= Lundomys =

Lundomys molitor , also known as Lund 's amphibious rat or the greater marsh rat , is a semiaquatic rat species from southeastern South America . Its distribution is now restricted to Uruguay and nearby Rio Grande do Sul , Brazil , but it previously ranged northward into Minas Gerais , Brazil , and southward into eastern Argentina . The Argentine form may have been distinct from the living form from Brazil and Uruguay . L. molitor is a large rodent , with the head and body length averaging 193 mm (7 @.@ 6 in) , characterized by a long tail , large hindfeet , and long and dense fur . It builds nests above the water , supported by reeds , and it is not currently threatened .

Its external morphology is similar to that of Holochilus brasiliensis and over the course of its complex taxonomic history , it has been confused with that species , but other features support its placement in a distinct genus , Lundomys . Within the family Cricetidae and subfamily Sigmodontinae , it is a member of a group of specialized oryzomyine rodents that also includes Holochilus , Noronhomys , Carletonomys , and Pseudoryzomys .

= = Taxonomy = =

Lundomys molitor was first described in 1887 by Danish zoologist Herluf Winge , who reviewed the materials Peter Wilhelm Lund had collected in the caves of Lagoa Santa , Minas Gerais , Brazil . Winge used four specimens for his description , including two skull fragments and an isolated maxilla (upper jaw) from the cave chamber Lapa da Escrivania Nr. 5 and a mandible (lower jaw) from Lapa da Serra das Abelhas , but the latter later turned out to be from a different species , probably Gyldenstolpia fronto . Lund named the animal Hesperomys molitor and placed it in the same genus (Hesperomys) as what is now Pseudoryzomys simplex and two species of Calomys . Subsequently , it was rarely mentioned in the literature on South American rodents ; those authors who did mention it placed it in either Oryzomys or Calomys .

In 1926 , American zoologist Colin Campbell Sanborn collected some rodents in Uruguay , which he identified as Holochilus vulpinus (currently Holochilus brasiliensis) in his 1929 report on the collection . When his successor at the Field Museum of Natural History , Philip Hershkovitz , reviewed Holochilus in 1955 , he recognized that the series from Uruguay contained two species , one close to the forms of Holochilus found across much of South America , and another unique to Uruguay and southern Brazil ; he named the latter as a new species , Holochilus magnus . Hershkovitz identified Holochilus as one of the members of a " sigmodont " group of American rodents , also including Sigmodon , Reithrodon , and Neotomys , on the basis of its flat @-@ crowned molars , which are lophodont (the crown consists of transverse ridges) . In 1 @,@ 981 ft (604 m) agnus was also recognized in the Late Pleistocene of Buenos Aires Province , Argentina , and in 1982 it was recorded from Rio Grande do Sul in southern Brazil .

In a 1980 article , Argentine zoologist Elio Massoia recognized the resemblance between Winge 's Hesperomys molitor and Hershkovitz 's Holochilus magnus , and recommended that the former be reclassified as a species of Holochilus , Holochilus molitor . When American zoologists Voss and Carleton restudied Winge 's material in a 1993 paper , they were unable to find any consistent differences between the two and accordingly considered them to pertain to the same species . In addition , they reviewed the differences between this species and other Holochilus and concluded that these were significant enough to place the former in a distinct genus , which they named Lundomys after Lund , who had collected the original material . Since then , the species has been known as Lundomys molitor .

In the same paper in which they described Lundomys , Voss and Carleton also , for the first time , diagnosed the tribe Oryzomyini in a phylogenetically valid way . Previously , Oryzomyini had been a somewhat loosely defined group defined among others by a long palate and the presence of a crest known as the mesoloph on the upper molars and mesolophid on the lower molars ; this crest is absent or reduced in Holochilus and Lundomys . Voss and Carleton recognized five synapomorphies for the group , all of which are shared by Lundomys ; the placement in Oryzomyini of Lundomys and of three other genera ? Holochilus , Pseudoryzomys , and Zygodontomys ? which

also lack complete mesoloph (id) s has been universally supported since .

Voss and Carleton had found some support for a close relationship between Holochilus , Lundomys , and Pseudoryzomys within Oryzomyini . In subsequent years , the related species Holochilus primigenus and Noronhomys vespuccii were discovered , providing additional evidence for this grouping . The allocation of the former , which is similar to Lundomys in features of the dentition , to Holochilus is controversial and placement as a second species of Lundomys has been suggested as an alternative . A comprehensive phylogenetic analysis of oryzomyines by Marcelo Weksler , published in 2006 , supported a close relationship among Lundomys , Holochilus , and Pseudoryzomys ; the other species of the group were not included . Data from the sequence of the IRBP gene supported a closer relationship between Holochilus and Pseudoryzomys , with Lundomys more distantly related , but morphological data placed Holochilus and Lundomys closer together , as did the combined analysis of both morphological and IRPB data . Subsequently , Carletonomys cailoi was described as an additional relative of Holochilus and Lundomys .

= = Description = =

Lundomys molitor is among the largest living oryzomyines , rivaled only by some large forms of Holochilus and Nectomys , but it is substantially smaller than some of the recently extinct Antillean species , such as " Ekbletomys hypenemus " and Megalomys desmarestii . Unlike in Holochilus brasiliensis , which occurs in the same area , the tail is longer than the head and body . It is sparsely haired and dark , and there is no difference in color between the upper and lower side . The coat , which is long , dense , and soft , is yellow ? brown at the sides , but becomes darker on the upperparts and lighter on the underparts . The large hindfeet are characterized by conspicuous interdigital webbing , but they lack tufts of hair on the digits and several of the pads are reduced . As in some other semiaquatic oryzomyines , fringes of hair are present along the plantar margins and between some of the digits . The forefeet also lack tufts on the digits and show very long claws , a character unique among oryzomyines . The female has four pairs of teats and the gall bladder is absent , both important characters of oryzomyines . The head and body length is 160 to 230 mm (6 @.@ 3 to 9 @.@ 1 in) , averaging 193 mm (7 @.@ 6 in) , the tail length is 195 to 255 mm (7 @.@ 68 to 10 @.@ 04 mm) , averaging 235 mm (9 @.@ 3 in) , and the length of the hindfoot is 58 to 68 mm (2 @.@ 3 to 2 @.@ 7 in) , averaging 62 mm (2 @.@ 4 in) .

The front part of the skull is notably broad . As in Holochilus , the zygomatic plate , the flattened front portion of the cheek bone , is expansive and produced into a spinous process at the anterior margin . The jugal bone is small , but less reduced than in Holochilus . The interorbital region of the skull is narrow and flanked by high beads . The incisive foramina , which perforate the palate between the incisors and the upper molars , are long , extending between the molars . The palate itself is also long , extending beyond the posterior margin of the maxillary bones , and it is perforated near the third molars by conspicuous posterolateral palatal pits . As in all oryzomyines , the squamosal bone lacks a suspensory process that contacts the tegmen tympani , the roof of the tympanic cavity , but Lundomys is unusual in that the squamosal and the tegmen tympani usually overlap when viewed from the side . In the mandible , the angular and coronoid processes are less well @-@ developed than in Holochilus . The capsular process of the lower incisor , a slight raising of the mandibular bone at the back end of the incisor , near the coronoid process , is small . The two masseteric ridges , to which some of the chewing muscles are attached , are entirely separate , joining only at their anterior edges , which are located below the first molar .

The molars are slightly more high @-@ crowned (hypsodont) than in most oryzomyines and many of the accessory crests are reduced , but they are sharply distinct from the highly derived , hypsodont molars of Holochilus . The main cusps are located opposite each other and have rounded edges . The enamel folds do not extend past the midlines of the molars . The mesoloph , an accessory crest on the upper molars that is usually well @-@ developed in oryzomyines , is present but short on the first and second upper molar ; it is much more reduced in Holochilus and Pseudoryzomys . The corresponding structure on the lower molars , the mesolophid , is present on the first and second molars in Lundomys , but absent in both Holochilus and Pseudoryzomys .

Another accessory crest , the anteroloph , is present , though small , on the first upper molar in Lundomys , but entirely absent in both other genera . As in Holochilus and Pseudoryzomys , the anterior cusp on the first lower molar , the anteroconid , contains a deep pit . Each of the three upper molars has three roots ; unlike in both Holochilus and Pseudoryzomys , the first upper molar lacks an accessory fourth root . The first lower molar has four roots , including two small accessory roots located between larger anterior and posterior roots . The second molar has either two or three roots , with the anterior root split into two smaller roots in some specimens .