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Semblanzas Ictiológicas
Mariano González Castro

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y
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Semblanzas Ictiológicas

Mariano González Castro

Hugo L. López y Justina Ponte Gómez

ProBiota
División Zoología Vertebrados
Museo de La Plata
FCNyM, UNLP

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Imagen de Tapa
Amplificando genes en el Laboratorio de Referencia Barcode, Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, 2011

El tiempo acaso no exista. Es posible que no pase y sólo pasemos nosotros.

Tulio Carella

Cinco minutos bastan para soñar toda una vida, así de relativo es el tiempo.

Mario Benedetti

Semblanzas Ictiológicas

A través de esta serie intentaremos conocer diferentes facetas personales de los integrantes de nuestra "comunidad".

El cuestionario, además de su principal objetivo, con sus respuestas quizás nos ayude a encontrar entre nosotros puntos en común que vayan más allá de nuestros temas de trabajo y sea un aporte a futuros estudios históricos.

Esperamos que esta iniciativa pueda ser otro nexo entre los ictiólogos de la región, ya que consideramos que el resultado general trascendería nuestras fronteras.

Hugo L. López

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Cuestionario

-**Un libro**: *El mundo perdido* de Sir. Arthur Conan Doyle.
-**Una película**: *La sociedad de los poetas muertos*.
-**Un CD**: *Cuando los ángeles lloran*; Intérprete: Maná.
-**Un artista**: Sting.
-**Un deporte**: padel.
-**Un color**: verde.
-**Una comida**: corvina negra a la parrilla.
-**Un animal**: perro.
-**Una palabra**: voluntad.
-**Un número**: 26.
-**Una imagen**: el amanecer en el mar.
-**Un lugar**: La Habana, Cuba.
-**Una estación del año**: otoño.
-**Un nombre**: Mariano.
-**Un hombre**: Martin Luther King.
-**Una mujer**: María teresa de Calcuta.
-**Un personaje de ficción**: Luke Skywalker de Star Wars.
-**Un superhéroe**: Batman.

Mariano González Castro, centro, Jefe Científico de la Campaña Costera Litoral Bonaerense, Buque Oceanográfico Puerto Deseado, CONICET, Santa Cruz, 2012

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Fish composition in a south-western Atlantic temperate coastal lagoon: spatial–temporal variation and relationships with environmental variables

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Mar Chiquita, an irregularly shaped brackish-water coastal lagoon, is located in the Buenos Aires province of Argentina and considered since 1996 by the Coordination Council of the Man and Biosphere Program of UNESCO as a World Reserve of Biosphere. The present paper aims to study both the spatial and temporal variation of fish composition in this coastal lagoon and the influence of some environmental variables on the relative abundance of the main fish species. Monthly sampling surveys over a two-year period in three different areas were conducted, using a beach-seine net and three monofilament-gill nets with different mesh size. Twenty-eight species belonging to four bio-ecological categories were identified, five of them are new records for Mar Chiquita fish community. The correspondence analysis showed strong relationships between high salinity range and the abundance of Brevoortia aurea, Cynoscion guatucupa *and* Pomatomus saltatrix. *Conversely, low salinity range corresponded to high abundance of* Mugil platanus *and* Odontesthes argentinensis. *High temperatures were corresponded with abundance of* Micropogonias furnieri *and* Brevoortia aurea. *In contrast, high abundance of both* Odontesthes argentinensis *and* Oligosarcus jenynsii *were corresponded to low temperatures.* Brevoortia aurea, Mugil platanus *and* Odontesthes argentinensis *were the most abundant species, representing more than 80% of the total capture. The group of estuarine-nondependent-marine fish presented the highest species richness. Estuarine-dependent-marine species presented for both juveniles and adults specimens the highest abundance values.*

Keywords: fish composition, species diversity, coastal lagoons, salinity gradients, environmental factors, multivariate analysis, South America, Argentina, Buenos Aires, Mar Chiquita

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INTRODUCTION

Coastal lagoons are shallow estuarine environments where salt and freshwater interact, usually oriented parallel to the coast, separated from the ocean by some type of sedimentary barrier, and connected to the open sea by one or more restricted inlets (Isla, 1995). Because of permanent exposure to the effects of the tides, seasonal amount of freshwater entering the estuarine environment and oceanic storms that may push in more salt water, coastal lagoons are extremely rigorous ecosystems, with highly fluctuating physical (temperature, salinity, turbidity and dissolved oxygen) and biological (recruitment, predation and competition) factors (Whitfield, 1999; Hemingway & Elliott, 2002).

Coastal lagoons are considered highly productive, even more so than the open sea (Day *et al.*, 1981). The functional roles of these habitats to fish have been extensively investigated worldwide, in temperate, subtropical and tropical areas (e.g. Whitfield, 1999; Elliott & Hemingway, 2002; James *et al.*, 2007), with a particular focus on their nursery function. These habitats also have long been recognized as important feeding areas for fish, and the role of coastal lagoons to commercial fish as a spawning area is relatively well understood (Elliott & Hemingway, 2002). This importance is related to the fact that coastal lagoon fish communities are seasonally dominated by high densities of juvenile stages of many marine species (Day *et al.*, 1981), potentially enhancing their early growth and survival (Elliot & Hemingway, 2002).

Fish fauna occurring in these habitats is a mixture of tolerant species from both marine and freshwater environments, species migrating from one environment to another, and a small number of resident species (Moyle & Cech, 2004). Therefore, these ecosystems are known as sites of low diversity but high abundance of a few dominant species (Veiga *et al.*, 2006).

The abundance of individual species and the composition, abundance, and diversity of the total fish fauna have been widely studied in both tropical (Araújo & Costa de Azevedo, 2001; Kuo *et al.*, 2001) and temperate lagoons (Vieira & Musick, 1994; Whitfield, 1999; Gordo & Cabral, 2001).

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Morphological, morphometric, meristic and osteological evidence for two species of hake (Actinopterygii: Gadiformes: *Merluccius*) in Argentinean waters

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Morphologically, both classic and landmark-based morphometry and meristic analyses of 241 specimens of *Merluccius*, along with the re-examination of six paratype specimens of *Merluccius hubbsi*, the holotype and three paratypes of *Merluccius patagonicus* and the syntype of *Merluccius australis* revealed the presence of only two species of *Merluccius* in Argentinean waters. Internal structures (hyomandibula, urohyal and sagitta otolith) of *M. hubbsi* were compared to those reported for *M. patagonicus* and were shown to have identical morphology. Type specimens of *M. patagonicus* showed a complete overlap in morphometric and meristic characters with *M. hubbsi*, whereas *M. australis* had a greater number of second dorsal and anal-fin rays, and more lateral-line scales. In addition, *M. australis* had a smaller eye and longer snout than *M. hubbsi* and *M. patagonicus*. The results indicate that there is no evidence for a third hake species in Argentinean waters. *Merluccius patagonicus* is a synonym of *M. hubbsi*.

Key words: landmarks; *M. australis*; *M. hubbsi*; *M. patagonicus*; Patagonia.

INTRODUCTION

Species of hake (*Merluccius* spp.) are widely distributed throughout temperate–cool waters of the continental shelf and shelf-break, in the Mediterranean Sea, eastern and western Atlantic Ocean, eastern and south-western Pacific Ocean, and the south-west Indian Ocean (Lloris *et al.*, 2003) where they constitute important fisheries resources. In Argentina, *Merluccius* spp. is the most important fish resource from an economic perspective. *Merluccius* spp. catches represented 63% of the total catch of the Argentine fleet at the end of the 1980s (Bezzi *et al.*, 1995). Declared landed commercial catches were 600 000 t per annum over 1995–1997. By 2007, landed

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Studies on reproduction of the mullet *Mugil platanus* Günther, 1880 (Actinopterygii, Mugilidae) from the Mar Chiquita coastal lagoon, Argentina: Similarities and differences with related species

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Abstract

The aim of the present study is to provide the first results on the reproductive biology of *Mugil platanus*, from the Mar Chiquita coastal lagoon (Argentina). To address this topic, we employed mainly female gonads, at both microscopic and macroscopic levels. The following stages of oocyte development were observed: (A) oogonias, (B) primary growth oocyte, (C) cortical alveolus stage, (D) yolked oocytes, and (E) atretic follicle. Also five of the seven stages of gonad maturity were macro and microscopically stated. The potential fecundity ranged between 1,002,026 and 2,548,769 yolked oocytes, with a mean of around 1,800,000 oocytes. The length at first maturity (L_{50}) was 450.6 total length (TL) and 367.7 standard length (SL) for females, 436.3 TL and 354.9 SL for males, showing a late sexual maturity for both sexes. Seasonal changes in gonadosomatic index (GSI) of females were observed. The mean GSI was ≤1 during six months of the year (January, June–October). Two modes in the ovarian maturation were observed, the most important in April–May and a secondary one in November–December. Both modes, correlated with the CPUE values, are indicative of the mullet migration from the coastal lagoon towards the sea for spawning. Differences and similarities have been found between *Mugil platanus* and other mugilid species (*Mugil cephalus*, *Mugil curema*, *Liza aurata*, *Liza abu*, *Liza argentea*, *Myxus elongatus*, and *Valamugil cunnesius*), from the reproductive point of view. The length at first maturity obtained for *M. platanus* is higher than in other mugilid species and when a relationship between maximum length and L_{50} is established the percentage corresponding to *Mugil platanus* is 75%, while the others range between 50 and 61%.

Keywords: *Fish reproduction, gonad histology, fecundity, Mugilidae,* Mugil platanus

Introduction

Fish species of Mugilidae occur in both coastal marine and brackish waters from all tropical and temperate seas (Nelson 2006). Conservative morphological features make identification of mullet species difficult. Recently, in order to clarify the controversy regarding the taxonomic status of the striped mullet *Mugil platanus*, in relation to the cosmopolite *Mugil cephalus*, a comprehensive analysis using sequences of the mitochondrial gene cytochrome *b*, landmark-based morphometry and meristic data have been performed (González Castro et al. 2008). The demonstrated discontinuity in geographic distribution and the mitochondrial DNA, morphometric and meristic analysis allow these authors to consider *Mugil cephalus* and *Mugil platanus* as valid allopatric nominal species.

The striped mullet *Mugil platanus* is the only mugilid of permanent presence in Argentina, with a wide distribution along the coast, coastal lagoons and some fresh water beds (Cousseau et al. 2005; González Castro 2007). However, the white mullet *Mugil curema* Valenciennes, 1836 has been occasionally captured (González Castro et al. 2006).

Mugil platanus is commercially exploited not only in the south of Brazil (Vieira & Scalabrin 1991), but also in Samborombón Bay, Argentina (González Castro 2007). It is a gonochoristic and ovuliparous species, which shows high fecundity and migratory

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Zoological Studies

Assessment of Lineal Versus Landmark-Based Morphometry for Discriminating Species of Mugilidae (Actinopterygii)

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Mariano González-Castro, Ana Laura Ibáñez, Sandra Heras, María Inés Roldán, and María Berta Cousseau (2012) Assessment of lineal versus landmark-based morphometry for discriminating species of Mugilidae (Actinopterygii). *Zoological Studies* **51**(8): 1515-1528. Meristic and different morphometric approaches were employed to assess the discrimination of 7 species of Mugilidae fishes (*Mugil cephalus*, *M. liza*, *M. curema*, *M. hospes*, *Liza aurata*, *L. ramada*, and *Chelon labrosus*), but also to contribute to a better understanding of body-shape differences among this valuable species group. Three types of variables and their corresponding morphometric approaches were employed: 1) linear morphometrics measurements (LMMs); 2) interlandmark distances (IIDs); and 3) coordinate data (landmarks). Before the analyses, data exhibiting allometric growth were normalized. Data analysis included a one-way ANOVA (meristic data), a principal component analysis (PCA), and a cross-validated discriminant analysis (DA). The ANOVA showed significant differences in both lateral and transverse series scales. The PCA based on LMMs allowed the characterization of 6 groups, although some overlap between them was detected. The DA correctly classified 68.4% of the fishes according to their LMMs. The centroids of the 8 groups were separated for both the 1st and 2nd discriminant functions. The morphometric analysis based on IIDs yielded the best discrimination rates of the 3 approaches employed (96% for the DA). In the geometric morphometric analysis, the DA correctly classified 83.8% of the fishes according to their body shape. Although 8 groups were defined, some overlap among samples was detected. *Mugil hospes* was the best defined and most isolated species as observed in both the PCA and DA. Interestingly, the 3 morphometrics approaches employed separated *M. curema* specimens in 2 groups (Argentinean and Mexican samples). Moreover, European and Mexican samples of *M. cephalus* plotted separately in the PCA of the LMM- and IID-based approaches. These shape differences among *M. curema* of Argentina/Mexico and *M. cephalus* of Europe/Mexico reinforce the current hypothesis of a species complex, or even undescribed species as previously suggested by the authors.
http://zoolstud.sinica.edu.tw/Journals/51.8/1515.pdf

Key words: Mugilidae, Landmarks, Meristic characters, Morphometry, Multivariate analysis.

Members of the Mugilidae, called mullet, are ray-finned fishes that usually inhabit coastal marine and brackish waters in tropical and temperate seas (Thomson 1997, Nelson 2006). This family

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Mariano González Castro, Profesor Titular de Ictiología (2009-2010) en la Estación Hidrobiológica, Facultad de Hidrobiología de la Universidad Autónoma Metropolitana, México DF, 2009

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