

FIRST RECORD OF *METRIORHYNCHUS* (REPTILIA: CROCODYLIFORMES) IN THE BATHONIAN (MIDDLE JURASSIC) OF THE EASTERN PACIFIC

ZULMA GASPARINI,¹ MARCELA CICHOWOLSKI,² AND DARIO G. LAZO²

¹Departamento de Paleontología de Vertebrados, Museo de La Plata, Paseo del Bosque (1900) La Plata, Argentina, <zgaspari@museo.fcnym.unlp.edu.ar> and ²Departamento de Ciencias Geológicas, Universidad de Buenos Aires, Pabellón II, Ciudad Universitaria (1428) Argentina, <mcicho@gl.fcen.uba.ar>, and <dlazo@gl.fcen.uba.ar>

INTRODUCTION

JURASSIC MARINE reptiles are best known from the study of European Jurassic collections. The record of these reptiles encompasses most of the period, but that of Aalenian–Bathonian rocks is quite incomplete (Andrews, 1913; Brown, 1981; Buffetaut, 1982; Godefroit, 1994; Bardet, 1995; O’Keefe, 2001; McGowan and Motani, 2003). South American marine reptiles of the early Middle Jurassic are especially significant because they

contribute to fill this gap of taxonomic and paleogeographic information (Fernández, 1994, 1999, 2003; Spalletti et al., 1994; Gasparini, 1997; Gasparini et al., 2000).

The largest amount and diversity of Jurassic marine reptiles of the Southern Hemisphere was found in northwestern Patagonia, in the Neuquén Basin (Yrigoyen, 1991; Fig. 1). These reptiles dominate in Tithonian rocks cropping out at numerous sites of the basin (Gasparini and Fernández, 1996; Spalletti et al., 1999). On the contrary, Middle Jurassic marine reptiles are restricted to Chacaico Sur area, southeast of the Neuquén Province (Fig. 1). There, until present, ichthyosaurs, plesiosaurs, and a crocodile vertebra were found in the upper part of Los Molles Formation, Cuyo Group (Lower Bajocian), and plesiosaurs and plesiosauroids were found in the lower part of Lajas Formation, Lower Callovian (Gasparini and Spalletti, 1993; Fernández, 1994, 1999; Spalletti et al., 1994; Gasparini, 1997).

Recently, during field work performed by the biostratigraphy students of the Geological Sciences Department (University of Buenos Aires) in the area of Chacay Melehue, Neuquén Province (Fig. 1), two of the authors (MC and DL) took part in the finding and extraction of the skull and postcranium of a marine crocodile from Upper Bathonian sedimentites. This specimen confirms the presence of marine crocodiles in the Middle Jurassic of Argentina, and is the first record of a metriorhynchid in the Late Bathonian of the Eastern Pacific.

GEOLOGICAL SETTING

The Neuquén Basin is located in west-central Argentina between latitude 34° and 41°S. It is developed in Neuquén and part of Mendoza, Río Negro, and La Pampa Provinces (Fig. 1). Its infill exceeds 6,000 m of marine and continental sedimentary rocks, which range from Late Triassic to Paleocene in age (Yrigoyen, 1991; Legarreta and Uliana, 1999). Over a great part of the basin, marine conditions prevailed from the Sinemurian until the Late Callovian. During this interval the Los Molles Formation was deposited. The maximum extent of the area with marine deposition occurred during the Bajocian. From then onwards, the area of sedimentation was gradually reduced until, during the mid-Callovian, the basin became virtually cut off from the open sea, resulting in the deposition of evaporites in the center (Gulissano and Gutiérrez Pleimling, 1994).

The crocodile remains proceed from the middle to upper part of the Los Molles Formation, at the classical Chacay Melehue section (Fig. 1). At the base of the outcrop, there are epiclastic and pyroclastic deposits, which lack a formal name and correspond to the base of the Cuyo Group (Gulissano and Gutiérrez Pleimling, 1994). These beds are overlain conformably by the Los Molles Formation (Fig. 2). This unit is composed of more than 850 m of black shales, claystones, sandstones, and limestones of Toarcian to Callovian age. It has been interpreted as having been deposited in an offshore, inner basinal to turbiditic basinal environment (Gulissano and Gutiérrez Pleimling, 1994).

The remains studied here have been found in a level within the interval V proposed by Gulissano and Gutiérrez Pleimling (1994)

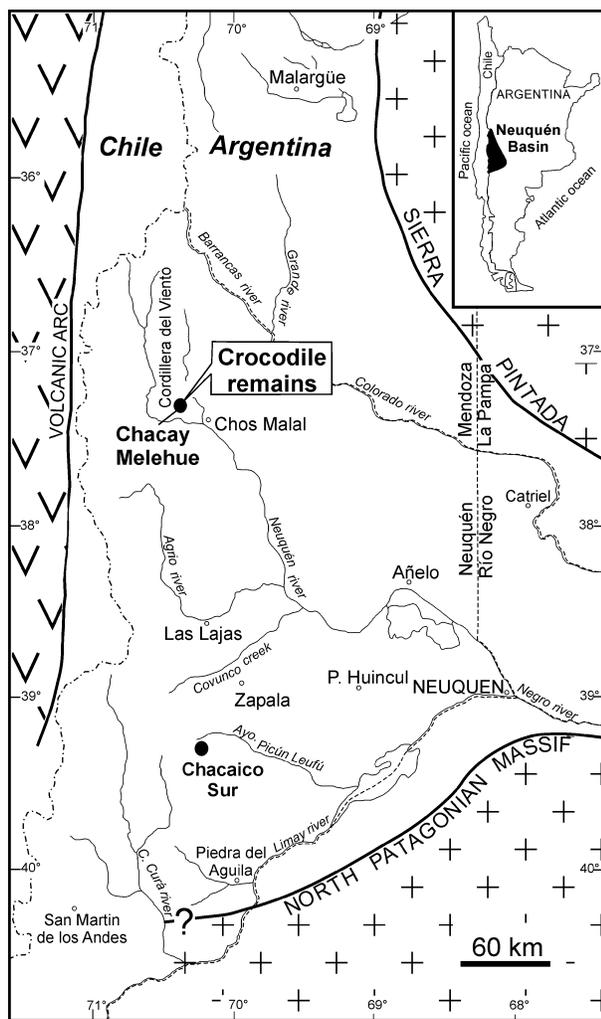


FIGURE 1—The Neuquén Basin in west-central Argentina, showing the location of Chacay Melehue section. The crocodile remains proceed from Los Molles Formation. Base map from Digregorio et al. (1984).