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Found Alive After 6,000 Years: Modern Records of an 'Extinct' Papuan Marsupial, *Dactylonax kambuayai* (Marsupialia: Petauridae), with a Revision of the Systematics and Zoogeography of the Genus *Dactylonax*

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Abstract. The Pygmy long-fingered possum, *Dactylonax kambuayai*, is the smallest of the striped possums (the petaurid subfamily Dactylopsilinae). It is a 'Lazarus species', found living when previously known only from fossils. Recently collected museum specimens, and observations and photographs of living individuals, correspond taxonomically to the only previously reported specimens of *D. kambuayai*, which are fossil remains from a nearby Holocene location, all occurring in low- to mid-elevation rainforests on the Vogelkop Peninsula of New Guinea. Together with the recent discovery of another Lazarus possum, *'Petauroides' ayamaruensis*, they represent the only marsupials known as modern animals only from low elevations (below 1000 m) on the Vogelkop Peninsula. Both of these species are diminutive species with enigmatic natural histories. In reviewing the systematics of this species, we demonstrate the distinctness of *Dactylonax* as a genus-level taxon, and clarify species boundaries in this genus. *Dactylonax palpator*, the type species of *Dactylonax*, was previously considered to be a widespread montane taxon, but is recognized here as two separate species: *D. palpator* is restricted to the Arfak Mountains of the Vogelkop, while *D. ernstmayri* is widely distributed on the New Guinean Central Cordillera and the Huon Peninsula at elevations above 800 m. *Dactylonax palpator* replaces, or co-occurs with, *D. kambuayai* at elevations between around 900 m and 1,400 m on the Vogelkop. We hypothesize that colonization of montane habitats on the Vogelkop by a *D. kambuayai*-like ancestor gave rise to the larger bodied *D. palpator*, and dispersal of this lineage to montane habitats in the Central Cordillera gave rise to the highly specialized *D. ernstmayri*. The fact that the montane taxon of the Vogelkop *Dactylonax* species couplet was able to migrate eastwards, while the lowland taxon was not, suggests that an unusual elevational zoogeographic filter was in play. We observe that *D. kambuayai* is thus far recorded from sites where the other small petaurid of New Guinea, *Petaurus papuanus*, is not recorded or is uncommon.

Keywords: Marsupialia; Petauridae; *Dactylonax*; *kambuayai*; *palpator*; *ernstmayri*; Lazarus taxon; Vogelkop; New Guinea; systematic review
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ABSTRAK. [Bahasa Indonesia]. Posum jari-panjang kerdil (*Dactylonax kambuayai*) merupakan anggota terkecil dari kelompok posum belang (subfamili petaurid Dactylopsilinae). Spesies ini termasuk 'spesies Lazarus', yakni ditemukan masih hidup setelah sebelumnya hanya dikenal dari catatan fosil. Spesimen museum yang dikoleksi baru-baru ini, serta pengamatan dan dokumentasi fotografi individu hidup, secara taksonomis sesuai dengan satu-satunya spesimen yang sebelumnya pernah dilaporkan untuk *D. kambuayai*, yaitu sisa-sisa fosil dari lokasi Holosen terdekat, seluruhnya berasal dari hutan hujan dataran rendah hingga menengah di Semenanjung Vogelkop, Papua Barat.

Bersama dengan penemuan terkini spesies Lazarus lainnya, *'Petauroides' ayamaruensis*, kedua spesies ini merupakan satu-satunya marsupial yang diketahui sebagai hewan modern yang terbatas pada elevasi rendah (di bawah 1.000 m) di Vogelkop. Keduanya merupakan spesies berukuran kecil dengan riwayat alami yang masih enigmatik.

Dalam tinjauan sistematika spesies ini, kami menunjukkan bahwa *Dactylonax* merupakan takson yang berbeda pada tingkat genus, serta memperjelas batas-batas spesies di dalam genus tersebut. *Dactylonax palpator*, sebagai spesies tipe genus *Dactylonax*, sebelumnya dianggap sebagai takson pegunungan yang tersebar luas, namun di sini diakui terdiri atas dua spesies terpisah: *D. palpator* terbatas pada Pegunungan Arfak di Vogelkop, sedangkan *D. ernstmayri* tersebar luas di Pegunungan Tengah Nugini (Central Cordillera) dan Semenanjung Huon pada elevasi di atas 800 m.

Dactylonax palpator menggantikan, atau hidup simpatrik dengan, *D. kambuayai* pada elevasi sekitar 900 m hingga 1.400 m di Vogelkop. Kami mengajukan hipotesis bahwa kolonisasi habitat pegunungan di Vogelkop oleh leluhur yang menyerupai *D. kambuayai* menghasilkan bentuk berukuran tubuh lebih besar, yaitu *D. palpator*, dan bahwa penyebaran garis keturunan ini ke habitat pegunungan di Pegunungan Tengah menghasilkan spesies yang sangat terspesialisasi, *D. ernstmayri*. Fakta bahwa takson pegunungan dari pasangan spesies *Dactylonax* di Vogelkop mampu bermigrasi ke arah timur, sementara takson dataran rendah tidak, menunjukkan adanya suatu penyaring zoogeografis elevasional yang tidak lazim.

Kami mencatat bahwa *D. kambuayai* sejauh ini hanya tercatat dari lokasi-lokasi di mana petaurid kecil lainnya dari Nugini, *Petaurus papuanus*, tidak ditemukan atau jarang dijumpai.

Introduction

A relatively small number of animal species hold the distinction of having been described initially from fossil remains, then subsequently discovered as a living animal. In palaeontology, lineages that drop out of the fossil record and then re-emerge after long periods are termed 'Lazarus taxa' (Flessa & Jablonski, 1983; Jablonski, 1986; Fara, 2001) and this term may be usefully extended to cover this special class of modern species. The Australo-New Guinea region hosts four previous examples of 'Lazarus' mammal species. The Mountain Pygmy Possum, *Burramys parvus* was described from cave deposits of late 'Pleistocene' age southeastern Australia, (Broom, 1895) before being found as a living animal almost 60 years later in Australian alpine habitats (Calaby *et al.*, 1971). The northern hairy-nosed wombat *Lasiorhinus krefftii*, of eastern Australia, was first named from a Pleistocene cave deposit (Owen, 1872), then renamed several times from extant populations (de Vis, 1900; Longman, 1939). Bulmer's Fruit Bat, *Aproteles bulmerae*, a large bat endemic to the highlands of New Guinea, was first recognized in an archaeological assemblage of late Pleistocene to early Holocene age (Menzies, 1977) and a few years later was found as a living animal in a remote location (Hyndman & Menzies, 1980; Flannery & Seri, 1993). Most recently the pseudocheirid possum *'Petauroides' ayamaruensis* (Aplin, 1999), of western New Guinea, was discovered as a living taxon after being previously known only from Holocene (*ca*. 6,000–7,500-year-old) fossils (Flannery *et al.,* 2026).

These most recent examples (*Aproteles bulmerae*, *Dactylonax kambuayai*, and *'Petauroides' ayamaruensis*) originate from the large tropical island of New Guinea. Another relatively recent example from the region comes from the Wallacean island of Flores, where the murid rodent *Paulamys naso*, originally described as a fossil (Musser, 1981; Musser *et al*., 1986), was documented as a living animal by Kitchener *et al*. (1991, 1998). Other surprises may await, given that on some other islands in the region, the mammal subfossil fauna is as yet better studied than the modern fauna. Possibilities include a variety of other rodents known to date only in the Holocene fossil records of the Wallacean islands of Flores (Musser, 1981; Veatch *et al*., 2023), Timor (Aplin & Helgen, 2010), and Morotai (Aplin *et al*., 2023) to the west of New Guinea, and in New Ireland in the Bismarck Archipelago (Flannery & White, 1991) and Buka in the Solomon Islands (Flannery & Wickler, 1990) to the east of New Guinea. Lazarus may yet awake in these islands.

Dactylonax kambuayai was described as *Dactylopsila kambuayai* Aplin, 1999, from craniodental remains within an archaeological excavation of mid Holocene age from the Ayamaru Plateau of the Vogelkop Peninsula (Cenderawasih Peninsula) of Indonesian West Papua (Aplin *et al*., 1999) (Fig. 1). Though listed as extinct in subsequent compendia (Turvey, 2009; Turvey & Fritz, 2011), Helgen (2007) suggested that the species was likely to be found extant when the mammal fauna of western New Guinea was better surveyed. One of us (KPA) uncovered two previously overlooked modern specimens referable to *D. kambuayai* among specimens stored in fluid jars at the University of Papua New Guinea, where they had been misidentified as *D. palpator*. Based on this information, Jackson (2015: 558–559) provided the first published notice of this modern survival of *D. kambuayai*, provided the first illustration of its external appearance, and discussed its biology. Here we expand on that preliminary account to describe these modern specimens of *D. kambuayai* in more detail, and discuss additional records of *D. kambuayai* based on field observations and photographs of living animals documented since 2023.

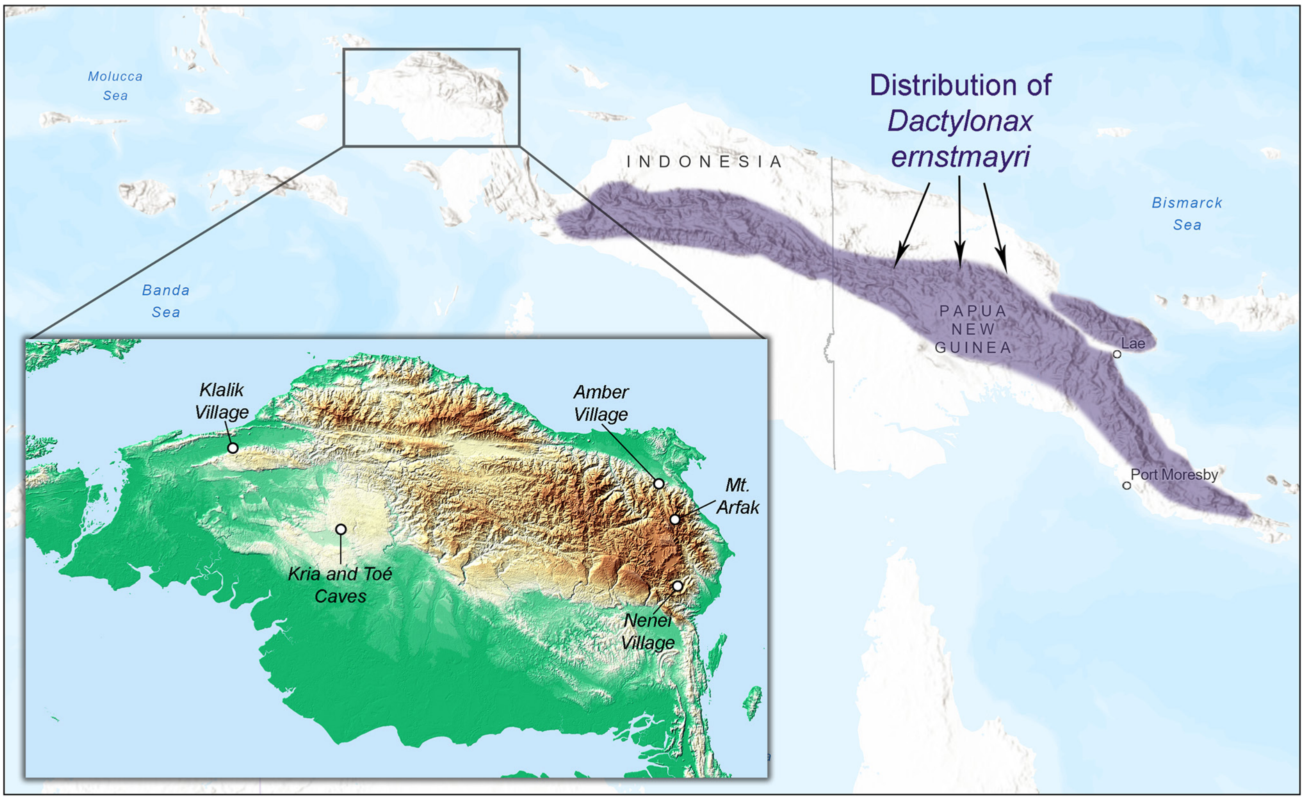

Figure 1. Map of New Guinea with distributional range of *Dactylonax ernstmayri* (shaded), and inset showing locations of *D. kambuayai* (Kria Cave, Klalik Village, and Nenei Village) and *D. palpator* (Mount Arfak, Toé Cave and Amber Village) referred to in main text.

Though originally described within the genus *Dactylopsila* (Aplin *et al*., 1999), here we allocate *D. kambuayai* to another, related genus, *Dactylonax*—*Dactylonax kambuayai* **n. comb.**

The genus *Dactylonax* was erected by Thomas (1910) for the broad-headed, long fingered (see Fig. 2b) striped possum *Dactylopsila palpator* Milne-Edwards, 1888 (Fig. 3). *Dactylonax* was subsequently synonymized with *Dactylopsila* by Ramme (1914), though Cabrera (1920) restored it to generic status, which was followed by Tate & Archbold (1937), Tate (1945), and Laurie & Hill (1954). Flannery (1990, 1994), however, followed Ramme in synonymizing with *Dactylopsila*, and most authors have followed this convention since (e.g., Groves, 2005; Jackson, 2015). We document below our reasons for using *Dactylonax* as a genus-level name, and for including *D. kambuayai* within the genus.

The only previously described fossil taxon in the subfamily Dactylopsilinae is *D. kambuayai*. The fossil record of dactylopsilines is fragmentary, with undescribed taxa from Oligo-Miocene Riversleigh (Archer *et al*., 1999) and Middle Pleistocene Mt Etna Caves, Queensland (Hocknull, 2005, 2009; Hocknull *et al*., 2007). The Middle Pleistocene dactylopsilines represent a lowland fauna and include a diminutive taxon of similar size and morphology to *D. kambuayai* (Hocknull, 2005, 2009). The Pleistocene occurrence of *D. kambuayai*, or a closely related species, on mainland coastal lowland eastern Australia demonstrates that this lineage of very small striped possum was, until relatively recently, more widespread, and suggests that entry of *Dactylonax* into New Guinea likely occurred in the Pliocene or early Pleistocene, possibly through the Vogelkop lowlands.

Here we review the rediscovery of *D. kambuayai* as a living animal and establish its taxonomic identity with respect to its closest living relatives. The aims of this study were to: (1) establish that the modern specimens of small striped possums from western New Guinea identified by us did indeed represent *Dactylonax kambuayai* (Aplin, 1999) (Fig. 2); (2) establish the taxonomic status of the other named forms of *Dactylonax*, *D. palpator* Milne-Edwards, 1888, and *D. ernstmayri* Stein, 1932; and (3) cement the generic standing of *Dactylonax* as a lineage distinct from its sister genus *Dactylopsila* Gray, 1858. We cover these aims below in reverse order, from the generic level to the specific.

Materials and methods

All morphological measurements were made with electronic calipers. Cranial and dental measurements are all listed in Tables 1 and 2. All cranial and dental measurements were rounded to the nearest 0.1 mm. All external body measurements were taken by the original collectors of the specimens in the field, apart from any exceptions mentioned below.

Museum abbreviations: AM M = Mammal collection, Australian Museum, Sydney; AMNH = American Museum of Natural History, New York; BMNH = Natural History Museum, London; BPBM = Bernice Pauahi Bishop Museum, Honolulu; MNHN = Muséum national d'Histoire naturelle, Paris; MZB = Museum Zoologicum Bogoriensis, Cibinong, Indonesia; NMS = Swedish Museum of Natural History, Stockholm; PNGNM = Papua New Guinea Museum and Art Gallery, Port Moresby; UPNG = University of Papua New Guinea, Port Moresby; WAM = Western Australian Museum, Perth; ZMB = Museum für Naturkunde, Berlin.

Systematics

Order Diprotodontia Owen, 1877

Family Petauridae Bonaparte, 1832

Subfamily Dactylopsilinae Kirsch, 1977

Content: There are two described genera in the subfamily, *Dactylopsila* Gray, 1858 (the 'striped possums') and *Dactylonax* Thomas, 1910 (the 'long-fingered possums'), both of which comprise possums with unmistakable markings consisting of bold black-and-white striping patterns on the dorsal surface of the body.

The evidence for generic separation of *Dactylonax* from *Dactylopsila* is strong. Their morphological distinction is trenchant. Specializations in skull shape (shortened rostrum, broader skull, enlarged incisors), the basicranium (Fig. 5), and fourth digit of the manus (Fig. 6) are part of a functional-adaptive complex that enables species of *Dactylonax* to specialize-feed on wood-boring insect larvae (Flannery, 1995), similar to the remarkable ecomorphology of the lemur *Daubentonia* (Szalay & Lucas, 1996; Rasmussen & Sussman, 2007) In addition to its uniquely derived hand morphology, *Dactylonax* is also easily distinguished externally by its short tail, which ranges from much shorter than, to subequal to, head-body length, as compared with the tail in species of *Dactylopsila*, which is much longer than the head and body. This difference denotes the largely terrestrial habits of *Dactylonax* compared to the arboreal *Dactylopsila*.

Molecular data demonstrate that the evolutionary divergence between *Dactylopsila* and *Dactylonax* dates to about 10 million years ago (Osborne & Christidis, 2001), a level of genetic difference and time-depth that approximates extant macropodid subfamily distinctions and is equivalent to the divergences between various well-recognized marsupial sister genera such as the Australo-Papuan cuscuses *Phalanger*-*Spilocuscus*, the Sulawesi cuscuses *Strigocuscus*-*Ailurops*, or the Australian wombats *Lasiorhinus*-*Vombatus* (Mitchell *et al*., 2014).

The sister lineage of the dactylopsilines is not yet clear. Some molecular studies (Osborne & Christidis, 2001; Meredith *et al*., 2009) and the total evidence (molecular and morphological data) study compiled by Beck *et al*. (2022) have recovered a sister relationship between the monotypic genus *Gymnobelideus* (with sole known species *G. leadbeateri* McCoy, 1867, the Wollert or Leadbeater's Possum) and dactylopsilines. The more recent and comprehensive molecular study of Mitchell *et al*. (2014) recovered *Gymnobelideus* as sister to the genus *Petaurus* (the gliders, sole genus of Petaurinae).

Difficulty in allocating *Gymnobelideus* to either modern petaurid subfamily demonstrates the depth of the tripartite division within the family Petauridae, with *Gymnobelideus* representing a deep evolutionary lineage dissimilar to either subfamily and with unclear immediate affinity. As a better reflection of its distinction, we allocate this genus to a newly-designated subfamily, Gymnobelideinae Helgen & Flannery, subfam. nov., with similar level of antiquity and morphological distinction as the other petaurid subfamilies, Petauridae and Dactylopsilinae. Gymnobelideinae is thus far monotypic and can be diagnosed as for the type genus, *Gymnobelideus*. *Gymnobelideus* is morphologically isolated, distinguishable from other petaurids by a large number of anatomical character states (Beck *et al*., 2022), and recognizable by its vestigial gliding membrane (absent in dactylopsilines, well developed in *Petaurus*), club-shaped tail, and minuscule claws, among many other distinctions (Fig. 2c). Incidentally, Leadbeater's Possum is a Lazarus species of another kind—first described as a living animal in 1867, then undocumented between 1909 and 1961 and widely feared extinct (Flannery, 1994) before being rediscovered in Victoria in 1961 (Wilkinson, 1961) and more recently discovered extant in New South Wales for the first time (New South Wales Government, 2025). Subfamily-level standing for *Gymnobelideus* helps to demonstrate the fundamentally tripartite taxonomic distinction of living deep petaurid lineages and also helps to highlight the evolutionary distinctness of this critically endangered species that is reliant on mature mountain ash forests (Lindenmayer, 1996).

Genus *Dactylopsila* Gray, 1858

Included species: Three species are recognized, all extant—*Dactylopsila megalura* Rothschild and Dollman, 1932 (montane central and western New Guinea); *D. tatei* Laurie, 1952 (mountains of Fergusson Island off southeastern New Guinea); and *D trivirgata* Gray, 1858 (widespread in New Guinea and extending to a number of Melanesian land-bridge islands including Aru and to Cape York Peninsula in northern Australia).

Diagnosis. Skull relatively narrow and elongate, as in petaurines. Fourth digit of manus only slightly elongated (Fig. 2a). Maxilla does not contact nasal bones, anterior incisors (upper and lower) large relative to other teeth, upper incisors strongly procumbent.

Genus *Dactylonax* Thomas, 1910

Type species: *Dactylopsila palpator* Milne-Edwards, 1888, by original designation (Thomas, 1910).

Included species: Three species are recognized, all extant—*D. palpator* (Milne-Edwards, 1888); *D. ernstmayri* (Stein, 1932); and *D. kambuayai* (Aplin, 1999), as discussed below. Until now, the similarly-sized *D. palpator* and *D. ernstmayri* have been treated as conspecific, often as separate subspecies, but we argue that these are allopatric species that differ substantively in morphology of the manus and in basicranial anatomy, as we discuss below.

Diagnosis. Skull short and extremely broad, fourth digit of manus greatly elongated (Fig. 2b). Zygomatic arches strongly convex, cranial vault high and rounded, facial region short. P^1 anteroposteriorly broad and angular, lanceolate in form, and flattened mediolaterally. P^4 longer relative to M^1 compared to *Dactylopsila*. I_1 alveolus posteriorly recessed relative to P_1. Lower premolar row (P_1–P_4) short and ascending steeply between I_1 and M_1. Molar gradient steeper than in *Dactylopsila*. Masseteric fossa massive.

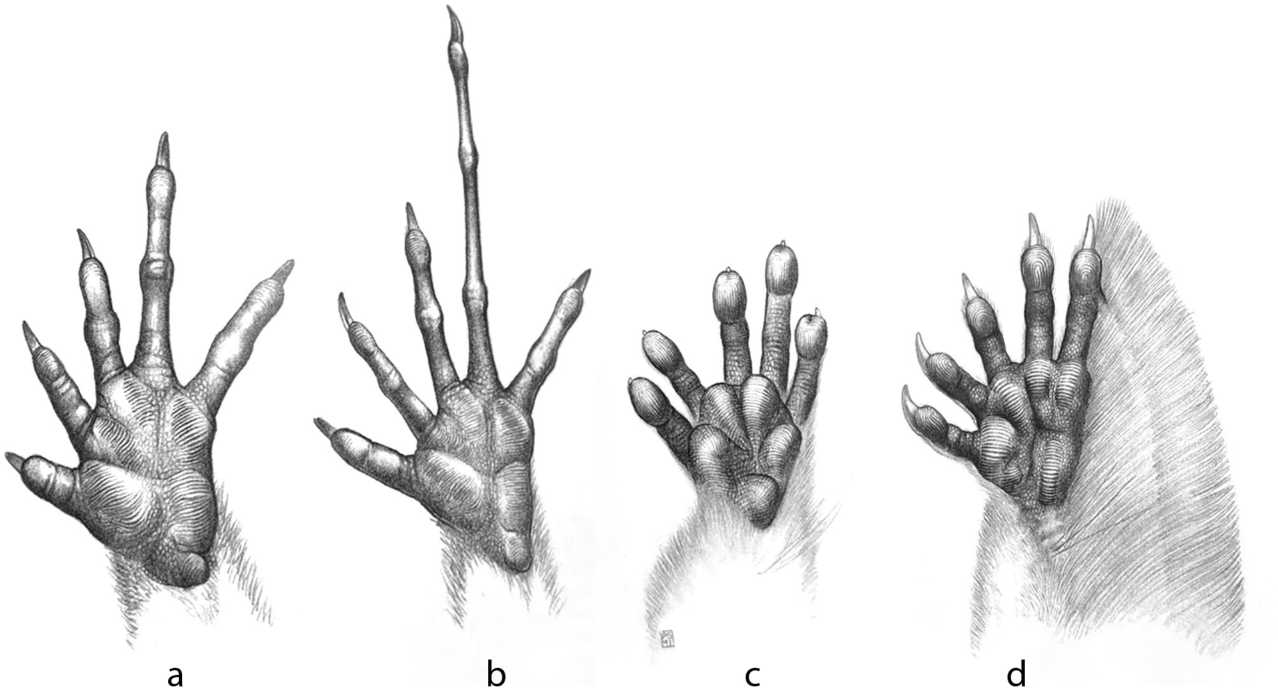

Figure 2. Hands of the four extant genera (and three subfamilies) of family Petauridae. Palmar surfaces of the manus, showing key differences in phalangeal proportions, claws, palmar pads, furring, and patagial development in (*a*) *Dactylopsila*, subfamily Dactylopsilinae (represented by *Dactylopsila trivirgata*); (*b*) *Dactylonax*, subfamily Dactylopsilinae (represented by *Dactylonax palpator*); (*c*) *Gymnobelideus*, represented by *G. leadbeateri* (*Gymnobelideus* McCoy, 1867 is type genus of the new subfamily proposed here: Gymnobelideinae Helgen & Flannery, **subfam. nov.**—urn:lsid:zoobank.org:act:286C8D5D-FB21-4AB7-B0C0-7BC8EEFEC7CD, *Gymnobelideus leadbeateri* McCoy, 1867 is type species of *Gymnobelideus,* the new subfamily and its type genus are both monotypic); (*d*) *Petaurus*, subfamily Petaurinae (represented by *P. norfolcensis*). Modified from Flannery (1994:61–65). Drawings by Peter Schouten.

Table 1. Craniodental measurements for selected specimens of *Dactylonax* (adult specimens at AM, plus the holotype of *D. palpator* at MNHN) in mm. CBL = condylobasal length, BZW = bizygomatic width, IOW = interorbital width, RW = rostrum width at I1 alveolus, LMRL = lower molar row length, M1w = lower first molar width. Additional cranial measurements for *Dactylonax* were reported by Tate and Archbold (1937) and Laurie (1952).

	CBL	BZW	IOW	RW	LMRL	M1w
Dactylonax kambuayai						
AM M.56796 ♀	45.0	34.1	12.5	6.3	8.5	1.7
Dactylonax palpator						
AM M.29254 ♀	54.3	42.0	14.5	17.6	11.0	2.3
AM M.38069	—	—	—	—	10.7	2.3
MNHM 1886-1224 ♂	60*	42.4	—	—	—	—
Dactylonax ernstmayri						
AM M.37997 ♀	54.9	42.5	16.2	18.5	10.4	2.3
AM M.7323 ♂	55.0	44.3	16.3	18.9	10.6	2.2
AM M.13587 ♂	—	—	20.8	19.6	—	—
AM M.15615 ♂	55.6	41.5	15.4	17.9	—	2.3
AM M.15614 ♂	58.0	46.0	15.4	18.5	10.3	2.1
AM M.15580 ♂	—	—	17.2	19.4	11.1	2.2
AM M.27312 ♂	57.8	45.5	18.8	19.5	10.4	2.2
AM M.30729 ♂	58.8	44.8	17.2	18.9	10.0	2.1
AM M.30735 ♂	57.8	43.3	16.8	18.4	10.5	2.2

* The skull is broken in the holotype, such that an accurate CBL cannot be measured. Milne-Edwards' (1888) measurement of 60 mm (larger than for other known *Dactylonax* specimens) is likely an estimate of the length of the skull including the forward-jutting incisor, rather than CBL per se, and is probably an overestimate.

Figure 3. The original figure of the holotype of *Dactylonax palpator* (Milne-Edwards, 1888) published in *Mémoires publiés par la Société Philomathique à l'occasion du Centenaire de sa Fondation 1788–1888*.

Figure 4. *Dactylonax kambuayai* (Aplin, 1999)—a painting by Peter Schouten. This artwork is based on the two modern specimens in the Australian Museum (M.56796 adult female and pouch young M.56797).

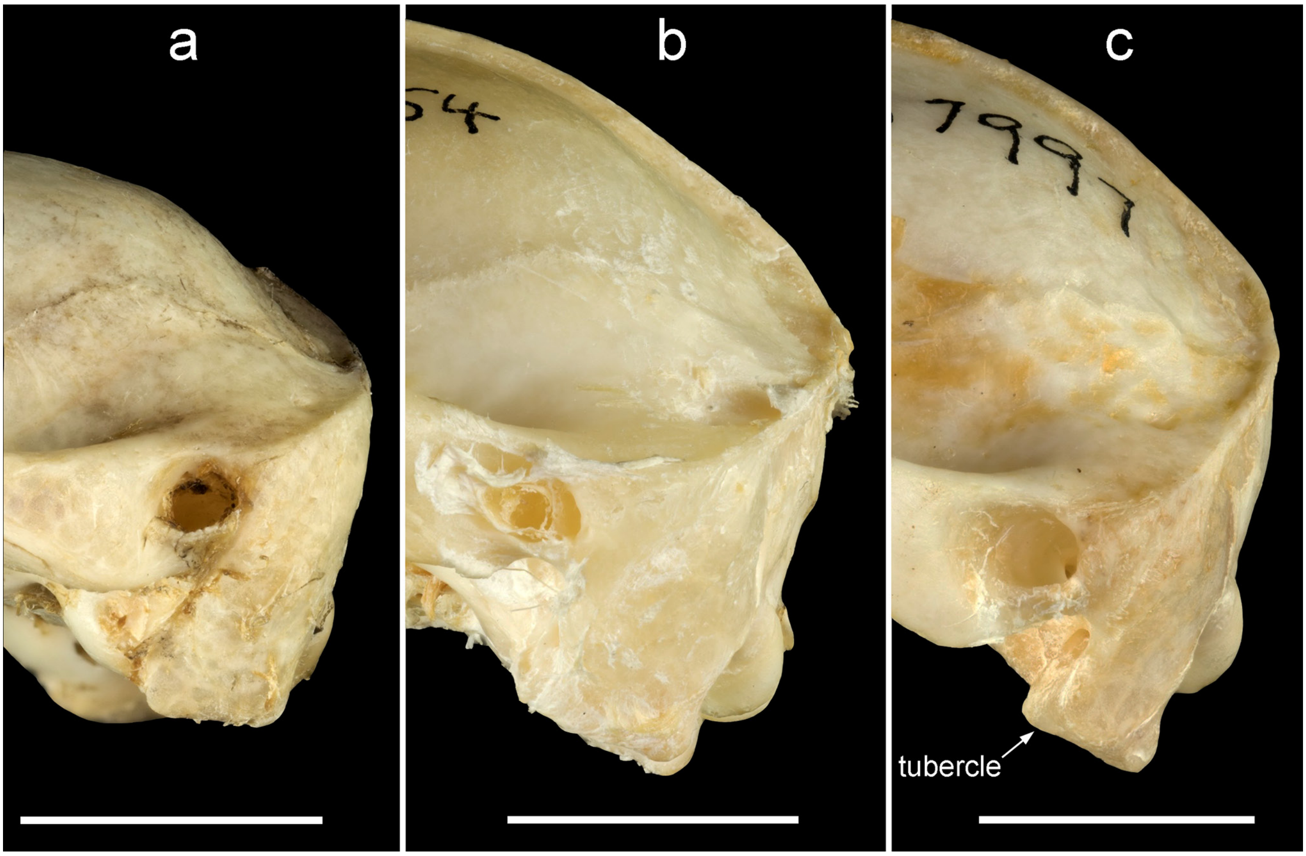

Figure 5. Lateral view of left auditory region of: (*a*) AM M.56796 (*Dactylonax kambuayai*); (*b*) AM M.29254 (*D. palpator*); and (*c*) AM M.37997 (*D. ernstmayri*). Tubercle = petrosal tubercle. All scale bars = 10 mm. Photo credit Emily Cave.

Dactylonax palpator (Milne-Edwards, 1888)

Western Long-fingered Possum

Diagnosis. A larger-bodied species (Tables 1–2) than *Dactylonax kambuayai*, *D. palpator* differs from *D. ernstmayri* in that the ectotympanic is large and slopes anterodorsally from the hyoid tubercle of the petrosal (homology as per Tate & Archbold, 1937) (Fig. 5a–c), in that the fourth digit of the manus is more elongate (Figs 3, 6, Table 3), and possesses a claw that is less reduced in size and less acutely hooked (Fig. 6a–c; Table 3). It may have a narrower rostrum than *D. ernstmayri* (Table 1). It is distinguished from *D. kambuayai* in lacking an ectotympanic bulla (Fig. 7), possessing a sagittal crest, in being much larger in body mass, yet with a relatively shorter ear (Table 2) and a proportionally shorter fourth digit of the manus which bears a claw that is less reduced in size relative to the other claws of the hand (Fig. 6).

Notes. Milne-Edwards (1888) received the type specimen of *palpator* from the collector Leon Laglaize in 1886, and gave the type locality as the 'côte sud de la Nouvelle-Guinée' (south coast of New Guinea), but this has always seemed unlikely, given that all subsequent specimens of larger *Dactylonax* (*D. palpator* and *D. ernstmayri*) originate from montane contexts above 800 m (Flannery, 1995; Helgen, 2007). Likely on the basis of this uncertainty, Beaufort (1966) stated the type locality simply as 'Nouvelle Guinée'. However, the plaque on the base of the holotype mount (MNHN 1886-1224) and the museum's General Catalogue state that the specimen was from Mount Arfak (Julien-Laferrière, 1994). Given this information, and the fact that the species is known in modern contexts otherwise only from the Arfak Mountains, we here restrict the type locality to Mount Arfak.

Dactylonax palpator is poorly represented in museum collections. An edentulous dentary of probable late Pleistocene age (WAM 98.7.32) is recorded from the lower level in Toé Cave, Ayamaru Lakes area (Jelsma, 1998), Vogelkop, by Aplin *et al*. (1999) (Fig. 1). Toé Cave lies at around 400 m elevation, and a number of mammalian taxa that today are restricted to higher elevations are recorded from its late Pleistocene levels in the cave (Aplin, 1998; Pasveer & Aplin, 1998; Aplin *et al*., 1999; Pasveer, 2004). (Elevational zonation was depressed during the last glacial maximum; for example the tree line in the Central Cordillera of New Guinea, which today occurs at 3,900 m, was then located at 2,100–2,300 m; Hope & Hope, 1976). Apart from the holotype of *palpator* from Mount Arfak, only two additional modern specimens are known: AM M.29254, an adult female skin and skull from Amber Village, Mokwam area, Vogelkop, collected on 10 October 1992; and AM M.38069, a pair of trophy mandibles from Pin-nai Village, Arfak Mountains. Amber village lies just east of Mokwam in the Menyambouw area (Fig. 1). The elevation of the region surrounding Amber village is from around 600 m to around 1,400 m. It is likely that AM M.29254 came from the higher elevation part of that range. The Hatam name given for *D.*

Figure 6. Manus of (*a*) *Dactylonax kambuayai* (AM M.56796), (*b*) *D. palpator* (AM M.29254), and (*c*) AM M.27312 (*D. ernstmayri*), showing phalanx proportions and ungual claw shape on elongate fourth digit. Photographs not to scale. Photo credit Emily Cave.

palpator is 'Doncheu'. AM M.29254 was located and caught by dogs while it was sheltering in a hole in the ground. A female, it was not lactating or carrying a pouch young when captured. It had no noticeable odour when fresh (TFF *pers. obs*.) and its preserved skin lacks the odour that is so pungent on skins of *D. ernstmayri*.

Dactylonax ernstmayri (Stein, 1932)

Eastern Long-fingered Possum

Diagnosis. A larger bodied member of the genus (Tables 1–2), with a relatively shorter second phalanx on the fourth digit (Table 3) and with the claw on the fourth digit of the manus reduced in size and more acutely curved than in other species (Fig. 6). The basicranium is unique in having a prominent petrosal tubercle for the hyoid (terminology follows Tate & Archbold, 1937). This results from an extreme reduction of the ectotympanic. It differs from the much smaller *D. kambuayai* in lacking an inflated ectotympanic bulla (Fig. 5) and possessing a sagittal crest and in possessing a modal number of four unicuspids in the lower jaw (three in *D. kambuayai*) (Fig. 7a–c).

Morphology. Stein (1932) originally described *ernstmayri*, based on a skin without skull, as a subspecies endemic to the outlying mountains of the Huon Peninsula (type locality Junzaing in the Saruwaged Range). He diagnosed *ernstmayri* as differing from *palpator* in possessing a band of yellowish-white fur around the wrist. Tate (1945) observed that this pelage character was of no systematic value, and varied in Huon Peninsula samples of *D. ernstmayri*. We conclude the same, from our larger sample of more than 80 specimens examined from throughout the broader range of this species. For example, the dorsal surface of the wrist is dark brown in AM M.37997 (Enga Prov.), while in AM M.15862 (Telefomin) it is pale brown, in AM M.7323 (Mt Hagen) it is grey, and in AM M.15880 (Telefomin), AM M.30729 and AM M.30735 (both from Kwiyawagi) it is whitish. (In AM M.29254 (the female skin of *D. palpator* available to us) the dorsal surface of the wrist is covered in extremely fine, pale (almost white) fur, but is somewhat darker colored in the male holotype (Fig. 3)).

Table 2. Body measurements of species of *Dactylonax*. HB = head-body length (mm); TV = tail-vent length (mm); TV/HB = ratio of TV to HB expressed as a percentage; HF = hindfoot length (mm); E = ear length (mm); WT = weight (grams). Table based on all adult specimens with field measurements at AM, AMNH, BMNH, BPBM, MZB, NMS, PNGNM, UPNG, ZMB.

	HB	TV	TV/HB	HF	E	WT (g)
♂ ***Dactylonax palpator***	270* n = 1	200 n = 1	74%* n = 1	— —	— —	— —
♂♂ ***Dactylonax ernstmayri***	236 ± 13.7 207–263 n = 42	203 ± 17.7 176–236 n = 41	87% 69–105% n = 41	46.0 ± 3.87 35–51 n = 34	26.9 ± 1.87 22–30 n = 34	453 ± 60.2 280–550 n = 19
♀ ***Dactylonax kambuayai***	176 n = 1	180 n = 1	102% n = 1	42 n = 1	30 n = 1	216 n = 1
♀ ***Dactylonax palpator***	195 n = 1	160 n = 1	82% n = 1	38.2 n = 1	24.4 n = 1	300 n = 1
♀♀ ***Dactylonax ernstmayri***	215 ± 10.4 191–235 n = 31	186 ± 19.8 135–216 n = 30	87% 61–106% n = 30	44.1 ± 3.65 37–51 n = 26	26.8 ± 1.80 24–30 n = 28	344 ± 43.5 280–420 n = 11

* Tate & Archbold (1937:476) regarded the rather large value for HB given by Milne-Edwards for the holotype of *D. palpator* (270 mm) to be 'probably stretched', and we agree. It is presumably estimated from the mounted skin (Fig. 3), and may more likely approximate the average HB of male *D. ernstmayri* (i.e., *ca*. 236 mm), as the species seem to be similar in overall body size. If so, this would yield a TV/HB percentage of 85%.

The basicranium is highly distinctive in *D. ernstmayri*, having a reduced ectotympanic bulla, and a prominent tubercle on the petrosal for attachment of the hyoid (Fig. 5). Individuals can be highly vocal, emitting a loud snarling growl when alarmed. Both males and females possess a distinctive, pungent odour which is noticeable on museum specimens even after years of storage. In its strong odour and its boldly striped pelage, *D. ernstmayri* offers a striking parallel with skunks and stink badgers of the carnivoran family Mephitidae.

Notes. The holotype of *Dactylonax ernstmayri* (Stein, 1932) (ZMB 42418) is from the Saruwaged Range on the Huon Peninsula, and previous assessments of this taxon have recognized it in a restricted sense as a Huon endemic subspecies of *D. palpator*. In our revised assessment, *D. ernstmayri* is instead widely distributed, generally at elevations above 1,400 m along the Central Cordillera, from the Weyland Range in the west to the Mt Dayman area in the east, and in the offlying Huon ranges (as '*D. palpator*' in Flannery, 1995). The vouchered elevational range of *D. ernstmayri* is from 850 m (AMNH 151964, from the Idenburg River transect on the northern face of the western Cordillera) to 2,950 m (AM M.30735, from Kwiyawagi in the Snow Mountains). The mean elevation of 38 vouchered sites of capture (specimens with elevational data at AM, AMNH, BMNH, BPBM, UPNG, ZMB) is 2,037 m (standard deviation 545 m). Helgen (2007b) noted a field observation at 3,000–3,100 m in the Kaijende Highlands near Porgera, Enga Province, and suggested this to be the upper limit of the species' elevational occurrence.

Dactylonax ernstmayri is markedly sexually dimorphic, males being around one third heavier than females (Table 2). There are indications that it is primarily terrestrial, living in underground burrows and fallen logs, though it has been observed climbing large diameter dead trees in search of the wood-boring beetle larvae that it feeds on and may also nest in tree hollows (Hide *et al*., 1984). Its ecology and distribution are summarized under *D. palpator* in Flannery (1995), where all ecological records and all distributional records (except for the type locality) in fact refer to *D. ernstmayri*. Females have two teats in the pouch but only one young at a time (Helgen, 2007b).

Ecotypic and geographic variation are both evident in this widespread montane species. Specimens from lower elevation localities (850–1,800 m), such as from the Weylands (ZMB specimens, 1,400–1,800 m) have less bushy tails than specimens from higher elevations, and have smaller skulls and teeth. At present we consider this likely to reflect local ecotypic response to different habitats across New Guinea montane gradients. On top of this kind of variation within local elevational gradients, other patterns of variation are associated with broader geographic occurrence. Body size is largest in populations from the Huon Peninsula, and from the southeast Peninsula of New Guinea, extending as far to the north and west as the Wau area and the Kratke Mountains. Specimens from further west, across much of the Central Highlands, Star and Snow Mountains regions, and the Weyland Range, average smaller. Huon specimens may generally have a darker grey venter with less cream-colored fur along the ventral midline, but this requires more comprehensive review. In past reviews, Tate & Archbold (1937) and other authors (e.g., Groves, 2005) have considered the isolated Cordilleran and Huon

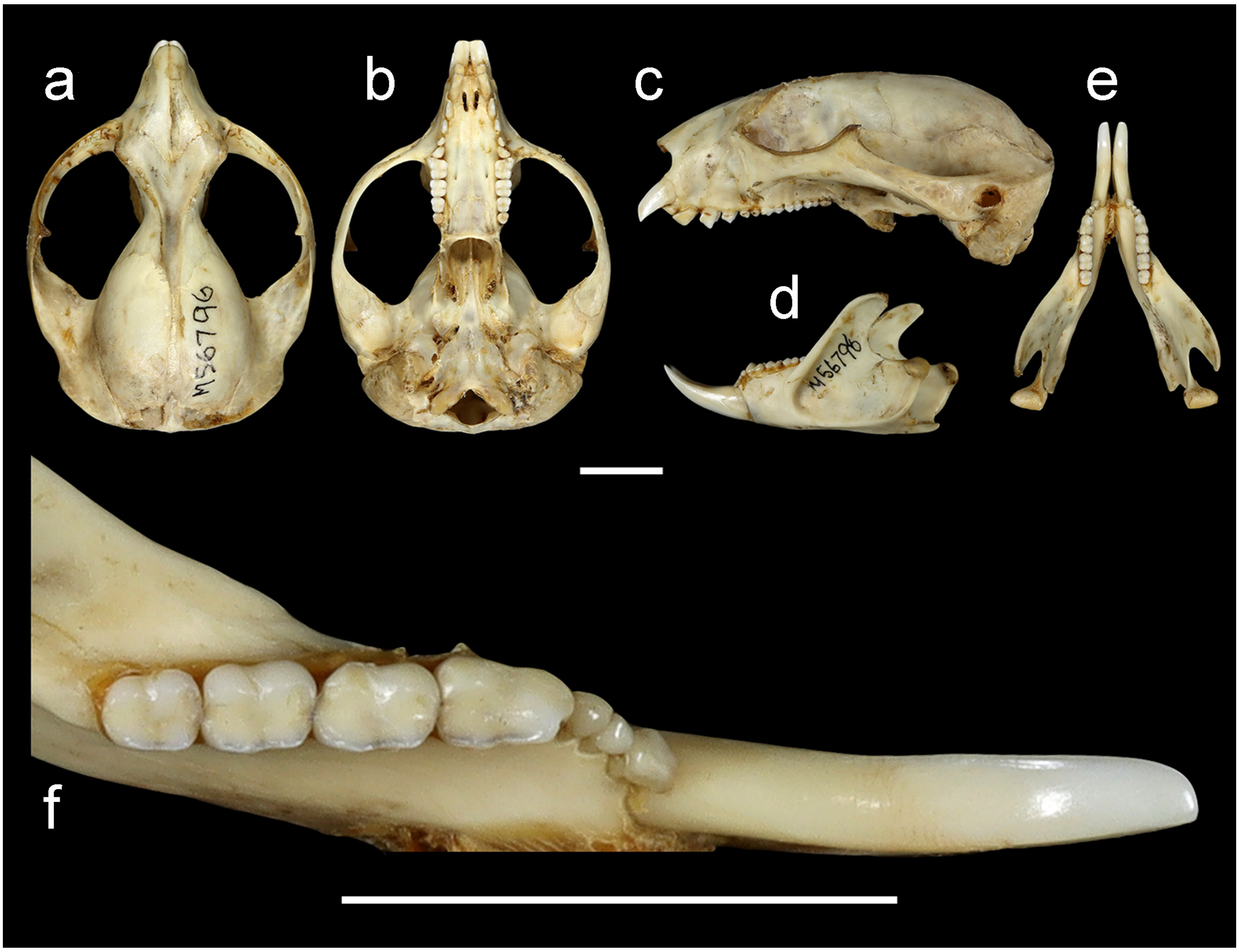

Figure 7. Skull of *Dactylonax kambuayai* AM M.56796 in dorsal (*a*), ventral (*b*), and lateral (*c*) views. Left mandible in lateral view (*d*) and occlusal tooth row (*e–f*) views. Scale bars equal 10 mm. Photo credit Emily Cave.

samples that we refer here to *D. ernstmayri*, to be separate subspecies (at that time with '*D. p. palpator*' used for all non-Huon populations of *Dactylonax*, and '*D. p. ernstmayri*' for Huon specimens). Whether our concept of *D. ernstmayri* as a species distributed across the entire Cordillera and Huon comprises additional taxonomic complexity, such as subspecies or cryptic species boundaries, awaits more detailed integrative systematic studies drawing on wide geographic sampling.

Dactylonax kambuayai (Aplin, 1999)

Pygmy Long-fingered Possum

Diagnosis. The smallest member of the genus (and of Dactylopsilinae). Despite its smaller body size, the fourth digit on the manus is as long as in other species of *Dactylonax* (and therefore proportionately longer). The claw on the fourth digit of the manus is not as reduced in size as in the other members of the genus, and not as recurved (Figs 4, 6a–c). The ears are markedly longer than in other species (30 mm vs 24–27 mm). A band of white fur extends from the upper lip to the lower margin of the eye, and the rostrum is foreshortened. The sagittal crest is absent, the bulla modestly inflated (as in species of *Dactylopsila*) (Fig. 7). The ventral projection of the basioccipital is reduced relative to other members of the genus. The available modern specimen shows that there are three unicuspids in the lower jaw (modally 4 in other *Dactylonax*, rarely any other number).

Description. The type material of *Dactylonax kambuayai* comprises a series of partial dentaries (WAM 98.7.40, 98.7.50–54), the holotype (WAM 98.7.40) being the most complete. All are of Holocene age (7,500–6,000 ybp) from Kria Cave, 3 km East of Suiwam/Mapura Village, Ayamaru Lakes region (Fig. 1). These specimens are not only smaller than all previously named dactylopsilines, but differ in important details of molar morphology (Aplin *et al*., 1999). The extracted and cleaned skull of the adult from Nenei (Fig. 7a–f) displays all of the diagnostic features of the type material of *D. kambuayai*, and its measurements agree with those of the holotype and referred specimens (Table 1).

Specific differences between *Dactylonax kambuayai* and *D. palpator* (including both *D. palpator* and *D. ernstmayri*) were originally argued on the basis of features observable in fragmentary dental remains; specifically, overall size and differences in molar morphology (Aplin *et al*., 1999). Specific differentiation is amply supported by examination of the complete specimens now available, with contrasts in

Table 3. Selected phalangeal measurements for species of *Dactylonax*. The first (P1) phalanx was measured from the rear of knuckle joint to the proximal end of the second phalanx (P2) and the second phalanx was measured from the knuckle joint to the ventral base of the claw.

	P1, Digit IV	PII, Digit IV	PII, Digit V	Ratio PII Digit IV: PII Digit V
Dactylonax kambuayai				
AM M.56796 ♀	18.4	12.6	6.6	0.52
Dactylonax palpator				
AM M.29254 ♀	17.3	14.8	6.3	0.43
Dactylonax ernstmayri				
AM M.5089 ♂	21.5	13.5	6.8	0.50
AM M.15997 ♀	17.6	11.5	—	—
AM M.17136 ♀	19.3	10.1	—	—
AM M.12877 ♂	18.1	12.2	7.3	0.60
AM M.37997 ♀	18.7	13.8	6.4	0.46
AM M.7323 ♂	17.5	13.5	6.7	0.49
AM M.18421 ♀	18.3	12.0	7.5	0.63
AM M.27312 ♂	19.3	12.5	7.2	0.58
AM M.30729 ♂	20.5	13.2	7.9	0.60
AM M.30735 ♂	17.6	11.6	7.3	0.63
AM M.15862 ♂	17.2	10.5	6.4	0.61
AM M.15880 ♂	21.6	13.9	6.4	0.46
mean	18.9	12.3	7.0	0.56
range	17.1–21.6	10.1–13.9	6.4–7.9	0.46–0.63
sample size	n = 12	n = 12	n = 10	n = 10

both external and cranial morphology. Striking differences between it and the other two species of *Dactylonax*, noted in the original description, include the greatly foreshortened rostrum and the proportionally much smaller cheek teeth of *D. kambuayai* (Fig. 7). Although the temporal lines coalesce to the centre of the skull in the adult specimen available, *D. kambuayai* is the only member of the genus *Dactylonax* that lacks development of a sagittal crest, and it is further distinguished by possessing inflated bullae (Fig. 5). *Dactylonax kambuayai* can be distinguished from *D. palpator* by external features including its smaller adult body size (Table 1), larger ears (30 mm vs 22–30 mm in the other, larger species), more subdued overall colouration (Figs 6–7), the broad dark furring of the fore- and hind-limbs, the poorly defined nature of the off-white upper lateral stripe, and the predominantly black-furred tail, with white fur restricted to the tail base and the tip. A further striking feature of *D. kambuayai* is the band of white fur that extends from the upper lip to the lower border of the eye (Figs 6–7); in all other dactylopsilines the cheek is black, part of a broad ‘mask’ that completely surrounds the eye. Many features of the pelage are seen more clearly in the short-furred pouch young (Fig. 9) than in the adult, where they are obscured by thick fur. External measurements of the adult female are listed in Table 2 (measurements for the pouch young are HB 98 mm, TV 100 mm, HF 26 mm, Ear 12 mm, weight 49 g). The fourth digit of the manus is exceptionally long relative to body size (Figs 6, 8; Table 3), being equal in length to the digits of its much larger congeners. In particular, the 2nd phalanx of the fourth digit is elongate (Table 3). The claw on the fourth digit is short and less strongly curved relative to that of other species. These modern preserved specimens of the Pygmy Long-fingered Possum were located in the teaching collection of the Biology Department of the University of Papua New Guinea. The alcohol preserved adult female (AM M.56796, now with skull extracted and cleaned) and an associated, well-furred immature female weighing (AM M.56797) are recorded in the university collection register as coming from ‘Nenei, Arfak Mountains’ and collected by Dr P. A. Woolley (formerly of La Trobe University, Victoria, Australia). Attached to both specimens are field tags labelled ‘PAW N/20’. The date of collection is recorded as 1992. Nenei is a small village in the Arfak Mountains and is located at 1.4921°S 133.9973°E (Fig. 1). The village and airstrip lie at an elevation of 867 m but forested ranges rise to the summit of Mt Arfak (2,955m) in the east. Woolley visited Nenei in the hope of locating a population of another poorly known marsupial, Doria’s Phascolosorex (*Phascolosorex doriae*; Dasyuridae) but made incidental collections of other species caught by traditional hunters (Woolley, *pers. comm*., 18 June 2013). This included the female and pouch young, which Woolley took to be examples of the long-fingered striped possum (*D. palpator*), and several specimens of the Torresian Striped Possum (*Dactylopsila trivirgata*). Both specimens of *D. kambuayai* were subsequently transferred by KPA to the Australian Museum as a longterm loan under permission from staff at UPNG.

Six other photographic records of living individuals of *D. kambuayai* come from three localities, all clustered around Klalik village in Sorong Regency, Vogelkop Peninsula (https://www.inaturalist.org/observations?subview=map&taxon_id=1575630). Klalik village lies along the main Sorong Road, and is located at (0.8175°S 131.8084°E) at approximately 50–100 m asl.

Figure 8. Photograph of a living female *Dactylonax kambuayai*, Klalik area, Vogelkop. Photo credit Carlos Bocos.

Klalik is situated 65 km north-west of Kria Cave (Pasveer, 1998, 2004), where the holotype and paratypical fossil material was found (Aplin *et al.,* 1999). The area around Klalik is primary lowland forest characterized by low trees with some evidence of tree felling for local use. An individual was photographed on 11 June 2023 by a mammal-watching tour group led by CB and Jon Hall (Fig. 8). Mammal-watching, is a rapidly growing sector of wildlife tourism which is analogous to bird-watching but where participants focus on viewing mammals (Dinets & Hall, 2018). At 10 pm a villager approached the mammal-watchers, holding a live *Dactylonax* in his hand. No detailed measurements were taken as but it was comprehensively documented with photographs and videos before being released onto the trunk of a tree.

Notes. Ecology. Direct observation by CB reveals that *D. kambuayai* moves about close to the ground, jumping from one tree-base to another, rather like African galagos. Their reluctance to climb high allows hunters to catch them by switching off their torch, creeping up on them and pouncing on them. The fact that the specialized fourth digit of the hand is as long in the diminutive *D. kambuayai* as in the much larger *D. ernstmayri*, suggests that there is a functional significance to digit length, perhaps related to the length or diameter of the burrows made in wood by their invertebrate prey, or perhaps the digit length is relative to the body length of the wood-boring invertebrate prey itself.

Discussion

Diversification in *Dactylonax*. The recognition of three species within the genus *Dactylonax*, two of which are restricted to the Vogelkop Peninsula, allows for a more nuanced assessment of the evolutionary history of the genus. The most morphologically divergent species is the lowland-dwelling *D. kambuayai*, which retains several plesiomorphic features, including the presence of an inflated ectotympanic bulla, not otherwise seen in the genus, but shared with the outgroup *Dactylopsila*. It seems likely that a *D. kambuayai*-like ancestor gave rise to *D. palpator* when a montane adapted population became genetically separate. This montane population in turn gave rise, following an eastwards migration, to the most specialized member of the genus, *D. ernstmayri*. This pattern of dispersal represents a conundrum, for it suggests that *D. palpator*, the montane member of the Vogelkop *Dactylonax* species pair, was able to disperse eastwards, while the lowlands species (*D. kambuayai*) was not. Some as yet unknown barrier to the dispersal of lowlands species must have existed. Apart from *'Petauroides' ayamaruensis* (Flannery *et al*., 2026), *Dactylonax kambuayai* is the only marsupial species whose known current range is restricted to lowland forests on the Vogelkop Peninsula, a general region it shares with *D. palpator*.

These two species (*D. kambuayai* and *D. palpator*) are different enough in body mass for them to co-occur, at least

Figure 9. Pouch young *Dactylonax kambuayai*, AM M.56797. Lateral view. Photo credit Emily Cave.

on a regional scale. We predict that they will prove to be altitudinally segregated, with a zone of parapatry or sympatry occurring between 867 and 1,200 m in the Arfak Mountains. Interestingly, the Middle Pleistocene Mt Etna Caves fauna from Queensland, possess one diminutive and one larger-bodied species of dactylopsiline (Hocknull, 2005, 2009), suggesting that this lowland co-occurrence of body-size disparity may be a long-held one for dactylopsilines. There are indications that a dispersion event involving *Dactylonax* and other taxa, such as monotremes, occurred between New Guinea and Australia during the Pliocene to early Pleistocene (Flannery *et al*., 2022, 2026).

Distribution of the larger montane species. The genus *Dactylonax* is now known to comprise at least three species, two of which are montane, and one lowland.

The montane species are the two larger *Dactylonax*. They are found in most high-elevation areas of New Guinea, including in the mountains of the Vogelkop Peninsula (*D. palpator*) and throughout the Central Cordillera of New Guinea, from the Weyland Range and Snow Mountains in the west, to the mountains of the Maneau Range (southeastern peninsula of New Guinea) and the outlying mountains of the Huon Peninsula (northeastern New Guinea) in the east (*D. ernstmayri*). The only significant large montane area where a larger *Dactylonax* does not occur is the North Coast Ranges, where the rare and evolutionarily distinctive large glider, *Petaurus abidi*, known to date at and above 800 m in the Torricelli Mountains, occurs. *Petaurus abidi* is less robust than, but of roughly equivalent size to, larger *Dactylonax* (*ca*. 300 g, condylobasal ≥ 52 mm: Ziegler, 1981; cf. Table 1 in this paper), and both kinds of animals have large front incisors capable of gouging bark to obtain invertebrates and tree exudates, and to enlarge hollows in trees or logs. Perhaps these two lineages of petaurids represent ecological vicars of a sort, and it is the success of larger *Dactylonax* across most of New Guinea's mountains, including on the Vogelkop and Huon Peninsulas, that has left *P. abidi* as an ancient large glider lineage confined to the smaller North Coast Range. *Dactylonax palpator*, but not *P. abidi*, is recorded in the Ayamaru Lakes subfossil record on the Vogelkop, a strong suggestion that the absence of *P. abidi* from the Vogelkop is real (Aplin *et al*., 1999). It is not yet known whether a larger species of *Dactylonax* or *Petaurus* occurs in the large but little-known north-coast Foja Range.

Distribution of the smaller lowland species. If there is a possibility that larger species of *Dactylonax* have excluded the modern distribution of larger *Petaurus* in the mountains of New Guinea, the reverse may be true for their smaller congeners in the lowlands. *Dactylonax kambuayai*, known only from the lowlands of the Vogelkop mainland, may represent a relict geographic population of a small *Dactylonax* lineage that was more widespread, including in the Middle Pleistocene fossil record of eastern Australia (Hocknull, 2005, 2009), in the past. It is the smallest petaurid in New Guinea apart from the small 'sugar gliders', which constitute a species-complex currently referred to as *Petaurus* cf. *papuanus* (Malekian *et al*., 2010; Powley & Mikac, 2024). Could the distribution of this other small

New Guinea help explain the restricted distribution of *D. kambuayai*? While sugar gliders are by far the most abundant petaurid in both montane and lowland contexts across eastern New Guinea, they may be uniquely patchy in occurrence across in western New Guinea, especially in the Vogelkop. Perhaps local absence or rarity of sugar gliders in western New Guinea provides an available ecological niche otherwise not available to this small petaurid lineage elsewhere in New Guinea.

In the Vogelkop region (Bird's Head and Bird's Neck) itself, most records of sugar gliders are from land-bridge and other offshore islands, including Salawati, Misool, and Waigeo, and they have probably been introduced to islands farther afield where they occur (including Halmahera, Bacan, Kayoa, Ternate, Kofiau: Flannery, 1994; Wiantoro *et al*., 2023). On the mainland Vogelkop itself, however, very few museum specimens are known, such that Thomas (1888), Tate & Archbold (1937), Tate (1945), and Ziegler (1981) did not have access to specimens of *Petaurus* from the Bird's Head region in their reviews of petaurid systematics, and Aplin *et al*. (1999) did not have access to modern specimens of *Petaurus* from the Vogelkop for morphological comparisons. Jentink (1887, 1888) recorded a single specimen of *Petaurus* cf. *papuanus* (as *Belideus ariel*) specimen from Lobo Bay on the Bird's Neck, and three specimens from Doreh in the northeastern Bird's Head; Flannery (1995a:207) mapped one additional record from Sorong, and has observed sugar gliders at Fef, in the northcentral Vogelkop. This dearth of *Petaurus* records in the Vogelkop may be the result, in part, of a history of relatively incomplete sampling of mammal biodiversity in the region. However, remains of *Petaurus* are apparently less common than those of *D. kambuayai* in the Ayamaru Lakes mammal subfossil assemblage reported by Aplin *et al*. (1999), a possible indication of real rarity of sugar gliders in the Vogelkop fauna, at least in that area.

Does the distribution or abundance of sugar gliders impact the occurrence of *D. kambuayai*, or vice versa, for example via ecological competition between these smaller-bodied petaurid lineages? Examination of local distributional data might point to this kind of relationship. In reviewing photo-vouchered records on the *iNaturalist* platform in February 2025, we counted 6 records of *D. kambuayai* and 8 records of *Petaurus* cf. *papuanus* from the Vogelkop, with no overlap in these recorded areas of occurrence. Combining the *iNaturalist* data with all known museum specimens demonstrates a recorded distribution for *D. kambuayai* that spans the north-central part of the Vogelkop, from sea level in the vicinity of Klalik in the west, to Nenei at 900 m in the southern body of the Arfaks in the east. For *Petaurus* cf. *papuanus*, combining Vogelkop *iNaturalist* records with museum records demonstrates sugar glider occurrence in the northeastern corner of the Vogelkop around Manokwari, in the northwestern corner of the Vogelkop west of Klalik, and in the Bird's Neck—areas to the west, north, and south, respectively, of the recorded north-central distribution of *D. kambuayai*. Perhaps *D. kambuayai* occurs especially in areas where *Petaurus* cf. *papuanus* is absent, rare, or at least relatively less dominant in the local fauna. To date, the only place where both species are documented is in the subfossil record of Kria Cave, Ayamaru Lakes (Aplin *et al*., 1999), which may speak to an area of overlap or parapatry of these two species, whether in the present or in the past, or both.

Conservation of *Dactylonax kambuayai*. Since 1992, when Woolley collected these modern specimens of *D. kambuayai*, the Arfak Mountains Nature Reserve, an area of 63,000 ha, was gazetted by the Government of Indonesia. This area includes small sections of low-elevation forest, along with large tracts of relatively undisturbed montane forest. The nature reserve is growing in popularity as an ecotourism destination. The records from the Klalik area suggests that the species may occur more broadly in the northern Vogelkop Peninsula, assuming its distribution is contiguous. Klalik is located 250 km (150 miles) west of Nenei in the Arfak Mountains, where the only other recent record comes from. The presence of *D. kambuayai* in lightly disturbed lowland forest indicates that there is suitable habitat for the species across much of the Vogelkop, and lack of records may well be due to limited surveying of nocturnal mammals across the West Papuan lowlands.

The lowland forests of the Vogelkop Peninsula are threatened by increasing commercial interests, including forestry, oil palm plantations, and ranching, as well as rapid population growth for people in the region. As one of the most range limited mammals in New Guinea, this combination of factors may threaten its survival. Adequate reservation of lowland rainforest in the Arfak region needs to be made if the future of the Pygmy Long-Fingered Possum is to be secured there. The increasing popularity of ecotourism in the area driven mainly by birdwatching and mammalwatching tours, offers a potentially sustainable form of income generation for local communities living on the Peninsula and provides an incentive for wildlife and habitat protection on community lands.

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