

## *Diaemus youngi* (White-winged Vampire Bat)

Family: Phyllostomidae (Leaf-nosed Bats)

Order: Chiroptera (Bats)

Class: Mammalia (Mammals)



**Fig. 1.** White-winged vampire bats, *Diaemus youngi*.

[[http://publish.uwo.ca/~gcarter2/Trinidad\\_batkey\\_small.pdf](http://publish.uwo.ca/~gcarter2/Trinidad_batkey_small.pdf), downloaded 3 November 2011]

**TRAITS.** *Diaemus youngi* is a fairly small bat weighing 30-38g, with a body of 80-85mm in length (Greenhall and Schutt, 1996). They are the most complex and agile quadrupedal bats in the world due to adapted quadrupedal locomotion (Schutt, 1997). The bats are brown in colour, with a light brown fur that covers their stomach area. The wings span about 8 inches and they have a short conical nose. Identifiable by the white tips of their ears and wings when in flight and distinguishable from the other two sanguivorous bat species by its lack of calcar (cartilage running along its wing membrane) and a tail. *Diaemus youngi* has well-developed incisor teeth to slice into the flesh of its victims while their other teeth at the back are smaller and serve no purpose (Figure 2). Bats are the only truly species of mammals that can fly, facilitated by the thin membrane of skin stretching from the fingers of the front arm to the hind legs.

**ECOLOGY.** They are neotropical bats found in the the tropical and sub-tropical regions from Mexico to Argentina. *Diaemus youngi*, common name the white-winged vampire bat, is one of three sanguivorous bats of the 1100 plus bat species in existence, and the only one belonging to the genus *Diaemus*. Studies by Dr. H. Metivier and Dr. J. L. Pawan into vampire bats began in the 1930's after an outbreak of rabies that was linked to their infected saliva (Wikipedia 2011).

Caves are particularly favourable habitats for bats because of the microclimate that occurs in it (de Aguiar, 2011) but because these bats' favoured food is bird blood, they are capable of climbing branches and hanging upside down to feed. They are strictly nocturnal and activity begins from dusk. They are sometimes found living in caves with the other two types of vampire bats, *Desmodus rotundus* and *Diphylla ecaudata*.

**SOCIAL ORGANISATION.** Thirty individuals usually roost in caves and trees together to form their colony (Greenhall and Schutt, 1996). Though all bats huddle together in a colony, they do not all go out to hunt at the same time. Thus they sometimes rely on each other to obtain food. They exhibit a dominance-hierarchy behaviour based on the amount of social interactions, thus the larger their contribution to the colony, the higher their ranking. This is a form of reciprocal altruism whereby the mother gives up her earnings of food for the sake of her pup, seen also in the colony sharing of food between adults. If a bat was not to share with its neighbour, they may not be helped in the future. The colony usually consists of more females than males.

**ACTIVITY.** The bats leave their roost in the cave at dusk to go out hunting. They prey on birds and so will stalk trees in search of these trees. They find their victims via the use of echolocation and anti-phonal sounds and attack as is fit. They hunt at the darkest time of the night for two reasons, one of which is to avoid their own predators, owls. The other reason is that their prey is less active at night, an advantage to the bats because of their adaptations to moving around in the dark. After their meals, they return to the roost to share their meal with their young or with others. The bats roost together by hanging upside down by feet, claws gripping the foothold tightly. The tendons in their legs are specially adapted to bend forwards to enable themselves to support their own weight. The bat colonies may move their roost to a more sufficient food source at times.

**FORAGING BEHAVIOUR.** *Diaemus youngi* is a sanguivorous bat, feeding on the blood of other vertebrates, also called hematophagy. They are stealthy hunters in trees. Its diet consists of blood of sleeping birds and some mammalian blood. They move slowly to a bird where individuals fight over a particularly rich feeding spot after sensing where the blood is closest to the surface of the skin. They lick the skin and shave off an area of hair before biting a small plug of flesh to release the blood. Schutt (2008) said that they choose to bite the bird's big toe because it is easier to hide (Figure 3). Their teeth are so small and sharp that the victim does not feel the puncture. These bats drink about half their body weight in blood at a time. They contain a submandibular gland that consists of serous cells that contribute to the anticoagulant constituents of saliva that prevent blood from clotting (Tandler and Phillips, 2002). The blood runs up a groove on the underside of its tongue. Having filled its stomach, the bats hang upside down on branches to urinate, thus removing some of the excess weight before flying off. This is so because the blood is mostly water and so it easily passes through their digestive system. They cannot go two nights without food before starving to death (Animal Planet, 2009). Limb morphology reflects its unique mode of feeding.

**COMMUNICATION.** These bats interact by a call and response style of sounds, with the ability to tell different individuals apart by these calls only, referred to as antiphonal. This helps them to find each other at a distance. This occurs often between mother bat and pup, who will produce such a distinct call that only the mother will respond to it, termed isolated and directive

calls. Calls between *Diaemus youngi* adults are also antiphonal and are specific to tone and frequency-modulation when feeding on chickens in order to identify one individual from the next (Carter, 2008). In groups, the call also helps the bats to form a group to protect their foraging site and to find each other at a distance. Vampire bats, especially *Diaemus youngi*, are unique in communication because they do not rely solely on high frequency echolocation because of the ineffectiveness of its low intensity over long distances. Echolocation occurs whereby high-pitched sounds are emitted and bounce back when they hit an object, thus enabling the bat to gauge how far away the object is when it is completely dark. The anti-phonal social calls they use have a much lower frequency, hence it is more intense.

**SEXUAL BEHAVIOUR.** It is suspected that reproduction occurs in the rainy season. As previously stated, there are less males than females within a colony. They mate upside down while in the roost. Through a process called delayed fertilisation, sperm is kept in the females' reproductive system for a while before ovulation. The embryo then begins to form and is born as a pup. Pregnancy depends on the ability of the bat to fly with the extra weight of the developing pup and lasts 8 months. Females reach sexual maturity after 2 years and are not helped by the males in caring for the pups. Where a mother leaves her baby while going off to hunt for fresh blood, another bat will look after it. Similarly, if a pup is orphaned, another bat will "adopt" it.

**JUVENILE BEHAVIOUR.** Little is known of the juveniles of *Diaemus youngi*, though one is produced per season. They call to their mothers and are responded to using an antiphonal pattern specific to the mother and pup. The newborn pup is blind and lacking fur, weighing 5-7 grams (Conservation Centre 2011) and being nursed for a period of 6 weeks before learning to fly. Pups are fed through regurgitation of blood after its mother has been out foraging for fresh blood (Figure 4). Only one pup is born at a time (Figure 5). The pup reaches maturity at about 9-10 months.

**ANTI-PREDATORY BEHAVIOUR.** They have near the rear of their mouths cup-shaped oral scent glands that swell when the bat feels threatened. They project forward as the bat opens its mouth, giving off an offensive odour and a fine spray of liquid. They also make a high-pitched hissing call, employed for self-defence.

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**Fig. 2.** The difference in facial features, predominantly of teeth and nose structures between *Diaemus youngi* (far right) and *Desmodus rotundus* (left) and *Diphylla ecaudata* (centre).

[<http://nhmag.com/features/25700/the-curious-bloody-lives-of-vampire-bats> downloaded 3 November 2011]



**Fig. 3.** A white-winged vampire bat attacks and feeds from the toes of a chicken on a branch.

[<http://nhmag.com/features/25700/the-curious-bloody-lives-of-vampire-bats> downloaded 3 November 2011]



**Fig. 4.** A depiction of a mother feeding her pup through regurgitation of blood.

[<http://www.darkbanquet.com/info.php?page=522> downloaded 11 November 2011]



**Fig. 5.** The first white-winged vampire pup born in captivity in the USA after its colony was rescued from Trinidad where they are reported to being eradicated.

[<http://babyanimalz.com/2010/08/vampires-bats/white-winged-vampire-bat-pup/>, downloaded 15 November 2011]

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