

## **A PRE-NEOGENE PHALANGERID POSSUM FROM SOUTH AUSTRALIA**

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Phalangeridae is one of the most widely dispersed families of possums (Marsupialia, Diprotodontia) in the Australasian region extending from Tasmania in the southeast to Sulawesi of the Greater Sunda Islands of Indonesia in the northwest. Yet this one family of possums has generated the most morphological and biochemical phylogenetic uncertainties of any family within the Order Diprotodontia. The various phylogenetic relationships for the family have led to different biogeographic models in regard to the site of origin and directions of dispersal for taxa within the family. The recovery of a maxilla from faunal zone B of the Oligo-Miocene Etadunna Formation at Lake Palankarinna, South Australia (ca. 25 mya) results in the oldest known phalangerid to date, some ten million years older than the numerous mid-Miocene fossil phalangerids described from Riversleigh, Queensland. Whereas the Riversleigh phalangerids are similar enough to the modern taxa to have originally been included in modern genera, the Etadunna specimen has morphologies that are very plesiomorphic for the family, such as a bladed P3 with a central main cusp with denticles posteriorly but no ridges, the P3 is aligned with the tooth row, M1 with paraloph shear aligned with the blade of P3; M2 and M3 more square in occlusal outline, the infraorbital canal is anterior to the second premolar and the opening of the lacrimal canal is inside of the orbit. With substantial molecular time of divergence data now available, plus the addition of this new pre-Neogene phalangerid from South Australia, a new biogeographic model of site of origin and dispersal can be offered, where phalangerids originate in Australia, diversify and give rise to the cuscus subfamilies, which disperse to New Guinea and then onto Indonesia.