

Marine Toad

Rhinella marina; formerly *Bufo marinus*

Class: Amphibia **Order:** Anura **Family:** Bufonidae

Other names: cane toad; giant neotropical toad; giant marine toad; Agua Toad, Shoulder-knot Frog; Crapaud (French); Sapo Común (Spanish); Sapo Grande (Spanish)

Other Subspecies:

Brandywine Zoo Toads 0.0.2

0.0.2 “Biggie” and “Smalls”

About Biggie and Smalls

Biggie DOH: March 1, 2008; Aq: March 26, 2008

Smalls DOH: March 1, 2008; Aq: March 26, 2008

Biggie and Smalls came from amphibian specialist breeders. Their genders are unknown.

Status Least Concern [1]; Invasive outside their native region

Geographic Region

The natural range of giant marine toad native to Central and South America, from the Rio Grande Valley of Texas south to the Central Amazon and southeastern Peru [2] [3].

However, it has been introduced and is considered invasive throughout much of Oceania and the Caribbean, as well as Australia [2]. It's now found in the Caribbean Islands, South Florida (Key West and Stock islands, Tampa Bay, Hillsborough, Dade and Broward counties), the Hawaiian islands, and Australia's east coast (East Queensland and Coastal New South Wales [3].



Habitat

Marine toads prefer forested areas with semi-permanent water nearby [3]. Humid areas with adequate cover, including cane fields, savannah, open forest, well watered yards and gardens [1]. It also inhabits dry equatorial forests [1]. It thrives in degraded habitats and man-made environments, and is occasionally found in pristine lowland and montane rainforests, but generally prefers open or disturbed habitat such as tracks, roads, low grassland and areas that are near human settlement [1].

Characteristics

Size: 3.74 oz. average, 5.9-9.3”

Longevity: Wild 10 years [3]-15 years [2]

Captivity 8 years [3]-35 years [2]

Physical Description

- **Ectothermic**
- Marine toads are extremely large, toads with dry, bumpy skin
- Their grey olive brown dorsal skin with many warts ending in dark brown caps [3]
- Huge **parotoid glands** located from behind the eyes, stretching from the **tympanum** down the side of the body [3].
- A high bony ridge meets at the snout between the nostrils [3].
- **Poisonous-** toxic glands located on its back secrete a poison, bufotoxin, which can cause a variety of symptoms (see Behavior)
- They can survive the loss of up to 50% of their body water, and can survive temperatures ranging from 5 - 40°C (41-104°F) [4].

Dimorphism

Four characteristics reliably allowed rapid assessment of sex: skin texture on the dorsal surface, skin color on the dorsal surface, the presence of a creamy-colored stripe along the dorsal margin and the presence of vocal sac openings (being most reliable) [5]

Males: Skin texture on dorsal surface -An evenly distributed pattern of small round warts. **Skin coloration on dorsal surface**- Yellowish-green dorsal surface with brown warts. **Creamy stripe on dorsal margin**- No creamy stripe observed along the dorsal margin. **Vocal sac**- Pair of vocal sac openings present on both sides of the inside of the mouth. Calling may also be heard during handling [5].

Females: skin texture on dorsal surface -Presence of larger and unevenly distributed warts on dorsal surface and two rows of evenly sized round warts present along the dorsal margin. **Skin coloration on dorsal surface**- Distinctive patches of brown mottled patterns with a dark green coloration. **Creamy stripe on dorsal margin**- Distinctive creamy stripe along the dorsal margin from head to vent region. **Vocal sac**- No vocal sac present [5].

Diet: Carnivore

Marine Toads forage primarily at night in mature forests and on roadways. Vision appears to be their primary mode of locating prey, but they can also use their sense of smell [2].



Diet in the Wild: They have the distinction of being one of the only known amphibians to eat plant matter and carrion as adults in rare instances. Insects, crustaceans, plant matter, dog and cat food, birds, lizards, small mammals and other amphibians are not uncommon. The marine toad is unusual from other members of the Bufonidae family in that it is known to eat stationary objects whereas most members of this family locate prey by movement.

Diet in the Zoo: crickets, worms and adult mice

Behavior

- *Nocturnal*, night active
- *Terrestrial* – despite their name ‘marine,’ the adults of this species are completely terrestrial, and only come to fresh water to breed [2].
- During cold or dry seasons it will remain inactive in shallow excavations beneath ground cover.
- When confronted by a predator, it is able to secrete toxin from glands on the back in the form of white poisonous fluid. If a predator ingests these toxins, or they contact mucous membranes, they may cause profuse salivation, twitching, vomiting, shallow breathing, and collapse of the hind limbs. This toxin can cause temporary paralysis or even death in some predators, including dogs.
- The cane toad is capable of inflating its lungs, puffing up and lifting its body off the ground to appear taller and larger to a potential predator [2]
- These toads were introduced to new habitats all over the world in order to help control an invasive pest, the sugar cane beetle. This introduction was ill thought out and allowed the prolific marine toads uncontrolled access to new tropical and subtropical habitats worldwide.

Reproduction and Growth

- **Oviparous**, egg-laying
- **Amplexus**
- *Polygynandrous* (promiscuous)
- The marine toad is able to reproduce nearly year round [3].
- The females are able to lay eggs after their second year [3].
- Males congregate in temporary or permanent still or slow moving water and call for mates. More than one male may fertilize the eggs of a single female, and a particularly successful males may fertilize the eggs of multiple females in a breeding season [3].
- Eggs are laid in long jelly-like strings on rocks, debris, or emergent vegetation; in excess of 8,000 – 17,000 eggs in a clutch, although some females may lay over 40,000 eggs. Eggs hatch in two to seven days [3].
- The eggs and tadpoles are poisonous to any animal that may eat them and will displace native tadpoles.
- Once the eggs are fertilized and arrayed in the water, there is no further parental care. [3]

Conservation

Rhinella marina has been called one of the 100 worst invasive species worldwide by the Invasive Species Specialist Group [3].

- **Use & Trade:** Originally introduced to control sugar cane pests; has also been accidentally and intentionally released by animal importers, zoos, and laboratories [6].
 - The species has been put to various uses across its geographic range. It is used for educational purposes, skins are used for bags in Mexico and for drum skins in Papua New Guinea, while whole animals are stuffed and sold as souvenirs in Nicaragua. Some toads are taken for traditional medicinal uses and then released [1].
- **Threats:** Overall, there are no significant threats to this very adaptable, invasive species. Introduced animals are carrying salmonella in Puerto Rico, putting other native species at risk. In some parts of its introduced range it competes with native frogs and has a negative impact on native wildlife that attempt to consume it. Survival and development of tadpoles in Bermuda are being affected both by contaminants found in a number of its ponds and by transfer of accumulated contaminants [1]
- **Predators:** Many species prey on the cane toad and its tadpoles in its native habitat, including the broad-snouted caiman, the banded cat-eyed snake, the eel, various species of killifish, the rock flagtail, some species of catfish, some species of ibis and bullet ants [2].
 - Predators outside the cane toad's native range include the whistling kite, the rakali, the black rat and the water monitor. There have been occasional reports of the tawny frogmouth and the Papuan frogmouth feeding on cane toads; some Australian crow species have also learned strategies allowing them to feed upon cane toads. Opossums likely can eat cane toads with impunity. Meat ants are able to kill poisonous cane toads, as the toxins that usually kill a cane toad's predators do not affect the meat ants [2].

Did You Know?/Fun Facts

- The cane toad has been introduced to many regions of the world—particularly the Pacific—for biological control of agricultural pests such as the greybacked cane beetle, *Lepidoderma albobirtum* (successful in Puerto Rico), or the failed attempt to have it control rats in Jamaica. Because of its success in controlling cane beetles, it has been introduced (and is now highly invasive) to many islands around the world [2].
- It preys on and outcompetes native amphibians and also causes predator declines, since these predators have no natural immunity to the bufotoxin it secretes [3].

Glossary: List of definitions of the most important recurrent technical terms used in the text.

Amplexus - a type of mating behavior exhibited by some externally fertilizing species (chiefly amphibians and horseshoe crabs) in which a male grasps a female with his front legs as part of the mating process, and at the same time or with some time delay, he fertilizes the female eggs as they are released from the body.

Dorsal Margin- line along the backside of female toads, from head to vent region. Think 'along the spine.'

Ectothermic – Organisms which rely on environmental heat sources to operate at very economical metabolic rates

Oviparous- refers to animals that lay eggs, with little or no other embryonic development within the mother.

Parotoid gland- an external skin gland on the back, neck, and shoulder of toads and some frogs and salamanders. It secretes a milky alkaloid substance to deter predators. The substance, *bufotoxin*, acts as a neurotoxin.

Tympanum - external hearing structure in animals; in frogs and toads, it is located just behind the eye. It does not actually process sound waves; it simply transmits them to the amphibian's inner ear, which is protected from water and other foreign objects.



Bibliography

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