



Pachytriton (Boulenger, 1878) Paddle-Tail Newts



Pachytriton labiatus, Photo © Dr. Burkhard Thiesmeier, AG Urodela

INTRODUCTION

Pachytriton spp. stream-dwellers, and use their long, paddle-shaped tails as propulsion and navigation devices. *Pachytriton* have small eyes, and short, stout limbs. Unlike other members of the family Salamandridae, *Pachytriton* spp. have smooth skin, instead of the typical tuberculate skin of newts, and are perhaps the most advanced species of this family. *Pachytriton* are exceptionally territorial, and are known to aggressively defend their turf.

David incorrectly described the first *Pachytriton* specimen, 1875, as *Cynops sinensis* (Zhao, 1988). This was most likely based on morphological and geographical observations, such as the blackish body, bright colored belly, Asian origin, and aquatic behavior. Later, a similar species was described by Sauvage as *Triton brevipes*, and in 1878, Boulenger coined the name *Pachytriton*, and applied it to *Triton brevipes*, making it *Pachytriton brevipes* (Zhao, 1988). Another new species was discovered by Unterstein in 1930, which he named *Molge labiatum*, and which was considered a synonym of *Pachytriton brevipes* by Pope in 1931, and then a subspecies by C.C. Liu in 1973 (Zhao, 1988). The two subspecies of *Pachytriton brevipes* were later considered separate species based on morphological differences, and the fact that there is no evidence of hybrids in the overlapping distributions. Today, there are two recognized species, *Pachytriton labiatus* (= *labiatum*), and *Pachytriton brevipes*.

There is still more work to be done with the genus *Pachytriton*, as there are three unknown forms appearing in the pet trade; *Pachytriton* A, B, and C, for which there is currently limited information about. *Pachytriton* A and B are relatively similar to both *P. labiatus* and *P. brevipes*, and one hypothesis describes them as hybrid *brevipes* x *labiatus* individuals. If this is true, *P. labiatus* and *P. brevipes* may be placed back into the same species. Other theories place them as separate species altogether. The third unknown form, Type C, is notably different in physical appearance than the other unknown forms and species, and is likely an entirely new species. Some have even speculated as to the need for a new genus just for this type. Unfortunately, there is no distribution or origin information for these mystery creatures, as is the nature of the pet trade, and until genetic research says otherwise, they are simply treated as unknown forms.

Pachytriton labiatus (Unterstein, 1930) Spotless Paddle Tail Newt

Taxonomic Synonyms: *Molge labiatum* (Unterstein, 1930), *Pachytriton brevipes* (Hu, Zhao, Liu, 1973), *Pachytriton labiatus* (Zhao & Hu, 1984)

Vernacular Names: Paddle Tail Newt, Spotless Paddle Tail Newt, Spotless Stout Newt.

The dorsum of *Pachytriton labiatus* is usually chocolate brown, or almost black, with or without broken, orange, dorsolateral stripes. Like all *Pachytriton* newts, except Type C, the skin is very smooth, lacking the rough texture characteristic of other newt species. The venter is bright orange or reddish, mottled with black coloration. This pattern is similar to some newts of the genus *Cynops*. The tail is as long as, or slightly longer, than the body, with a prominent paddle-shaped tip. The tail is used for propulsion through flowing streams in the wild, and the shape distinguishes *Pachytriton* sp. from other newt species. The limbs are short, with stubby digits that are noticeably less defined than those of *P. brevipes*, and that almost appear webbed (Theismeier & Hornberg, 2003). The differentiation of toe form is most noticeable in the hind feet of both species. *P. labiatus* are also slimmer, and slightly shorter than *P. brevipes*, attaining lengths of 6-6.5 inches on average (Theismeier & Hornberg, 2003); however, some have reported larger individuals. Breeding males will develop one or more bluish-white spots or blotches along the distal end of the tail, and swollen cloaca. *P. labiatus*, and *P. brevipes* are known to develop lighter coloration with age, a characteristic more prominent in *P. brevipes* (Theismeier & Hornberg, 2003).

Breeding behavior is similar to *Triturus* and *Cynops*, in that males seek out females, and fan pheromone secretions toward them with the tail. *P. labiatus* males attempt to lead females off, while tail-fanning. An interested female will follow the steps of the male, nudging his cloaca with her snout periodically (Theismeier & Hornberg, 2003). The male will then deposit one or more spermatophores onto the substrate, in hopes that at least one adheres to the females cloaca as she passes over. Females will deposit eggs onto the roofs and sides of caves and crevices, and will aggressively guard them against any intruders. Interestingly, females have also been known to consume their own eggs. Because of their defensive behavior, fertilized females should be housed alone to avoid fighting and attacks against other newts.

Females produce a rather small number of eggs in captivity, usually around 40-50 for the entire season (Theismeier & Hornberg, 2003). This is rather low compared to other newt species, such as *Triturus* and *Cynops*, which may produce hundreds of eggs in a single season. *P. labiatus* eggs are relatively large, around 4.4-

4.5 mm, and hatch after about 2 months in temperatures of 55°F-66°F (13°F-16°F) (Theismeier & Hornberg, 2003). Warmer temperatures result in shorter incubation periods. Larvae hatch before complete development, for unknown reasons (Theismeier & Hornberg, 2003). Mature larvae are stream type, lacking balancers, and possessing short gills, and streamlined bodies. Larvae may begin metamorphosis after only a few months at moderate temperatures of around 60°F, and morphs are considerably small, around 35-42 mm (Theismeier & Hornberg, 2003). In captivity, young *P. labiatus* have been raised both aquatically and terrestrially. In the wild, *P. labiatus* juveniles are thought to live terrestrially for the first few years of life, before reaching sexual maturity and returning to the water.

P. labiatus are thought to inhabit two disconnected areas in Eastern China (Zhao, 1988), where adults are presumed to remain completely aquatic. According to Zhao, et al., 1988, *P. labiatus* are found in two disconnected areas that include the Chinese Provinces of Guizhou, Guangxi, southern Hunan, and Zhejiang, and overlaps with *P. brevipes* in the Provinces of Guangxi and Hunan. Other references show maps that include Guangdong, and exclude Guangxi, while others include Jiangxi, Jiangsu, and Anhui. Although the southeastern populations overlap with *P. brevipes*, there is no confirmation of hybrids. It can be presumed that the exact range of *P. labiatus* is poorly known, especially in light of the unknown types appearing in the pet trade. It is also assumed that the current distribution of *P. labiatus* has been reduced due to human encroachment, habitat loss, and pollution.

Pachytriton brevipes (Sauvage, 1876) Spotted Paddle-Tail Newt

Taxonomic Synonyms: *Cynops sinensis* (David, 1875), *Triton brevipes* (Sauvage).

Vernacular Names: Spotted Paddle Tail Newt, Spotted Stout Newt, Chinese Brook Salamander.

Pachytriton brevipes are similar in physical shape to *P. labiatus*, but differ in coloration and size. *P. brevipes* may be dark chocolate brown, with darker colored spots about the dorsum, head, and tail, or a light brown or tannish color, also covered in dark spots. The dark spotting is more difficult to see on browner individuals, and some may lack spotting altogether. The belly color and pattern is variable, and may consist of lighter color, with or without dark spotting, solid black coloration, or absent black coloration (Theismeier & Hornberg, 2003). Adults may reach 5.5-7.5 inches (14-19cm) (Theismeier & Hornberg, 2003). The labial folds are also more prominent than in *P. labiatus*. Like *P. labiatus*, *P. brevipes* possess the characteristic long paddle-shaped tail, short limbs, and stubby digits, however, the digits of *P. brevipes* are longer, and more distinguishable than *P. labiatus*, a characteristic especially noticeable in the hind feet (Theismeier & Hornberg, 2003). Breeding males will develop one or more bluish-white spots along the posterior end of the tail, and swollen cloaca. *P. labiatus*, and *P. brevipes* are known to develop lighter coloration with age, a characteristic that shows the dark spotting more clearly in *P. brevipes* (Theismeier & Hornberg, 2003).

The breeding requirements and behaviors of *P. brevipes* are still unknown.

P. brevipes are found in southeastern China (Zhao, 1988). According to Zhao, et al., 1988, *P. brevipes* are found in the Chinese Provinces of Guangxi, Guizhou, Jiangxi, Fujian, Zhejiang, and Hunan, and overlaps with *P. labiatus* in the Provinces of Guangxi and Hunan. Other references show maps that include Guangdong, and exclude Guizhou, while others show an overlap of *P. brevipes* and *P. labiatus* in the Provinces of Guangxi, Guangdong, and Hunan. The habitat is the same as *P. labiatus*, that is, cool, clean streams with high oxygen content. It is assumed that the the current distribution of *P. brevipes* has been reduced due to human encroachment, habitat loss, and pollution, and like *P. labiatus*, the exact range is poorly known. Although the southeastern populations overlap with *P. brevipes*, there is no confirmation of hybrids.

Unknown forms: *Pachytriton* A, B, C

Three distinguishable, unknown newts have recently appeared in the the pet trade. Based on behavior and physical appearance, they are thought to be species or subspecies of *Pachytriton*, but are simply considered unknown forms for now. Each type does not completely fit the description of either *P. labiatus*, or *P. brevipes*, but has yet to be accurately described or classed due to the lack of origin and definitive life history information.

Pachytriton A is similar in appearance to *P. brevipes*, but males develop bluish-white coloration on the entire tail, up to the cloaca. This unknown form also lacks conspicuous spotting, a distinguishing characteristic of *P. brevipes* (Theismeier, 2003). The shape of the hind toes is more similar to *P. labiatus*, but the toes are slightly more defined. Juvenile *Pachytriton A* have bright bellies, like *P. labiatus* adults, reddish dorsolateral stripes, and develop dark spotting with age (Theismeier, 2003).

Despite the lack of origin and natural history, *Pachytriton A* has been successfully bred in captivity. Breeding behavior is very similar to that described in the *Pachytriton labiatus* section, above. For a breeding account of *Pachytriton A*, see Deutsche Gesellschaft für Herpetologie und Terrarienkunde, Salamandra Abstracts Volume 33, Number 2/97.

Pachytriton B are thought to be more similar to *Pachytriton labiatus* in physical appearance, but are larger, with lighter brown coloration, and more faded belly color. *Pachytriton B* may reach up to 7.10 inches (18cm), and are also more rectangular in shape when compared to *P. labiatus* (Theismeier, 2003). However, the hind toes are similar to *P. brevipes* in that they are longer, and more distinguishable than in *P. labiatus* (Theismeier, 2003).

Pachytriton C are most likely the easiest to distinguish from the other unknown forms. They are olive green or brown with a greenish tint, some with dark markings along the back, tail, and head. The skin is almost leathery in appearance, and considerably rough compared to the smooth skin characteristic of *Pachytriton spp.*, and the typical paddle-shaped tail is present. Some individuals may also possess a pale peach or yellow colored dorsal stripe that extends along the upper side of the tail. *Pachytriton C* will hibernate during the winter, at temperatures around 40°F (Wallays). Juveniles and adults can secrete a sticky,

odorous mucus if disturbed, and adults may "play dead" if disturbed during winter temperatures (Wallays).

Pachytriton C has also been successfully bred in captivity. Courtship includes tail-fanning, which also may be displayed when the newt feels threatened. Males and females are increasingly aggressive during the mating season, and will attack approaching members of the same sex (Wallays). Eggs are attached to the sides of rock walls and crevices, and are guarded by the female. For more information and a breeding account, see the Moscow Webpage of Henk Wallays.

A possible new form has recently appeared, *Pachytriton D*. More information about this type will be added when available. Photos by Henk Wallays are available at <http://www.livingunderworld.org/photos/showgallery.php?cat=500&ppuser=8>

Overview of *P. labiatus* and *P. brevipes* Housing Requirements

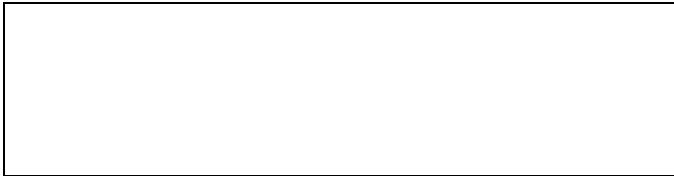
In the wild, *P. labiatus* and *P. brevipes* are thought to inhabit cold, oxygenated waters. In captivity, healthy individuals will remain fully aquatic in the right temperature range. A small land area may be required if the newts enter hibernation, or if one or more are bullied out of the water by more aggressive individuals. To avoid continuous aggression, some keepers find it necessary to house these newts separately outside of the breeding season, only introducing single male-female pairs during the breeding season. *Pachytriton* are aggressive, territorial newts, but can usually be housed in multi-member tanks if ample territory and hiding places are provided. Very large tanks may not be sufficient for excessively aggressive individuals, however. If they are seen fighting, or fighting wounds are found on any members, the culprits should be separated, as this species have been known to fight to the death. Two-three individuals can usually be housed in a large aquarium of 40 x 15 inches with plenty of hiding places, but again, this may not be large enough for some individuals. Exceedingly aggressive individuals may persistently seek out and attack any other members of the tank, regardless of the size of the tank. If a male-female pair enters breeding mode, it is best to separate them from others, as both males and females become increasingly aggressive during this time. Females will guard eggs in nest sites, and are thought to claim these spots early in the season (Theismeier & Hornberg, 2003). Like many other species, *Pachytriton* prefer cooler temperatures, and may develop health problems if exposed to high temperatures for long periods of time.

In general, *Pachytriton* are housed in stream-type environments with moderately deep, flowing water. A land area should be included if more than one newt is housed in the same tank, as a means of escape for a bullied newt. Again, newts that are excessively or continuously fighting should be separated to avoid stress and wounds. A few mossy rocks protruding from the waters surface are suitable for short term refuge for *Pachytriton* species. Generally, established and cohabitating individuals housed in spacious tanks will not use a land area at all. A filter or air pump can be used to simulate a moving stream in captivity, but should not create an overly-powerful current. Most filter outputs can be positioned to create flowing water

throughout the tank. Oxygen rich water is essential for *Pachytriton* species, as low oxygen content waters are thought to produce sluggish behavior. It is recommended to create a few spots in the tank that are shielded from the water flow so that the inhabitants can choose the level of aeration they prefer. Rocks, driftwood, or thick vegetation in some areas work well to slow or block the current. The water level can be 6-20 inches deep, with some shallower areas in places. Because they require moderately flowing waters, thick vegetation is not recommended throughout the entire tank, however, a few rooted and/or floating plants can be added. As recommended by at least a few avid keepers, *Pachytriton* species are most active between 50°F and 65°F, and temperatures should not rise above 72°F for long periods of time.

It is recommended to keep a freshwater test kit on hand, and regularly check the pH, ammonia, nitrite, and nitrate levels, as is suggested with any aquatic species. The water area should support a filter with a carbon and sponge insert, or a canister type biological filter for larger tanks. The filter will aid in keeping the water clean of chemicals and pollutants, as well as provide adequate aeration. Gravel is the standard form of submersed substrate, however, some have used sand with no ill effects. Small fish, such as guppies or white cloud minnows, are sometimes added with this species, but keep in mind that fish can introduce harmful disease into the tank. Also, *Pachytriton* are capable of chasing and consuming small fish rather efficiently. See [article 0020 - Captive Habitats: Ideas, Instructions, and Examples](#) and the [Captive & Wild Habitats](#) section of the [Photo Gallery](#).

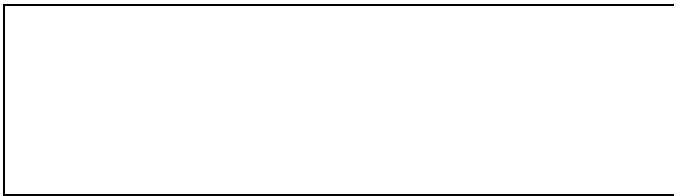
As with all amphibians, tap water should be treated with a water conditioner or primer prior to the introduction of amphibians. Never use plain tap water, de-ionized, distilled, or reverse osmosis water alone with amphibians. Also, the tank should be cycled (nitrogen cycle) prior to the introduction of amphibians to avoid health problems or death. See [article 0006 - Water Quality and Amphibians](#) and [article 0009 - Introduction to the Nitrogen Cycle](#) for more information about water quality and the importance of the nitrogen cycle.



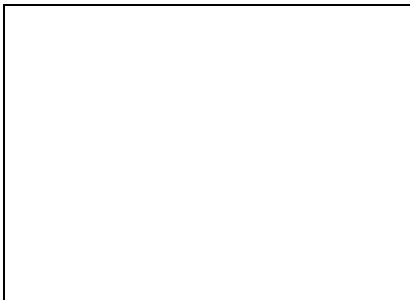
Pachytriton labiatus. Photo © Dr. Burkhard Thiesmeier, AG Urodela



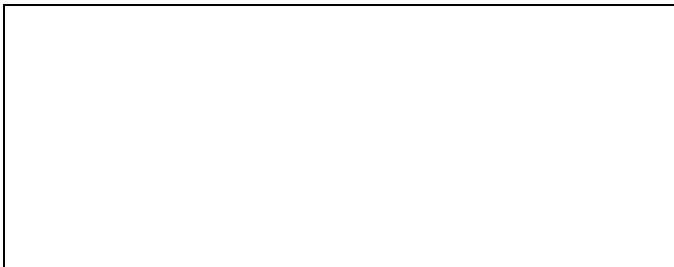
Pachytriton labiatus. Photo © Dr. Burkhard Thiesmeier, AG Urodela



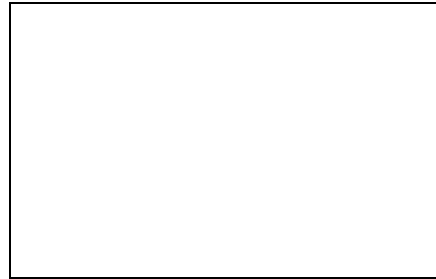
Pachytriton labiatus. Photo © Dr. Burkhard Thiesmeier, AG Urodela



Pachytriton brevipes. Photo © Takeshi Ebinuma, endless@interone.jp



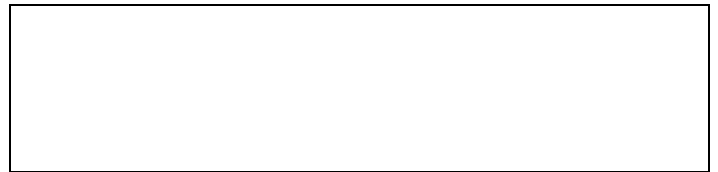
Pachytriton A. Photo © Dr. Burkhard Thiesmeier, AG Urodela



Pachytriton A. Photo © Dr. Burkhard Thiesmeier, AG Urodela



Pachytriton B (male). Photo © Dr. Burkhard Thiesmeier, AG Urodela



Pachytriton B (female). Photo © Dr. Burkhard Thiesmeier, AG Urodela



Pachytriton C. Photos © Thomas Mutz, AG Urodela



Pachytriton C. Photos © Thomas Mutz, AG Urodela

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