PERAMELES SOBBEI SP. NOV. (MARSUPIALIA, PERAMELIDAE), A PLEISTOCENE BANDICOOT FROM THE DARLING DOWNS, SOUTH-EASTERN QUEENSLAND

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Price, G.J. 2002 5 31: *Perameles sobbei* sp. nov. (Marsupialia, Peramelidae), a Pleistocene bandicoot from the Darling Downs, south-eastern Queensland. *Memoirs of the Queensland Museum* **48**(1): 193-197. Brisbane. ISSN 0079-8835.

Perameles sobbei sp. nov. is described from Pleistocene fluviatile sediments from King Creek on the eastern Darling Downs. *Perameles sobbei* falls within the size range of modern *Perameles* species, but its molar morphology indicates a closer affinity with the early Pliocene species, *P. bowensis*. Both species retain the plesiomorphic states of possessing straight cristid obliquas with closely approximated trigonid cuspids, and the synapomorphic state of the reduction of the hypoconulid on M_3. However, the great size difference and slight molar morphology differences between the two are considered sufficient to warrant specific separation. *Perameles sobbei* sp. nov. is the third fossil *Perameles* species described and the first from Pleistocene deposits. ❐ *Bandicoot, Perameles, Pleistocene, Darling Downs, King Creek.*

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Pleistocene fossils have been known from the eastern Darling Downs for over 160 years, with the first fossils collected by Sir Thomas Mitchell by 1842 (Owen, 1877). Recent faunal lists, such as that of Molnar & Kurz (1997), indicate a high degree of taxonomic diversity and wide distribution of Pleistocene vertebrates within the Darling Downs. Such lists are dominated by megafaunal species, notably mammals, in particular members of the Diprotodontidae, Vombatidae, Thylacoleonidae and Macro- podidae, plus large reptiles from the Crocodylidae and Varanidae. Molnar & Kurz (1997) suggested that past collecting on the Darling Downs has been biased towards the recovery of larger specimens, thereby leading to an underestimation of the smaller vertebrate component.

Molnar & Kurz's (1997) view is supported by recent systematic collecting from an extensive fluviatile deposit located 8 km W of Clifton along the banks of King Creek (Queensland Museum site L796). Along with representatives of the aforementioned Darling Downs megafaunal families, other vertebrate species recovered from this site include members of the Tachyglossidae, Ornithorhynchidae, Dasyuridae, Peramelidae and Muridae, plus Agamidae, Scincidae and Elapidae. Among the peramelids is a previously undescribed species of *Perameles*. To date, only two fossil species of *Perameles* have been described, both from Pliocene deposits: *P. allinghamensis* from the Bluff Downs Local Fauna (Archer, 1976), and *P. bowensis* from the Bow, Big Sink (Muirhead et al., 1997) and Chinchilla Local Faunas (Mackness et al., 2000). *Perameles sobbei* sp. nov., is the first extinct species of the genus described from Pleistocene deposits.

Dental nomenclature follows Luckett (1993) where the adult unreduced cheek tooth formula of marsupials is P1-3 and M1-4 in both upper and lower dentitions. Tooth morphology nomenclature follows Freedman (1967). Some distinguishing features of *Perameles* follow those described by Smith (1972). Higher systematics follow Aplin & Archer (1987). Types are deposited in the Queensland Museum (QMF).

SYSTEMATIC PALAEONTOLOGY

Supercohort MARSUPIALIA Cuvier, 1817
Cohort AUSTRALIDELPHIA Szalay, 1982
Order PERAMELEMORPHIA Kirsch, 1968
Family PERAMELIDAE Gray, 1825

Perameles Geoffroy, 1804

TYPE SPECIES. *Perameles nasuta* Geoffroy, 1804.

OTHER SPECIES. *Perameles bougainville* Quoy and Gaimard, 1824, *P. gunnii* Gray, 1838, *P. eremiana* Spencer, 1897; *P. allinghamensis* Archer, 1976; *P. bowensis* Muirhead, Dawson & Archer, 1997.

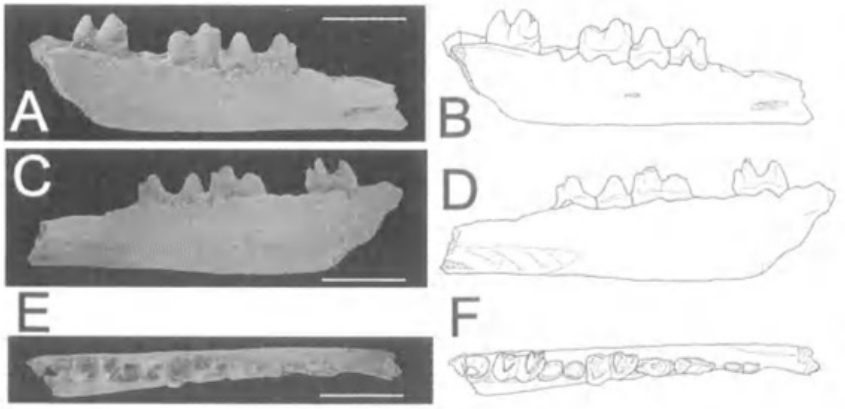

FIG. 1. *Perameles sobbei* sp. nov., holotype QMF43878, right dentary: A, B, buccal view; C, D, lingual view; E F, occlusal view. Scale bars: 5mm.

Perameles sobbei sp. nov.
(Figs 1, 2)

ETYMOLOGY. For Ian H. Sobbe of Clifton, for his contributions to Pleistocene faunas of the Darling Downs.

MATERIAL. HOLOTYPE: QMF43878 (Fig 1), portion of the horizontal ramus of a right dentary with P_2-M_1 and M_3. PARATYPES: QMF43879 (Fig. 2A, B), isolated right M_2; QMF43880 (Fig. 2C, D), isolated left M_4. All types are from QML796, King Creek, E Darling Downs.

DIAGNOSIS. Hypoconulid reduced to absent on M_{1-3}; M_1 long; M_3 narrow; M_4 talonid, markedly reduced in comparison to similar-sized species; trigonid cuspids equidistant; anterior cingulid on M_2 and M_3 prominent, rounded in its anterolingual corner.

DESCRIPTION. *Dentary*. Deepest below M3; mandibular symphysis extending posteriorly to below P_1; mental foramen is anteroventral to anterior alveolus of the P_1; P_1 is missing, though length of its alveoli suggests premolars increase in size from P_1 to P_3. M_4 is the shortest molar tooth, followed in ascending order by M_3, M_1 and M_2.

Right P_2. Laterally compressed; sub-rectangular in occlusal outline, with slight lateral constriction one-third from anterior margin; anterior, central and posterior cuspids occupy midline of crown; central cuspid tallest and posterior cuspid shortest; central cuspid base in midline of tooth, though apex is curved lingually; wear facet present on posterior apex of central cuspid; abrasion from upper premolars has obscured any unique structures on posterior cuspid.

Right P_3. Sub-rectangular in occlusal outline; anterior, central and posterior cuspids on crown; central cuspid tallest and anterior cuspid shortest; anterior cuspid in lingual corner of tooth, its buccal surface sloping more gently towards crown base than does the lingual surface; central cuspid slightly lingual to midline, not curved lingually like corresponding cuspid of P_2; small blade-like crest running posteriorly along midline from apex of central cuspid to posterior extreme of posterior cuspid; horizontal shelf-like structure on lingual side of crest of posterior cuspid extending anteriorly to posterolingual base of main cuspid; small shallow basin on horizontal shelf, positioned close to base of main cuspid; posterior cuspid slopes steeply to base of crown on buccal side of crest; faint ridge runs antero-posteriorly along longitudinal extent of the buccal sloped surface of posterior cuspid.

Right M_1. Anterior one-third triangular, remainder rectangular in occlusal outline; talonid markedly wider than trigonid; metaconid taller than protoconid, both taller than paraconid; relative heights of hypoconid and entoconid indeterminable due to wear; paraconid forms anterior margin of tooth, positioned slightly lingual to midline; metaconid posterolingual to paraconid; protoconid occupies buccal portion of trigonid, slightly anterobuccal to metaconid; entoconid lies directly posterior to metaconid; hypoconid posterobuccal to protoconid; entoconid and hypoconid lie on same transverse plane; hypoconulid reduced to slight swelling at posterior base of entoconid; faint posthypocristid connects hypoconulid to hypoconid; form of cristid obliqua has been obliterated by wear; no anterior or posterior cingulid present.

Right M_2. (Based on QMF43879, Fig. 2A, B); Anterior one-third triangular, remainder rectangular in occlusal outline; talonid markedly wider than trigonid; protoconid is tallest cuspid on crown, followed in descending order by metaconid, entoconid, hypoconid, and paraconid; paraconid is just posterior to anterior margin, positioned slightly lingual to midline; metaconid is posterolingual to paraconid; metaconid and protoconid are in same transverse plane; hypoconid is directly posterior to protoconid; entoconid is posterolingual to

metaconid; entoconid is lingual and slightly anterior to hypoconid; no hypoconulid is present; a faint posthypocristid runs posterolingually to posterior base of entoconid; cristid obliqua descends anterolingually from apex of hypoconid, curving slightly anteriorly to terminate at posterobuccal base of protoconid; anterior cingulid is low on the base of crown, rounded and bulbous in its lingual corner, tapering buccally to terminate at anterobuccal base of protoconid.

Right M_3. Sub-rectangular in occlusal outline; trigonid and talonid are of approximately equal width; metaconid is tallest cusp followed by protoconid then paraconid; comparison of heights of talonid cuspids to those of the trigonid not possible due to wear and broken posterior lingual corner of talonid; paraconid slightly posterior to anterior margin, positioned on lingual portion of tooth; metaconid directly posterior to paraconid; metaconid and protoconid are in same transverse plane; entoconid directly posterior to metaconid; hypoconid directly posterior to protoconid; entoconid and hypoconid are in the same transverse plane; hypoconulid reduced to a slight swelling at posterior base of entoconid; no posthypocristid present; cristid obliqua runs anterolingually from hypoconid curving slightly anteriorly to terminate lingual to midline of tooth at posterior base of metaconid; anterior cingulid positioned low on base of crown, rounded at its lingual corner, tapering buccally to terminate at anterobuccal base of protoconid.

Left M_4. (Based on QMF43880, Fig. 2C, D). Sub-rectangular in occlusal outline; trigonid wider than talonid; relative heights of cuspids indeterminable owing to wear, but trigonid cuspids are clearly taller than those of talonid; paraconid slightly posterior to anterior margin of tooth, positioned lingual to midline; metaconid posterolingual to paraconid; metaconid and protoconid are on same transverse plane; entoconid and hypoconid are closely approximated, positioned lingual to midline of tooth; talonid has been worn such that hypoconid and entoconid appear to be fused to form one main cuspid, however a slight constriction on apex suggests demarcation between very small entoconid and hypoconid cuspids; lingual corner of anterior cingulid is one half the way up anterior face of paraconid; anterior cingulid rounded and bulbous in lingual corner, descending buccally to terminate at anterobuccal base of protoconid, with its lowest point just lingual to its buccal corner.

FIG. 2. *Perameles sobbei* sp. nov., paratypes, A, B, RM_2 QMF43879, occlusal view; C, D, LM_4 QMF43880, occlusal view. Scale bars 1mm.

REMARKS. This species is placed in *Perameles* based on its anterior cingulid being significantly lower than the apex of the paraconid, the result of the low position of the anterior cingulid on the crown (Smith, 1972).

P. allinghamensis is known only from an isolated right M^2, which is larger than that of all other extant *Perameles*. While *P. sobbei* is known only from lower dentition, it is smaller than extant species such as *P. nasuta* and *P. gunnii*, hence is extremely unlikely to be referable to *P. allinghamensis*.

P. sobbei is clearly distinguished from *P. bougainville*, *P. eremiana*, and *P. bowensis* by its much larger size.

P. sobbei is most similar in size to *P. nasuta* and *P. gunnii*, but differs from those species by possessing the following combination of features: (1) smaller P_2 and P_3, (2) longer M_1, (3) narrower M_3, (4) rounded lingual corner of the anterior cingulid on M_{2-4}, (5) hypoconulid reduced on M_1 and absent from M_{2-3}, and (6) closer approximation of entoconid and hypoconid on M_4.

AFFINITIES. *Perameles sobbei* shares a combination of plesiomorphic and apomorphic

TABLE 1. Measurements of type specimens of *Perameles sobbei* from QML796. All measurements are maximum distances in mm. Length is the anterior-posterior distance. Cent. width is the width accross the central cuspid of a premolar. Ant. width is the lingual-buccal distance accross the trigonid. Post. width is the lingual-buccal distance accross the talonid. Parad = paraconid, metad = metaconid, protod = protoconid, entod = entoconid, hypod = hypoconid.

Tooth	Length	Cent. width	Ant. width	Post. width	metad -parad	metad - protod	Entod –hypod
RP_2	2.92	1.05	N/A	N/A	N/A	N/A	N/A
RP_3	3.08	1.26	N/A	N/A	N/A	N/A	N/A
RM_1	4.05	N/A	1.96	2.33	1.09	1.18	1.85
RM_2	4.03	N/A	2.30	2.46	1.12	1.17	1.70
RM_3	3.87	N/A	2.11	2.10	0.87	1.10	0.99 (approx.)
LM_4	3.81	N/A	2.14	1.44	1.04	1.53	indet.

morphological characters with most modern *Perameles* species. Muirhead et al. (1997) suggested that *P. bougainville* is the most plesiomorphic of the recent species by reason of its possession of the following combination of characters: (1) equidistant paraconids, metaconids and protoconids, (2) a more widely separated paraconid and metaconid in comparison to other recent species, and (3) an incomplete anterior cingulid on M_1. The plesiomorphic characters of equidistant trigonid cuspids and relatively widely separated paraconid-metaconid also occur in *P. bowensis* (Muirhead et al., 1997) and in *P. sobbei*.

In common with all recent *Perameles* except *P. eremiana*, *P. sobbei* has a relatively straight cristid obliqua, a condition regarded as plesiomorphic by Muirhead et al. (1997), who noted the autapomorphic trait was a more concave cristid obliqua as part of a narrower talonid. Like *P. eremiana*, a narrower talonid is also present in *P. sobbei*, but alternatively may have arisen by the closer approximation of the entoconid and hypoconid.

Perameles sobbei and *P. bowensis* are the only species of the genus with the synapomorphic reduced hypoconulid on M_3. In all other known species (with the possible exception of *allinghamensis* in which the M_3 is unknown) the hypoconulid is prominent, functioning as an extension of the crown, as well as providing support for the succeeding tooth.

The M_4 attributed to *P. sobbei* possesses a closely approximated entoconid and hypoconid, a trait regarded by Muirhead & Filan (1995) as representing the plesiomorphic condition. This is unlike all recent *Perameles* species, which exhibit the apomorphic condition in which the entoconid is conical in shape and is clearly distinct from the hypoconid. Comparison with the condition in *P. bowensis* is not possible due to the poor state of preservation of the M_4 talonid in the known material.

P. bowensis is more pleisomorphic than *P. sobbei* in the possession of a pre-entocristid on the M_2. However, on the basis of the synapomorphic condition of the reduction of the hypoconulid on M_1 and its absence from M_3, *Perameles sobbei* is here regarded as the sister taxon to the early Pliocene *P. bowensis*. In other respects, notably in sharing the characters of equidistant trigonid cuspids and wider paraconid-metaconid, both species are more plesiomorphic than *P. nasuta*, *P. gunnii* and *P. eremiana*. The relationship of the *P. sobbei-P. bowensis* clade to *P. bougainville* remains unclear, but following Muirhead et al. (1997), the *P. sobbei-P. bowensis* clade may represent a sister clade to the *P. nasuta* - *P. gunnii* - *P. eremiana* clade.

Bartholomai (1977) noted slightly smaller tooth dimensions in the *Perameles nasuta* population from the Pleistocene fissure-fill deposits of Gore, south-eastern Queensland, than those in modern Queensland populations, but did not consider the differences sufficient to warrant specific separation. While the possibility of a similar morphoclinal relation may also exist between the Pliocene *P. bowensis* and Pleistocene *P. sobbei*, the much greater size difference and slight morphological differences between the two, is here considered sufficient to warrant specific separation.

ACKNOWLEDGEMENTS

I thank Scott Hocknull, Bernie Cooke, Gregg Webb and Brendan Brooke for guidance in preparation of this manuscript. Joanne Wilkinson, Debbie Dolby, Graham Jordan, Philip Colqhoun, Ricky Bell, Brad Martin and Trevor Sutton are thanked for assistance in fossil preparation. Desmond and Jennifer Price are

thanked for continued support and encouragement. I especially thank Ian Sobbe for his continued assistance into the research on Pleistocene faunas of the Darling Downs. This research has been funded by the Queensland University of Technology and the Queensland Museum.

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