

= *Miniopterus mahafaliensis* =

Miniopterus mahafaliensis is a bat in the genus *Miniopterus* that occurs in southwestern Madagascar . Populations of this species have historically been included in *Miniopterus manavi* , but molecular data published in 2008 and 2009 indicate that this supposed species in fact consists of five separate species , including the newly described *M. mahafaliensis* . The species has been found in dry , spiny , and gallery forest , as well as more open habitats , in southwestern Madagascar .

Miniopterus mahafaliensis is a small , brown *Miniopterus* ; its forearm length is 35 to 40 mm (1 @. @ 4 to 1 @. @ 6 in) . The hairs of the underparts have gray tips . The tragus (a projection in the outer ear) is thick and blunt @-@ tipped . The uropatagium (tail membrane) is well @-@ furred and the palate is concave .

= = Taxonomy = =

During the 2000s , molecular studies have revealed that the widely distributed African , Eurasian , and Australian genus *Miniopterus* is much more species @-@ rich than previously thought . In a 1995 contribution to Faune de Madagascar on Malagasy bats , Randolph Peterson and colleagues listed four species of *Miniopterus* on Madagascar and the nearby Comoros , including the small *Miniopterus manavi* with a broad distribution on both Madagascar and the Comoros . In 2008 and 2009 , however , Steven Goodman and colleagues presented evidence that the former concept of *M. manavi* in fact encompassed five morphologically and molecularly distinct species of small *Miniopterus* . These included *M. manavi* itself in the Central Highlands , *M. griveaudi* and *M. aelleni* in the Comoros and northern and western Madagascar , *M. brachytragos* in northern and western Madagascar only , and *M. mahafaliensis* in southwestern Madagascar . The five recognized species of *M. manavi* @-@ like bats are not each other 's closest relatives , but apparently acquired their similarities through convergent evolution .

Miniopterus mahafaliensis was described as a new species in the second 2009 paper by Goodman and colleagues . The specific name is derived from the Malagasy word Mahafaly , which refers to the Mahafaly Plateau , where the specimen has been recorded , and to the Mahafaly ethnic group of the region . Analysis of sequences of the mitochondrial cytochrome b gene suggested that *M. brachytragos* is most closely related to another Malagasy species , *M. sororculus* . Although samples of *M. mahafaliensis* differed from each other by a maximum of 2 @. @ 2 % in their cytochrome b , Goodman and colleagues could not discern any phylogeographic structure within the species .

= = Description = =

Miniopterus mahafaliensis is a small , short @-@ tailed *Miniopterus* with long and dense fur . The fur of the upperparts is brown and the hairs on the underparts have gray tips . *Miniopterus brachytragos* is similar in color , but other small Malagasy *Miniopterus* are darker . The ears are partially haired above , but virtually naked below and end in a rounded tip . The tragus (a projection on the inner side of the outer ear) is relatively thick , has the sides mostly parallel , and ends in a curved , rounded tip . The wing membrane is also brown , but the uropatagium (tail membrane) is lighter . The wing membrane and uropatagium are attached to the upper leg at the same level , above the ankle . The uropatagium is relatively densely covered with hairs , particularly on the upper side . *M. manavi* and *M. brachytragos* also have a densely haired uropatagium , but in *M. aelleni* and *M. griveaudi* it is only sparsely haired or even mostly naked .

In 66 to 74 specimens measured by Goodman and colleagues , total length was 87 to 96 mm (3 @. @ 4 to 3 @. @ 8 in) , averaging 91 @. @ 1 mm (3 @. @ 59 in) ; tail length was 38 to 48 mm (1 @. @ 5 to 1 @. @ 9 in) , averaging 42 @. @ 4 mm (1 @. @ 67 in) ; hindfoot length is 6 to 7 mm (0 @. @ 2 to 0 @. @ 3 in) , averaging 6 @. @ 3 mm (0 @. @ 25 in) ; tragus length was 5 to 6 mm (0 @. @ 2 to 0 @. @ 2 in) , averaging 5 @. @ 8 mm (0 @. @ 23 in) ; ear length was 9 to 11 mm (

about 0 @. @ 4 in) , averaging 9 @. @ 4 mm (0 @. @ 37 in) ; forearm length was 35 to 40 mm (1 @. @ 4 to 1 @. @ 6 in) , averaging 37 @. @ 4 mm (1 @. @ 47 in) ; and body mass was 3 @. @ 8 to 7 @. @ 3 g (0 @. @ 13 to 0 @. @ 26 oz) , averaging 4 @. @ 9 g (0 @. @ 17 oz) . There is no evidence for substantial size differences between males and females .

In the skull , the rostrum (front part) is relatively long and line @-@ shaped . The central groove in the nasal depression is relatively narrow . The frontal bones are slightly rounded and bear a prominent sagittal crest . Further back on the braincase , the lambdoid crest is also prominent . The middle part of the palate is concave , not flat as in *M. aelleni* and *M. manavi* . At the palate 's back margin is a long , thin posterior palatal spine . *Miniopterus mahafaliensis* has 36 teeth in the dental formula 2 @. @ 1 @. @ 2 @. @ 33 @. @ 1 @. @ 3 @. @ 3 (three incisors , one canine , three premolars , and two molars in both upper tooththrows and two incisors , one canine , two premolars , and three molars in the lower tooththrows) . As is characteristic of *Miniopterus* , the first upper premolar (P1) is smaller and more simplified than the second (P2) .

= = Distribution and ecology = =

The range of *Miniopterus mahafaliensis* extends through southwestern Madagascar in the spiny forest and dry forest , often but not always near caves ; it has been found on the Mahafaly Plateau , in the Forêt des Mikea , and the Kirindy Mitea National Park . Further inland , it has been found in disturbed gallery forest in Isalo National Park , in a cave in savanna habitat near Ihosy , and in unspecified habitat at Betroka . Little is known of the ecology of *M. mahafaliensis* , but species of *Miniopterus* generally feed on insects , breed seasonally , and roost in large colonies in caves .