Dasypus novemcinctus (Nine-banded Armadillo or Tatu)

Family: Dasypodidae (Armadillos)
Order: Cingulata (Armadillos)
Class: Mammalia (Mammals)

Fig. 1. Nine-banded armadillo, *Dasypus novemcintus.*

[http://www.animalspot.net/nine-banded-armadillo.html, downloaded 25 October 2011]

TRAITS. The is one of the most widespread and ancient species found, and can be dated 3 million years back (Wikipedia, 2011.) It is relatively small in size, about 62 to 80 cm. *D. novemcinctus* is greyish-brown in colour and contain several bony plates known as scutes that provide protection from predators. Their body armour is not as hard as a turtle's and contains ribbons of flesh between each band, which lies down the sides of the body. It is named the nine–banded armadillo since it usually contains 9 bands on their tough outer armor, but records show that they may possess from 8 -11. The body shape is oval, with a long and narrow tail, in which the armour extends coverage (Fig. 1). They have distinctively big ears that frame their elongated head that extends into a sharp snout (Nowak, 1999) Armadillos have small eyes and lack colour vision. Their teeth that are simple pegs, and their front legs extend into feet with wide, thick, sharp and vicious claws. These claws help in their burrowing and digging activities. This species can jump sometimes up to 90-120cm straight in the air.

ECOLOGY. *D. novemcinctus* can be found over a range of habitats from northern Argentina, Peru selected areas of the US and among the islands of Grenada and Trinidad and Tobago (Pelotes Island Reserve, 2011). The most important factors that influence that habitat selection are soil texture. Soils that are easily penetrated and dug will result in higher population densities.

This species is also fond of moist areas that contain water bodies, especially if the climate present favors high temperature and arid conditions (Museum of Natural History, 2008).

The armadillo family is notoriously known as a tropical one, and is usually widespread in areas of loose soils. This species is known to be crepuscular and nocturnal in nature, but can be seen engaging in activities on cloudy days. They forage mainly at dawn and dusk and are well adaptable, thus orienting themselves in prairies and tropical forests of hardwoods near marshy regions. Their population density has been accounted up to 280 per km^2 in Southern America.(McBee and Baker 1982). Their diet's main composition comprises almost completely of animal sources but has to ability to be flexible based on the present foraging condition and can be switched to a vegetarian diet (selected fruits). The armadillo has few predators but the Mountain lion and American Alligator are capable of eating them (Benedictine University, 2010).

SOCIAL ORGANISATION. These armadillos are solitary, nocturnal species that primarily forage during dusk. Their level of activity peak during moderate climate conditions and decreases during extremes. They are seen foraging alone and the weaned juveniles begin foraging with their mothers as soon as movement is enabled closely after birth. They are very territorial and mark their areas with the use of urine and faeces. They also use the waste products that are secreted form the eyelids, the feet and the scent glands located in the nostrils (McBee and Baker 1982). These armadillos tend to express an aggressive and volatile nature in high densities and they usually remedy their disputes by pursuing and physically assaulting each other with kicking or "boxing" which is the ability to steady one-self on their tails and hind legs and attack with their claws (Fig. 3). With respect to their aggressive nature, the adult males exude more hatred to the sub adult males and the young experience the wrath of the pregnant females (Nowak 2009)

D. novemcinctus dig burrows from scratch for homes and nesting, with several openings for aeration and protection ranging roughly from 1-7m in length and about 20 inches in depth. Armadillos do not have co-ed burrows but share their homes with other armadillos of the same sex only. It may also be seen that the house themselves with other organisms such as skunks and rabbits and occasionally opossums (Animal Spot, 2011). The female armadillo exhibit clearly marked territories but the males possess larger areas. However it may occur periodically that both territories overlap and coincide with each other.

ACTIVITY. *D. novemcinctus* are nocturnal and usually stay within the confines and comfort of their borrows during the day. More than 50% of the armadillos are usually seen foraging during the periods of dusk and dawn when the climate is considerably cooler in Florida. Despite armadillos being warm-blooded they have difficulty regulating their temperature due to the lack of external hairs and therefore retreat to areas that are cooler, moist and have low light level (Nowak, 1999). During summer time the *Dasypus novemcinctus* is seen out in the open foraging during the evening and night and the reverse occurs in mid winter. They continue their foraging during rainfall due to the protection of their outer shell. Most armadillos do not stay out longer than necessary and usually retreat to their homes or take shelter in dense vegetation (Animal Spot, 2011). They can also swim quite well and remain under water for close to 6 minutes (Fig. 4).

COMMUNICATION. These organisms show vocal communication by exuding a loud and noticeable grunting sound quite consistently during their foraging activity which brings attention to them, making them viable targets for prey (Museum of Natural History, 2008). *Dasypus novemcinctus* may sometimes exhibit growls towards opponents in confrontation, and may even resort to physically assaulting their opponents by kicking and scraping. This behaviour is commonly seen by adults and sub adults (Nowak, 1999).When, hurt or trapped it is reported to exude a whimpering or guttural shriek which is nasal in nature. *D. novemcinctus* utilise olfactory communication by using scent markers to define their territories such as urine, faeces, and the secreted waste materials from their eyelids, scent-glands and feet (Animal Spot, 2011). This practice helps maintain distinctions of the dwellings between genders as they do not cohabitate in the same burrows.

FORAGING BEHAVIOUR. *D. novemcinctus* usually dedicate all their time above ground towards foraging and food gathering. This armadillo is generally insectivorous. They cover roughly 1 km/hr, stopping occasionally to utilise their prime sense of smell for the presence of insects along the ground's pathway, hence, it can cover most of its home range during a foraging activity (Animal Spot, 2011). Their main foraging technique is to propel their snout region into the vegetation type ranging from leaf litter to loose soils, and dig in a frenzied/ haphazard pattern (Fig. 2). They pause periodically to assess their findings of desired food groups such as several species of worms and insects, grub-like matter, ants, small beetles, and termites. Due to their sensitive nose they possess the ability to identify these organisms from up to 8 inches in soil depth (Nowak, 1999). The armadillo consumes their food by lapping it up through their sticky tongues. This process is enabled by a salivary bladder which is encompassed by a skeletal muscle. This bladder houses the thick gluey salivatory fluid employed to immobilise the prey and muscles which propels it onto the tongue (McBee and Baker 1982). Their diets are also supplemented with varied reptiles and amphibians, and the occasional fungi. They also like some fruits and the eggs of birds. The *D. novemcinctus* exhibits loud and consistent grunting sounds during foraging (Benedictine University, 2010).

LIFE CYCLE/ SEXUAL REPRODUCTION. *D. novemcinctus* comprise of two unique periods in their reproductive cycle. Firstly they experience an extended fertilisation period, illustrated by mating occurring in either the months of July or August with the fertilisation and implantation taking precedence in the upcoming March or April (McBee and Baker 1982). This pattern varies in the Southern and Northern Hemisphere, based on the armadillo's successful entry into a region that has optimum climatic condition for the survival of the offspring. Once the zygote has been successfully implanted in the uterus, the armadillo sustains a gestation duration of roughly 120 days or 4 months (Wikipedia, 2011). The second unique attribute is polyembryony and this is caused by the zygote dividing into four identical and equal embryos. Each infant constitutes a separate placenta, to prevent the sharing of blood and nutrients. After birth, the quadruplets are born of the same sex with their eyes open. Sexual maturity is attained at the age of 1 yr and they reproduce for up to 15 yrs with the ability to produce 56 young ones (Nowak, 1999). Their life span is about 7 years providing the conditions are suitable.

JUVENILE BEHAVIOUR. The *D. novemcinctus* is born as identical quadruplets of the same sex, due to all being produced from the same egg. The infants are born with their eyes opened, and pursue a weaning period of 4 to 5 months (McBee and Baker 1982). These armadillos

become sexually active at the age of 1 yr. There is very little physical difference between the adult and young. They begin movement soon after birth and occasionally accompany females on foraging trips out of nest. The infant armadillo however stay away from their mothers during the summer months and spring time (Nowak, 1999).

ANTIPREDATOR. *D. novemcinctus* rarely has predators and is well protected due to their hard outer layer. Their armour provides a degree of difficulty to dislodge, though they can sustain bites from predatory species such as the Mountain lion and American alligator. (Grzimeck, 1975). The armadillo usually curls in a ball to hide and shield themselves or use dense bushes to hide. They are easily alerted , thus exhibits a reflexive reaction by jumping high in the air and sprinting away from their enemies, or in some instances they may swim underwater for protective security (Fig. 4). They alert their few predators by their consistent "grunting" (Museum of Natural History, 2008). *D. novemcinctus* can move at a quick pace (1km per hr) hence providing them with an extra edge over their predators. In extreme cases, the armadillo may attack by using their claws to scrape and kick their opponent while standing on their hind legs and tail.

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Fig. 2. Nine-banded Armadillo feeding.

[http://www.ehow.com/info_8381228_armadillo-lawn-pests.html, downloaded 10 November 2011]

Fig. 3. Nine-banded armadillo showing fighting stance with claws.

[http://www.samsarmidilloblog.blogspot.com, downloaded 11 November 2011]

Fig. 4. Nine-banded armadillo swimming.

[http://www.art.com/products/p14261452-sa-i2894268/nine-banded-armadillo-swimming-underwater-melbourne-florida.htm, downloaded 10 November 2011]