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A NEW SPECIES OF *LECHRIODUS* BOULENGER (ANURA: LEPTODACTYLIDAE) FROM THE EARLY EOCENE OF QUEENSLAND

by M. J. TYLER* & H. GODTHELP†

Summary

TYLER, M. J. & GODTHELP, H. (1993) A new species of *Lechriodus* Boulenger (Anura: Leptodactylidae) from the Early Eocene of Queensland. *Trans. R. Soc. S. Aust.* **117**(4), 187–189, 30 November 1993.

Lechriodus casca sp. nov. numerically is the dominant species in a collection of ilia obtained at Murgon in South-east Queensland. Radiometric dating of illites that form part of the matrix of mammalian material taken there is 54.6±0.05 million years. Accordingly *L. casca* is the earliest frog fossil known from Australia.

The principal significance of the discovery of this material is the demonstration that generic differentiation at least in part antedates the separation of Australia from Antarctica, and that the dominant anuran genus of the Oligo-Miocene also was dominant in the Eocene.

KEY WORDS: *Lechriodus*, new species, ilia, Leptodactylidae, Tertiary, Queensland.

Introduction

The leptodactylid (myobatrachid of some authors) genus *Lechriodus* Boulenger comprises four extant species restricted to Australia and New Guinea. Amongst the 22 genera of Australopapuan leptodactylid frogs recognised, four are represented on both landmasses and are the only ones in New Guinea (*Crinia*, *Lechriodus*, *Limnodynastes* and *Mixophyes*). *Lechriodus* is unique amongst that group in having more species in New Guinea (three) than in Australia (one) (Zweifel 1972). The nature of the geographic distribution of *Lechriodus* also is unusual, for in all of the other genera common to both landmasses, representatives exist on the adjacent shorelines, whereas the solitary species in Australia (*L. fletcheri* Boulenger) is confined to the eastern seaboard of New South Wales, and its northern limit is north of the Queensland border. The northern limit in Australia is approximately 2000 km distant from the nearest congener in New Guinea (Zweifel 1972; McDonald & Miller 1982).

The fossil record partially bridges the geographic gap in the distribution of extant species because *L. intergerivus* Tyler, 1989 is known from Oligo-Miocene sites at Riversleigh Station south of the Gulf of Carpentaria, in northern Queensland.

Here we report a further new species of *Lechriodus* from an early Eocene site at Murgon, 160 km northwest of Brisbane. It represents the earliest frog fossil material yet found in Australia. The biogeographic and systematic significance of the new species is discussed elsewhere (Tyler & Godthelp in prep.).

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Material and Methods

The material is deposited in the Queensland Museum, Brisbane (QM), and the South Australian Museum, Adelaide (SAM). Letters following the abbreviations are departmental identifications.

Comparative studies are based on osteological collections in the Department of Zoology, University of Adelaide, with fossil material from Riversleigh being processed at the time of these studies, and with scanning electron micrographs included in Tyler (1989).

Osteological nomenclature follows Tyler (1976, 1989). Scanning electron micrographs were prepared on a Cambridge Autoscan.

Systematics

Family: Leptodactylidae Werner, 1896
Sub-family: Limnodynastinae Tyler, 1978
Genus: *Lechriodus* Boulenger, 1882

The definition of the generic characteristics of the ilium of *Lechriodus* of Tyler (1976) has been expanded by Tyler (1979). A distinguishing feature of the genus is the high dorsal crest extending for the entire length of the ilial shaft.

Lechriodus casca sp. nov.
FIGS 1-3

Holotype: QM F24824, a left ilium located at Main Quarry, Boat Mountain area, Murgon (Latitude 26°15′S, Longitude 151°57′E), southeast Queensland. Tingamarra Local Fauna.

Description of holotype: The proximal portion of the ilium lacks the greater portion of the acetabular fossa, and both the dorsal and ventral acetabular expansions (Fig. 1). The shaft bears a conspicuous concave dorsal

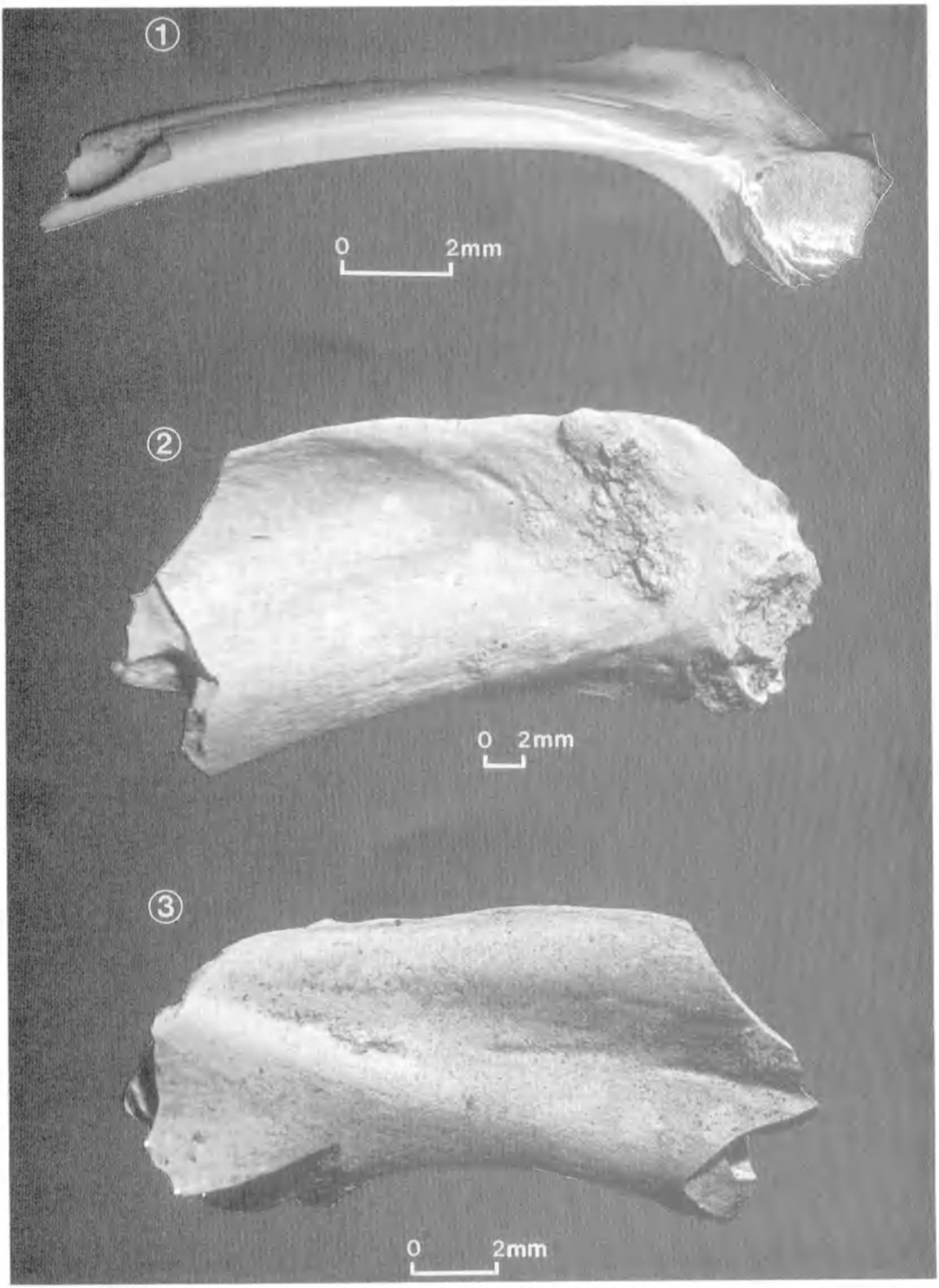

Fig. 1. (QM F24824) Holotype of *Lechriodus casca* sp. nov. 2. (QM F33558) Paratype of *Lechriodus casca* sp.nov.; lateral view. 3. medial view.

crest proximally. The medial surface bears a conspicuous, longitudinal indentation which is shallow and weakly rounded proximally and deeper and angular distally. The total length is 11.8 mm.

Paratypes: 34 ilia - QM F20197, 20216, 20243, 20565, 20567, 20689-93, 20912, 21395, 23018, 23208, 23279, 24824-28; SAM P31700, 31703-06, 31710, 33558-65. All specimens were collected at Main Quarry, Boat Mountain, Murgon.

Variation: All of the paratypes are fragmentary, but SAM P33558 (possessing a dorsal crest – Figs 2, 3) exhibits most of the features lacking in the holotype. The dorsal acetabular expansion is poorly developed whilst the pre-acetabular zone is evenly curved. The most complete shaft is that of QM F24824 which is 11.8 mm. It is unlikely that any of the type series would have a complete ilial length greater than 15 mm.

Comparison with other species: *Lechriodus intergerivus* Tyler (1989) is the only known Tertiary member of the genus and completely dominates the frog fauna at sites at Riversleigh Station during much of the Oligocene and Miocene (Tyler *et al.* 1990). From that species *L. casca* is distinguished most readily by the absence of any proximal tapering of the dorsal crest and by the very poor development of the dorsal acetabular expansion (*vide* Tyler 1989, Figs 2, 3).

Etymology: L. "casca", old.

Stratigraphy and Lithology

The anuran and mammalian fossil remains have been recovered from authigenic illite/smectite clays which are part of a sequence of clays and dolomites. Illites from this horizon have been dated radiometrically and have revealed a minimum age of 54.6±0.05 Myr. A minimum age estimate of 29.0±0.2 Myr was obtained from Potassium/Argon dating of a superpositional basalt (Godthelp *et al.* 1992).

Discussion

Lechriodus is the dominant anuran genus in the Tertiary of Queensland, constituting 28-82% of individual ilia located at sites at Riversleigh Station (Tyler *et al.* 1990) and with the lower percentages found at the more recent sites. This trend of an early dominance of *Lechriodus* has been maintained as work on the Riversleigh Station sites continues and more ilia are recovered. As at 6.xi.92, 1114 ilia had been recovered and identified and 562 (50%) represent *L. intergerivus*.

The recovery of a new species of *Lechriodus* dominating the fauna at the early Eocene site at Murgon extends the known antiquity of the genus to almost 55 million years. The biogeographic and systematic significance of the find are discussed by Tyler & Godthelp (in preparation).

Acknowledgments

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