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Neotype Designation for the Australian Pig-footed Bandicoot *Chaeropus ecaudatus* Ogilby, 1838

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ABSTRACT. The original description of the now extinct Australian Pig-footed Bandicoot *Chaeropus ecaudatus* Ogilby, 1838 was based on one specimen from which the tail was missing. Re-examination of the skull thought to be the holotype of *C. ecaudatus*, revealed that it was associated with a skeleton with caudal vertebrae, thereby negating its type status. The holotype has not been reliably sighted since 1860 and is presumed lost as it has not been identified in world collections. We designate PA422, a skull and partial skeleton in the Australian Museum, Sydney as neotype for *Chaeropus ecaudatus*. This arose from a recent taxonomic revision of *Chaeropus* that recognized two subspecies of *C. ecaudatus*, prompting resolution of the type material of nominate *ecaudatus*.

Introduction

The extinct Pig-footed Bandicoot *Chaeropus ecaudatus* Ogilby, 1838 has long been regarded as a monotypic species within a monotypic genus following the decision of Iredale & Troughton (1934). Jackson & Groves (2015) give a summary of the taxonomic history of the genus. In their generic revision, Travouillon *et al.* (2019) described a new species and recognized two subspecies within *C. ecaudatus*. Their taxonomic work required resolution of type material for nominate *C. ecaudatus*, the holotype of which was thought to be lost (Parnaby *et al.*, 2017). Although Travouillon *et al.* (2019) concluded that the holotype was PA422 in the Australian Museum (AM), this has subsequently been invalidated, necessitating designation of a neotype for *C. ecaudatus ecaudatus*.

The original description of *Chaeropus ecaudatus* was based on the drawings and field notes of Sir Thomas Mitchell who collected a single specimen near the Murray River in New South Wales. The specimen did not have a tail, which

led Ogilby (1838), who never examined the specimen then in the Australian Museum, Sydney, to name the species “*ecaudatus*” meaning tailless. Mahoney & Ride (1985) concluded that Mitchell’s original specimen was listed in the first AM catalogue (Bennett, 1837: 7) as number 35, a female, which is listed without a name as “A new and undescribed marsupial animal, of singular form”. Their conclusion appears to be based on elimination of other unnamed new mammal species listed by Bennett, which Mahoney (1982) had established to be rodent taxa. Krefft (1864) lists only two specimens of *Chaeropus ecaudatus* in the Australian Museum collection, an adult male from “Gall Creek”, which originally came from Museum Victoria (MV), and a skull from the lower Murray, which he thought was Sir Thomas Mitchell’s original specimen. Gerard Krefft was first employed at the AM in 1860. Krefft (1870) states that he found the original skull “10 years ago” but did not locate the associated skin, which he concluded had been destroyed through the neglect of his curatorial predecessors. Troughton (1932) believed the holotype disappeared from

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the collection soon after it was named and Mahoney & Ride (1988) and Parnaby *et al.* (2017) concluded that the holotype could not be identified amongst the specimens now in the AM. There appear to be no illustrations or measurements of the holotype skull which represents a major impediment to its rediscovery. Travouillon *et al.* (2019) suggested that AM PA421 seemed to match Krefft's (1864) specimen from "Gall Gall Creek" and that AM PA422 was the holotype from the lower Murray River collected by Mitchell. Their conclusions were based on the assumption that the number of 19th century specimens of *C. ecaudatus* in the AM collection had been reliably determined, which has subsequently been found to be incorrect. After re-examining AM PA422, we noticed a number of inconsistencies that negate its type status. First, the specimen that was thought to be a single skull was instead associated with a partial skeleton that included 13 caudal vertebrae. The presence of a tail means that this specimen cannot be the holotype of *Chaeropus ecaudatus*. Additionally, the sex of the specimen, male, recorded on the label, did not match the sex recorded by Mitchell (i.e. a female). The locality is noted as "Murray River" as for the holotype, but no collector is recorded. Since AM PA422 is not the holotype of *C. ecaudatus*, and no trace of the holotype can be found, we propose here to designate a neotype. Given that Travouillon *et al.* (2019) treated AM PA422 as the holotype in their revision of the genus, we consider it appropriate to designate AM PA422 as the neotype.

Systematics

Order Peramelemorphia Kirsch, 1968

(Aplin & Archer, 1987)

Superfamily Perameloidea Gray, 1825

Family Chaeropodidae Gill, 1872 (Groves, 2005)

Genus *Chaeropus* Ogilby, 1838

Chaeropus ecaudatus Ogilby, 1838

Chaeropus ecaudatus ecaudatus

Ogilby, 1838

Fig. 1

Neotype. Australian Museum PA422, juvenile male skull and the associated partial skeleton (Fig. 1), collector and date of collection unknown.

Type locality. The only locality information entered by Secretary Palmer in the PA catalogue is "Murray River".

Remarks. The skull is clearly that of a juvenile, with deciduous premolars still being in place and incompletely erupted upper 4th molars. The skeleton also shows evidence of being that of a juvenile, with incomplete fusion of the epiphyses of the long bones of the limbs. This is most obvious in the humerus. The skeleton has 4 cervical vertebrae represented including the axis (C2) and C3 to C5. The atlas (C1) and C6 are missing. A total of 10 thoracic vertebrae are present, though it is difficult to be certain which one is

missing as only the last 4 are still articulated. All 6 lumbar vertebrae are present, as well as the first sacral vertebra. Some of the caudal vertebrae are preserved with 6 chevrons and includes Ca01–Ca13, though only the anterior half of Ca13 is present. The right scapula, humerus and ulna are present, but only the left ulna is present. Two thoracic bones are present. The fused left and right tibia and fibula are present, as well as all bones of the left and right pes.

Australian Museum PA422 was selected as the neotype because it is the only sexed specimen displaying key diagnostic dental criteria, some of which are only seen in unworn teeth. Only two specimens are complete enough to be considered for neotype selection, AM PA422 and NMV C2900. The latter is an unsexed adult with teeth that are too worn to reveal key diagnostic characters. As a result, the juvenile dentition of the sexed AM PA422 is taxonomically more informative as a neotype than NMV C2900. AM PA422 has been fully described in Travouillon *et al.* (2019) and was the principal comparative specimen used in the species diagnosis of *Chaeropus yirratji* Travouillon *et al.* (2019).

Discussion

The collecting locality of Mitchell's original specimen has been determined by Wakefield (1966), who mapped the approximate locality in his fig. 1. His figure indicates that the locality is c. 10 miles (16 km) SE of the junction of the Murray and Murrumbidgee Rivers, Victoria. Article 76.3 of the Code (ICZN, 1999) states that the collecting locality of the neotype becomes the new type locality, irrespective of previously published statement of the type locality. A total of 12 modern specimens of *C. ecaudatus ecaudatus* are known in world collections (as well as 7 fossil specimens), some of which have precise locality data. However, PA422 is one of the two (the other being NMV C2900) that consists of a skull and post-cranial skeleton. Displacing the original type locality with the vague "Murray River" associated with the neotype is a regressive step but appears to be required by the current version of the Code. We would prefer to restrict the type locality of the neotype to that of the original type locality and hope that the next edition of the Code can accommodate situations such as this.

It is very unlikely that PA422 is the original specimen collected by Mitchell. The partial skeleton associated with skull PA422 cannot be his original specimen because it contains caudal vertebrae yet the tail was reportedly absent from Mitchell's specimen. Further, it consists of a complete set of skeletal elements of manus and pes that would have invariably been included in the preparation of a skin mount. The skull and post-cranial bones are both of a juvenile animal. The occipital region of the skull is missing. This prevents absolute confirmation that the skull has been correctly matched with the partial skeleton, but as both are of a juvenile individual, we accept that they are unlikely to have been mismatched at an earlier time.

As far as we are aware, the remarks by Krefft (1870) are the last record of the holotype of *C. ecaudatus*. Ogilby (1892) states that the holotype is in the AM collection but it is not clear if this was conjecture or if he actually sighted the specimen. Iredale and Troughton (1932: v) were critical of Ogilby (1892), which they imply was largely a "desk top" study with little reference to specimens in the collection. We have not found any further reference to the type specimen



Figure 1. Australian Museum PA422, neotype skull and partial skeleton of *Chaeropus ecaudatus* Ogilby 1838. Scale = 5 cm.

in the literature or archival documents. Troughton (1930: 179) remarked that “This type specimen was lodged in the Australian Museum, but some time afterwards unfortunately disappeared.” His statement is significant because he was well placed to draw on the “Institutional memory” of the AM from zoologists who worked or were associated with the AM throughout the decades immediately after the end of Krefft’s curatorship. For example, Troughton joined the AM in 1908 and was a contemporary of E. P. Ramsay, who was a research associate at the AM until 1915 and Krefft’s immediate curatorial successor. Troughton was also a contemporary of R. Etheridge Jr, who had replaced Ramsay as Director in 1895.

We have found only two specimens of *C. ecaudatus* in the early specimen registers of the AM. Both were registered by Secretary Palmer in the “Palmer” register at an unrecorded date but probably 1877 or 1878. Both are listed as “*Chaeropus castanotus*” (a misspelling of *Chaeropus castanotis*, a junior synonym of *Chaeropus ecaudatus*) and “Murray River”. Palmer listed PA421 as a “Mounted skin” and PA422 as a “skeleton” but Palmer did not enter any further information, perhaps because nothing further was associated with the specimen labels. A subsequent entry in the Palmer register indicates that both specimens were received from the “Melbourne Museum”. This entry was probably made during a specimen inventory around 1907

(see Parnaby *et al.*, 2017: 288) but remains problematic. Several specimens were received from Museum Victoria during the 1860s and possibly the early 1870s but the poor documentation of all of the early mammal specimens in the AM at that time prevents a reliable determination of the provenance of surviving specimens. The exact number received from the MV also remains unclear, some of which could have been sent to other institutions in the ensuing century. The total number of specimens of *C. ecaudatus* held by the AM during the 19th century thus remains unknown and not all specimens were necessarily registered at that time. Further, it is not known how many specimens of *C. ecaudatus* had been obtained by Krefft at the time his association with the AM was terminated in 1874. Krefft (1870) states “The animal is still rare, and after endless correspondence I obtained one; two more have since been captured by my friend, Mr John Williams of Gall Gall, who is only waiting an opportunity to send them to Sydney.” Williams was a local resident who assisted the Blandowski Expedition of 1856–1857. It is not known if Krefft ever received the specimens. It has not yet been established how many specimens of *C. ecaudatus* existed in the AM collection by the end of Krefft’s curatorship in 1874. The AM collection could have contained perhaps five specimens in addition to the holotype skull: perhaps two specimens from MV, and possibly up to three other specimens mentioned by Krefft

(1870). Inadequate documentation of material exchanged out of the AM collection during the 19th century is a further consideration.

Perhaps the skull of Mitchell's original specimen disappeared around the time of Krefft's dismissal from the AM in 1874, but we are not implying that Krefft was necessarily responsible for its fate. Several key specimens in the AM collection have not been sighted since his dismissal (see Parnaby *et al.*, 2017: 289).

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