= Hypogeomys australis =

Hypogeomys australis is an extinct rodent from central and southeastern Madagascar . First described in 1903 , it is larger than its close relative , the living Hypogeomys antimena , which occurs further west , but otherwise similar . Average length of the femur (upper leg bone) is 72 @.@ 1 mm , compared to 63 @.@ 8 mm in H. antimena . One of the few extinct rodents of Madagascar , it survived to at least around 1536 BP based on radiocarbon dating . Little is known of its ecology , but it may have lived in burrows like its living relative and eaten some arid @-@ adapted plants .

= = Taxonomy = =

Hypogeomys australis was described in 1903 by Guillaume Grandidier from subfossil material collected in the cave of Andrahomana in southeastern Madagascar . The Hypogeomys material was similar to the living Hypogeomys antimena , but distinct enough for Grandidier to recognize it as a separate species , different in size and some morphological details . Grandidier described another subfossil Hypogeomys species in 1912 , H. boulei , but the material that species was based on was later identified as the enigmatic mammal Plesiorycteropus . In 1946 , Charles Lamberton illustrated another femur (upper leg bone) of H. australis ; the origin and current whereabouts of this specimen are unknown . In 1996 , Steven Goodman and Daniel Rakotondravony reviewed the distribution of Hypogeomys and confirmed that H. australis is a distinct species . H. australis and H. antimena are classified together within the exclusively Madagascan subfamily Nesomyinae of the family Nesomyidae , which includes various African rodents .

= = Description = =

Hypogeomys australis was generally similar to H. antimena , the largest living rodent of Madagascar , but even larger , with little if any overlap in measurements . Grandidier described the extinct species as more robust , with more prominent muscle scars on the long bones and with longer molars with more distinct crests and lobes . The length of the first lower molar is 5 @.@ 2 to 6 @.@ 4 mm , averaging 5 @.@ 7 mm , in ten H. australis and 3 @.@ 9 to 5 @.@ 5 mm , averaging 4 @.@ 8 mm , in twenty @-@ four H. antimena . The width of the femur at the proximal (near) end is 18 @.@ 6 to 21 @.@ 5 mm , averaging 19 @.@ 9 mm , in thirteen H. australis and 16 @.@ 8 to 18 @.@ 5 mm , averaging 17 @.@ 5 mm , in nine H. antimena . In ten H. australis , total length of the femur is 69 @.@ 9 to 75 @.@ 1 mm , averaging 72 @.@ 1 mm , compared to 59 @.@ 7 to 69 @.@ 9 mm , averaging 63 @.@ 8 mm in nine H. antimena .

= = Distribution and ecology = =

Remains attributed to Hypogeomys australis are known from Andrahomana in southeastern Madagascar and Antsirabe in central Madagascar , suggesting a broad former distribution . Its range is not known to overlap that of H. antimena , which has undergone a dramatic reduction during the Holocene . A bone from Andrahomana has been radiocarbon dated to about 4440 BP and another to 1536 BP . Although almost nothing is known of the ecology of H. australis , Goodman and Rakotondravony presumed that it was similar to its living relative in living in burrows in areas with loose soils . H. australis shows relatively high content of carbon @-@ 13 isotope , likely because it ate some plants which were enriched in carbon @-@ 13 through C4 carbon fixation and crassulacean acid metabolism ; both of these photosynthesis @-@ related processes occur most frequently in plants adapted to dry environments .

Hypogeomys australis is one of only three extinct rodents known from Madagascar (the others are Brachytarsomys mahajambaensis and Nesomys narindaensis from northwestern Madagascar) . In general , few small animals became extinct on Madagascar , except for these rodents , two species of Plesiorycteropus , and the shrew tenrec Microgale macpheei ; in contrast , large animals such as

subfossil lemurs , the carnivore Cryptoprocta spelea , Malagasy hippopotamuses , Dipsochelys tortoises , and Aepyornis and Mullerornis birds all became extinct around the time that humans arrived .