Publicación Electrónica
ASOCIACIÓN PALEONTOLÓGICA ARGENTINA

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Recibido: 23 de febrero 2026 - **Aceptado:** 16 de junio 2026 - **Publicado:** 20 de agosto 2026

Para citar este artículo: Candelaria Rodríguez Canalis, Agustín Carnicero, Sole Gouiric-Cavalli, & Yanina Herrera (2026). Type specimens of fossil fishes at the Museo de La Plata: a catalog. *Publicación Electrónica de la Asociación Paleontológica Argentina* 26(2): 1–29.
Link a este artículo: http://dx.doi.org/10.5710/PEAPA.16.06.2026.566

ISSN 2469-0228

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ARTÍCULO Año 2026 - 26(2): 1–29 PeAPA Publicación Electrónica ASOCIACIÓN PALEONTOLÓGICA ARGENTINA

TYPE SPECIMENS OF FOSSIL FISHES AT THE MUSEO DE LA PLATA: A CATALOG

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Abstract. We present the first annotated and illustrated catalog of fossil fish type specimens that are housed in the *División Paleontología Vertebrados* of the *Museo de La Plata*, Argentina. The catalog comprises 31 type specimens (including 21 holotypes, five syntypes, two lectotypes, two paratypes, and one neotype), systematically arranged within a phylogenetic framework. For each taxon, we provide updated information on geographical and stratigraphical provenance, systematic placement, and type status. Relevant taxonomic or historical remarks are included where appropriate. This catalog serves as a critical resource for researchers by enhancing access to primary paleontological data and supporting future taxonomic, systematic, and biogeographical studies of fossil fishes. In addition to improving the visibility and usability of this historical collection, the catalog contributes to the preservation of essential type material in line with the International Code of Zoological Nomenclature (ICZN) guidelines. It also underscores the relevance of institutional efforts in curating and digitizing fossil collections as a foundation for global collaboration and renewed investigations into the evolutionary history of Gondwanan ichthyofaunas.

Key words. Chondrichthyes. Actinopterygii. Sarcopterygii. Gondwana. South America. Argentina.

Resumen. ESPECÍMENES TIPO DE PECES FÓSILES EN EL MUSEO DE LA PLATA: UN CATÁLOGO. Presentamos el primer catálogo comentado e ilustrado de especímenes tipo de peces fósiles que se conservan en la División Paleontología Vertebrados del Museo de La Plata, Argentina. El catálogo comprende 31 especímenes tipo (incluyendo 21 holotipos, cinco sintipos, dos lectotipos, dos paratipos y un neotipo), ordenados sistemáticamente dentro de un marco filogenético. Para cada taxón, proporcionamos información actualizada sobre su procedencia geográfica y estratigráfica, su ubicación sistemática y su estatus de tipo. Se incluyen observaciones taxonómicas o históricas relevantes cuando corresponde. Este catálogo constituye un recurso fundamental para los investigadores, ya que mejora el acceso a los datos paleontológicos primarios y respalda futuros estudios taxonómicos, sistemáticos y biogeográficos de los peces fósiles. Además de mejorar la visibilidad y la facilidad de uso de esta colección histórica, el catálogo contribuye a la conservación del material tipo esencial, de conformidad con las directrices del Código Internacional de Nomenclatura Zoológica (ICZN). También subraya la relevancia de los esfuerzos institucionales en la conservación y digitalización de colecciones fósiles como base para la colaboración global y la renovación de las investigaciones sobre la historia evolutiva de la ictiofauna de Gondwana.

Palabras clave. Chondrichthyes. Actinopterygii. Sarcopterygii. Gondwana. América del Sur. Argentina.

INTRODUCTION

The *Museo de La Plata* (MLP) has a long-standing tradition of cataloging its vertebrate fossil collections, beginning with the first catalog compiled by Francisco Pascasio Moreno and Alcides Mercerat (1891), which focused on fossil birds. Subsequent catalogs, which primarily documented fossil mammals, dinosaurs and birds, were compiled by researchers and/or collection staff of the Museo de La Plata (*e.g.*, Roth, 1898; Cabrera, 1926; Bargo & Reguero, 1998; Prevosti & Reguero, 2000; Acosta-Hospitaleche et al., 2001; Otero & Reguero, 2013; Reguero et al., 2025a). Recently, Reguero et al. (2025b) presented a historical overview of the Antarctic fossil vertebrates collection.

Santiago Roth (1850–1924), as the Head of the *Sección Paleontología*, implemented the first catalog of fossil vertebrate books for the MLP collection, the *Libro Catálogo de Vertebrados Fósiles N.° 1* (Book Catalog of Fossil Vertebrates N.° 1). He organized the entries into 16 systematic groups—including mammals, fishes, and an additional entry

for casts—and listed the species names with sequential numbering within each group (see Reguero et al., 2025a for details).

The Book Catalog of Fossil Vertebrates N.° 1 includes a list of "Pisces" (sic) between folios 547–556 and 563–570, under entry number 21. In some cases, the collection number and the word *Tipo* (Type specimen) were added later beside the taxon name. The author of these annotations remains unknown, as does the reason the specimens were not published using their "original number", a practice followed in a few cases for fishes (see below) and for many other vertebrate remains in the DPV-MLP collection.

The earliest fossil fish specimens in the collection were likely collected by Florentino and Carlos Ameghino, followed by substantial contributions from Santiago Roth between 1895 and 1924. Until 1927, *Ceratodus iheringi* Ameghino, 1899 was the only fish type specimen in the collection. Throughout the 20th century, additional type specimens were described by Ángel Cabrera, Matilde Dolgopol de Sáez, and Andreina Bocchino (*e.g.*, Cabrera, 1927, 1944a, b; Dolgopol de Sáez, 1939, 1941, 1949; Bocchino, 1964, 1967a, b, 1977, 1978). In the mid-1980s, Alberto Luis Cione expanded and systematized the paleoichthyological collection. Research and curation have continued since.

This contribution presents the first comprehensive, illustrated, and annotated catalog of fossil fish type specimens housed in the *División Paleontología Vertebrados* of the *Museo de La Plata* (DPV-MLP). In accordance with Recommendation 72F of the International Code of Zoological Nomenclature (ICZN, 1999), the catalog facilitates accurate specimen identification and proper labeling. It provides updated taxonomic information as well as detailed geographical and stratigraphical provenance for all type specimens described up to 2023. This work constitutes a significant advancement in improving access to the collection and supporting ongoing and future research in paleoichthyology.

MATERIALS AND METHODS

This catalog is an annotated inventory of fossil fish type specimens. For each entry, it provides the specimen number (noting that the current acronym is MLP-PV; therefore, PV has been added to all specimens cited herein), taxonomic identification, collector, a brief description, and geographical and stratigraphical provenance. In some cases, particularly regarding older records or donations, the collector and/or collection year remain unknown due to omissions in the original record books. When this information is available, it has been incorporated into the manuscript. Along with information available in published literature, this catalog includes the original data recorded in the Books Catalog of Fossil Vertebrates, as well as in the record books. Following the recommendations of the International Code of Zoological Nomenclature (ICZN, 1999), species previously classified as *nomina vana* (see below) by Mones (1989) are here treated as *nomina dubia*.

The taxonomy of Chondrichthyes follows Cappetta (2012), while the higher taxonomy of Osteichthyes follows Nelson et al. (2016). For specimens requiring particular taxonomic considerations, we follow the most recent available research.

Except for specimens MLP-PV 39-VI-30-10, MLP-PV 39-VI-30-12, MLP-PV 40-XI-7-1, MLP-PV 40-XI-7-2, MLP-PV 40-XI-7-4, and MLP-PV 77-XII-22-9—which were photographed using a Canon Powershot G-10 attached to a Zeiss Stemi C-2000 binocular microscope—all remaining holotype specimens were photographed with a Canon EOS T2i. Additionally, ultraviolet (UV) light was used to enhance the visibility of anatomical features and improve the photographic documentation of poorly preserved specimens. All photographs were subsequently processed using Adobe Inc (1990-2026) Adobe Photoshop (V 21.0.2 and 27.8.0). A dagger (†) denotes fossil taxa.

Institutional acronyms. AMNH, American Museum of Natural History, New York, USA; **AMNH YPF,** American Museum of Natural History, New York, USA (historical YPF collection); **DPV-MLP,** División Paleontología Vertebrados del Museo de La Plata, La Plata, Buenos Aires, Argentina; **MACN-Pv,** Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Colección Nacional de Paleontología de Vertebrados, Ciudad Autónoma de Buenos Aires, Argentina; **MLP-PV,** Museo de La Plata, Paleontología Vertebrados, La Plata, Buenos Aires, Argentina; **YPF,** Yacimientos Petrolíferos Fiscales, Ciudad Autónoma de Buenos Aires, Argentina.

SYSTEMATIC PALEONTOLOGY

CHONDRICHTHYES Huxley, 1880
HOLOCEPHALI Bonaparte, 1841
HOLOCEPHALIMORPHA Goto, 2001
CHIMAERIFORMES Obruchev, 1953

Remarks. Chimaeriformes (chimaeras, rabbitfish, or ratfish) are characterized by a bradyodont dentition consisting of six dental plates (vomerine, palatine, and mandibular) that are not replaced throughout life (Stahl & Chatterjee, 1999). Each plate is composed of hypermineralized tissues and fused to the palatoquadrate or Meckelian cartilage (Stahl & Chatterjee, 1999).

Chimaeras have a holostylic jaw suspension, where the upper jaw is fused to the cranium and the lower jaw pivots upward as the mouth closes. Their elongated, slender bodies feature a single dorsal fin, modified pectoral fins resembling "wings", and fused teeth forming crushing plates (Compagno, 1990; Didier & Stahl, 1996). A single gill slit, covered by a skin flap protects the gills (Compagno, 1990). These fishes are typically small to medium-sized and inhabit deep waters in temperate and tropical oceans worldwide. However, this morphological and ecological constraint was not constant throughout their evolutionary history, with several chimaeroid lineages achieving considerably larger body sizes (Didier & Stahl, 1996; Gouiric-Cavalli et al., 2015). Currently, 39 living holocephalan species are known (Inoue et al., 2010), primarily found in deep waters of the Pacific, Atlantic, and Indian oceans, though some species occur in shallower coastal waters (Carrier et al., 2004).

CALLORHINCHIDAE Garman, 1901

Genus †***Edaphodon*** Buckland, 1838

Type species. (Original designation; Agassiz, 1843): †*Edaphodon bucklandi* Agassiz, 1843. Lower–Middle Miocene, England.

†***Edaphodon snowhillensis*** Gouiric-Cavalli, Cabrera, Cione, O'Gorman, Coria and Reguero, 2015
Figure 1A–C, Table 1

2015 †*Edaphodon snowhillensis* Gouiric-Cavalli, Cabrera, Cione, O'Gorman, Coria and Reguero, p. 4, figs. 3–5.

Type Material. Holotype MLP-PV 13-I-26-1, complete dentition including two vomerine dental plates (Fig. 1A), two almost complete palatine plates (Fig. 1B), and one complete left and one almost complete right mandibular dental plates (Fig. 1C) (Gouiric-Cavalli et al., 2015).

Geographic and Stratigraphic Distribution. James Ross Island, Antarctica (Gouiric-Cavalli et al., 2015). Snow Hill Island Formation (Herbert Sound Member), Santa Marta Cove locality, late Campanian, Upper Cretaceous (Gouiric-Cavalli et al., 2015).

Collectors. Rodolfo Coria, Marta S. Fernández, Ari Iglesias, Juan José Moly and José P. O'Gorman, 2013.

ELASMOBRANCHII Bonaparte, 1838
EUSELACHII Hay, 1902
CARCHARHINIFORMES Compagno, 1973

Remarks. Carcharhiniforms are characterized by the presence of two dorsal fins, which are not preceded by spines. They also have five gill slits, with the last one or the last three located dorsal to the pectoral fin. Carcharhiniforms lack gill rakers, and their mouth opening is wide and extends behind the eyes (Nelson et al., 2016). The earliest known record of carcharhiniforms dates back to the Middle Jurassic (*e.g.*, Cappetta, 1987; Underwood & Ward, 2004, 2008). Carcharhiniforms are predominantly marine, with a few species inhabiting freshwater habitats. Today, they are found all over the world, ranging from tropical to temperate and even arctic waters (Compagno et al., 2005).

SCYLIORHINIDAE Gill, 1862

Genus †***Megascyliorhinus*** Cappetta and Ward, 1977

Type species. (Original designation; Cappetta and Ward, 1977): †*Megascyliorhinus cooperi* Cappetta and Ward, 1977. Ypresian, lower Eocene, London Clay, Burnham-on-Crouch, Essex, England.

†***Megascyliorhinus trelewensis*** Cione, 1986
Figure 1D–F, Table 1

1986 †*Megascyliorhinus trelewensis* Cione, p. 107, fig. 2I–L.

Type Material. Holotype MLP-PV 77-XII-22-9, one anterior tooth (Cione, 1986, fig. 2I–L).

TABLE 1. List of type specimens and type series housed in the *Colección de Paleontología de Vertebrados* of the *Museo de La Plata*.

Taxon	Collection number	Type status	Current taxonomic status	Locality	Stratigraphy	Chronostratigraphy	Material description
†*Edaphodon snowhillensis*	MLP-PV 13-I-26-1	Holotype	†*Edaphodon snowhillensis*	James Ross Island, Antarctica	Herbert Sound Member, Snow Hill Island Formation	Campanian, Upper Cretaceous	Complete dentition
†*Megascyliorhinus trelewensis*	MLP-PV 77-XII-22-9	Holotype	†*Megascyliorhinus trelewensis*	Chubut, Argentina	Monte León Formation	Lower Miocene, Neogene	One anterior tooth
†*Myriolepis elongatus*	MLP-PV 44-VII-16-3	Holotype	†*Challaia elongata*	Quebrada del Río Agua de la Peña, San Juan, Argentina	Los Rastros Formation	Ladinian, Middle Triassic	An almost complete fish preserved in left lateral view
†*Macromesodon agrioensis*	MLP-PV 75-V-18-1	Holotype	†*Tranawuen agrioensis*	Bajada del Agrio, Neuquén, Argentina	Agrio Formation	Valanginian–Hauterivian, Lower Cretaceous	Incomplete vomerine dentition
†*Notodectes argentinus*	MLP-PV 48-I-1-1	Holotype	†*Notodectes argentinus*	Near to the La Valenciana Mine, Mendoza, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Incomplete partially articulated skull, and fragments of the branchial apparatus. Some bones are three-dimensionally preserved
†*Pholidophorus argentinus*	MLP-PV 39-VI-30-4	Holotype	†Aspidorhynchidae indeterminate	Picún Leufú area, Neuquén, Argentina	Picún Leufú Formation	Tithonian, Upper Jurassic	Incomplete specimens comprising the caudal fin and fragment of the caudal peduncle
†*Megapiranha paranensis*	MLP-PV 96-XI-5-1	Holotype	†*Megapiranha paranensis*	Paraná riverside, Entre Ríos, Argentina	Ituzaingó Formation	Upper Miocene, Neogene	Right pre-maxilla with teeth
†*Bachmannia chubutensis*	MLP-PV 40-V-17-1	Holotype	†*Bachmannia chubutensis*	Laguna del Hunco, Chubut, Argentina	Laguna del Hunco Formation	Ypresian, lower Eocene, Paleogene	Complete specimens preserved as an impression
†*Arius argentinus*	MLP-PV 40-V-17-3	Holotype	Junior synonym of †*Bachmannia chubutensis*	Laguna del Hunco, Chubut, Argentina	Laguna del Hunco Formation	Ypresian, lower Eocene, Paleogene	Partially articulated cranial and postcranial skeleton, including skull roof bones, jaws, palatal bones with tooth plates, opercular bones, pectoral girdle, and pectoral spines and fin rays
†*Phractocephalus ivy*	MLP-PV 86-V-1-6	Paratype	†*Steindachneridion ivy*	Toma Vieja, Paraná, Entre Ríos, Argentina	Ituzaingó Formation	Tortonian, Upper Miocene, Neogene	Fragment of sphenotic
†*Haplospondylus clupeoides*	MLP-PV 25-XI-24-1	Holotype	†*Haplospondylus clupeoides*	San Martín Lake area, Santa Cruz, Argentina	Río Mayer Formation	Valanginian–Albian, Lower Cretaceous	Almost complete specimens lacking the caudal fin
†*Guayquichthys feruglioi*	MLP-PV 48-IX-16-5	Holotype	†*Percichthys hondoensis*	Cañadón Hondo, Chubut, Argentina	Gran Barranca Member, Sarmiento Formation	Lutetian–Bartonian, middle Eocene, Paleogene	Incomplete specimen that lacks the head
†*Guayquichthys feruglioi*	MLP-PV 48-IX-16-4	Paratype	†*Percichthys hondoensis*	Cañadón Hondo, Chubut, Argentina	Gran Barranca Member, Sarmiento Formation	Lutetian–Bartonian, middle Eocene, Paleogene	Incomplete specimens preserving the head, dorsal and anal fins and pelvic girdle
†*Palaeocichla longirostrum*	MLP-PV 92-V-3-4	Neotype	†*Palaeocichla longirostrum*	Quebrada del Cachiyuyal, Catamarca, Argentina	Metán Subgroup, Anta Formation	Langhian–Serravallian, Middle Miocene, Neogene	Incomplete specimen preserving the head, vertebrae and pectoral fin
†*Luisiella inexcutata*	MLP-PV 35-III-1-4	Holotype	†*Luisiella feruglioi*	Cerro Cóndor area, Chubut, Argentina	Cañadón Calcáreo Formation	Oxfordian–Tithonian, Upper Jurassic	Complete specimen

TABLE 1. Continuation.

Taxon	Collection number	Type status	Current taxonomic status	Locality	Stratigraphy	Chronostratigraphy	Material description
†*Bunoderma baini*	MLP-PV 39-VI-30-10	Lectotype	†*Bunoderma baini*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Upper Jurassic	Scales
†*Bunoderma baini*	MLP-PV 39-VI-30-11	Syntype	†*Bunoderma baini*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Upper Jurassic	Scales
†*Bunoderma baini*	MLP-PV 39-VI-30-12	Syntype	†*Bunoderma baini*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Upper Jurassic	Scales
†*Ceratodus iheringi*	MLP-PV 21-967	Holotype	†*Atlantoceratodus iheringi*	Tres Lagos, Santa Cruz, Argentina	Mata Amarilla Formation	Upper Cretaceous	Left pterygopalatine tooth plate
†*Gyrolepidoides cuyanus*	MLP-PV 44-VII-16-2	Holotype	†*Gyrolepidoides cuyanus nomen dubium*	Between Cacheuta and Potrerillos, Mendoza, Argentina	Cerro de Las Cabras Formation	Middle Triassic	Tooth, fragments of fin rays, imprint of a ?preopercular, ?branchiostegal rays and scales
†*Leptolepis argentinus*	MLP-PV 40-XI-7-5	Holotype	†*Leptolepis argentinus nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Poorly preserved fish impression, from the front of the face to the tip of the caudal fin, with only the distal part of the lower lobe missing
†*Leptolepis patagonicus*	MLP-PV 40-XI-7-1	Lectotype	†*Leptolepis patagonicus nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Preopercular, opercular; associated scales later referred to †*Bunoderma baini*
†*Leptolepis patagonicus*	MLP-PV 40-XI-7-2	Syntype	†*Leptolepis patagonicus nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Two preopercles
†*Leptolepis patagonicus*	MLP-PV 40-XI-7-3	Syntype	†*Leptolepis patagonicus nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Caudal endoskeleton
†*Leptolepis patagonicus*	MLP-PV 40-XI-7-4	Syntype	†*Leptolepis patagonicus nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Preopercular and opercular
†*Leptolepis australis*	MLP-PV 39-VI-30-3	Holotype	†*Leptolepis australis nomen dubium*	Plaza Huincul, Neuquén, Argentina	Vaca Muerta Formation	Tithonian, Upper Jurassic	Poorly preserved fish impression
†*Leptolepis leanzai*	MLP-PV 48-I-1-2	Holotype	†*Leptolepis leanzai nomen dubium*	Near Cerro Cóndor, Chubut, Argentina	Cañadón Calcáreo Formation	Oxfordian–Tithonian, Upper Jurassic	Complete specimen with arched vertebral column
†*Tharrias shamani*	MLP-PV 48-VIII-1-3	Holotype	†*Tharrias shamani nomen dubium*	Near Cerro Cóndor, Chubut, Argentina	Cañadón Calcáreo Formation	Oxfordian–Tithonian, Upper Jurassic	Incomplete specimens lacking anteriormost part of the head and ventral lob of the caudal fin
†*Neolycoptera gracilis*	MLP-PV 39-VI-30-1	Holotype (part)	†*Neolycoptera gracilis nomen dubium*	Cordillera oriental, Jujuy, Argentina	Yacoraite Formation	Maastrichtian, Upper Cretaceous	Material lost
†*Neolycoptera gracilis*	MLP-PV 39-VI-30-2	Holotype (counterpart)	†*Neolycoptera gracilis nomen dubium*	Cordillera oriental, Jujuy, Argentina	Yacoraite Formation	Maastrichtian, Upper Cretaceous	Material lost
†*Propygidium primaevus*	MLP-PV 21-871	Holotype	†*Propygidium primaevus nomen dubium*	Las Bayas, Río Negro, Argentina	Ñirihuau Formation	Upper Miocene	Incomplete and poorly preserved specimen

Original Geographic and Stratigraphic Distribution. "Southern cliffs at the lower course of the Chubut river, between Gaiman and Trelew, Chubut province, Argentina" (Cione, 1986, p. 107). "Late Oligocene–early Miocene, Monte León Formation (= Gaiman Formation = "Patagoniano" *partim*)" (Cione, 1986, p. 107).

Reviewed Stratigraphic Distribution. According to palynological, micropaleontological, and isotopic dating evidence, the Monte León Formation is assigned to a Lower Miocene (Aquitanian–Burdigalian) age (Parras & Cuitiño, 2021 and references therein).

Collectors. Alberto L. Cione and Eduardo P. Tonni, 1977.

Remarks. The genus †*Megascyliorhinus* was originally erected for teeth found near London (Cappetta & Ward, 1977). It also includes the species †*Megascyliorhinus miocenicus* (Antunes and Jonet, 1970) from the Miocene of Portugal and †*Megascyliorhinus trelewensis* from Chubut and Entre Ríos provinces of Argentina (Cione et al., 2008).

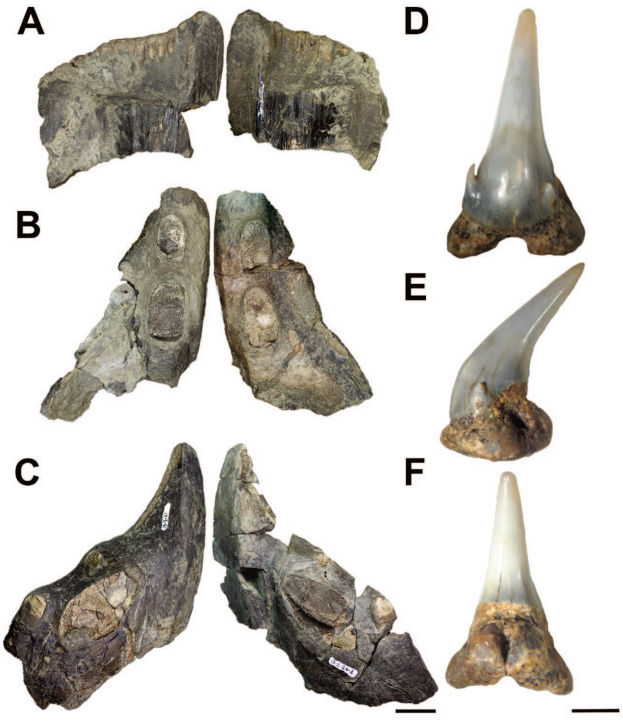

Figure 1. Chondrichthyes holotype specimens at the *Colección de Paleontología de Vertebrados del Museo de La Plata*. A–C, Holotype of †*Edaphodon snowhillensis*, MLP-PV 13-I-26-1; A, pair of vomerine dental plates in basal view; B, pair of nearly complete palatine plates in occlusal view; C, complete left and nearly complete right mandibular dental plate in occlusal view. D–F, Holotype of †*Megascyliorhinus trelewensis*, MLP-PV 77-XII-22-9 anterior tooth; D, buccal view; E, lateral view; F, lingual view. Scale = 2 cm.

OSTEICHTHYES Huxley, 1880

ACTINOPTERYGII Cope, 1887

†"PALAEONISCIFORMES" Hay, 1902

Remarks. †"Palaeonisciformes" is considered paraphyletic by several authors, but see Lund et al. (1995) and Cloutier and Arratia (2004). They exhibit a distinctive cranial morphology, with an immobile maxilla-palato-preopercular complex (*e.g.*, Kazantseva-Selezneva, 1982). This group gather fishes with an elongated fusiform body, a single dorsal fin, a heterocercal caudal fin, and rhombic scales (Moy-Thomas & Miles, 1971; Mickle, 2012; Nelson et al., 2016; Schultze et al., 2021). The fossil record of the group dates back to the upper Silurian and became extinct in the Triassic (Cloutier & Arratia, 2004; Mickle et al., 2009; Zhu et al., 2009; Schultze et al., 2021). The Carboniferous is considered the age of "palaeonisciforms" in terms of morphological diversity and taxonomic disparity. The group has a worldwide distribution.

†ACROLEPIDAE Aldinger, 1937

Genus †***Challaia*** Rusconi, 1946

Type species. (Original designation; Cabrera, 1944a, p. 574, fig. 4): †*Myriolepis elongatus* Cabrera, 1944a. Middle Triassic, Los Rastros Formation, San Juan, Argentina.

†***Challaia elongata*** (Cabrera, 1944a)

Figure 2A, Table 1

1944a †*Myriolepis elongatus* Cabrera, p. 574, fig. 4.

2006 †*Challaia elongata* (Cabrera, 1944a) López-Arbarello, Rogers and Puerta, p. 250, fig. 9.

Type Material. Holotype of †*Myriolepis elongatus* MLP-PV 44-VII-16-3 (Fig. 2A), an almost complete fish preserved in left lateral view (Cabrera, 1944a, fig. 4).

Original Geographic and Stratigraphic Distribution. "*Quebrada del Río Agua de la Peña, provincia de San Juan, en el límite con la provincia de La Rioja*" (Cabrera, 1944a, p. 574) [Quebrada del Río Agua de la Peña, San Juan Province, on the border with La Rioja Province]. "*Estratos de Los Rastros, muy probablemente Triásico Medio.*" (Cabrera, 1944a, p. 574) [Los Rastros strata, probably Middle Triassic].

Reviewed Stratigraphic Distribution. Los Rastros Formation, Triassic (Ladinian), Bermejo Basin (López-Arbarello

et al., 2006), assigned to a lacustrine-deltaic environment (Lutz et al., 2011).

Collector. Joaquín Frenguelli, 1944.

Remarks. Cabrera (1944a) assigned the specimen to the Australian genus †*Myriolepis* based on a comparison with †*Myriolepis clarkei* Egerton, 1864 from the Hawkesbury Formation of Australia. He erected the new species, †*Myriolepis elongatus* (Cabrera, 1944a), based on the differences in specimen size. Later, López-Arbarello et al. (2006) reassigned the species to the genus †*Challaia*. The taxonomic placement of the specimen has changed over time: Rusconi (1946) classified it within †Palaeoniscidae, Arratia and Cione (1996) and López-Arbarello et al. 2006 considered it an Actinopterygii *incertae sedis*, and López-Arbarello et al. (2006) placed it in †Acrolepidae. †*Challaia* is endemic to Argentina.

NEOPTERYGII Regan, 1929

†PYCNODONTIFORMES Berg, 1937

Remarks. †Pycnodontiformes is a highly distinctive clade of mainly marine actinopterygians, characterized by a circular, laterally compressed body, and predominantly molariform dentition. The group diversified throughout the Mesozoic (Cawley et al., 2021 and references therein). Although many pycnodontiforms are known only from isolated teeth or incomplete dentitions (*e.g.*, Kriwet, 2008; Stumpf et al., 2017; Shimada et al., 2021), complete and well-preserved specimens have been recovered from Mesozoic and early Cenozoic deposits in the Tethys region (*e.g.*, Poyato-Ariza, 2005; Cawley & Kriwet, 2017; Ebert, 2020).

The fossil record of †Pycnodontiformes extends from the Late Triassic until their extinction in the Eocene (Kriwet, 2005; Cawley & Kriwet, 2018). These fishes primarily inhabited coastal marine environments and pelagic waters, but they were also present in brackish, freshwater-influenced, and fully freshwater settings across Europe and the Americas (*e.g.*, Nursall, 1996; Poyato-Ariza et al., 1998; Poyato-Ariza, 2005; Martín-Abad & Poyato-Ariza, 2013). In South America, including Argentina, Chile, and Brazil, †Pycnodontiformes have been reported from multiple Jurassic and Cretaceous marine, brackish, and freshwater localities (*e.g.*, Benedetto & Sánchez, 1972; Cione & Pereira, 1985; Arratia, 1987; Kriwet, 2000; Machado & Brito, 2006; Barbosa et al., 2008; Gouiric-Cavalli et al., 2019a).

†GYRODONTIDAE Berg, 1940

Genus †***Tranawuen*** Bocchino, 1977

Type species. (Original designation; Bocchino, 1977, p. 176, fig. 1): †*Macromesodon agrioensis* Bocchino, 1977. Lower Cretaceous, Agrio Formation, Neuquén, Argentina.

†***Tranawuen agrioensis*** (Bocchino, 1977)

Figure 2B, Table 1

1977 †*Macromesodon agrioensis* Bocchino, p. 176, fig. 1.

2019a †*Tranawuen agrioensis* (Bocchino, 1977) Gouiric-Cavalli, Remírez and Kriwet, p. 53, fig. 6A.

Type Material. Holotype of †*Macromesodon agrioensis* MLP-PV 75-V-18-1 (Fig. 2B), "*Dentición vomerina casi completa*" (Bocchino, 1977, p. 176, fig. 1) [Incomplete vomerine dentition].

Geographic and Stratigraphic Distribution. "*Bajada del Agrio, a 3 km aguas arriba de la Villa del Agrio, provincia de Neuquén, Argentina*" (Bocchino, 1977, p. 176) [Bajada del Agrio, 3 km upstream of Villa del Agrio, Neuquén province, Argentina]. "*Formación Agrio, Cretácico inferior*" (Bocchino, 1977, p. 176) [Agrio Formation, Lower Cretaceous].

Reviewed Stratigraphic Distribution. Agrio Formation assigned to lower Valanginian–lower Hauterivian, Lower Cretaceous, corresponding to a marine environment (Gouiric-Cavalli et al., 2019a).

Collectors. Miguel A. Uliana and Claudia Viviers, 1974.

Remarks. Bocchino (1977) described the specimen MLP-PV 75-V-18-1 and assigned it to the genus †*Macromesodon*. Later, Gouiric-Cavalli et al. (2019a) reassigned the species to the genus †*Tranawuen*.

TELEOSTEOMORPHA Arratia, 2001

†ASPIDORHYNCHEI Nelson, Grande and Wilson, 2016

†PACHYCORMIFORMES Berg, 1937

Remarks. †Pachycormiformes is a clade of Mesozoic (Early Jurassic–Late Cretaceous) stem-teleost actinopterygians, considered typical marine fishes. They are historically characterized by the presence of a compound rostrodermeth-

moid forming the anterodorsal edge of the mouth, absence of supraorbital bones, and pectoral fins with three distinctive morphotypes (Mainwaring, 1978; Lambers, 1992; Liston et al., 2019; Cooper & Maxwell, 2022; Gouiric-Cavalli & Arratia, 2022). Nelson et al. (2016) included both †Aspidorhynchiformes and †Pachycormiformes within the Division †Aspidorhynchei.

These actinopterygians are primarily known from the Northern Hemisphere (*e.g.*, Wagner, 1860, 1862; Woodward, 1916; Lehman, 1949; Wenz, 1968; Lambers, 1992; Arratia & Schultze, 2013; Maxwell et al., 2020; Cooper et al., 2022). However, recent discoveries have expanded their distribution to Australia, Japan, Cuba, Chile, Argentina, and Antarctica (Gregory, 1923; Arratia, 1987, 2015; Yabumoto et al., 2006; Kear, 2007; Friedman et al., 2010; Liston, 2010; Gouiric-Cavalli & Cione, 2015; Gouiric-Cavalli, 2017; Gouiric-Cavalli et al., 2019b; Gouiric-Cavalli & Arratia, 2022).

†PACHYCORMIDAE Woodward, 1895

Genus †***Notodectes*** Dolgopol de Sáez, 1949

Type species. (Original designation; Dolgopol de Sáez, 1949, p. 449, fig. 3): †*Notodectes argentinus* Dolgopol de Sáez, 1949. Upper Jurassic, Vaca Muerta Formation, Mendoza, Argentina.

†***Notodectes argentinus*** Dolgopol de Sáez, 1949
Figure 2C, Table 1

1949 †*Notodectes argentinus* Dolgopol de Sáez, p. 449, fig. 3.

Type Material. Holotype MLP-PV 48-I-1-1, "an incomplete partially articulated skull, and fragments of the branchial apparatus" (Gouiric-Cavalli & Cione, 2015, p. 6, fig. 2).

Original Geographic and Stratigraphic Distribution. "*Mina La Valenciana, al Oeste de Malargüe, Mendoza*" (Dolgopol de Sáez, 1949, p. 450) [Valenciana Mine, West of Malargüe, Mendoza]. "*Margas negras del Titoniano*" (Dolgopol de Sáez, 1949, p. 450) [Tithonian black marls].

Reviewed Geographic and Stratigraphic Distribution. Casa Pincheira, near the La Valenciana Mine (middle part of the Malargüe river basin), Mendoza Province, Argentina (Gouiric-Cavalli & Cione, 2015, p. 4). "Vaca Muerta Formation, Mendoza Group, Tithonian (Late Jurassic)" (Gouiric-Cavalli & Cione, 2015, p. 4). The Vaca Muerta Formation is defined as a marine environment (Weaver, 1931).

Collector. Armando F. Leanza.

Remarks. This specimen is listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1 under the number 21-31. Dolgopol de Sáez (1949) erected the species †*Notodectes argentinus* and assigned it to †Ichthyodectiformes based on similarities in dentition. Cione and Pereira (1990) reviewed the type material and proposed that it be assigned to †Pachycormiformes. Gouiric-Cavalli and Cione (2015) re-described the specimen, confirming its assignment to †Pachycormiformes.

†ASPIDORHYNCHIFORMES Bleeker, 1859

Remarks. †Aspidorhynchiformes is an order of neopterygians characterized by a slender and laterally compressed body shape, with dorsal and anal fins posteriorly located and squamation including between one and three rows of dorsoventrally expanded flank scales. This group has traditionally been considered marine, with a global distribution except in Asia (Brito, 1997). Their fossil record ranges in age from the Middle Jurassic to the Late Cretaceous (Brito, 1997). Currently, the order is represented by a single family, †Aspidorhynchidae, which includes five nominal genera: †*Aspidorhynchus* Agassiz, 1833, †*Belonostomus* Agassiz, 1834, †*Vinctifer* Jordan, 1919, †*Richmondichthys* Bartholomai, 2004 and †*Jonoichthys* Gouiric-Cavalli, 2015.

†ASPIDORHYNCHIDAE Nicholson and Lydekker, 1889

†ASPIDORHYNCHIDAE indeterminate
Gouiric-Cavalli and Cione, 2013

Figure 2D, Table 1

1939 †*Pholidophorus argentinus* Dolgopol de Sáez, p. 430, fig. 4.
1990 †"*Pholidophorus argentinus*" *nomen vanum* Cione and Pereira, p. 386, fig. A.
2013 †Aspidorhynchidae indeterminate Gouiric-Cavalli and Cione, p. 180, fig. 3A.

Type Material. Holotype of †*Pholidophorus argentinus* MLP-

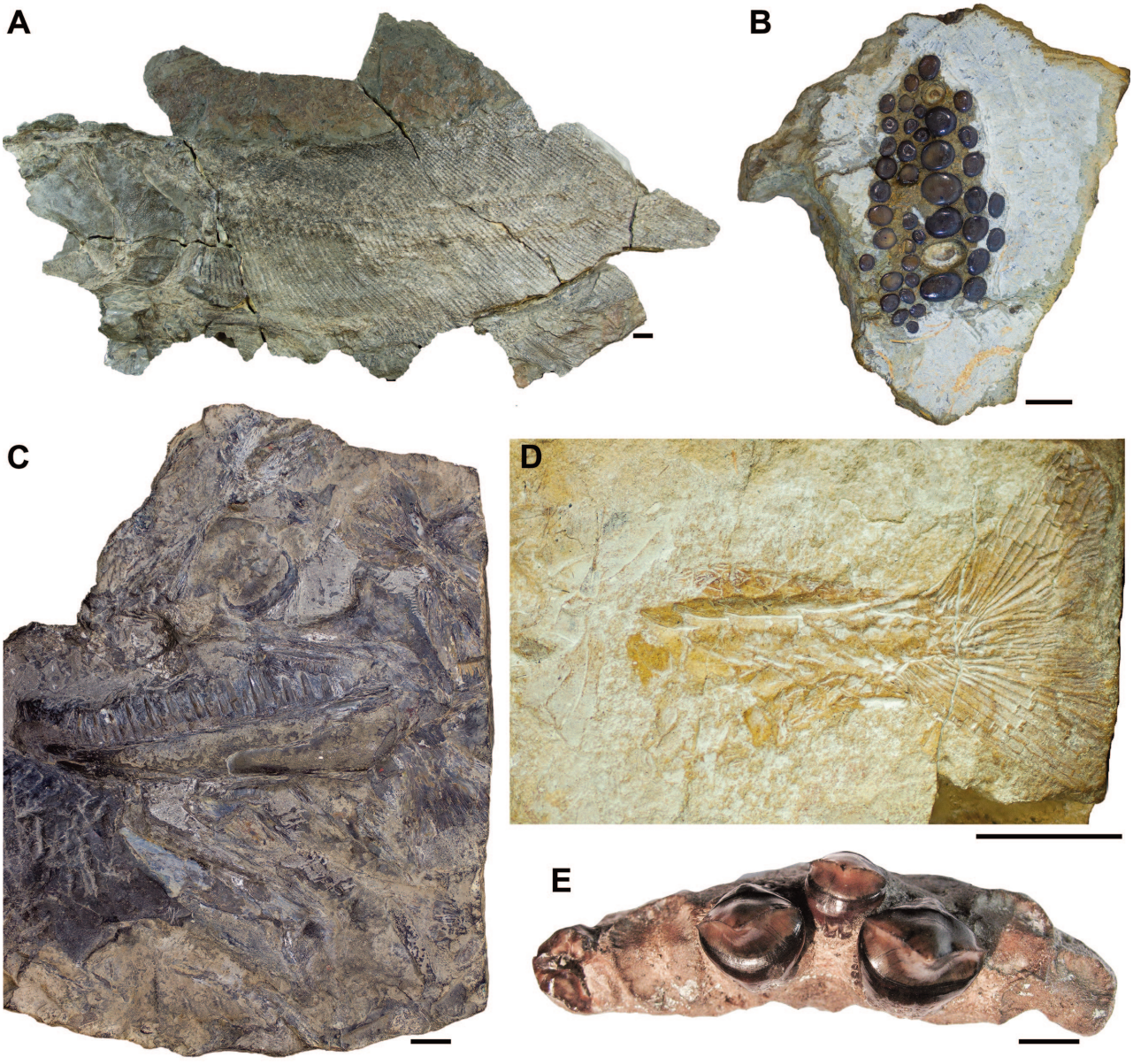

Figure 2. Actinopterygian holotypes housed at the *Colección de Paleontología de Vertebrados del Museo de La Plata*. A, Holotype of †*Myriolepis elongatus*, MLP-PV 44-VII-16-3 nearly complete specimen in left lateral view. B, Holotype of †*Macromesodon agrioensis*, MLP-PV 75-V-18-1 vomerine dentition in occlusal view. C, Holotype of †*Notodectes argentinus*, MLP-PV 48-I-1-1 incomplete and partially articulated skull with fragments of the branchial apparatus in left lateral view. D, Holotype of †*Pholidophorus argentinus*, MLP-PV 39-VI-30-4 caudal fin and partial caudal peduncle in rigth lateral view (mirroded). E, Holotype of †*Megapiranha paranensis*, MLP-PV 96-XI-5-1 fragmentary right premaxilla bearing three complete teeth, one fragmentary tooth and the insertion base of three teeth in buccal view. Scale = 1 cm.

PV 39-VI-30-4 (Fig. 2D), "a partially preserved caudal fin and part of the caudal peduncle. The caudal peduncle is covered with scales. Some deep disarticulated scales (deeper than long) are associated" (Gouiric-Cavalli & Cione, 2013, p. 180).

Original Geographic and Stratigraphic Distribution. "*Plaza Huincul, Arroyo Picún Leufú junto a la ruta que une Zapala con San Martín de los Andes, Neuquén*" (Dolgopol de Sáez, 1939, p. 428) [Plaza Huincul, Arroyo Picún Leufú next to the road linking Zapala with San Martín de los Andes, Neuquén]. "*Areniscas feldespaticas titonicas de Plaza Huincul*" (Dolgopol de Sáez, 1939, p. 428) [Tithonic feldspathic sandstones of Plaza Huincul].

Reviewed Geographic and Stratigraphic Distribution. "National Road 40 where it crosses the Picún Leufú Creek"

(Gouiric-Cavalli & Cione, 2013, p. 180). The stratigraphic provenance of the material has been the subject of several reinterpretations. Cione and Pereira (1987, p. 386) referred the specimen to the Vaca Muerta Formation (Tithonian, Upper Jurassic). Subsequently, Gouiric-Cavalli and Cione (2013, p. 181), based on lithological characteristics and the reported collection area, concluded that the material more likely originated from the lower levels of the Picún Leufú Formation, also of Tithonian age.

Collector. Italo Simonatto.

Remarks. This specimen is listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-18. Dolgopol de Sáez (1939) studied the specimen MLP-PV 39-VI-30-4, assigning it to †*Pholidophorus argentinus*. However, Cione and Pereira (1987) noted that the specimen lacks diagnostic features and designated the species as *nomen vanum* (formally *nomen dubium*). A subsequent study by Gouiric-Cavalli and Cione (2013) reexamined the holotype and concluded that it could not be assigned to the genus †*Pholidophorus*, but instead belongs to †Aspidorhynchidae.

TELEOSTEI Müller, 1846

CLUPEOCEPHALA Arratia, 2010

CHARACIFORMES Fink and Fink, 1981

Remarks. Characiformes is a diverse group of teleostean fishes that today inhabit freshwater ecosystems of South and Central America, and Africa. The order comprises approximately 90% of the Neotropical freshwater ichthyofauna (Reis et al., 2003). Characiformes include fishes with a highly-specialized dentition, such as the family Serrasalmidae (pacues and piranhas) or Characidae, which exhibit conical teeth (*e.g.,* golden dorado and pike) or multicuspidate teeth as seen in tetras. Their diet varies from omnivorous, detritivorous, carnivorous, and scale-eaters (Berkovitz & Shellis, 2016). The timing of the group's origin and its phylogenetic relationships are still in debate (Fink & Fink, 1981; Nakatani et al., 2011; Arcila et al., 2017; Chakrabarty et al., 2017; Betancur-R. et al., 2019; Melo et al., 2024). The characiform fossil record dates back to the Late Cretaceous in the Northern Hemisphere (*e.g.,* Newbrey et al., 2009; Capobianco & Friedman, 2019; Wick, 2021).

SERRASALMIDAE Günther, 1864

Genus †***Megapiranha*** Cione, Dahdul, Lundberg and Machado-Allison, 2009

Type species. (Original designation; Cione, Dahdul, Lundberg and Machado-Allison, 2009, p. 353, fig. 3): †*Megapiranha paranensis* Cione, Dahdul, Lundberg and Machado-Allison, 2009. Upper Miocene, Ituzaingó Formation, Entre Ríos, Argentina.

†***Megapiranha paranensis*** Cione, Dahdul, Lundberg and Machado-Allison, 2009

Figure 2E, Table 1

2009 †*Megapiranha paranensis* Cione, Dahdul, Lundberg and Machado-Allison, 2009, p. 353, fig. 3.

Type Material. Holotype MLP-PV 96-XI-5-1, "fragmentary right pre-maxilla with three complete teeth and one fragmentary tooth" (Cione et al., 2009, p. 353).

Geographic and Stratigraphic Distribution. Cliffs in the Paraná eastern riverside near the city of Paraná, Entre Ríos Province, Argentina (Cione et al., 2009). "Ituzaingó Formation, Huayquerian Age, Late Miocene" (Cione et al., 2009, p. 353). The Ituzaingó Formation corresponds to a fluvial environment (Aceñolaza, 1976).

Collector. Santiago Roth, "was collected by Santiago Roth at the beginning of the 20th Century..." (Cione et al., 2009, p. 352).

SILURIFORMES Hay, 1929

Remarks. Siluriformes are defined by the following characteristics: adipose fin usually present; spine-like (spinous) rays frequently present at the front of the dorsal and pectoral fins; body either naked or covered with bony plates; and a small, toothless maxilla; absence of the symplectic, subopercular, and intermuscular bones (Nelson et al., 2016).

The order has a global distribution, predominantly in freshwater environments, with only two families including marine species. Of the 33 extant families of Siluriformes, 13 are endemic to South America. In South America, the fossil record of Siluriformes dates back to the Late Cretaceous (Cione & Laffite, 1980; Cione et al., 1985; Cione, 1987). Although numerous Siluriformes have been reported from

various Cenozoic localities in Argentina, most remains are fragmentary.

†BACHMANNIIDAE Azpelicueta and Cione, 2011

Genus †***Bachmannia*** Dolgopol de Sáez, 1941

Type species. (Original designation; Dolgopol de Sáez, 1941, p. 453, fig. 1): †*Bachmannia chubutensis* Dolgopol de Sáez, 1941. Lower Eocene, Tufolitas Laguna del Hunco, Chubut, Argentina.

†***Bachmannia chubutensis*** Dolgopol de Sáez, 1941
Figure 3A, Table 1

1941 †*Bachmannia chubutensis* Dolgopol de Sáez, p. 453, fig. 1.
1996 †*Arius argentinus* Dolgopol de Sáez, 1941, Arratia and Cione, p. 30.
2011 †*Arius argentinus* Dolgopol de Sáez, 1941, Azpelicueta and Cione, p. 259.

Type Material. Holotype of †*Bachmannia chubutensis* MLP-PV 40-V-17-1 (Fig. 3A), "*impresión de un pez de mediano tamaño*" (Dolgopol de Sáez, 1941, p. 452, fig. 1) [impression of a medium-sized fish]. Holotype of †*Arius argentinus* MLP-PV 40-V-17-3 (Fig. 3B; Tab. 1), "parte es impresión y parte restos de hueso" (Dolgopol de Sáez, 1941, p. 457, fig. 3) [It is part impression and part bone fragments].

Original Geographic and Stratigraphic Distribution. "*laguna del Hunco y del Mirador de Chubut*" (Dolgopol de Sáez, 1941, p. 451) [Laguna del Hunco and Mirador de Chubut]. "*Terciario*" (Dolgopol de Sáez, 1941, p. 451) ["Tertiary"].

Reviewed Geographic and Stratigraphic Distribution. Outcrops near the Laguna del Hunco, Chubut, Argentina (Azpelicueta & Cione, 2011). "The material comes from the early Eocene (Ypresian) Tufolitas Laguna del Hunco, outcropping near the Laguna del Hunco, Chubut, Argentina…" (Azpelicueta & Cione, 2011, p. 260).

Collector. According to the Record Book of Fossil Vertebrates N.° 1, the specimen MLP-PV 40-V-17-1 was donated by Ernesto Bachmann, and MLP-PV 40-V-17-3 was donated by Joaquín Frenguelli in 1939.

Remarks. The specimens MLP-PV 40-V-17-1 and MLP-PV 40-V-17-3 are listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the numbers 21-24 and 21-2, respectively. †*Bachmannia chubutensis* was originally described based on an incomplete but well-preserved specimen (Dolgopol de Sáez, 1941, fig. 1; Azpelicueta & Cione, 2011, figs. 3–4).

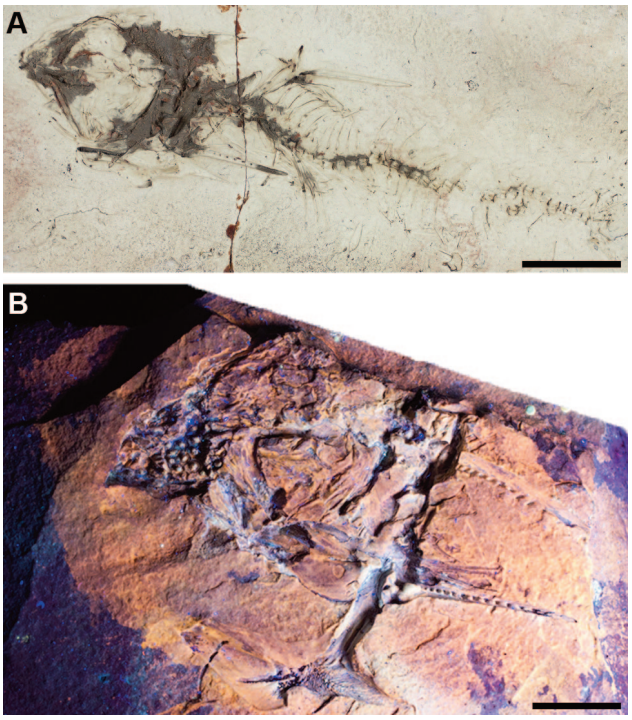

Figure 3. Actinopterygian holotypes housed at the *Colección de Paleontología de Vertebrados del Museo de La Plata.* A, Holotype of †*Bachmannia chubutensis*, MLP-PV 40-V-17-1 nearly complete specimen in right lateral view (mirrored). B, Holotype of †*Arius argentinus*, MLP-PV 40-V-17-3 UV-image of a partially articulated cranial and postcranial skeleton, including skull roof bones, jaws, palatal bones with tooth plates, opercular bones, pectoral girdle, and pectoral spines and fin rays in dorsal view (mirrored). Scale = 1 cm.

Arratia and Cione (1996) synonymized †*Bachmannia chubutensis* with the holotype and only known species of †*Arius argentinus* (Dolgopol de Sáez, 1941; MLP-PV 40-V-17-3). As a consequence, †*Arius argentinus* became a junior synonym of †*Bachmannia chubutensis*. Subsequently, Azpelicueta and Cione (2011) established the family †Bachmanniidae for the species †*B. chubutensis*.

PIMELODIDAE Lundberg and Littmann, 2003

Genus ***Steindachneridion*** Eigenmann and Eigenmann, 1919

Type species. (Original designation; Eigenmann and Eigenmann, 1888): *Steindachneria amblyurus* Eigenmann and Eigenmann, 1888. Recent, Jequitinhonha River, Brazil.

†***Steindachneridion ivy*** (Azpelicueta and Cione, 2016)
Figure 4A, Table 1

2016 †*Phractocephalus ivy* Azpelicueta and Cione, p. 222, figs. 3–4.
2019 †*Steindachneridion ivy* (Azpelicueta and Cione, 2016) Bogan and Agnolin, p. 2, figs. 2–3.

Type Material. Paratype of †*Phractocephalus ivy* MLP-PV 86-V-1-8 (Fig. 4A), "fragment of sphenotic" (Azpelicueta & Cione, 2016, p. 223).

Geographic and Stratigraphic Distribution. Toma Vieja and other nearby sites located to the northeast of the city of Paraná, Entre Ríos Province, Argentina (Azpelicueta & Cione, 2016). "*Conglomerado osífero, which is located at the base of the fluvial Ituzaingó Formation*" (Azpelicueta & Cione, 2016, p. 222); Tortonian, Upper Miocene (Brunetto et al., 2013).

Remarks. Azpelicueta and Cione (2016) originally described †*Phractocephalus ivy* based on a type series that included MACN-Pv 14224-2 as the holotype together with several specimens deposited at the MLP designated as paratypes. Bogan and Agnolín (2019) reassigned the holotype to the genus *Steindachneridion*, establishing the new combination †*Steindachneridion ivy*. At the same time, these authors concluded that most of the MLP specimens originally referred to †*P. ivy* actually belonged to the genus *Phractocephalus* and reassigned them to a new species, †*Phractocephalus yaguaron* Bogan and Agnolín, 2019, as referred material.

Azpelicueta and Cione (2016) listed specimen MLP-PV 86-V-1-6, identified as a fragmentary sphenotic, among the paratype material of †*Phractocephalus ivy*. However, in the descriptive text (p. 224) and in figure 8.4, the specimen actually illustrated is MLP-PV 86-V-1-8, although the figure caption cites it as MLP-PV 86-V-1-6. The subsequent revision by Bogan and Agnolín (2019) neither mentioned nor illustrated specimens MLP-PV 86-V-1-6 and MLP-PV 86-V-1-8. During the present revision, specimen MLP-PV 86-V-1-6 could not be located in the collection. Examination of the material currently housed at MLP indicates that MLP-PV 86-V-1-8 is the specimen illustrated by Azpelicueta and Cione (2016, fig. 8.4) and should be regarded as the paratype of †*Phractocephalus ivy*, rather than MLP-PV 86-V-1-6 as stated in their caption. Because MLP-PV 86-V-1-8 was not included among the referred material of †*Phractocephalus yaguaron*, we consider it to remain attributable to †*Phractocephalus ivy* and to represent the only paratype currently identifiable with certainty. In the present catalog, Figure 4A illustrates specimen MLP-PV 86-V-1-8, the specimen figured by Azpelicueta and Cione (2016, fig. 8.4).

CLUPEOMORPHA Greenwood et al., 1966
CLUPEOMORPHA *incertae sedis*

Genus †***Haplospondylus*** Cabrera, 1927

Type species. (Original designation; Cabrera, 1927, p. 318, fig. 1): †*Haplospondylus clupeoides* Cabrera, 1927. Lower Cretaceous, Río Mayer Formation, Santa Cruz, Argentina.

†***Haplospondylus clupeoides*** Cabrera, 1927
Figure 4B, Table 1

1990 †"*Haplospondylus*" *clupeoides* Cione and Pereira, p. 393, pl. 7.

Type Material. Holotype MLP-PV 25-XI-24-1, an incomplete fish that lacks the caudal skeleton and is preserved as an impression (Cabrera, 1927).

Original Geographic and Stratigraphic Distribution. San Martín lake, Santa Cruz Province, Argentina (Cabrera, 1927). Lower Cretaceous shale layers with †*Leptoceras* (Cabrera, 1927).

Reviewed Geographic and Stratigraphic Distribution. Vicinity of San Martín lake, Santa Cruz, Argentina (Cione, 1985). Río Mayer Formation, Lower Cretaceous (upper Valanginian–Albian), Austral Basin (*e.g.*, Riccardi, 1971; Cione, 1985; Aguirre-Urreta, 2002; Pérez-Loinaze et al., 2021).

Collectors. Guido Bonarelli and Juan José Nágera, 1918.

Remarks. †"*Haplospondylus*" *clupeoides* was originally considered the southernmost record of leptolepidids (Cabrera, 1927). Cione (1985) reexamined the specimen and assigned it to Clupeomorpha as an *incertae sedis* taxon. Specimen MLP-PV 25-XI-24-1 is poorly preserved, and its assignment to Clupeomorpha *incertae sedis* is maintained herein, pending further revision.

PERCOMORPHA Johnson and Patterson, 1993
PERCIFORMES Bleeker, 1859

Remarks. Perciformes is the largest order of percomorph fishes and includes most marine and freshwater fishes inhabiting the littoral zone and coral reefs (Bellwood & Wainwright, 2002). Their fossil record dates back to the Late Cretaceous and ranges from isolated otoliths to complete specimens (Schwarzhans et al., 2024 and references therein). Perciformes are relatively well-known from the "Tertiary", especially in the Eocene (Arratia et al., 2004 and references therein). The Maastrichtian Saldeño Formation in Mendoza, Argentina, yields †*Saldenoichthys remotus* López-Arbarello, Arratia and Tunik, 2003, a specimen originally interpreted as Perciformes *incertae sedis* (López-Arbarello et al., 2008a) but reinterpreted as an *incertae sedis* ?percomorph by Friedman et al. (2023).

PERCICHTHYIDAE Jordan and Eigenmann, 1890

Genus ***Percichthys*** Girard, 1855

Type species. (Original designation; Cuvier and Valenciennes, 1833): *Percichthys trucha* Cuvier and Valenciennes, 1833. Recent, Río Negro, Argentina.

†***Percichthys hondoensis*** Schaeffer, 1947
Figure 4C, Table 1, Appendix 1, Fig. S1A

1947 †*Percichthys hondoensis* Schaeffer, p. 5, fig. 3.
1949 †*Guayquichthys feruglioi* Dolgopol de Sáez, p. 453, figs. 5–7.
1982 †*Percichthys hondoensis* (Dolgopol de Sáez, 1949) Arratia, pp. 13–14, figs. 45, 74, 76, 86.

Type Material. Holotype of †*Guayquichthys feruglioi* MLP-PV 48-IX-16-5 (Fig. 4C), an impression of a fish, missing its head (Dolgopol de Sáez, 1949, p. 453, fig. 5). Paratype of †*Guayquichthys feruglioi* MLP-PV 48-IX-16-4 (Tab. 1; Appendix 1, Fig. S1A), impression of the anterior section of a fish (Dolgopol de Sáez, 1949, fig. 6).

Original Geographic and Stratigraphic Distribution. "*Cañadón Hondo, Chubut, el que desemboca a la derecha del Río Chico, algunos kilómetros aguas arriba de Paso Nieman, en la región del golfo de San Jorge*" (Dolgopol de Sáez, 1949, p. 454) [Cañadón Hondo, Chubut, which flows to the right of the Chico River, a few kilometers upstream from Paso Nieman, in the San Jorge Gulf region]. Note that the correct spelling is Paso Niemann. " '*Terciario inferior*', *situado debajo del Patagoniano*" (Dolgopol de Sáez, 1949, p. 454) ["Lower Tertiary", underlying those of the Patagonian].

Reviewed Geographic and Stratigraphic Distribution. "Fish-bed" upper portion of Cañadón Hondo near Monte Verde, Northwest of Comodoro Rivadavia on the San Jorge Gulf, Chubut, Argentina (Dolgopol de Sáez, 1949). Cañadón Hondo Formation (Schaeffer, 1947; Arratia, 1982; Arratia & Cione, 1996). In the Cañadón Hondo area, the so-called Cañadón Hondo Formation correspond to the Gran Barranca Member of the Sarmiento Formation (Raigemborn et al., 2010) and is dated as late Lutetian–Bartonian (middle Eocene) (Ré et al., 2010).

Collector. Alejandro Mateievich Piatnitzky and Egidio Feruglio.

Remarks. The specimens MLP-PV 48-IX-16-4 and MLP-PV 48-IX-16-5 are listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the numbers 21-29 and 21-28, respectively.

†*Percichthys hondoensis* was originally described by Schaeffer (1947) based on material housed at the AMNH (holotype AMNH 10000). Subsequently, Dolgopol de Sáez (1949) erected †*Guayquichthys feruglioi* based on a holotype and referred material consisting of incomplete but relatively well-preserved specimens recovered from the "fish-bed" levels of the Cañadón Hondo region. Because both taxa derived from the same locality and represent freshwater actinopterygians, Dolgopol de Sáez (1949) explicitly compared †*G. feruglioi* with †*P. hondoensis*. Nevertheless, despite recognizing morphological similarities between them, she proposed a separate genus for the new material. Arratia (1982) later reexamined the specimens referred to both taxa and concluded that †*Guayquichthys feruglioi* is a junior synonym of †*Percichthys hondoensis*.

CICHLIFORMES Betancur-R. et al., 2013

Remarks. Cichliformes comprises two families, Cichlidae and Pholidichthyidae, which exhibit different body plans (Nelson et al., 2016). Cichlidae is one of the most diverse families of fishes worldwide. Cichlid fishes are a key model system in the study of adaptive radiation, speciation, and evolutionary developmental biology (Friedman et al., 2013). They inhabit both freshwater and marginal marine

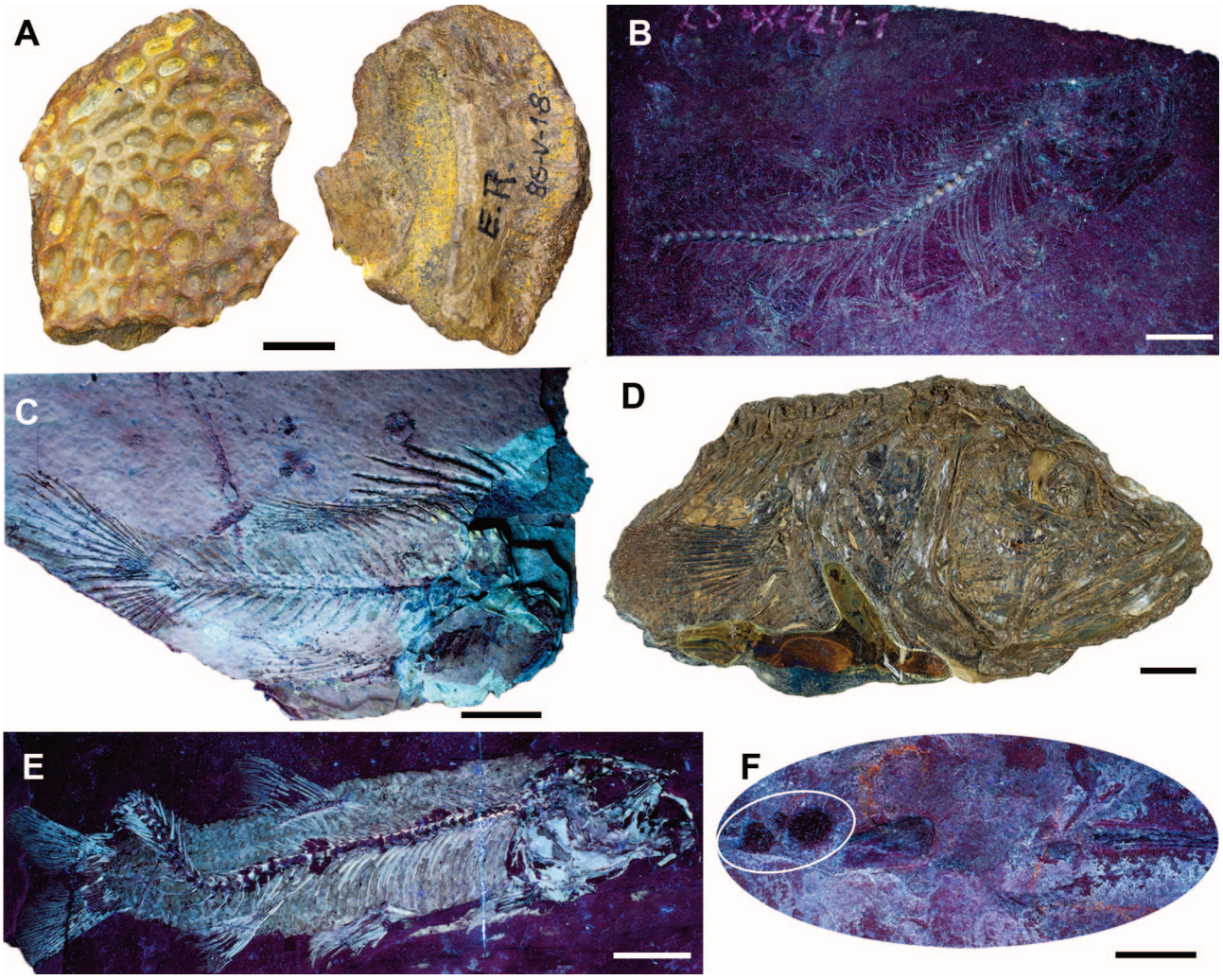

Figure 4. Actinopterygian holotypes, paratype and neotype housed at the *Colección de Paleontología de Vertebrados del Museo de La Plata*. A, Paratype of †*Phractocephalus ivy*, MLP-PV 86-V-1-8 fragment of sphenotic external (left) and internal (rigth) views. B, Holotype of †*Haplospondylus clupeoides*, MLP-PV 25-XI-24-1 UV-image of the incomplete specimen lacking the caudal skeleton in right lateral view. C, Holotype of †*Guayquichthys feruglioi*, MLP-PV 48-IX-16-5 UV-image of the specimen in left lateral view (mirrored). D, Neotype of †*Palaeocichla longirostrum*, MLP-PV 92-V-3-4 incomplete specimen with preserved head bones, anteriormost abdominal vertebrae, pectoral girdle and fin, and incomplete pelvic fin in right lateral view. E, Holotype of †*Luisiella inexcutata*, MLP-PV 35-III-1-4 UV-image of the specimen in left lateral view (mirrored). F, Lectotype of †*Bunoderma baini*, MLP-PV 39-VI-30-10 UV-image of the sample in lateral view, white circle emphasizes the scales. Scale = 1 cm.

environments. The origin of this clade is estimated to date back to the Late Cretaceous (Friedman et al., 2013), although the earliest known fossils are Eocene. The cichlids from Argentina represent the oldest known members of the family, with a fossil record dating back to the early to middle Eocene (Malabarba et al., 2006, 2010; Pérez et al., 2010).

CICHLIDAE Bonaparte, 1835

Genus †***Palaeocichla*** Casciotta and Arratia, 1993

Type species. (Original designation; Bardack, 1961, p. 16, figs. 6–7): †*Acaronia longirostrum* Bardack, 1961. "Tertiary" Subandino, La Yesera Creek, Salta, Argentina.

†***Palaeocichla longirostrum*** (Bardack, 1961)

Figure 4D, Table 1

1961 †*Acaronia longirostrum* Bardack, p. 16, figs. 6–7.
1993 †*Palaeocichla longirostrum* (Bardack, 1961) Casciotta and Arratia, p. 202, fig. 3.

Type Material. Neotype MLP-PV 92-V-3-4, an incomplete

specimen with preserved head bones, anteriormost abdominal vertebrae, pectoral girdle and fin, and incomplete pelvic fin (Casciotta & Arratia, 1993, fig. 3).

Geographic and Stratigraphic Distribution of the Holotype. "Tertiary Subandino, La Yesera Creek, Salta Province, Argentina" (Bardack, 1961, p. 16–17).

Geographic and Stratigraphic Distribution of the Neotype. Serie Loro Huasi, Quebrada del Cachiyuyal, right side of Santa María, Catamarca Province, Argentina (Casciotta & Arratia, 1993). "Tertiary" (Casciotta & Arratia, 1993, p. 202).

Reviewed Stratigraphic Distribution of the Neotype. Metán Subgroup, Anta Formation, Middle Miocene (Serravalian–Langhian) (Cione, 1978; Reynolds et al., 2000; Quattrocchio et al., 2003). The Anta Formation corresponds to a saline lagoon environment (Quattrocchio et al., 2003).

Collector of the Holotype and Paratypes. Juan J. Zunino and Enrique T. Mauri (YPF).

Remarks. †*Palaeocichla longirostrum* (Bardack, 1961) was originally described based on the holotype (AMNH YPF 19664) and two paratypes (AMNH YPF 19662 and YPF 19663), which are partially preserved specimens recovered from Quebrada La Yesera in Salta Province, Argentina. In their revision of the "Tertiary" cichlids from Argentina, Casciotta and Arratia (1993) noted that the original type material was presumably lost. Consequently, they established the new genus †*Palaeocichla*, designated a neotype for †*P. longirostrum*, and redescribed the species based on additional material from Salta and Catamarca provinces, although the collectors of these specimens were not specified.

Cione (1978) stated that the fish-bearing sediments at Quebrada de la Yesera belong to the Anta Formation. Later, Cione et al. (1995) reviewed the specimens from Quebrada La Yesera and confirmed that the material described by Casciotta and Arratia (1993) came from sediments of Anta Formation.

†LUISIELLIDAE Sferco, López-Arbarello and Báez, 2015a

Genus †***Luisiella*** Bocchino, 1967b

Type species. (Original designation; Bocchino, 1967b, p. 92, figs. 2–3): †*Luisiella inexcutata* Bocchino, 1967b. Upper Jurassic, Cañadón Asfalto Formation, Chubut, Argentina.

†***Luisiella feruglioi*** (Bordas, 1942) Sferco, López-Arbarello and Báez, 2015a

Figure 4E, Table 1

1936 †*Diplomystus longicostatus* Cope, 1887: Cabrera in Piatnitzky, 1936, p. 105 (referred).
1942 †*Tharrias feruglioi* Bordas, p. 316, pl. 1.
1967b †*Luisiella inexcutata* Bocchino, p. 92, figs. 2–3.
1978 †*Leptolepis feruglioi* (Bordas, 1942) Bocchino, p. 303, fig. 1, pl. 1.
1987 †"*Tharrias" feruglioi* (Bordas, 1942) Cione and Pereira, p. 290, pl. 3, 5, fig. C.
2015a †*Luisiella feruglioi* Sferco, López-Arbarello and Báez, p. 2, fig. 2B.

Type Material. Holotype of †*Luisiella inexcutata* MLP-PV 35-III-1-4 (Fig. 4E), a single and almost complete specimen (Bocchino, 1967b).

Original Geographic and Stratigraphic Distribution. "*Margen derecha del Río Chubut, frente a la Mina de Plomo, Sección 1, Fracción A, Lote 24 del Departamento de Gastre, provincia de Chubut, Argentina*" (Bocchino, 1967b, p. 92) [Right bank of the Chubut River, in front of the Lead Mine, Section 1, Fraction A, Lot 24, Department of Gastre, Province of Chubut, Argentina]. "*Jurásico superior, Chubut, Argentina*" (Bocchino, 1967b, p. 92) [Upper Jurassic, Chubut, Argentina].

Reviewed Geographic and Stratigraphic Distribution. "*Cercanías de Cerro Cóndor, río Chubut medio, prov. de Chubut, Argentina.*" (Cione & Pereira, 1987, p. 289). [Vicinity of Cerro Cóndor, middle Chubut River, Chubut Province, Argentina]. "Estratos de Almada" basal lacustrine section of the Cañadón Calcáreo Formation, Chubut (Late Jurassic, Oxfordian–Tithonian) (Sferco et al., 2015b).

Collector. Alejandro Mateievich Piatnitzky.

Remarks. The material was initially identified by Cabrera in Piatnitzky (1936) as †*Diplomystus longicostatus* Cope, 1887, a species originally described from the Cretaceous of Brazil. Later, Bocchino (1967b) reexamined the specimen and determined it as a new species, †*Luisiella inexcutata*, which is classified within the Clupeiformes, Dussumieriidae. Bocchino (1967b) also proposed a Jurassic age for the fossil based on fossil plants. Cione and Pereira (1987) assigned the species †*Luisiella inexcutata* to Teleostei *incertae sedis* pending taxonomic revision. These authors considered that †*Luisiella inexcutata*, †*Tharrias shamani*, and †*Leptolepis leanzai* were synonyms of †"*Tharrias*" *feruglioi*. López-

Arbarello (2004) suggested that †*L. inexcutata* might be a junior synonym of †"*Tharrias*" *feruglioi*. Sferco et al. (2015a) later reexamined the teleostean fauna from the Cañadón Calcáreo Formation and concluded that all species previously described belong to a single species, †*Luisiella feruglioi* (Bordas, 1942). They established the family †Luisiellidae to include †*L. feruglioi*, along with the Australian genera †*Cavenderichthys* Arratia, 1997, and †*Waldmanichthys* Sferco, López-Arbarello and Báez, 2015a.

Teleostei *incertae sedis*

Genus †***Bunoderma*** Dolgopol de Sáez, 1940a

Type species. (Original designation; Dolgopol de Sáez, 1940a, p. 297): †*Bunoderma baini* Dolgopol de Sáez, 1940a. Upper Jurassic, Vaca Muerta Formation, Neuquén, Argentina.

†***Bunoderma baini*** Dolgopol de Sáez, 1940a

Figure 4F, Table 1

1940a †*Bunoderma baini* Dolgopol de Sáez, p. 297.
1990 †*Bunoderma baini* (in part) Cione and Pereira, p. 389, pl. 3 and pl. 4, fig. A.

Type Material. Lectotype MLP-PV 39-VI-30-10 (Fig. 4F), impression of scales, the jugular plate, and part of the pectoral fin, preserved in bituminous muscovitic sandstone (Bocchino, 1967a). Syntypes MLP-PV 39-VI-30-11, scales; and MLP-PV 39-VI-30-12, scales (Tab. 1; Appendix 1, Fig. S1B-C).

Geographic and Stratigraphic Distribution. "*Plaza Huincul, Neuquén, perforaciones petrolíferas en profundidad 755 a 955 metros*" (Dolgopol de Sáez, 1940a) [Plaza Huincul, Neuquén, oil drilling at depths of 755 to 955 meters]. Vaca Muerta Formation, Upper Jurassic, Neuquén.

Collector. Hugo G. Bain.

Remarks. The specimens MLP-PV 39-VI-30-10, MLP-PV 39-VI-30-11 and MLP-PV 39-VI-30-12, are listed as Type on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-17. Dolgopol de Sáez (1940a) classified the specimens as belonging to Coelacanthidae. Later, Bocchino (1967a) designated MLP-PV 39-VI-30-10 as the lectotype and provided a more detailed description. Cione and Pereira (1990) reported that some specimens originally described by Dolgopol de Sáez (1940a) were lost. Concluding that †*Bunoderma baini* is represented exclusively by scales, including those preserved in the specimens MLP-PV 40-XI-7-1, MLP-PV 40-XI-7-2 and MLP-PV 40-XI-7-4, which Dolgopol de Sáez (1940b) had previously assigned to †*Leptolepis patagonicus*. Furthermore, Cione and Pereira (1990) determined that the two poorly preserved skulls present in samples MLP-PV 39-VI-30-11 and MLP-PV 39-VI-30-12 actually belong to an indeterminate teleostean fish. However, the scales present in MLP-PV 39-VI-30-11 and MLP-PV 39-VI-30-12 are regarded as †*Bunoderma baini.* Dolgopol de Sáez (1940a) compared the scales of †*Bunoderma* with those of other coelacanths, including †*Rhabdoderma* Reis, 1888 and †*Heptanema* Bellotti, 1857. However, although coelacanths possess elasmoid scales, these are larger than those of †*Bunoderma* and exhibit coarser, enamel-coated ridges that converge toward and terminate in a pointed median region.

SARCOPTERYGII Romer, 1955

DIPNOI Müller, 1846

CERATODONTIFORMES Berg, 1940

Remarks. Ceratodontiformes comprise the three extant families—Neoceratodotidae, Lepidosirenidae, and Protopteridae—along with their fossil relatives (Nelson et al., 2016). Their fossil record dates back to the Triassic and includes the families Arganodontidae, Ceratodontidae, and Asiatoceratodontidae (Nelson et al., 2016). The fossil record of Ceratodontiformes is primarily represented by their tooth plates (*e.g.*, Martin, 1982). In South America, ceratodontiform tooth plates have been recorded as early as the Triassic (Schultze, 1991).

†CERATODONTIDAE Günther, 1871

Genus †***Atlantoceratodus*** Cione, Gouiric-Cavalli, Goin and Poiré, 2007

Type species. (Original designation; Ameghino, 1899, p. 10): †*Ceratodus iheringi* Ameghino, 1899. Upper Cretaceous, Mata Amarilla Formation, Par-Aike, Santa Cruz, Argentina.

†***Atlantoceratodus iheringi*** (Ameghino, 1899)

Figure 5A, Table 1

1899 †*Ceratodus iheringi* Ameghino, p. 134.
2007 †*Atlantoceratodus iheringi* (Ameghino, 1899) Cione, Gouiric-Cavalli, Goin and Poiré, p. 8, figs. 3–4.

Type Material. Holotype †*Ceratodus iheringi* MLP-PV 21-967 (Fig. 5A), left pterygopalatine tooth plate.

Original Stratigraphic Distribution. Shehuenense stage, middle Cretaceous (Ameghino, 1899, p. 3).

Reviewed Geographic and Stratigraphic Distribution. "*Tres Lagos 2* (3LAG2) 49° 37' 07.4" S, 71° 07' 46.1" W *(Estancia La Soriana)*" (Cione et al., 2007, p. 3). Mata Amarilla Formation, Upper Cretaceous (middle Cenomanian) (Varela et al., 2012).

Collector. Carlos Ameghino.

Remarks. The specimen MLP-PV 21-967 was originally described as *Ceratodus iheringi* by Ameghino (1899) in a supplement containing additions and corrections to his 1898 work. He did not specify its geographical origin in his 1899 work, but Pascual and Bondesio (1976) later re-examined the original description and identified the location as Par-Aike in Santa Cruz. It consists of an isolated, incompletely preserved left pterygopalatine tooth plate. Later, based on its general morphology, the specimen was assigned to †*Ptychoceratodus* (Cione, 1987; Arratia & Cione, 1996). Cione et al. (2007) subsequently reviewed the holotype along with approximately 200 tooth plates from both the type locality and Tres Lagos 1 (Estancia Bajada de los Orientales). They concluded that these specimens belong to a new genus, †*Atlantoceratodus.*

Nominal holotypes considered as *nomina dubia*

†***Gyrolepidoides cuyanus*** Cabrera, 1944a
nomen dubium
Figure 5B–C, Table 1

1944a †*Gyrolepidoides cuyanus* Cabrera, p. 569.
2010 †*Gyrolepidoides cuyanus nomen dubium* López-Arbarello, Rauhut and Cerdeño, p. 12, fig. 9.

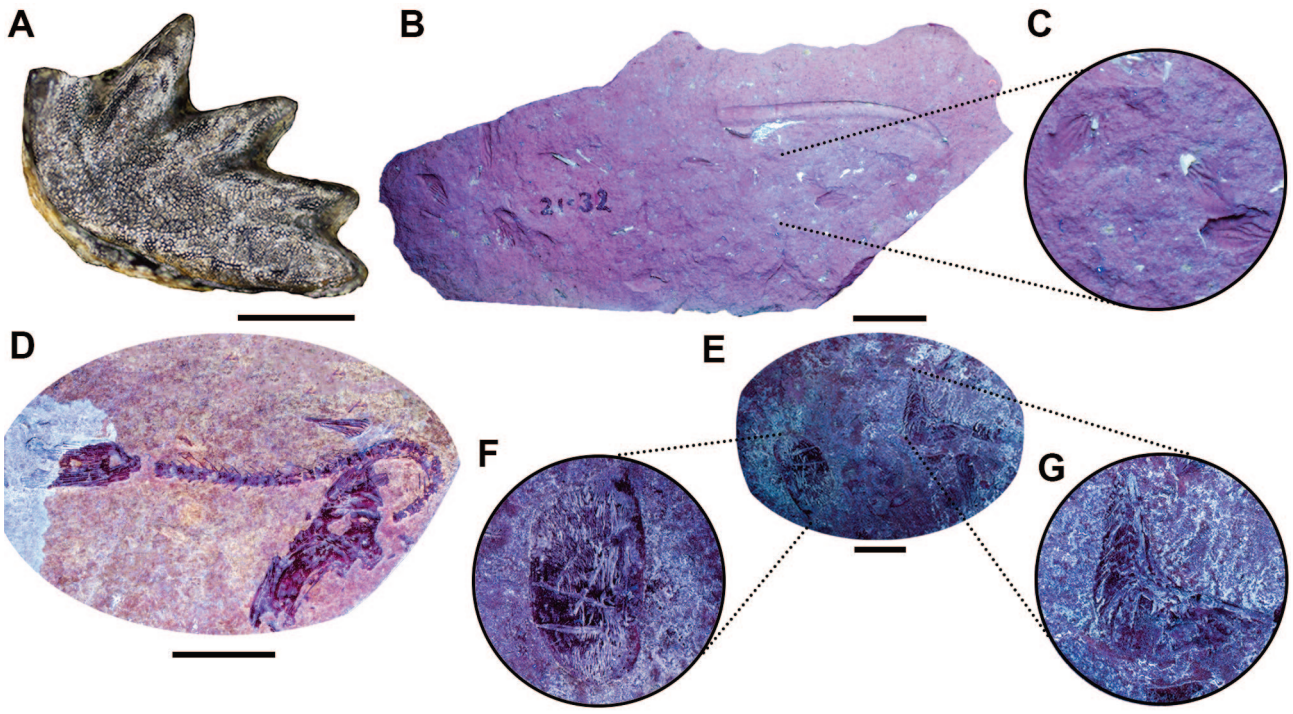

Figure 5. Actinopterygian and sarcopterygian holotypes housed at the *Colección de Paleontología de Vertebrados del Museo de La Plata.* A, Holotype of †*Ceratodus iheringi*, MLP-PV 21-967 left pterygopalatine tooth plate in occlusal view. B–C, Holotype of †*Gyrolepidoides cuyanus*, MLP-PV 44-VII-16-2; B, UV-image showing an isolated tooth, gill raker and impressions of a "preopercular bone", "fin rays", and scales; C, detail of scales. D, Holotype of †*Leptolepis argentinus*, MLP-PV 40-XI-7-5 UV-image of the incomplete and arched specimen in rigth lateral view. E–G, Lectotype of †*Leptolepis patagonicus*, MLP-PV 40-XI-7-1; E, UV-image of the preopercular and opercular in lateral view; F, close-up of opercular; G, close-up of preopercular. Scale = 1 cm.

Type Material. Holotype MLP-PV 44-VII-16-2, "*Fragmento de roca conteniendo un diente suelto, varios pequeños trozos de radios de aletas y la impresión de un hueso preopercular, de algunas otras piezas cefálicas, al parecer fragmentos de branquiostegos y de siete escamas...*" (Cabrera, 1944a, p. 570) [Fragment of rock containing a loose tooth, several small pieces of fin rays and the impression of a preopercular bone, some other cephalic pieces, apparently fragments of gill plates and seven scales...].

Original Geographic and Stratigraphic Distribution. "*Kilómetro 44 del ferrocarril transandino, entre Cacheuta y Potrerillos, provincia de Mendoza.*" (Cabrera, 1944a, p. 570) [Kilometer 44 of the Trans-Andean Railroad, between Cacheuta and Potrerillos, Mendoza Province.]. "*Estrato de Cerro de las Cabras, referible al Triásico Medio o tal vez a la parte más moderna del Triásico Inferior*" (Frenguelli, 1944, p. 268) [Estrato de Cerro de las Cabras, referable to the Middle Triassic or perhaps to the youngest part of the Lower Triassic].

Review Stratigraphic Distribution. Cerro de Las Cabras Formation is considered Middle Triassic based on paleontological content and U-Pb SHRIMP dating (*e.g.*, Spalletti et al., 2008; Ruffo-Rey, 2021).

Collector. Joaquín Frenguelli.

Remarks. The specimen MLP-PV 44-VII-16-2 is listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-32. Cabrera (1944a) described the specimen as a primitive Actinopterygii, noting similarities in its scales, branchiostegal rays, and preopercular to those of the genus †*Gyrolepis*. Later, Arratia and Cione (1996) reclassified the specimen as an indeterminate Actinopterygii due to the poor preservation of the specimen and the absence of diagnostic characters. López-Arbarello et al. (2010) designated this species as a *nomen dubium*.

†***Leptolepis argentinus*** Dolgopol de Sáez, 1940b
nomen dubium
Figure 5D, Table 1

1940b †*Leptolepis argentinus* Dolgopol de Sáez, p. 305, fig. 4.
1990 †"*Leptolepis argentinus*" *nomen vanum* Cione and Pereira, p. 390, pl. 5, fig. A.

Type Material. Holotype MLP-PV 40-XI-7-5, an almost complete specimen in a poor state of preservation.

Geographic and Stratigraphic Distribution. Plaza Huincul, Neuquén. Yacimientos Petrolíferos Fiscales (YPF), oil drilling core samples at depths from 755 to 999.5 meters (Dolgopol de Sáez, 1940b). Vaca Muerta Formation, Upper Jurassic, Tithonian (Cione & Pereira, 1987).

Collector. Yacimientos Petrolíferos Fiscales.

Remarks. The specimen MLP-PV 40-XI-7-5 is listed on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-19. †*Leptolepis argentinus* is based on a single specimen, in which an arched fish can be discerned (Fig. 5D). Cione and Pereira (1990) noted that the anatomical features listed by Dolgopol de Sáez were insufficient to justify the establishment of a new species. Due to its poor preservation, the specimen can neither be adequately described nor valid as a new species and is formally assigned herein as *nomen dubium.*

†***Leptolepis patagonicus*** Dolgopol de Sáez, 1940b
nomen dubium
Figure 5E–G, Table 1

1940b †*Leptolepis patagonicus* Dolgopol de Sáez, p. 303, figs. 1–3.
1990 †"*Leptolepis patagonicus*" *partim nomen vanum* Cione and Pereira, p. 390, pl. 4, fig. B, pl. 6, fig. D.

Type Material. Lectotype MLP-PV 40-XI-7-1, preopercular and opercular (Bocchino, 1967a). Syntypes MLP-PV 40-XI-7-2, two preopercles; MLP-PV 40-XI-7-3, poorly preserved caudal endoskeleton; and MLP-PV 40-XI-7-4, preopercular and opercular (Appendix 1, Fig. S1D–F).

Geographic and Stratigraphic Distribution. Plaza Huincul, Neuquén. Yacimientos Petrolíferos Fiscales (YPF), oil drilling core samples at depths from 755 to 999.5 meters (Dolgopol de Sáez, 1940b). "Vaca Muerta Formation, Upper Jurassic, Tithonian" (Cione & Pereira, 1990, p. 390).

Collector. Yacimientos Petrolíferos Fiscales from Plaza Huincul (Dolgopol de Sáez, 1940b, p. 299).

Remarks. The specimens MLP-PV 40-XI-7-1, MLP-PV 40-XI-7-2, MLP-PV 40-XI-7-3, and MLP-PV 40-XI-7-4 are listed as Type on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the numbers 21-14 to 21-16.

The species †*Leptolepis patagonicus* was based on four highly incomplete and uninformative specimens. Dolgopol

de Sáez (1940b) did not designate a holotype; however, Bocchino (1967a) proposed specimen MLP-PV 40-XI-7-1 as the lectotype. Cione and Pereira (1990) considered that the skull fragments and supposed fin elements preserved in samples MLP-PV 40-XI-7-2, MLP-PV 40-XI-7-3, and MLP-PV 40-XI-7-4 lack diagnostic characters to support their taxonomic assignment, considering the species as *nomen vanum*. However, the authors considered that the scales preserved in the samples MLP-PV 40-XI-7-1, MLP-PV 40-XI-7-2, and MLP-PV 40-XI-7-4 are referrable to †*Bunoderma baini* (Cione and Pereira, 1990). The cranial remains of the sample MLP-PV 40-XI-7-1 are unidentifiable, and because of that, †*Leptolepis patagonicus* is formally designated as a *nomen dubium*. The scales are considered a junior synonym of †*Bunoderma baini.*

†***Leptolepis australis*** Dolgopol de Sáez, 1939
nomen dubium
Figure 6A, Table 1

1939 †*Leptolepis australis* Dolgopol de Sáez, p. 430, fig. 3.
1990 †"*Leptolepis australis*" *nomen vanum* Cione and Pereira, p. 391.

Type Material. Holotype MLP-PV 39-VI-30-3, an extremely poorly preserved fish impression.

Original Geographic and Stratigraphic Distribution. "*Arroyo Picún Leufú junto al camino que va desde Zapala a San Martín de los Andes, Neuquén*" (Dolgopol de Sáez, 1939, p. 428) [Picún Leufú creek next to the road that goes from Zapala to San Martín de los Andes, Neuquén.]. "*...muestras de arenis-cas feldespáticas procedentes del titónico de Plaza Huincul...*" (Dolgopol de Sáez, 1939, p. 428) [...samples of feldspathic sandstones from the Tithonian of Plaza Huincul...].

Reviewed Geographic and Stratigraphic Distribution. Plaza Huincul, Neuquén. Oil drilling from YPF (Cione & Pereira, 1990). "Vaca Muerta Formation, Upper Jurassic, Tithonian" (Cione & Pereira, 1990, p. 391).

Collector. Italo Simonatto.

Remarks. The specimen MLP-PV 39-VI-30-3 is listed as Type on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-20. †*Leptolepis australis* is based on a poorly preserved specimen. Although Dolgopol de Sáez (1939) described this species, a reexamination by Cione and Pereira (1990), as well as the present study, concluded that no diagnostic characters are present in MLP-PV 39-VI-30-3. Therefore, †*Leptolepis australis* is formally designated as a *nomen dubium.*

†***Leptolepis leanzai*** Dolgopol de Sáez, 1949
nomen dubium
Figure 6B, Table 1

1949 †*Leptolepis leanzai* Dolgopol de Sáez, p. 447, fig. 2.
1987 †"*Tharrias*" *feruglioi* (Bordas, 1942) Cione and Pereira, p. 290, pl. 4, fig. A.
2015b †*Leptolepis leanzai nomen dubium* Sferco, López-Arbarello and Báez, p. 15.

Type Material. Holotype MLP-PV 48-I-1-2, a complete specimen with an arched vertebral column.

Original Geographic and Stratigraphic Distribution. "*Cerro Mirador, Chubut*" (Dolgopol de Sáez, 1949, p. 447). No clear stratigraphical provenance in the original description of Dolgopol de Sáez (1949).

Reviewed Geographic and Stratigraphic Distribution. "*Cercanías de Cerro Cóndor, provincia de Chubut, Argentina*" (Cione & Pereira, 1987, p. 290) [Near Cerro Cóndor, Chubut Province, Argentina]. Lowermost part of the Cañadón Calcáreo Formation, Upper Jurassic (Oxfordian–Tithonian) (Cione & Pereira, 1987; López-Arbarello et al., 2008b, 2013; Sferco et al., 2015b).

Collector. Armando F. Leanza.

Remarks. The specimen MLP-PV 48-I-1-2 is listed as Type on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-30. †*Leptolepis leanzai* was based on a single well-preserved specimen. Although Dolgopol de Sáez (1949) described this species, differentiating it from other leptolepids, a reexamination by Cione and Pereira (1987) concluded that the morphological characters of the specimen MLP-PV 48-I-1-2 do not allow differentiation from †*Leptolepis feruglioi* (Bordas, 1942). Sferco et al. (2015b) reviewed the teleostan fauna from Cañadón Calcáreo and concluded that †*Leptolepis leanzai* resembles †*L. feruglioi*; however, the type specimen, MLP-PV 48-I-1-2, lacks diagnostic characters that allow it to be assigned to †*L. feruglioi* or distinguished as a separate species. Consequently, it is regarded as *nomen dubium*.

†***Tharrias shamani*** Dolgopol de Sáez, 1949

nomen dubium

Figure 6C, Table 1

1949 †*Tharrias shamani* Dolgopol de Sáez, p. 447, fig. 1.
1987 †"*Tharrias*" *feruglioi* (Bordas, 1942) Cione and Pereira, p. 290, pl. 4, fig. B.
2015b †*Tharrias shamani nomen dubium* Sferco, López-Arbarello and Báez, p. 15.

Type Material. Holotype MLP-PV 48-VIII-1-3, "*fragmento de roca conteniendo la impresión de un pez en casi toda su extensión*" (Dolgopol de Sáez, 1949, p. 443, fig. 1) [fragment of rock containing the impression of a fish in almost all its extension].

Original Geographic and Stratigraphic Distribution. "*Departamento de Tehuelches, Chubut*" (Dolgopol de Sáez, 1949, p. 443) [Department of Tehuelches, Chubut]. "*Formación cretácea superior*" (Dolgopol de Sáez, 1949, p. 443) [Upper Cretaceous Formation].

Reviewed Geographic and Stratigraphic Distribution. "*Cercanías de Cerro Cóndor, río Chubut medio, Chubut, Argentina*" (Cione & Pereira, 1987, p. 289) [Near Cerro Cóndor, middle Chubut River, Chubut, Argentina]. Lowermost part of the Cañadón Calcáreo Formation, Upper Jurassic (Oxfordian–Tithonian) (Cione & Pereira, 1987; López-Arbarello et al., 2008b, 2013; Sferco et al., 2015b).

Collector. Antonio R. Corrada.

Remarks. The specimen MLP-PV 48-VIII-1-3 is listed as Type on folio 563 of the Book Catalog of Fossil Vertebrates N.° 1, under the number 21-27. †*Tharrias shamani* was described based on an incomplete specimen (Fig. 6C). Cione and Pereira (1987) later synonymized it with †*Luisiella feruglioi*. However, subsequent studies considered †*T. shamani* a *nomen dubium* since MLP-PV 48-VIII-1-3 lacks diagnostic characters of †*L. feruglioi* and is insufficient to establish a distinct species (Sferco et al., 2015b).

†***Neolycoptera gracilis*** Dolgopol de Sáez, 1939

nomen dubium

Table 1

1939 †*Neolycoptera gracilis* Dolgopol de Sáez, p. 425, figs. 1–2.
1996 Teleostei indeterminate Arratia and Cione, p. 31.
1996 Osteoglossiformes indeterminate Arratia and Cione, p. 68.

Type Material. Holotype MLP-PV 39-VI-30-1 and MLP-PV 39-VI-30-2, an incomplete fish preserved as part and counterpart. The type material is lost (Arratia & Cione, 1996).

Original Geographic and Stratigraphic Distribution. "*Campamento de Saladillo, Jujuy, Argentina*" (Dolgopol de Sáez, 1939) [Saladillo Camp, Jujuy, Argentina]. "*Muestra obtenida a 2031 m. La roca es oscura (arenisca muscovítica bituminosa)*" (Dolgopol de Sáez, 1939, p. 425) [Sample taken at 2031 m. The rock is dark (bituminous muscovite sandstone)].

Reviewed Geographic and Stratigraphic Distribution. Cordillera oriental, Jujuy Province, Northwestern Argentina (*e.g.*, Cónsole-Gonella, 2011). Yacoraite Formation. Upper Cretaceous (Maastrichtian–Danian) (*e.g.*, Marquillas et al., 2005). An absolute U-Pb zircon dating has confirmed a Maastrichtian age for at least part of the unit (Marquillas et al., 2011).

Collector. Yacimientos Petrolíferos Fiscales.

Remarks. †*Neolycoptera gracilis* was described based on an incomplete and poorly preserved specimen (Dolgopol de Sáez, 1939, figs. 1–2). It was originally considered a freshwater leptolepid actinopterygian with similarities to the marine clupeiform †*Haplospondylus clupeoides* from the Lower Cretaceous, Río Mayer Formation, Santa Cruz Province, Argentina (Cabrera, 1927). Arratia and Cione (1996) cited the species among osteoglossiforms without providing a diagnosis, but also considering it an indeterminate Teleostei and recommending its classification as a *nomen dubium* (Arratia & Cione, 1996). The specimens MLP-PV 39-VI-30-1 and MLP-PV 39-VI-30-2 remain lost, and the species is formally regarded herein as a *nomen dubium.*

†***Propygidium primaevus*** Bocchino, 1964

nomen dubium

Figure 6D, Table 1

1964 †*Propygidium primaevus* Bocchino, p. 186, fig. 1.
1988 †*Propygidium primaevus nomen vanum* Cione and Torno, p. 656, fig. 1.

Type Material. Holotype MLP-PV 21-871, "*incrustación e*

impresión casi completa, pero muy deficientemente conservada" (Bocchino, 1964, p. 186) [almost complete skeleton preserved as embedded bone and impression but very poorly preserved].

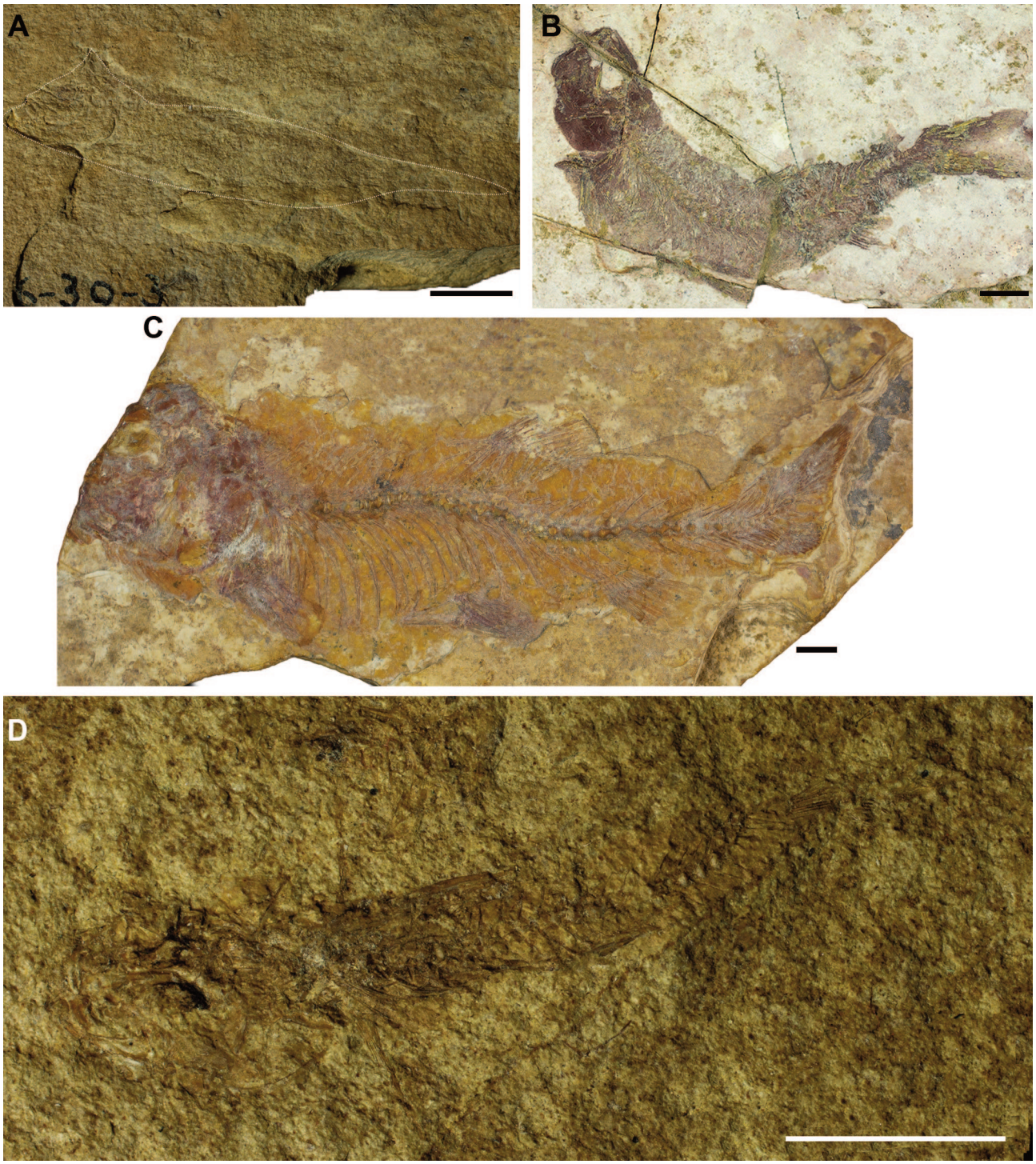

Figure 6. Actinopterygian holotypes housed at the *Colección de Paleontología de Vertebrados del Museo de La Plata*. A, Holotype of †*Leptolepis australis*, MLP-PV 39-VI-30-3 poorly preserved specimen, from the front of the face to the tip of the caudal fin, with only the distal part of the lower lobe missing, in left lateral view. B, Holotype of †*Leptolepis leanzai*, MLP-PV 48-I-1-2 complete specimen with an arched vertebral column in rigth lateral view (mirrored). C, Holotype of †*Tharrias shamani*, MLP-PV 48-VIII-1-3 nearly complete specimen in rigth lateral view. D, Holotype of †*Propygidium primaevus*, MLP-PV 21-871 nearly complete skeleton poorly preserved in left lateral view. Scale = 1 cm.

Original Geographic and Stratigraphic Distribution. "*Las Bayas está situada en la provincia de Río Negro, sobre la ruta nacional 40 entre paralelos 41 y 42 y meridianos 70 y 71...equidistante de Pilcaniyeu y Ñorquincó*" (Bocchino, 1964, p. 185) [Las Bayas is located in Río Negro Province, on National Route 40 between parallels 41 and 42 and meridians 70 and 71... equidistant from Pilcaniyeu and Ñorquincó]. "*Serie Andesítica*", Eocene (Bocchino, 1964, p. 185).

Reviewed Geographic and Stratigraphic Distribution. "A site facing Cerro David, 1.5 km from the road connecting San Carlos de Bariloche to Chenqueniyeu, Río Negro Province" (Cione & Torno, 1988, p. 656). Middle levels of the Ñirihuau Formation (Cione & Torno, 1988, p. 656). Upper Miocene (Langhian to Tortonian) (Santonja et al., 2021).

Collector. Joaquín Frenguelli and A. Orlando.

Remarks. †*Propygidium primaevus* was described based on an incomplete and poorly preserved specimen by Bocchino (1964). Bocchino assigned the specimen to Siluriformes, within the family Trycomicteridae (=Pygidiidae). Cione and Torno (1988) reexamined and redescribed the holotype, MLP-PV 21-871, and reassigned it to a percomorph, tentatively a Cichlidae. However, they stated: "none of the observed traits permits an assignment to one of the several south american freshwater percomorphs, nor identify the genus and species" (Cione & Torno, 1988, p. 656). Moreover, the authors considered †*Propygidium primaevus* a *nomen vanum*. Since the ICZN (1999) does not recognize the term *nomen vanum*, we formally designate the specimen as a *nomen dubium*.

FINAL COMMENTS

The present catalog represents a crucial step toward improving accessibility, visibility, and taxonomic accuracy of the fossil fish collection housed at the Museo de La Plata. By compiling and updating information on all recognized type specimens, this work contributes to the preservation of historical data and supports future research in paleoichthyology, biogeography, and systematics. In line with international best practices and the ICZN, it ensures the traceability and correct use of type material in taxonomic revisions and comparative studies. Continued efforts to digitize, curate, and publish on institutional collections such as this are essential for fostering global collaboration and advancing our understanding of the paleodiversity of Gondwanan ichthyofaunas.

ACKNOWLEDGMENTS

The present catalog was initiated in 2004 and is the result of a long process in which several colleagues were involved. SGC sincerely thanks A. L. Cione, an encouraging and supportive mentor, who also collaborated in the organization and curation of the fossil fish collection until his retirement. Special thanks are also extended to J. A. Mennucci and F. Santalucita, who joined in developing the first version of this catalog and provided invaluable support in methodological aspects and bibliographic research. We also thank L. L. Rasia for helping to clarify the synonymy list of the specimens. M. Reguero is acknowledged for initially providing access to the specimens under his care. Finally, we thank the staff of the Biblioteca Florentino Ameghino of the La Plata Museum for granting access to references and for scanning several relevant papers.

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doi: 10.5710/PEAPA.16.06.2026.566

Recibido: 23 de febrero 2026
Aceptado: 16 de junio 2026
Publicado: 20 de agosto de 2026

APPENDIX 1

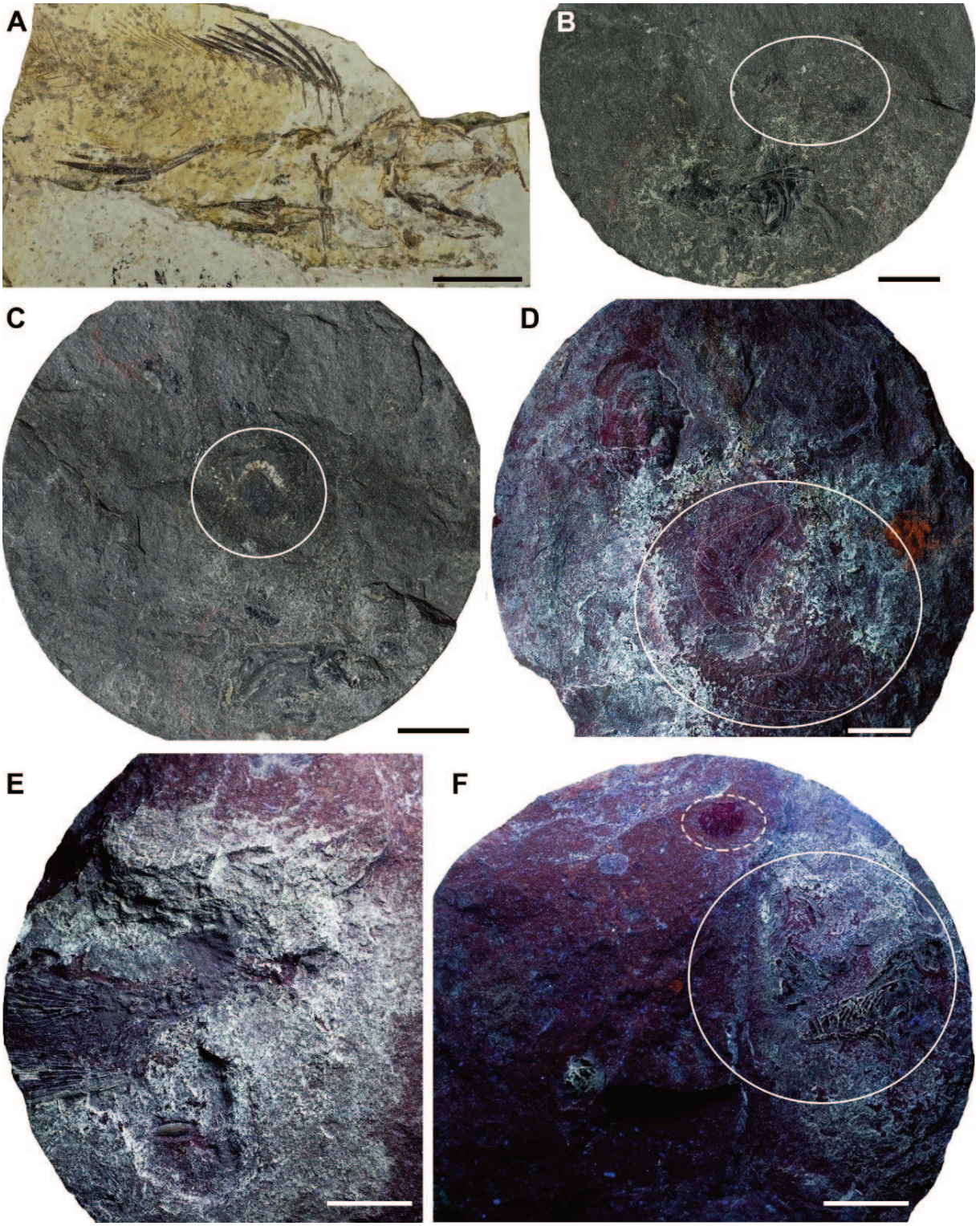

Figure S1. Syntypes and paratypes at the *Colección de Paleontología de Vertebrados del Museo de La Plata.* A, Paratype of †*Guayquichthys feruglioi*, MLP-PV 48-IX-16-4 incomplete specimen in left lateral view (mirrored). B–C, Syntypes of †*Bunoderma baini,* MLP-PV 39-VI-30-11 and MLP-PV 39-VI-30-12; isolated scales, white circle indicates the figured scales. D–F, Syntypes of †*Leptolepis patagonicus,* MLP-PV 40-XI-7-2, MLP-PV 40-XI-7-3, and MLP-PV 40-XI-7-4; D, UV-image of two preopercles, white circle indicates the figured preopercle; E, UV-image of the caudal endoskeleton; F, UV-image of preopercular and opercular, white circle indicates the paratype and the dotted circle indicates an isolated †*Bunoderma baini* scale. Scale = 1 cm.