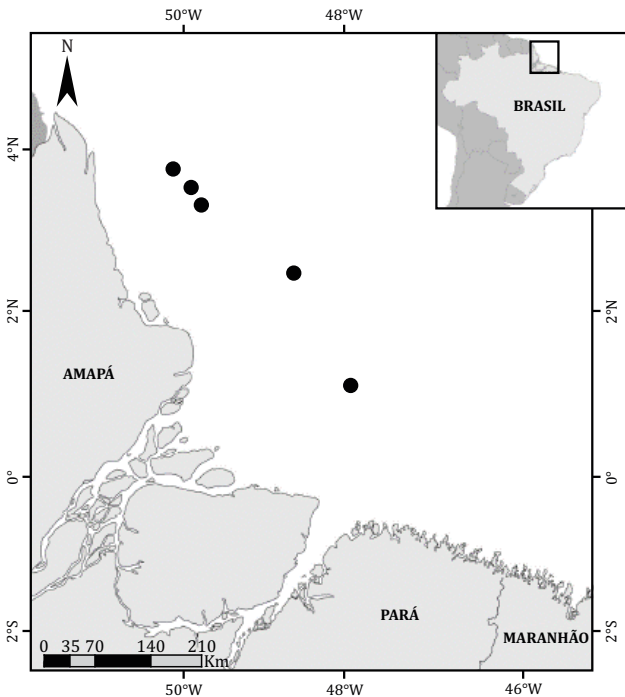


Figure 2. Geographic points of incidental captures of Atlantic goliath grouper by pink shrimps industrial fishing system in Brazilian northern continental shelf. Map: Lutz, 2018.

4. **Description:** 7 a 9 rays in anal fins (rarely 10); dorsal fin with 11 spines and 15 or 16 soft rays; ctenoids scales; small eyes, diameter included 5 to 9 times in total length for fish to 30 cm (FAO 2002).

5. **Body colour:** brownish yellow, grey or greenish.

6. **Distribution:** Official data published by IUCN shows that *Epinephelus itajara* is found in tropical and subtropical waters of the Atlantic Ocean. In the western Atlantic, the species ranges from North Carolina (USA) to southeast Brazil (Francesconi & Schwartz 2000), and is caught widely in the Gulf of Mexico and throughout most of the Caribbean. It is reported in the eastern Atlantic from Senegal to Congo.

7. **Habitat and ecology:** Specimens are found from inshore to about 100 m in reef, mangrove, seagrass, and estuarine habitats (Sadovy & Eklund 1999). According IUCN published data, juveniles live in shallow bays, holes, below undercut ledges in swift tidal creeks draining mangrove swamp, rivers and estuaries while adults live around structures in, near, and offshore (Bullock et al., 1992, Gerber et al., 2005, Koenig et al., 2007). Juveniles exhibit high site fidelity to mangrove habitat for 5-6 years, then emigrate to offshore reefs at body length of about 1m TL and juvenile distribution in mangroves depends on local water quality, particularly dissolved oxygen content (>4 ppm) and mid-range salinities (>10 ppt) (Koenig et al., 2007).

During a survey of the freshwater fish of southern Florida from 1976 to 1983, *E. itajara* was collected although the salinity-tolerant juveniles could be found in shallow, coastal waters (Loftus & Kushlan 1987). In 181 sites, presence of mangrove areas appears to be important for juveniles (Sadovy & Eklund 1999). Koenig et al. (2007) demonstrated the high nursery value of mangrove to juveniles.

8. **Feeding:** *Epinephelus itajara* feed a diversity of fishes and invertebrates (Sadovy & Eklund 1999). It is a classic apex predator, large, rare and only a few individuals occur on any given reef unit (Huntsman et al., 1999).

9. **Fishing gear related screenshots:** Artisanal spear fishing and long lines; artisanal bottom trawling fleet (shrimps) and gillnets (Gerhardinger et al., 2006). In Pará state (Brazil), some traps locally named 'currais' (fixed traps) often capture goliath groupers in man-

groves and coastal areas.

10. **Economic importance:** Atlantic goliath grouper were extensively exploited by small and large scale artisanal fishing, especially in environments of juveniles were founded. Nowadays, few capture are described, it can be relation to instituted moratorium since 2002 in Brazil. Fishermen relate that captures of young and adults goliath grouper occur in all year months in coastal northern of Brazil.

11. **Conservation status:** nowadays, is categorized critic endangered species by IUCN (The International Union for the Conservation of Nature and Natural Resources <http://www.iucnredlist.org/details/195409/0> accessed 07-08- 2014).

12. **Discussion about industrial catches** – Even though catches are frequently recorded, this work is the first to publish information, alarming society and especially decision makers about the need to invest in surveys that minimize such catches. Research with Bycatch Reduction Devices (BRD) would be alternatives that could possibly help escape large specimens whose ecological impact is significant. The need for measures with the industry on the possibility of reducing these catches is reinforced.

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