= Drymoreomys =

Drymoreomys is a rodent genus in the tribe Oryzomyini that lives in the Atlantic Forest of Brazil . The single species , D. albimaculatus , is known only from the states of São Paulo and Santa Catarina and was not named until 2011 . It lives in the humid forest on the eastern slopes of the Serra do Mar and perhaps reproduces year @-@ round . Although its range is relatively large and includes some protected areas , it is patchy and threatened , and the discoverers recommend that the animal be considered " Near Threatened " on the IUCN Red List . Within Oryzomyini , Drymoreomys appears to be most closely related to Eremoryzomys from the Andes of Peru , a biogeographically unusual relationship , in that the two populations are widely separated and each is adapted to an arid or a moist environment .

With a body mass of 44 ? 64 g (1 @.@ 6 ? 2 @.@ 3 oz) , Drymoreomys is a medium @-@ sized rodent with long fur that is orange to reddish @-@ buff above and grayish with several white patches below . The pads on the hindfeet are very well developed and there is brown fur on the upper sides of the feet . The tail is brown above and below . The front part of the skull is relatively long and the ridges on the braincase are weak . The palate is short , with its back margin between the third molars . Several traits of the genitals are not seen in any other oryzomyine rodent .

= = Taxonomy = =

Drymoreomys was first recorded in 1992 by Meika Mustrangi in the state of São Paulo . The animal was not , however , formally described until 2011 , when Alexandre Percequillo and colleagues named it as a new genus and species within the tribe Oryzomyini : Drymoreomys albimaculatus . The generic name , Drymoreomys , combines the Greek ?????? (drymos) , meaning " forest " , ?????? (oreios) , meaning " mountain @-@ dwelling " , and ??? (mys) , meaning " mouse " . The name refers to the animal 's occurrence in mountain forest . The specific name , albimaculatus , derives from the Latin albus , meaning " white " , and maculatus , meaning " spotted " , a reference to the spots of white in the animal 's fur . Percequillo and colleagues found little geographic variation among samples of Drymoreomys , although a few traits differ in frequency between populations from the states of São Paulo and Santa Catarina .

According to a phylogenetic analysis of evidence from morphology , the nuclear gene IRBP , and the mitochondrial gene cytochrome b , Drymoreomys albimaculatus is most closely related to Eremoryzomys polius , an oryzomyine from northern Peru and the only species in the genus Eremoryzomys . Together , Drymoreomys and Eremoryzomys are part of Marcelo Weksler 's clade D , one of four main clades within Oryzomyini . Some subsequent studies did not support a relationship between the Drymoreomys ? Eremoryzomys clade and the rest of clade D , but this is probably due to saturation of the phylogenetic signal in mitochondrial data . Oryzomyini includes well over a hundred species distributed mainly in South America , including nearby islands such as the Galápagos Islands and some of the Antilles . It is one of several tribes recognized within the subfamily Sigmodontinae , which encompasses hundreds of species found across South America and into southern North America . Sigmodontinae is the largest subfamily of the family Cricetidae , other members of which include voles , lemmings , hamsters , and deermice , all mainly from Eurasia and North America .

= = Description = =

= = = External morphology = = =

Drymoreomys albimaculatus is a medium @-@ sized , long @-@ tailed , short @-@ eared , short @-@ footed rodent . It is quite distinct from other oryzomyines and has a number of unique traits . In 11 adults from Parque Natural Municipal Nascentes do Garcia in Santa Catarina , head and body length was 122 to 139 mm (4 @.@ 8 to 5 @.@ 5 in) , tail length was 140 to 175 mm (5 @.@ 5 to

6 @.@ 9 in) , hindfoot length was 25 @.@ 8 to 30 @.@ 5 mm (1 @.@ 02 to 1 @.@ 20 in) , ear length was 16 to 22 mm (0 @.@ 63 to 0 @.@ 87 in) , and body mass was 44 to 64 g (1 @.@ 6 to 2 @.@ 3 oz) . The fur is long and dense and consists of thin , short , woolly underfur and long , thick overfur . Overall , the fur of the upperparts is orange to reddish @-@ buff . In the closely related Eremoryzomys , the upperparts are grayish . The hairs of the underfur , which are 12 to 14 mm (0 @.@ 47 to 0 @.@ 55 in) long , are grayish for most of their length and orange or brown at the tip . In the overfur , the cover hairs (which form the main body of the fur) , are 14 to 17 mm (0 @.@ 55 to 0 @.@ 67 in) long and brown at the tip , with an orange band below the tip , and the longer , sparse guard hairs are red to dark brown in the half closest to the tip and are 17 to 21 mm (0 @.@ 67 to 0 @.@ 83 in) long . The sides are reddish brown . On the underparts , the hairs are grayish at the base and white at the tip , except on the throat , chest , and (in some specimens) groin , where the hairs are entirely white ? a trait unique among the oryzomyines . In overall appearance , the underparts are grayish , with white spots where the hairs are completely white .

The small , rounded ears are covered with dense golden hairs on the outer and with reddish brown hairs on the inner surface . The mystacial vibrissae (whiskers on the upper lip) are long , usually extending a little beyond the ears when laid back against the head , but the superciliary vibrissae (whiskers above the eyes) are short and do not extend beyond the ears . The upper surface on the forefeet is covered with brown fur , and there is white or silvery fur on the digits . Ungual tufts (fur around the bases of the claws) are present on the second through fourth digits . On the short , fairly broad hindfeet , the upper side is covered densely with silvery to white hairs near the tips of the feet and toes , and with brown fur otherwise . No other oryzomyine has such brown fur on its hindfeet . The second through fourth digits have long silvery @-@ white ungual tufts , but those on the first digit are short . On the sole , the pads are very large . Among oryzomyines , only Oecomys and the extinct Megalomys have similarly large pads between their digits . There is a dense cover of short brown hairs on both the upper and lower sides of the tail . Unlike in Eremoryzomys , the tail is the same color above and below . The tail ends in a tuft , an unusual feature among oryzomyines .

= = = Skull = = =

In the skull , the rostrum (front part) is relatively long . The nasal and premaxillary bones extend in front of the incisors , forming a rostral tube , which is shared among oryzomyines only with Handleyomys . The zygomatic notch (a notch formed by a projection at the front of the zygomatic plate , a bony plate at the side of the skull) is shallow . The interorbital region (between the eyes) is narrow and long , with the narrowest part towards the front . The crests on the braincase and interorbital region are weakly developed . Eremoryzomys has larger crests on its interorbital region .

The incisive foramina (openings in the front part of the palate) are long , sometimes extending to between the first molars (M1) . The bony palate is broad and short , with the posterior margin between the third molars (M3) . Nephelomys levipes is the only other oryzomyine with such a short palate , although that of Eremoryzomys polius is only slightly longer . The posterolateral palatal pits (openings in the back part of the palate near the M3) vary from small to fairly large and are located in slight fossas (depressions) . In Eremoryzomys , these fossas are deeper . The roof of the mesopterygoid fossa , the opening behind the palate , is completely closed or contains small sphenopalatine vacuities . The vacuities are much larger in Eremoryzomys . The alisphenoid strut , a piece of bone that separates two foramina (openings) , is present in all Drymoreomys specimens examined , except in one juvenile specimen .

The mandible (lower jaw) is long and low . The coronoid process , the frontmost of the three main processes (projections) at the back of the jawbone , is large and about as high as the condyloid process behind it . The angular process , below the condyloid , is fairly short and does not extend further backwards than the condyloid . There is no noticeable capsular process (a raising at the back of the jaw that houses the root of the lower incisor) .

= = = Dentition = = =

The upper incisors are opisthodont (with the cutting surface oriented backwards) and have orange to yellow enamel . The upper molar rows are either almost parallel or slightly convergent with each other toward the front . Holochilus and Lundomys are the only other oryzomyines with non @-@ parallel molar rows . The valleys between the cusps of the upper molars extending from the inner and outer sides overlap slightly across the midlines of the teeth . The molars are high @-@ cusped , almost hypsodont . On M1 , the anterocone (the front cusp) is divided into two cuspules on the lingual (inner , towards the tongue) and labial (outer , towards the lips) sides of the teeth . The mesoloph , a crest near the middle of the labial side of the tooth , is long and well developed on each of the three upper molars . On the lower molars (m1 to m3) , the cusps on the labial side are located slightly in front of their lingual counterparts . The anteroconid , the front cusp on the m1 , is divided in two . The m1 , m2 , and usually m3 have a mesolophid , a crest corresponding to the mesoloph but located on the lingual side . Each of the lower molars has two roots .

= = = Other anatomy = = =

There are 12 ribs and 19 thoracolumbar (chest and abdomen) , four sacral , and 36 to 38 caudal (tail) vertebrae . There are three digits at the tip of the penis , of which the central one is the largest . The two lateral digits are not supported by mounds of the baculum (penis bone) . There is only one spine on the papilla (nipple @-@ like projection) on the upper side of the penis . On the urethral process , located in the crater at the end of the penis , a fleshy process at the side , the lateral lobule , is present . The preputial glands (glands in front of the genitals) are large . The lack of lateral bacular mounds , presence of a lateral lobule , and size of the preputial glands are all unique traits among the oryzomyines .

= = = Karyotype = = =

The karyotype of Drymoreomys albimaculatus is 2n = 62 , FN = 62 : the animal has 62 chromosomes , and 29 pairs of autosomes (non @-@ sex chromosomes) are acrocentric (with one arm so short as to be almost invisible) and one small pair is metacentric (with two equally long arms) . Both sex chromosomes are submetacentric (with one arm noticeably longer than the other) , and X is larger than Y. Blocks of heterochromatin are present on all autosomes and the long arm of Y. Telomeric sequences are found near the centromeres of the sex chromosomes . Aspects of this karyotype ? with a high number of mostly acrocentric chromosomes and the presence of heterochromatin on the Y chromosome ? are consistent with the pattern seen in other oryzomyines . However , no other oryzomyine has exactly the same karyotype as D. albimaculatus . Other species in clade D have fewer chromosomes , down to 16 in Nectomys palmipes , although the karyotype of Eremoryzomys polius is unknown . This suggests an evolutionary trend of decreasing chromosome number within the clade .

= = Distribution and ecology = =

Drymoreomys albimaculatus occurs in the Atlantic Forest on the eastern slopes of the Serra do Mar in the Brazilian states of São Paulo and Santa Catarina , at 650 to 1 @,@ 200 m (2 @,@ 130 to 3 @,@ 940 ft) above sea level . It has not been found in the intervening state of Paraná , but is likely to occur there . The biogeographical pattern indicated by the relationship between Drymoreomys and the Andean Eremoryzomys is unusual . While there are some similar cases of relationships between Andean and Atlantic Forest animals , these involve inhabitants of humid forests in the Andes ; Eremoryzomys , by contrast , lives in an arid area .

Drymoreomys albimaculatus appears to be a specialist of dense , moist , montane and premontane forest . It has been found in disturbed and secondary forests as well as in pristine forest , but probably needs contiguous forest to survive . Reproductive activity has been observed in females in June , November , and December and in males in December , suggesting that the species breeds year @-@ round . Although some of its morphological traits , such as the very large pads , are

suggestive of arboreal (tree @-@ dwelling) habits , most specimens were collected in pitfall traps on the ground .

= = Conservation status = =

The range of Drymoreomys albimaculatus is relatively large and the species occurs in several protected areas , but it has only been found in seven localities and its habitat is threatened by deforestation and fragmentation . Therefore , Percequillo and colleagues suggest that the species be assessed as " Near Threatened " under the IUCN Red List criteria .