

Natalus tumidirostris (Trinidadian Funnel-eared Bat)

Family: Natalidae (Funnel-eared Bats)

Order: Chiroptera (Bats)

Class: Mammalia (Mammals)



Fig. 1. Trinidadian funnel-eared bat, *Natalus tumidirostris*.

[<http://www.trinibats.com/natalidae-funnel-eared-bats.html>, downloaded 21 February 2016]

TRAITS. *Natalus tumidirostris* is a very small bat, with broad wings. Most range in body length from 35-45mm, with the average forelimb length being 38mm. The average weight of an adult is 6.3g. Males generally weigh between 4.3-8.6g while females generally weigh between 4.5-8.9g (Tejedor, 2011). The tail is 43-60mm long and in most cases longer than the head-body length (Kleiman et al., 2004). Fur is reddish-brown in colour. Dorsal hairs are bicoloured, with bases lighter than tips. Dorsal hairs range in length from 7-9mm. Ventral hairs are mono-coloured and lighter in colour than dorsal hairs. These are also shorter (6-7mm) than dorsal hairs. The ear pinna has a characteristic funnel shape (Fig. 1), which gives the bat its name. Ears are usually 13-16mm long, thin and pointed, with a concavely shaped ear margin (Tejedor, 2011). The eyes are tiny and circular with the eyeball axial length being 0.66 mm (Eklof, 2003). The nostrils are located at apex of the muzzle, usually large and circular, and with no associated noseleaf. Both upper and lower lips are thickened. Upper lip densely covered with moustache-like hairs (Tejedor, 2011). Males are distinguished from females by a bulbous natalid organ located at the base of the forehead (Hill and Smith, 1984).

DISTRIBUTION. Widely distributed in Trinidad and Tobago, South America (Venezuela, Columbia, Guyana, Suriname and French Guiana) and in the Netherlands Antilles (Curacao and Bonaire) (Fig. 2) (IUCN, 2008). There have been no reports of these bats in Brazil, however, due to its close proximity to Guyana and Suriname, it is likely that the species is present in the region (Tejedor, 2011).

HABITAT AND ACTIVITY. *Natalus tumidirostris* roost in both wet and dry habitats ranging from sea level to mid elevations. They are primarily found in caves (Fig. 3) and in arid habitats such as dry, deciduous or semi deciduous forests. Sporadically found in rainforest. Many are also prevalent in gardens and plantations where insects are common (IUCN, 2008). Most seek caves that are medium to large. Roosting sites within the caves are warm and humid, however, the hottest regions of the caves are avoided. The caves selected for roosting are formed from limestone, and may contain high concentrations of ammonia (Tejedor, 2011). Roosting sites are not permanent, as bats move to different habitats over the course of the year. These sites also vary depending on the region. For example, the bats of Bonaire are found roosting in dry cactus scrub, while those found near Tamana caves roost in the hollowed trunks of rubber trees. *Natalus tumidirostris* are nocturnal bats. Unlike other insectivorous bats that fly at high speeds, *Natalus tumidirostris* flies slowly and closer to the ground (IUCN, 2008). Its flight is characterized by erratic moth-like fluttering and high manoeuvrability (Hill and Smith, 1984). When these bats land on the ground, they are unable to crawl, however, they are capable of easily propelling themselves into the air to resume flight (Tejedor, 2011).

FOOD AND FEEDING. *Natalus tumidirostris* is an aerial insectivore that feeds mainly on moths (Lepidoptera), flies and mosquitoes (Diptera) (Tejedor, 2011). Insects are captured on the wing using a foraging style called aerial hawking, however, depending on the density of prey, these bats may switch to foliage gleaning, picking insects from leaves (Hill and Smith, 1984). Aerial hawking involves the use of echolocation to detect prey during flight. While echolocation provides most of the information required to capture prey, background chatter makes it difficult to effectively locate its prey. When this occurs, the bat uses its ears to listen for prey calls and movement or uses its eyes to confirm the presence of prey (Schnitzler and Kalko, 2001). Since *Natalus tumidirostris* is nocturnal, foraging activity commences just before or after dusk and terminates just before sunrise. During this period, bats traverse their nightly routes in search of food. They are most active on dark nights, during periods of light rainfall or immediately after heavy rainfall, when insects are displaced and abundant (Hill and Smith, 1984). During nightly foraging, *Natalus tumidirostris* rarely uses its mouth for capture. Instead, they use their elongated tails or wing membranes to capture insects (IUCN, 2008). Since the insects captured are soft, they are chewed and swallowed directly. However due to the small size of the insects, these bats must consume large quantities of prey to avoid starvation (Hill and Smith, 1984). When kept in captivity, *Natalus tumidirostris* dies of starvation in less than twenty hours if food is not provided (Tejedor, 2011).

POPULATION ECOLOGY. *Natalus tumidirostris* roost individually, or may form clusters in which individuals are well separated from each other (IUCN, 2008). These clusters consists of both male and female bats, however, during gestation, males and females segregate into separate clusters (Deoraj, 2008). During lactation, juveniles form separate clusters which are usually supervised by a couple of adult females (Tejedor, 2011). Colony sizes vary from small to large. Some contain tens, while others may contain thousands of individuals (IUCN, 2008). Often times, *Natalus tumidirostris* shares roosting sites with several other species of bats, however, it most

commonly roosts in association with the species *Carollia perspicillata* with which it forms mixed groups (Tejedor, 2011).

REPRODUCTION. *Natalus tumidirostris* is viviparous, meaning it gives birth to live young. Like most bats, this species has a single cycle of oestrus, pregnancy and lactation, producing only one pup annually (Petit, 2007). Gestation periods are timed precisely to give the greatest chance of survival to both the female and her pup, however, slight variations are recorded among territories (Altringham, 2011). Generally, the gestation period for *Natalus tumidirostris* ranges from February through April, with some variation. During gestation, males and females segregate, with the females forming maternal colonies to raise their young. Gestation usually last about three months (Deoraj, 2008). When young are born, they are nursed by their mothers until they are old enough to forage independently (Petit, 2007).

BEHAVIOUR. Juvenile behaviour: Once born, juveniles remain in the care of their mothers until they are able to obtain food for themselves. They are dependent on their mother's milk, and during daytime roosts, they form compact clusters which grow in size as more young are produced by pregnant females. Once the juveniles are fully grown, the size of the clusters decrease and instead, they form well dispersed groups (Tejedor, 2011).

Anti-predator behaviour: Natural predators of *Natalus tumidirostris* are not known, however, bats do fall victim to opportunistic predators such as snakes, owls, monkeys, large spiders and giant centipedes (Altringham, 2011). These bats attempt to limit their chances of becoming prey by foraging on dark nights and decreasing their activity on nights when the moon is full or when the sky is bright (Hill and Smith, 1984).

APPLIED ECOLOGY. According to IUCN, *Natalus tumidirostris* is a species of least concern. Despite their fragile nature and ease at which they may die, populations are generally stable and are not likely to decrease at concerning rates. Since these bats are most dependent on cave roosts, it is essential that these habitats be conserved and properly managed (IUCN, 2008). Although *Natalus tumidirostris* is not harvested, hunted or captured for domestication, they are sensitive to disturbance, pollution and deforestation. These bats play an important role in pest control by consuming mosquitoes, flies and destructive moths (Petit, 2007). In the Americas, *Natalus tumidirostris* has been identified as a natural reservoir of the bacterium *Borrelia recurrentis* (Hill and Smith, 1984).

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Fig. 2. Geographic distribution of *Natalus tumidirostris*.

[<http://maps.iucnredlist.org/map.html?id=14362>, downloaded 5 March 2016]



Fig. 3. *Natalus tumidirostris* roosting in a cave.

[<http://www.trinibats.com/natalidae-funnel-eared-bats.html> , downloaded 21 February 2016]

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