= 58 , FN =
80) , a highly differentiated karyotype . The karyotype of T. talamancae is variable , but has fewer chromosomes (34 to 54) and major arms (60 to 67) . H. alfaroi has more chromosomes (60 to 62) and major arms (100 to 104) .

= = = Skull and teeth = = =

The skull is relatively long and has a long , narrow rostrum (front region) , broad interorbital region (between the eyes) and narrow braincase with almost vertically oriented walls at the sides and behind . It differs from that of T. talamancae in various proportions . Although the subspecies previously recognized in " Oryzomys bombycinus " have been separated by small differences in skull features , Pine rejected these on the basis of his much larger samples . Musser and colleagues agreed , but noted that Colombian animals appeared to have larger skulls . The zygomatic plates are broad and the zygomatic arches (cheekbones) behind them are nearly parallel to each other . The margins of the interorbital region contain prominent beads , which extend to the braincase as temporal ridges ; these are usually less well @-@ developed in T. talamancae . Unlike in T. talamancae and H. alfaroi , the parietal bone is usually limited to the roof of the braincase and does not extend to the sides .

The incisive foramina , which perforate the front part of the palate , do not extend between the molars . The palate ends beyond the third molars and is perforated by posterolateral palatal pits there . Behind it , the roof of the mesopterygoid fossa is perforated by poorly developed sphenopalatine vacuities . The auditory bullae , which house the inner ear , are large . Usually , the mastoid bone lacks openings (fenestrae) , which are present in T. talamancae . The pattern of the arteries in the head is primitive , as indicated by the condition of various foramina (openings) and grooves in the skull .

The mandible (lower jaw) looks chunky and has a long condyloid process at its back ; that of T. talamancae is more slender . The capsular process , a projection at the back of the jaw which houses the root of the lower incisor , is poorly developed .

The incisors are large and ungrooved . Their enamel is orange , but paler on the lowers . The orientation of the upper incisors is opisthodont , with the cutting edge oriented backwards . The molars are brachydont (low @-@ crowned) and have two rows of main cusps separated by deep valleys and complemented by a network of crests and smaller cusps . The first upper molar is broader than in T. talamancae . As in this species , but unlike in many other rice rats , including H. alfaroi , the mesoflexus on the second upper molar , which separates the paracone (one of the main cusps) from the mesoloph (an accessory crest) , is not divided in two by an enamel bridge . The hypoflexid on the second lower molar , the main valley between the cusps , is very long , extending more than halfway across the tooth ; in this trait , it is similar to T. talamancae but unlike H. alfaroi . Each of the upper molars has three roots (two on the outer and one on the inner side) and each of the lowers has two (one at the front and another at the back) .

= = Distribution , ecology , and behavior = =

Transandinomys bolivaris is an uncommon species . Its known distribution extends from northeastern Honduras , on the Caribbean seaboard , through eastern Nicaragua , Costa Rica , and Panama , into coastal western Colombia and northwestern and west @-@ central Ecuador . It has been found near sea level and the upper altitudinal records are at nearly 1 @,@ 500 m (4 @,@ 900 ft) in Panama and 1 @,@ 800 m (5 @,@ 900 ft) in Ecuador . This distribution coincides with that of the humid Transandean forest . It generally occurs in areas with mean temperatures above 16 ° C (60 @.@ 8 ° F) and annual rainfall of 4 @,@ 000 to 6 @,@ 000 mm (157 to 236 in) , prefers mid @-@ elevation forests (600 to 900 m or 1 @,@ 970 to 2 @,@ 950 ft) , and often occurs near water . The actual range of this species may be expected to extend further north and west , perhaps into Veracruz , southern Mexico , and western Venezuela , where it has not yet been recorded . Omar Linares mentioned a possible record from the Lake Maracaibo region of northwestern Venezuela in

1998 . Its range is similar to that of various other rainforest animals , including the semiplumbeous hawk (Leucopternis semiplumbeus) , the rice rats Sigmodontomys alfari and S. aphrastus , the spiny rats Proechimys semispinosus and Hoplomys gymnurus , and the opossum Marmosa zeledoni . T. talamancae and H. alfaroi are often found in the same localities as T. bolivaris , but also occur in other areas .

Little is known of its biology . The species mainly lives on the ground , but some young animals have been taken in vegetation , up to 1 @.@ 5 m (4 @.@ 9 ft) above the ground . It is usually captured " under logs , around the roots of large trees , or among rocks along streams . " Two females with four embryos each have been caught in Panama in June , one with two in Nicaragua in September , and one with four in Costa Rica in December . A very young specimen was trapped in Costa Rica in March . One pregnant female was herself still in juvenile fur . Four species of mites have been found on T. bolivaris in Panama (Gigantolaelaps gilmorei , G. oudemansi , Laelaps pilifer , and Haemolaelaps glasgowi) , two chiggers (Leptotrombidium panamensis and Pseudoschoengastia bulbifera) , and two fleas (Polygenis roberti and Polygenis klagesi) .

= = Conservation status = =

The 2009 IUCN Red List lists T. bolivaris as " Least Concern " , as it is a widely distributed species with a presumably large population that is found in numerous protected areas . However , habitat destruction by deforestation may pose a threat .