

A specimen of little bush moa *Anomalopteryx didiformis* (Owen, 1844), Emeidae Bonaparte, 1854 from the National Museum of Natural History, Sofia

Zlatozar Boev

National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, boev@nmnh.com, zlatozarboev@gmail.com

Abstract: A complete right tarsometatarsus from an unknown site of New Zealand was identified as little bush moa (*Anomalopteryx didiformis* (Owen, 1844)), possibly an adult male individual.

Keywords: Dinornithiformes, moa, *Anomalopteryx didiformis*, extinct birds, New Zealand

Introduction

The specimen, described here, is the only representative of the order Dinornithiformes Bonaparte, 1852 in the collections of the National Museum of Natural History in Sofia (NMNHS). In a previous paper (Boev, 2005), it was reported as “Dinornithidae gen. indet.” of “(Holocene) from an unknown locality in New Zealand”. The specimen is a complete right tarsometatarsus (tmt) of very good preservation. The whole bone was burnt, an indication the species had been used as prey of local people. It was given as a gift by Dr Cyril Alexander Walker (1939–2009) from the Natural History Museum, London during the author’s short visit in May 1986.

Material and methods

Material: tarsometatarsus dex. ad. The date, collector’s name and the site are unknown.

For the species identification of this subfossil find, we used the special key for identification of the long bones of moas (Worthy, 1988). The measurements of this specimen are given in Table 1.

Results and discussion

According Worthy (1988), if the ratio TL : WD is less than 2.5, the tmt belongs to a species of *Anomalopterygidae*. If this ratio is 2.1–2.5, the key leads

Table 1. Measurement of tarsometatarsus dex. ad. NMNHS 3852 of *Anomalopteryx didiformis*.

Measurement	Abbreviation	Value (mm)
Maximum total length	TL	185.00
Width of proximal epiphysis	WP	65.93
Width of distal epiphysis	WD	85.15
Minimal width of diaphysis	MW	35.89
Diameter of condyles medialis of trochlea metatarsi tertii	DM	36.69
Diameter of condyles lateralis of trochlea metatarsi tertii	DL	37.00
Length of cotyla medialis	LC	39.64



Plate 1. Little bush moa (*Anomalopteryx didiformis*), tarsometatarsus dex. ad. NMNHS 3852: anterior view – a; posterior view – b; medial view – c; lateral view – d; dorsal view – e; ventral view – f. Scale bar = 2 cm. Photographs: Z. Boev.

to *Emeus crassus* (Owen, 1846) or *Anomalopteryx didiformis* (Owen, 1844). The ratio TL : WD of the specimen NMNHS 3852 was 2.17 and fell within the range.

Other features that helped to identify the species as *Anomalopteryx didiformis* (Worthy, 1988): lateral hypotarsal ridge longer than medial (Plate 1 – b); medial nutrition foramen not in distinct hollow, bounded proximally by a ridge (Plate 1 – b); length typically 2.2 times distal width (in the specimen NMNHS 3852 it is 2.17, i. e. approx. 2.2).

Measurements (Cracraft, 1976): TL – 179.02 (n = 43); WP – 59.15 (n = 41); WD – 77.43 (n = 42). The values of all these measurements for the specimen NMNHS 3852 were very close to them (Table 1). As they exceeded slightly the mean values of Cracraft (1976), I supposed the examined specimen belonged to an adult male individual.

At present, the little bush moa *Anomalopteryx didiformis* belongs to the family of the emeid moas Emeidae Bonaparte, 1854 (Worthy & Scofield, 2012).

The species used to be “the more common and occurred on both the North and South islands (Cracraft, 1976). According Day (1981), *A. didiformis* belongs to the group of the so-called “Pygmy Moas”, which used to be between 90 cm and 120 cm in height.”. The same is stated by Cracraft (1980). The last moas survived until 600 to 800 B.P., although “a small species of *Anomalopteryx*... may have survived in the remote wilderness of the Southern Alps until the eighteenth or nineteenth centuries.” (Cracraft, 1980). The little bush moa used to be abundant at “slightly lower altitudes” (Worthy & Scofield, 2012).

Anomalopteryx didiformis is known from the Fern Flat, Marton, near the Waimutu Stream, the Kaimatira Pumice Sand (dated 700 000 to 800 000 years ago), Scinde Island, Hawke’s Bay, Near Napier, Hawke’s Bay, Gleniti Valley, Timaru, Cook Strait (New Zealand). The finds of “Timaru Basalt, would be about 2.5 m. y. old and would, therefore, be the oldest known fossil record of moa.” (Worthy et al., 1991). Another locality where it has been recorded is the Takaka Fos-

sil Cave on the Takaka Hill, South Island (Worthy & Roscoe, 2003).

Worthy (1997) summarises that (1) *A. didiformis* preferred unmodified habitats, (2) it disappeared in the prehistoric time and (3) it is known from a total of 22 sites (9 on the Northern Island and 13 on the South Island).

Thus, the little bush moa is the moa species of both the oldest and the latest fossil/subfossil record of all nine species of Dinornithiformes.

Conclusions

Although relatively numerous at the paleontological and archaeological sites in the New Zealand, the little bush moa is a rarity among the avian museum collections. The examined tarsometatarsus NMNHS 3852 is one of the most valued specimens in the avian collection of fossil and subfossil birds of the NMNHS.

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