

## *Rhinella marina* (Cane Toad or Crapaud)

Family: Bufonidae (True Toads)

Order: Anura (Frogs and Toads)

Class: Amphibia (Amphibians)



**Fig. 1.** Cane toad, *Rhinella marina*.

[[http://a-z-animals.com/media/animals/images/original/marine\\_toad1.jpg](http://a-z-animals.com/media/animals/images/original/marine_toad1.jpg). downloaded 17<sup>th</sup> November 2011]

**TRAITS.** The cane toad, marine toad or crapaud was previously known by the scientific name *Bufo marinus*. Considered as the largest species in the Bufonidae family, female specimens are considerably larger than males, attaining a snout-vent length of 15 cm (Page et al, 2008). Juvenile toads may bear an appearance similar to other species but can be distinguished by the presence of paravertebral tubercles (Zug and Zug, 1979). Head broad with short snout, bony ridges present along edge of head (Zug and Zug, 1979). Large parotoid glands located behind eyes. Interorbital and supraocular regions separated by bony ridge that traverses forward from both sides and terminates between the nostrils (Page et al, 2008). Skin along back and limbs covered with warts. Fore limbs lack webbing between fingers, whereas webbing on toes extend to midway (Zug and Zug, 1979). Males have horny spines present on warts. Toad coloration may vary. Specimens may have grey, brown or rust brown dorsal region and creamish-white to

yellow ventral region with brown blotches (Zug and Zug, 1979). Juveniles have mottled dorsal patterning of bars or lines. This patterning can also be observed on adult females (Zug and Zug, 1979). Tadpoles have rounded bodies and range between 10 to 35mm (Page et al, 2008). Body and tail black to brown with white speckled under belly and a pale stripe along lower caudal muscle. Mouth is typical oral disc with serrated marginal papilla (Zug and Zug, 1979).

**ECOLOGY.** *R. marina* is a lowland toad inhabiting areas that are primarily below 1000 m; however altitude appears to be dependent on minimum temperature that the toad can tolerate. Habitats that are at higher latitudes would have toads existing at lower altitudes (Zug and Zug, 1979). Specimens have been located in various habitats ranging from sandy beaches and forests, to flood plains. Toads seem to avoid areas of overly dense vegetative growth, which is speculated, can be a hindrance to species dispersal (Page et al, 2008). The highest density of toads is observed in close proximity to, and is related to the degree of human habitation; hence their ability to thrive in disturbed habitats. Natural habitats of toads range from Texas, Mexico, Central and northern Southern America, Amazon Basin (Brandt and Mazzotti, 2005), and Trinidad and Tobago (IUCN, 2010). Toads have been introduced into several countries throughout the world including Africa, Asia, Australia, the Caribbean, New Guinea, North America, and islands that make up Oceania (Page et al, 2008). Female toads can produce approximately 200,000 eggs during its reproductive life and toads can live for 10 to 24 years (Page et al, 2008).

*B. marinus* is capable of consuming a variety of small terrestrial organisms. Toads primarily consume small arthropods and insects, as well as gastropods. Prey preference seems non-existent and organisms consumed follow seasonal patterns and species abundance (Zug and Zug, 1979). Toad diet has also been proven to include inanimate objects accidentally ingested, as well as instances in which individuals have been observed consuming pet food and feces (IUCN, 2010). The introduction of *R. marina* into non-native territories has resulted in the toad being listed as an invasive species. Introduction of *R. marina* has led to the decline in native species due to predation, competition for resources and toxicity to predators. Toads have been known to consume local amphibians and small mammals, and caused fatalities of reptiles in Australia and decreased monitor lizard populations in Guam (IUCN, 2010).

**SOCIAL BEHAVIOUR.** *R. marina* is a solitary nocturnal toad, with little to no social interaction between individuals with the exception of the larval stage, mating, or the congregation of individuals at an abundant feeding source or den (Zug and Zug, 1979). Toads that have recently undergone metamorphosis from the larval stage may gather at the pond edge briefly before individuals migrate to a suitable habitat (Zug and Zug, 1979). Toads show no attempt at claiming or defending territories but individuals maintain conserved regions between each other when occupying the same feeding station. Agonistic behaviour has been displayed between competing toads at feeding whereby tongue strikes at the eyes, throat, limbs or back of the opponent (Fig. 2.) were in hopes of deterring capture of a prey item (Robins et al, 1998). Toad aggregation can occur at dens that have high moisture content. These preferred sites allow for hydration during diurnal periods.

**ACTIVITY.** Toad activity is dependent of environmental factors, as well as time of day. Occupation of temperate zones exposes toads to variations in temperature and day/night length. Tropical areas experience seasons of drought and periods of higher than average rainfall. Severe drought results in a dramatic decline in toad activity whereas during rainy seasons toads have

been recorded as having activity based on a three day cycle (Zug and Zug, 1979). Toads are primarily nocturnal with the exception of tadpoles and newly metamorphosed toads. Activity occurs soon after dusk and continues only for short periods at select feeding sites, after which toads then retreat for the rest of the night. Diurnal activities of toads are a rare occurrence due to the possibility of desiccation attributed to their permeable skin, thus individuals retreat to suitable dens that allow for moisture retention and up-take. Hydration is maintained by absorption of water through a thin, extremely vascularized section of skin located on the ventral pelvic region (Cohen and Alford, 1996). Movement through a toad's environment is achieved by jumping or swimming which is facilitated via propulsion produced by muscular hind limbs (Gillis and Biewener, 2000). When stationary, toads sit in an up-right position whereas travel is obtained primarily through hops over short distances (Hilgris, 2001).

**FEEDING BEHAVIOUR.** Prey location by toads is achieved primarily through visual stimuli. Motion produced by suitably sized organisms initiates a sequence of actions beginning with the toad positioning its body in the direction of the prey item. The toad subsequently fixates and stalks its prey until within suitable striking range. The prey is quickly captured using the tongue which is quickly protracted. Prey is captured with the dorsal region of the tongue. The tongue is quickly retracted into the mouth, prey swallowed and mouth wiped with forelimbs. Olfactory and auditory senses are utilized much less; however the apparent noise created by insects can attract toads to a feeding area (Zug and Zug, 1979).

Food choice is influenced by seasonal events leading to changes in food abundance; therefore the type of prey that comprises a toad's main diet is decided by availability rather than preference (Zug and Zug, 1979). Toads are not overly selective of prey size but limited by size of buccal opening and expansion of stomach. Typical prey size falls between 0.5 cm and 1.0 cm in length with large adults capable of ingesting prey the size of a mouse (Page et al, 2008). Observations, however indicate that large adults may ignore prey that measure below 0.2 cm in length (Zug and Zug, 1979).

**COMMUNICATION.** Communication between toads occur through vocalizations and body vibrations (Bowcock et al, 2008). These signals are utilized as aides in reproductive strategies. Vocalizations, with the exception of the release call, are performed solely by the male of the species whereas vibrations are performed by both sexes. Body vibrations are utilized by females, along with a release call, in attempts to cue mounted males to alight from the mating embrace (Bowcock et al, 2008).

**SEXUAL BEHAVIOUR.** Sexually maturity occurs in females that have attained sizes ranging from 7.5-10cm, and males from 8.5-9.5cm (Zug and Zug, 1979). Mating can commence within the period ranging from the end of the dry season up until late in the rainy season. The larger female is mounted by a male and remains attached until eggs are released into a shallow water body at which point sperm is released by the male resulting in fertilization. Release of eggs occurs during a single amplexus and not spanning several matings with different males (Zug and Zug, 1979). Tadpoles emerge within 36 to 48 hours measuring approximately 0.5 cm, and metamorphosis occurs approximately within two months at approximately 1.5 cm. Speed of metamorphosis is influenced by change in seasons from wet to dry thereby resulting in drying of water bodies.

**POST-METAMORPHIC TOADS.** Recently emerged toads disperse from pond edge to a suitable habitat. Predation of these toadlets is high due to small size and reduced toxicity. Reduction in predation occurs as juveniles increased in size (Zug and Zug, 1979).

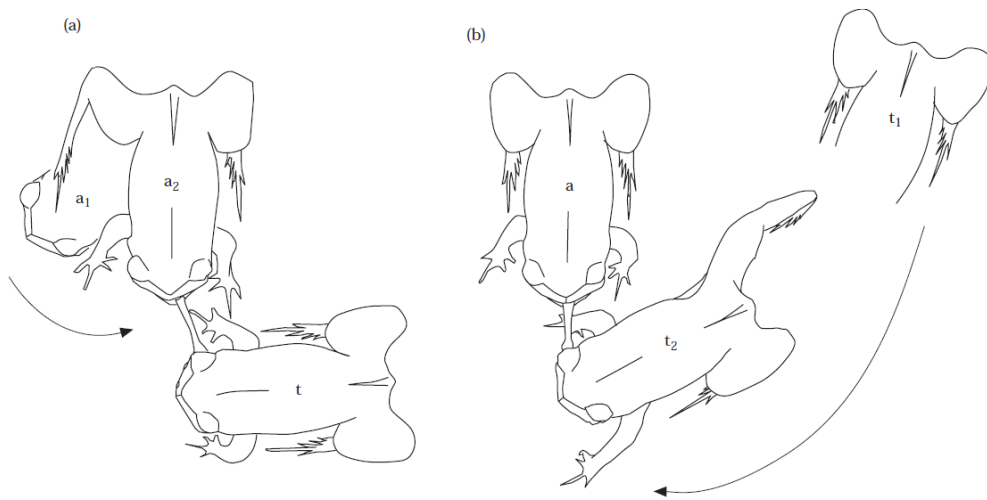
**ANTI-PREDATOR BEHAVIOUR.** Predation of recently metamorphosed toads and juveniles is higher than in adults due to size and the secretion of bufotoxin from parotoid glands. Eggs have lower predation by fish as compared to other toad species due to toxic mucus covering. Confrontation by possible threat initiates avoidance tactics in which the toad elevates its body and presents its dorsal region to the on-coming threat.

#### REFERENCES

- Bowcock, H, G Brown, and R Shine. 2008. Sexual communication in cane toads, *Chaunus marinus*: what cues influence the duration of amplexus? *Animal Behaviour*. Volume: 75, Issue: 4, Pages: 1571-1579
- Brandt L. A., and F. J. Mazzotti, 2009. Marine Toads (*Bufo marinus*). *WEC 11*. IFAS.
- Cohen, Martin P., and Ross A. Alford. 1996. Factors affecting Diurnal Shelter use by the Cane Toad, *Bufo marinus*. *Herpetologica*. Vol 52 (2), Pgs.172-181.
- Gillis, G. B. and A. A. Biewener. 2000. Hindlimb Extensor Muscle Function during Jumping and Swimming in the Toad (*Bufo Marinus*). *The Journal of Experimental Biology*. Pgs. 3547–3563.
- Hilgris, R. 2001. "Bufo marinus" (On-line), Animal Diversity Web. Accessed October 27, 2011 [http://animaldiversity.ummz.umich.edu/site/accounts/information/Bufo\\_marinus.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Bufo_marinus.html).
- IUCN SSC Invasive Species Specialist Group. "Rhinella marina (=Bufo marinus) (amphibian)." Last Modified: Wednesday, May 26, 2010. <<http://www.issg.org/database/species/ecology.asp?si=113&fr=1&sts=&lang=EN>>
- Page, A., W. Kirkpatrick and M. Massam. 2008. Risk Assessments for Exotic Reptiles and Amphibians introduced to Australia – Cane Toad (*Bufo marinus*) (Linnaeus, 1758) *Department of Agriculture and Food, Western Australia*
- Robins, A., G. Lippolis, A. Bisazza, G. Vallortigara, and L. J. Rogers. 1998. Lateralized agonistic responses and hindlimb use in toads. *Animal Behaviour*, Vol. 56, 875–881
- Zug, G. R. and P. Zug. 1979. The Marine Toad, *Bufo marinus*. A Natural History Resume of Native Populations. Smithsonian Institution Press. City of Washington.

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**Fig. 2.** Agonistic behaviour displayed by *R. marina* - tongue striking eye of opponent.

[Fig.1 of Robins et al (1998)]