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Semblanzas Ictiológicas
Alberto Sergio Fenocchio

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y
Justina Ponte Gómez

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Semblanzas Ictiológicas

Alberto Sergio Fenocchio

Arroyo Chimiray, Azara, provincia de Misiones, 2014

Hugo L. López y Justina Ponte Gómez

ProBiota
División Zoología Vertebrados
Museo de La Plata
FCNyM, UNLP

Octubre de 2014

Imagen de Tapa
Alberto Fenocchio en la casa histórica de Tucumán, 2010

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

Nombre y apellido completos: Alberto Sergio Fenocchio

Lugar de nacimiento: Posadas, Misiones

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Lugar de trabajo: Universidad Nacional de Misiones. Facultad de Ciencias Exactas, Químicas y Naturales. Licenciatura en Genética

Especialidad o línea de trabajo: Genética y Citogenética de Peces, Citotaxonomía, Monitoreo Ambiental

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Cuestionario

- **Un libro:** *Martín Fierro* … entre tantos otros …
- **Una película:** muchas …. *El graduado, Extraños en la Noche, La Sociedad de los Poetas Muertos, Apocalipto* …
- **Un CD:** *Cosechero* de Ramón Ayala (en él, el tema *Retrato de un Pescador*)
- **Un artista:** Miguel Angel
- **Un deporte:** la pesca
- **Un color:** verde (s)
- **Una comida:** que tal un "chupin" … de bagre o de armado?
- **Un animal:** varios … los peces, principalmente los "bagres"
- **Una palabra:** amigo/a
- **Un número:** 4
- **Una imagen:** amanecer / atardecer cerca del agua
- **Un lugar:** el río (los ríos)
- **Una estación del año:** todas
- **Un nombre:** para la ictiología argentina, Raúl Adolfo Ringuelet
- **Un hombre:** mi padre, Sergio
- **Una mujer:** mi madre, Zulema Meza
- **Un personaje de ficción:** tantos … los de Robin Wood …
- **Un superhéroe:** Maradona, el Dr. Esteban Laureano Maradona, no "el Diego"
- **Una Ictióloga/o del pasado:** Eingenmann ... & Eigenmann
- **Una ictióloga/o del presente:** Heraldo Britski

Con sus hijos, Fabricio y Pierina, San Carlos de Bariloche, Río Negro, 2009

Hijos y sobrinos; de izquierda a derecha: Santiago, Pierina, María José, Juan Francisco, Fabricio, María Clara, Priscilla y Juan Pedro; Casa Rosada, Plaza de Mayo, Buenos Aires, 2008

Vacaciones en familia; de izquierda a derecha, en pie: Alberto, Ana Claudia (esposa), Oscar (hermano), Fabricio (hijo) Juan Francisco (sobrino); sentados: María José (sobrina), Pierina (hija), Ceciia (cuñada), Santiago y María Clara (sobrinos); Florianópolis, Brasil, 2012

Genetica **81**: 193–198, 1990.

Supernumerary chromosomes in a *Rhamdia hilarii* population (Pisces, Pimelodidae)

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Received 11.1.1989 Accepted in revised form 28.9.1989

Abstract

A study was conducted on the chromosomes of a *Rhamdia hilarii* (Pisces, Pimelodidae) population. The results suggest that the basic chromosome number is 2n=58, with numerical variation up to a limit of 2n=63, due to the presence of supernumerary chromosomes which seem to be mitotically stable. These chromosomes are metacentrics and can be different in size. The C-banding pattern, showing heterochromatin especially in both telomeric regions, permits their identification in the karyotype. The NORs are located on secondary terminal constrictions on the short arm of a pair of subtelocentric chromosomes. However, there may be heteromorphism in the size of the secondary constrictions and, consequently, in the size of the NORs.

Karyotype similarities among Pimelodidae (Pisces, Siluriformes) from the Brazilian Amazon region

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Abstract

Three neotropical species of freshwater fish (*Pseudoplatystoma fasciatum*, *P. tigrinum* and *Sorubim lima*) of the Amazon region (Brazil) were cytogenetically analysed by means of conventional, silver staining and C-banding techniques. All showed 2n = 56, with a predominance of biarmed chromosomes. The NORs were located in the terminal position on the short arms, and only two chromosomes bearing NORs were detected. Heterochromatin was found to be equilocally distributed in some chromosomes of the three species, which may share homologous chromosomes. The present data indicate a somewhat conservative karyotypic evolution in this fish group.

Cytologia **62**: 171–176, 1997

Karyotypes of Five Tetragonopterinae Species (Pisces, Characidae) from Argentina

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Accepted March 5, 1997

The Characidae family is one of the most specious within the Order Characiformes and includes fishes with different morphological and ethological patterns and food-habits (Britski *et al.* 1986). The subfamily Tetragonopterinae comprises many forms of small fishes commonly called "mojarras", which are usually breed as ornamental fishes. It is believed that this subfamily represent an artificial group because of the morphological diversity of its species and also of the very different karyotypic situations detected (Portela *et al.* 1988).

Cytogenetic studies made in the Tetragonopterinae have shown a wide range of 2n values from 2n=36 (*Astyanax schubarti*: Morelli *et al.* 1983) to 2n=52 (*Tetragonopterus chalceus*, *Piabina argentea*, *Bryconamericus stramineus*: Portela *et al.* 1988). This variability is related to a large diversity of karyotypic formulae, place and size of nucleolus organizer regions (NORs), and also to the location and amount of constitutive heterochromatin (Morelli *et al.* 1983, Portela *et al.* 1988, Moreira Filho and Bertollo 1991). However, the fishes of this group share the presence of a larger 1st chromosome pair. This fact is an important cytotaxonomic character observed for the first time by Scheel (1972) and widespread in the Characidae (Morelli *et al.* 1983).

In the present study, five species of the Tetragonopterinae from Argentina were cytogenetically analyzed.

Brazilian Journal of Genetics, 20, 3, 425-427 (1997)
(Revista Brasileira de Genética)

SHORT COMMUNICATION

First description of microchromosome in the Anostomidae fish *Schizodon nasutus* from Argentina

M.C. Pastori, A.S. Fenocchio and P.A. López

ABSTRACT

Thirty-six specimens of *Schizodon nasutus* (Anostomidae-Characiformes) from the middle Paraná River (Posadas, Argentina) were analyzed cytogenetically. The karyotype of this species was similar to those described for this species in the literature. C-banding technique showed a rich heterochromatic pattern relative to other Anostomidae species. The NORs were located on one chromosome pair in terminal position and showed a very marked size heteromorphism. A microchromosome was observed with a frequency of about 20% in the sample studied. This additional element was punctiform, negative C-band, and constant in all metaphase plates of the seven carriers. The present study is the first karyotypic approach to *Schizodon nasutus* from Argentina and the first description of microchromosome in Anostomidae.

Ital. J. Zool., 65. *Suppl.*: 57-60 (1998)

Cytogenetic study of two species of needlefish (Belonidae) from Argentina

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ABSTRACT

The chromosomes of the two species of needlefish, *Potamorraphis* cf. *eigenmanni* and *Strongylura microps*, from fresh waters of Argentina were analyzed using C-banding and silver staining and their karyotypes were described for the first time. The former species possessed 2n = 54 and karyotype composed of

INTRODUCTION

As recently recognized (Nelson, 1994), the order Beloniformes is composed of two suborders with four families in each. The small family Belonidae of the suborder Belonoidei include ten genera with about 32 species, one half of them are species assigned to the genera *Tylosurus* and *Strongylura*. The whole group is predominantly marine but at least 11 species are restricted to fresh waters. Their vernacular name 'needlefish' reflects their sharply elongated jaws. In Argentina, there are at least two freshwater species of needlefish occurring in Paraná River basin, *Strongylura microps* and *Potamorraphis* cf. *eigenmanni*, the later of still unresolved taxonomic status (Ringuelet *et al.*, 1967; Castello *et al.*, 1978).

The chromosomes as well as other cytological markers of needlefish species are rather unknown. The haploid chromosome number 24 was reported for *Potamorraphis guianensis* (Hinegardner & Rosen, 1972). The identical karyotype 2n = 48 with exclusively uniarmed chromosomes were reported for *Tylosurus leirus* and *T. strongylurus* (Rishi, 1973) while more complex karyotypes were found in *Strongylura strongylura* (Rishi & Singh, 1982) and *Xenontodon cancila* (Srivastava & Kaura, 1964; Sharma & Tripathy, 1981). Preliminarily, Pastori *et al.* (1995) reported diploid chromosome numbers for *Strongylura microps* and *Potamorrhaphis* cf. *eigenmanni*. The nuclear DNA contents were determined only for *Potamorrhaphis guianensis*, *Strongylura microps* and *S. marinus* (Hinegardner & Rosen, 1972).

Present study deals with the description of karyotypes and analysis of chromosome banding patterns of the two freshwater species of needlefish, *Strongylura microps* and *Potamorrhaphis* cf. *eigenmanni* from Paraná River basin, Argentina. The cytotaxonomic diversity of the family is also discussed.

CARYOLOGIA Vol. 53, no. 1: 39-43, 2000

Chromosome characterization of *Trichomycterus spegazzini* (Siluriformes, Trichomycteridae) from three hydrographic basins of the Northwest of Argentina

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Abstract — Cytogenetic studies involving conventional air drying techniques, Giemsa staining, constitutive heterochromatin analysis and silver staining were carried out on *T. spegazzini* from three hydrographic basins of the northwest of Argentina. In spite of colour and subtle morphological differencies the three populations showed the same karyologycal formulae, 54 biarmed chromosomes, 42 M and 12 SM pairs, NF = 108, with a very conspicuous first metacentric pair. The NORs were located at the terminal region on the short arm on a single submetacentric medium sized pair. The C banding analysis showed the presence of small blocks in pericentromeric position in an single metacentric large chromosome pair (3° o 4°). The species showed a conservative karyotype, with plesiomorphic condition for chromosome number and NOR bands.

Key words: Cytogenetics; Neotropical Fishes; Trichomycteridae; *Trichomycterus*.

CARYOLOGIA Vol. 56, no. 2: 197-204, 2003

A Cytogenetic Survey of the Fish Fauna from Argentina

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Abstract - Were citogenetically analyzed 83 fish species from the Paraná-Plata river basin. Diploid numbers range from 36 to 102 chromosomes and three modal numbers were determined $2n$=54, $2n$=48 and $2n$=56 for Characiformes, Perciformes and Siluriformes, respectively. Supernumerary chromosomes were observed also, as well as polymorphic B chromosomes, microchromosomes and systems of sex chromosomes (ZZ/ZW). The present data will be useful for cytotaxonomic and evolutionary studies.

Key words: Neotropical Region, Argentina, Fish Cytogenetics, Chromosome Numbers.

Cytologia **68**(4): 363–368, 2003

Cytogenetic Studies and Correlate Considerations on Rhamdiinae Relationships (Pisces, Siluroidei, Pimelodidae)

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[1] Universidad Nacional de Misiones, Depto. de Genética, Argentina
[2] Universidade Federal de São Carlos, Depto. de Genética e Evolução, Brasil
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Received June 11, 2003; accepted September 9, 2003

Summary In Pimelodidae fish the available chromosome numbers range from $2n$=46 to $2n$=63, the value $2n$=56 being the most frequent one. In the present paper 6 species belonging to the Rhamdiinae subfamily were analyzed: *Rhamdia hilarii*, *R. quelen*, *Cetopsorhamdia* sp., *C. iheringhi*, *Imparfinis* cf. *piperatus* and *Imparfinis* aff. *schubarti*. Chromosome preparations were obtained by direct and short term culture methods from kidney cells and analysed under standard Giemsa staining, C-banding and NOR silver staining. *Rhamdia* species present a basic karyotype composed by 58 chromosomes and the NORs are located on the short arm of a subtelocentric chromosome pair. *Cetopsorhamdia* sp., *C. iheringhi* and *Imparfinis* aff. *schubarti*, also shows $2n$=58, while *I.* cf. *piperatus* is the only analyzed species presenting $2n$=56. However, these 4 species show an interstitial NOR location. These chromosomal data agree with the occurrence of subgroups in the Rhamdiinae subfamily, proposed on the basis of their morphological traits.

Key words Fish cytogenetics, Cytotaxonomy, Rhamdiinae, Siluriformes.

Heredity (2004) 93, 228–233

www.nature.com/hdy

Chromosome evolution in the erythrinid fish, *Erythrinus erythrinus* (Teleostei: Characiformes)

LAC Bertollo[1], C Oliveira[2], WF Molina[3], VP Margarido[4], MS Fontes[1], MC Pastori[5], J das N Falcão[6] and AS Fenocchio[5]

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The genus *Erythrinus* belongs to the family Erythrinidae, a neotropical fish group. This genus contains only two described species, *Erythrinus erythrinus* being the most widely distributed in South America. Six samples of this species from five distinct Brazilian localities and one from Argentina were studied cytogenetically. Four groups were identified on the basis of their chromosomal features. Group A comprises three samples, all with $2n = 54$ chromosomes, a very similar karyotypic structure, and the absence of chromosome differentiation between males and females. One sample bears up to four supernumerary microchromosomes, which look like 'double minute chromosomes' in appearance. Groups B–D comprise the three remaining samples, all sharing an $X_1X_1X_2X_2/X_1X_2Y$ sex chromosome system. Group B shows $2n = 54/53$ chromosomes in females and males, respectively, and also shows up to three supernumerary microchromosomes. Groups C and D show $2n = 52/51$ chromosomes in females and males, respectively, but differ in the number of metacentric, subtelocentric, and acrocentric chromosomes. In these three groups (B–D), the Y is a metacentric chromosome clearly identified as the largest in the complement. The present results offer clear evidence that local samples of *E. erythrinus* retain exclusive and fixed chromosomal features, indicating that this species may represent a species complex.
Heredity (2004) **93**, 228–233, advance online publication, 30 June 2004; doi:10.1038/sj.hdy.6800511

Keywords: *Erythrinus* fish; chromosomal diversity; sex chromosomes

Neotropical Ichthyology, 3(1):107-110, 2005

Cytogenetical and morphological features reveal significant differences among Venezuelan and Brazilian samples of *Mugil curema* (Teleostei: Mugilidae)

Mauro Nirchio*, Roger Cipriano**,
Margarete Cestari**, and Alberto Fenocchio***

Karyotype of *M. curema* from the Gulf of Mexico and Brazil have been reported as possessing chromosome complement with 2n=28 and FN=48, whereas specimens from Venezuela has been reported as possessing a diploid number 2n=24 and a conserved FN (48). Although at first sight this variation suggests the presence of a chromosomal intraspecific (interpopulational) variability, the possibility that we are dealing with two different species was examined. This work revisit the karyotypes of *M. curema* from Venezuela and Brazil, including new data on C-banding, and NOR localization, and compares morphologic characteristics of samples from both localities. Thus, besides diploid number, the constitutive heterochromatin distribution and NORs location, mark other differences between *M. curema* Cytotype 1 (2n=28; FN=48) and Cytotype 2 (2n=24; NF=48). Moreover, morphologic comparison revealed differences in the scale counts and pectoral fin rays: 35 scales in the middle body line and 15 pectoral fin rays in specimens possessing the karyotype 2n=28, compared with 37-39 scales in the middle body line and 17 pectoral fin rays in specimens with the karyotype 2n=24. These differences lead us to suggest that both cytotypes are not related merely to geographic polytipic variations but could correspond to different species.

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GMR Genetics and Molecular Research
EVOLUTION AND TECHNOLOGY

First chromosome data on *Steindachneridion scripta* (Pisces, Siluriformes, Pimelodidae) from Brazilian rivers: Giemsa, CBG, G-, and RE banding

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[2]Departamento de Genética, Universidade Federal do Paraná, Curitiba, PR, Brasil
[3]Departamento de Genética, Universidad Nacional de Misiones, Posadas, Misiones, Argentina
Corresponding author: A.C. Swarça
E-mail: szwarcy@bol.com.br

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ABSTRACT. A cytogenetic study was performed on the large pimelodid species *Steindachneridion scripta* (Siluriformes, Sorubiminae) from the Paraná River basin (Brazil). Chromosome preparations were obtained avoiding sacrifice of the specimens, by means of lymphocyte culture, and several staining and chromosome banding techniques were applied. The karyotype consisted of 56 chromosomes, 24 metacentrics, 20 submetacentrics, 4 subtelocentrics, and 8 acrocentrics (fundamental number = 104). The first pair of acrocentric chromosomes (pair 25) consistently had a decondensed secondary constriction; the C-banding pattern of some chromosomes allows them to be considered cytogenetic markers (i.e., pairs 1, 3, 4, 6, 7, 9, 13, 23, and 24). G-banding and restriction enzymes provided patterns that helped improve chromosome pairing. This is the first report on a Neotropical pimelodid species of economic

Integrantes del Programa de Investigación Pesquera Regional iniciado por Blas Roa y Rafael Guillem, Represa El Saltito I, Dos de Mayo, Misiones, 1978
De izquierda a derecha Susana Dos Santos, Alberto Fenocchio, Susana Absi y Horacio Schwieters

Siembra de peces en el estanque del Programa Granjas Integradas, Reconversión de la Zona Productora de Tabaco, Aristóbulo del Valle, Misiones., 1983
De izquierda a derecha: el chofer, Pared; Samuel Prokopchuk y Alberto Fenocchio

Colecta de material biológico, Ituzaingó, Corrientes, 1983
De izquierdaa derecha: Pablo López, Alberto Fenocchio, Sebastián Sánchez y Marcos Miretti

Barco Laboratorio Harald Sioli, Instituto Nacional de Pesquisas da Amazônia, Manaus, Brasil, 1986
Dr. L. A.. C. Bertollo y A. Fenocchio

Barco Laboratorio Harald Sioli, Instituto Nacional de Pesquisas da Amazônia
Fenocchio con ejemplares de *Pseudoplatystoma tigrinus*, Región próxima a la confluencia de los ríos Negro y Solimoes, Amazonas, Brasil, 1986

Excursión de colecta de peces con amigos, río Aguapey, prov. Corrientes, 1990

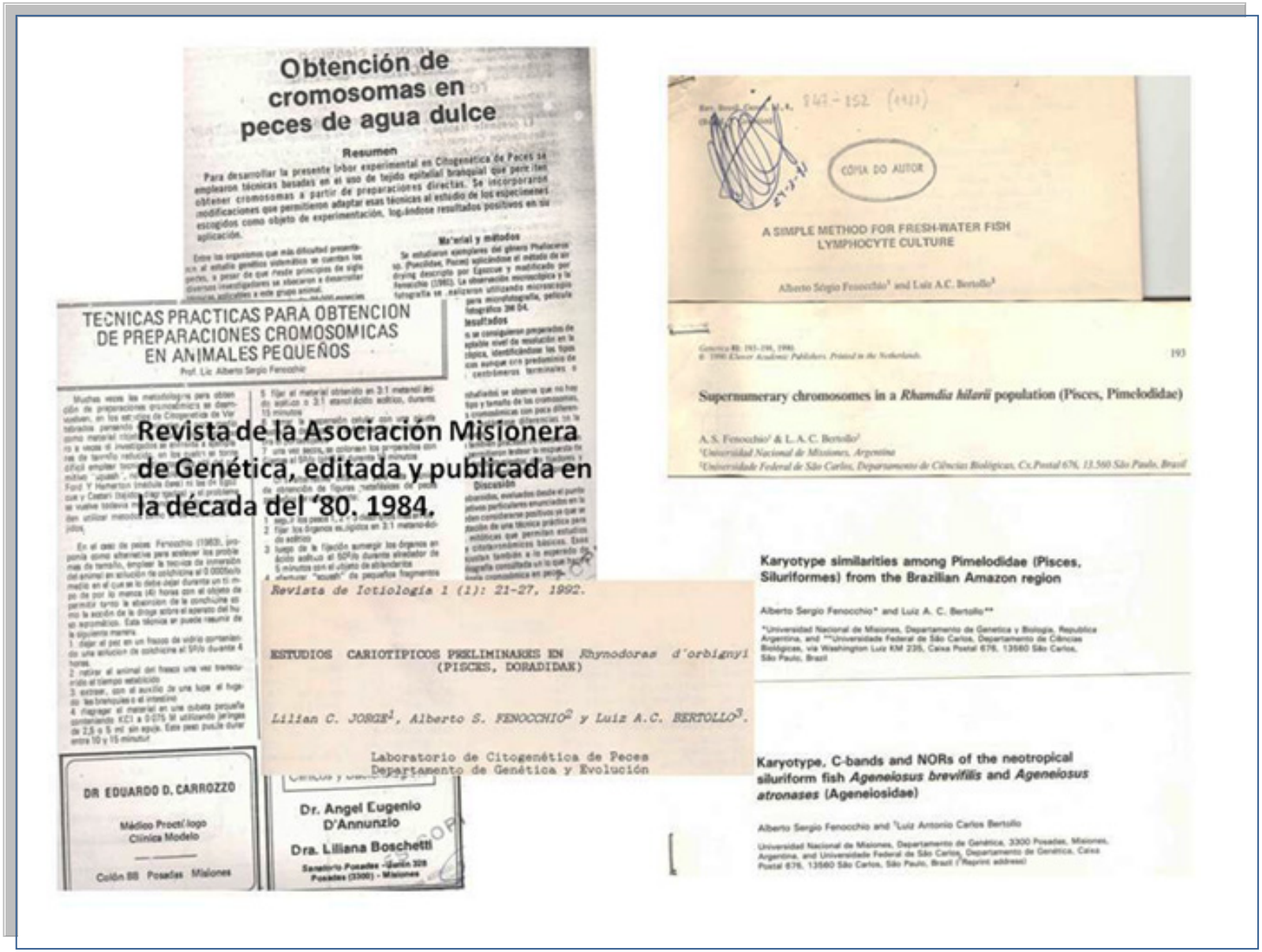
Junto a Oscar Fenocchio con un ejemplar de surubí, río Paraná, Caraguatay, Misiones, 1992

Excursión de colecta de peces con ayudante, Fabricio Fenocchio, río Aguapey, Corrientes, 1994-95

Junto a Oscar Fenocchio (derecha) con un ejemplar de *Lepidosiren paradoxa* de alrededor de 1 m, Posadas, Misiones 2011

Excursión de colecta de peces con el Dr. Mario Orsi (izquierda), río Paranapanema, en el límite de los estados de Parana y São Paulo, Brasil, 2012

Colecta de peces con Ulises Pioli (derecha) en el río Chimiray, Azara, Misiones, 2012


Obtención de cromosomas en peces de agua dulce
Resumen
TECNICAS PRACTICAS PARA OBTENCION DE PREPARACIONES CROMOSOMICAS EN ANIMALES PEQUEÑOS
Prof. Lic. Alberto Sergio Fenocchio
Revista de la Asociación Misionera de Genética, editada y publicada en la década del '80. 1984.
COPIA DO AUTOR
A SIMPLE METHOD FOR FRESH-WATER FISH LYMPHOCYTE CULTURE
Alberto Sérgio Fenocchio and Luiz A.C. Bertollo
Supernumerary chromosomes in a Rhamdia hilarii population (Pisces, Pimelodidae)
A.S. Fenocchio & L.A.C. Bertollo
Revista de Ictiología 1 (1): 21-27, 1992.
ESTUDIOS CARIOTIPICOS PRELIMINARES EN Rhynodoras d'orbignyi (PISCES, DORADIDAE)
Lilian C. JORGE, Alberto S. FENOCCHIO y Luiz A.C. BERTOLLO.
Laboratorio de Citogenética de Peces
Departamento de Genética y Evolución
Karyotype similarities among Pimelodidae (Pisces, Siluriformes) from the Brazilian Amazon region
Alberto Sergio Fenocchio* and Luiz A. C. Bertollo**
Karyotype, C-bands and NORs of the neotropical siluriform fish Ageneiosus brevifilis and Ageneiosus atronases (Ageneiosidae)
Alberto Sergio Fenocchio and Luiz Antonio Carlos Bertollo
DR EDUARDO D. CARROZZO
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Clínica Modelo
Colón 88 Posadas Misiones
Dr. Angel Eugenio D'Annunzio
Dra. Liliana Boschetti

Grupo de investigación en Citogenética, Genética y Monitoreo Ambiental, Facultad de Ciencias Exactas, Químicas y Naturales, Universidad Nacional de Misiones, 2013
De izquierda a derecha: Gabriela Furmus, Mauricio Benítez, Alberto Fenocchio, Cristina Pastori, Erica García, Ulises Pioli, Jaqueline Caffetti, Flavia Leveroni, Héctor Roncati y un ejemplar de sábalo

ProBiota

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