= Nesomys narindaensis =

Nesomys narindaensis is an extinct rodent that lived in northwestern Madagascar . It is known from subfossil skull bones and isolated molars found in several sites during field work that started in 2001 . First described in 2010 , it is placed in the genus Nesomys together with three smaller living species , which may differ in some details of molar morphology . The presence of N. narindaensis , a rare element in the local rodent fauna , suggests that the region was previously more humid .

= = Taxonomy = =

Remains of Nesomys narindaensis were found during fieldwork in northwestern Madagascar that started in 2001 . The species was described in a 2010 paper by Pierre Mein and colleagues , together with another extinct rodent , Brachytarsomys mahajambaensis . The specific name , narindaensis , where one of the sites where the species has been found is located . It is placed in the genus Nesomys , together with three smaller living species , N. audeberti , N. lambertoni , and N. rufus . Nesomys is classified in the exclusively Madagascan subfamily Nesomyinae of the family Nesomyidae , which includes various African rodents .

= = Description = =

Nesomys narindaensis is known from a damaged skull , missing part of the back , a mandible (lower jaw) with the first two molars (m1 and m2) , and four isolated molars (one first upper molar , M1 , one third upper molar , M3 , and two m2) . It is larger than each of the three living species , and the known material additionally differs from those in a few details that may not hold in larger samples . Total skull length is 61 @.@ 3 mm , longer than in the largest living species , N. lambertoni (50 @.@ 3 ? 53 @.@ 8 mm) . The width of the palate between the M1 is 8 @.@ 7 mm (7 @.@ 2 ? 7 @.@ 9 mm in N. lambertoni) and the length of the upper toothrow is 9 @.@ 04 and 9 @.@ 16 mm on the two sides of the skull (7 @.@ 2 ? 7 @.@ 9 mm in N. lambertoni) .

M1 is flat @-@ crowned . The anteroloph , a crest at the front of the tooth , lacks a smaller accessory spur that is present in N. rufus . The paracone , one of the main cusps , is quite small ; this cusp is more prominent in N. rufus . The mesoloph , a crest on the middle of the tooth , is distinct but short and located further to the back than in N. rufus . M2 has a longer mesoloph . M3 is largely flat @-@ crowned , but the paracone is a bit more prominent than the rest . The valley between the cusps at the front is deeper than the valleys at the back . Each of the upper molars has three roots .

The m1 is long and narrow . The anteroconid , the cusp at the front of the tooth , is oriented perpendicularly to the main axis of the tooth and on the lingual (inner) side is separated from the metaconid cusp . The protoconid , another cusp on the labial (outer) side , is connected at its back to a longitudinal crest , which in turn anchors the transverse mesolophid crest , and then joins the hypoconid labial cusp . In front of the hypoconid , an ectostylid (a smaller cuspule) is present . The entoconid cusp , located lingually , is relatively high and is separated from the mesolophid before it by a deep valley . Another crest , the posterolophid , is present behind the hypoconid . At the front of the m2 , crests known as the anterolophid and anterolabial cingulum are present before the protoconid and the metaconid . As on the m1 , a transverse mesolophid and an ectostylid are present . The hypoconid and the entoconid are present , as is the posterolophid behind them . Within the posterolophid , there is a small valley that is absent in N. rufus . Both m1 and m2 have two roots ; m3 is unknown .

= = Distribution and ecology = =

Remains of Nesomys narindaensis have been found at the sites of Antsingiavo , Ambongonambakoa , and Ambatomainty in northwestern Madagascar , which are late Pleistocene (126 @,@ 000 to 10 @,@ 000 years ago) and Holocene (less than 10 @,@ 000 years ago) in age

. Nesomys is a rare element of the rodent fauna , which is dominated by multiple species of Eliurus and Macrotarsomys . Modern Nesomys live on the ground in eastern (N. audeberti and N. rufus) and western (N. lambertoni) Madagascar . The only surviving western species , N. lambertoni , is restricted to a relict humid karst area ; the presence of N. narindaensis and Brachyuromys mahajambaensis suggests that the past environment in northwestern Madagascar was also more humid . Subfossil remains of Nesomys have been recorded from some other localities in northwestern Madagascar , but these have not been described .