Macroperipatus torquatus (Peripatus or Velvet Worm)

Order: Euonychophora (Living Onychophorans)
Class: Udeonychophora (Terrestrial Onychophorans)
Phylum: Onychophora (Onychophorans or Velvet Worms)

Fig. 1. *Macroperipatus torquatus.*

[https://tropicalnaturalhistory.files.wordpress.com/2012/07/peripatus.jpg, downloaded 22 March 2015]

TRAITS. *Macroperipatus torquatus,* originally *Peripatus torquatus,* is a member of the Phylum Onychophora (pronounced oh-nee-co-for-ah), commonly known as the velvet worms. These organisms are an ancient group believed to be related to arthropods. This species has between 37- 40 pairs of legs and a defining red-brown or red colouration (Read, 1988). It is the largest known onychophoran and is easily distinguished by its bright yellow collar which takes the form of two bands as seen in Fig. 1, or a continuous line, which separates the head from the rest of the body (Read, 1988). The head and antennae are black in colour while the underside of the entire organism is white which may be tinted with red (Read, 1988). The antennae serve as the major sense organs (Read and Hughes, 1987). *M. torquatus* also possesses paired jaws with blades that face backwards and move alternatingly (Read and Hughes, 1987). Another distinguishing feature is the integument which is comprised of flat scales that overlap in a regular arrangement resulting in a hexagonal pattern (Read, 1988). There are also very specifically modified quadrangular projections along the dermis of the integument, a feature believed to be seen only in this species (Oliveira et al., 2012).

DISTRIBUTION. This species is endemic to Trinidad and is found only in the Northern Range, specimens have been known to be collected near Mount Aripo (Oliveira et al., 2012) as well as in disused cocoa plantations and secondary forest in the proximity of the William Beebe Research Station (Read, 1988). This species has been found along the Arima-Blanchisseuse Road, near to Asa Wright Nature Centre, in caves in Caura Valley and along Verdant Vale Road (Read, 1988).

HABITAT AND ACTIVITY. This nocturnal carnivore lives on the forest floor, usually under or within the layer of leaf litter (Read and Hughes, 1987). On steeper slopes where erosion is more common and the soil is malleable, it dwells in small holes in the soil itself (Read and Hughes, 1987), it has also been found to live in caves (Read, 1988). Read (1988) found many specimens in rotten logs, piled leaf moulds as well as the roots of a fern in a gully, all of which are very damp, dark environments indicating this organism's preference for undisturbed, humid surroundings. It is highly active at night and usually beings hunting just after dusk, returning to a suitable location before sunrise (Read and Hughes, 1987).

FOOD AND FEEDING. *Macroperipatus torquatus* is a nocturnal carnivore, it is a secondary consumer which lies at the third trophic level within the forest ecosystem. It has a very diverse diet and has been found to feed on a wide range of crickets, and cockroaches along with some species of centipedes, millipedes, spiders and woodlice in its natural habitat (Read and Hughes, 1987). Under laboratory conditions it was also found to feed upon beetle larvae, spiders, bush crickets and even juvenile lizards and geckos (Read and Hughes, 1987). It usually forages between 7:30 pm and 9:30 pm, if no suitable prey is found during this period it returns to its hiding place. Foraging is conducted by sweeping its head from side to side using slow steady movements, potential prey is stealthily inspected using the antennae which recoil gently and quickly so as to avoid detection by the potential prey (Read and Hughes, 1987). If prey is deemed suitable, *Macroperipatus torquatus* ambushes it by squirting a proteinaceous glue from its oral papillae (Fig. 2). This glue-like substance can be squirted a distance of up to 4 cm and serves to entangle the prey and prevent its escape. Next it locates a weak area between the thorax and abdomen of the prey and uses its jaws to bite through the membrane in this area (Read and Hughes, 1987). It then immobilizes its prey by injecting its saliva into the site and then extends its oral cone which it uses in conjunction with its jaws to extract the flesh of the prey (Fig. 3). This period of ingestion takes the longest and can last between a few hours to the entire night, depending on the size of the prey. Juveniles prefer smaller prey as compared to adults and feed once every 5.6 days, adults eat once every 22.3 days (Read and Hughes, 1987).

POPULATION ECOLOGY. This organism is generally solitary and does not have any kind of social interaction or order with other organisms of its species. Other species of velvet worms have been recorded to have very complex social structures, such as those found in Australia. They are very rare organisms and are not easily found in the field due to the very limited geographic range in which they live.

REPRODUCTION. This species is known to be viviparous (Anderson et al., 1972) meaning, it gives birth to live young. This organism reproduces sexually and has a spermatheca, a small pouch like organ used to store sperm, and a long oviduct in which the embryos develop after fertilization occurs. Depending on the length of the organism, the number of developing embryos

it contains at any one time is variable. Specimens ranging in length from 80-90 mm contained eight pairs of embryos, four in each oviduct (Anderson et al., 1972). The longest and most developed of these embryos was 40 mm long, indicating that newly birthed juveniles are approximately half the length of the adult organisms. The oviduct of this species behaves uniquely in that it grows and extends from the ovary and is reabsorbed close to the end of the oviduct, near the genital opening (Anderson et al., 1972). There is no documentation on parental care in this species.

BEHAVIOUR. This organism is able to utilize its predatory strategies for defence as well. When threatened it may squirt glue in a defensive capacity (Read and Hughes, 1987) so as to stop predators and allow for escape. The choice to use glue as a defensive strategy is costly as reserves of glue can take up to 24 days to be replenished if completely depleted, during which time hunting and feeding would not be possible. Juvenile organisms have a high tendency to hunt and consume small prey which contribute towards faster development and growth because less glue is wasted and thus energy does not have to be used to produce more. Adults are very unlikely to abandon large prey once caught as it represents a significant investment of their glue reserves (Read and Hughes, 1987).

APPLIED ECOLOGY. This organism while not endangered, is only found in Trinidad and so represents a significant aspect of the biodiversity of fauna on the island. It is not recorded as a pest or other nuisance, again probably due to its limited geographical range as well as its food source.

REFERENCES

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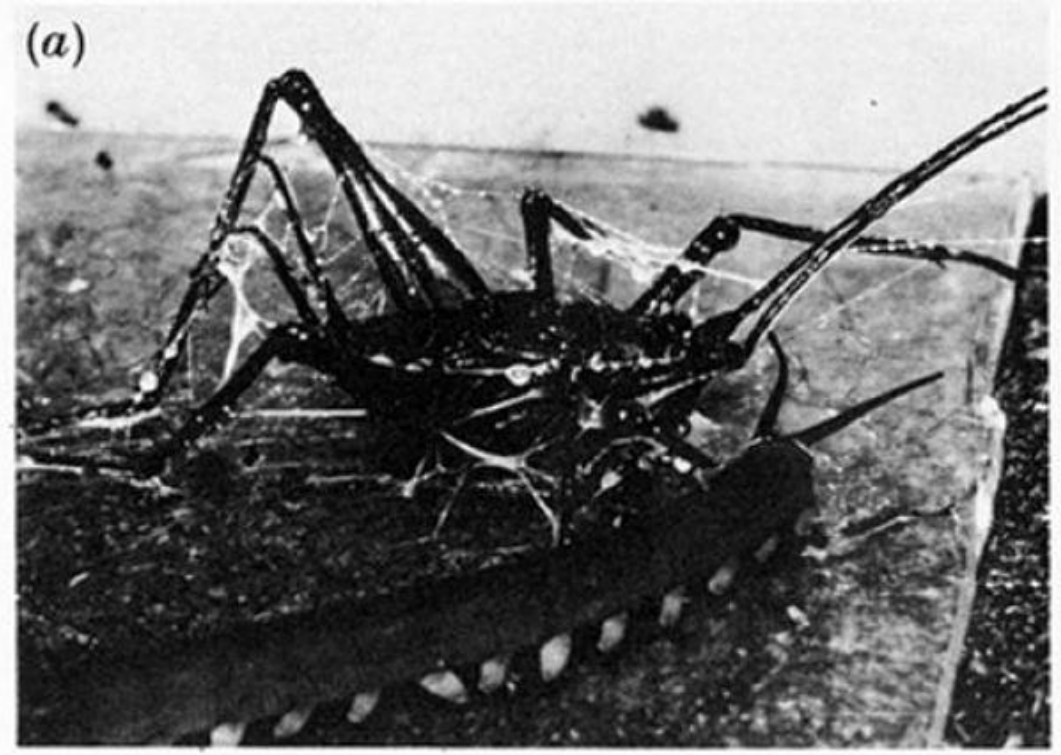

Fig. 2. *Macroperipatus torquatus* entangling a cricket (*Aclodes sp.*) in glue.

[Fig. 1a of Read and Hughes (1987)]

Fig. 3. *Macroperipatus torquatus* feeding on the internal tissues of a camel cricket.

[http://www.sciencephoto.com/media/366659/enlarge, downloaded 30 March 2015]