

A NOTE ON THE APENNINE YELLOW BELLIED TOAD, *BOMBINA VARIEGATA PACHYPUS* BONAPARTE

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It is pleasant, when walking in the mountains, to encounter small breeding groups of *Bombina*, always active and boisterous, almost appearing playful to the human observer. In my wanderings about the Italian mountains such encounters have stimulated further thought, which prompts this note, informal and subjective in nature, based as it is on passing, casual observations.

Bombina variegata pachypus is found in the Italian peninsular, south of the basin of the Po Valley, its range approximately that of the Appennine Mountains. It occurs in scattered populations in hilly or mountainous country, usually wooded or semi-wooded. It is not rare, but because of its habits it is seldom found in large numbers anywhere. I have no knowledge of the northern part of its range, but in the drier mountains of central Italy it is not especially frequent; it becomes more common in the south, and is probably most common in the mountain forests of Calabria.

While the habits of *pachypus* are generally similar to those of other *variegata*, it seems – at least this is the impression I have – more restricted to upland areas, preferably forested, than other races. It is not seen in the kind of warm, open exposed country where *variegata* (*kolombatovici*) is often found in the coastal karst of Yugoslavia (Dalmatia), for example.

Like other races of *variegata*, *pachypus* prefers to breed in tiny bodies of water not inhabited or used by any other amphibians or potential aquatic predators, and almost always temporary by nature. Favourite places are puddles formed in wheel ruts along tracks in woods, usually in a sunny position, or roadside ditches or pools formed where a road blocks the passage of a tiny stream or water seepage of a roadside bank. Other places are drinking troughs for farm livestock, roadside drinking fountains, and the water-filled hoof prints of horses or cattle. For such ephemeral bodies of water the reproductive strategy of *Bombina variegata* is ideally suited: mating and egg-laying continue intermittently throughout the summer, usually from May to August, and is stimulated by fresh rainfall and the renewed filling of its breeding puddles.

The small pools chosen of course can support only limited numbers of toads, and for this reason their colonies are seldom great in size. The fairly small numbers of eggs laid by a female at any one time (usually far less than 100) are a further adaptation to the limited carrying capacity of the breeding pools – small clutches of eggs laid opportunistically over an extended period in scattered puddles presumably maximise the chances of successful development and survival of the tadpoles. However, as puddles and ditches of only a few inches deep probably seldom hold water long enough for tadpoles to reach metamorphosis, average survival and recruitment are probably low. To endure as a species in these conditions (if the conditions are in fact so – this is an unverified hypothesis) *Bombina variegata* would have to be long lived and with few enemies. Its enemies, or lack of them, present a puzzle. I doubt if mammals or birds would normally take *Bombina* in significant numbers: the skin toxins must be some deterrent, and an animal with such small and scattered populations could hardly form a regular food source for a warm-blooded predator, which would require more abundant and consistently available prey; *Bombina* would probably only be taken coincidentally and occasionally. For similar reasons man is not a direct threat: systematic commercial collection of this species is unknown and the small value of the animals would not warrant the covering of long distances, and expense, necessary to find any number. In any case, the “all restricting” Berne Convention, by erroneously listing this species as in need of strict legal protection throughout its range, has effectively stopped collecting for any purpose in Europe.

Other amphibians, such as the Edible Frog (*Rana esculenta/lessonae*) and the Crested Newt (*Triturus cristatus/carnifex*), which would undoubtedly take tadpoles or very young *Bombina*,

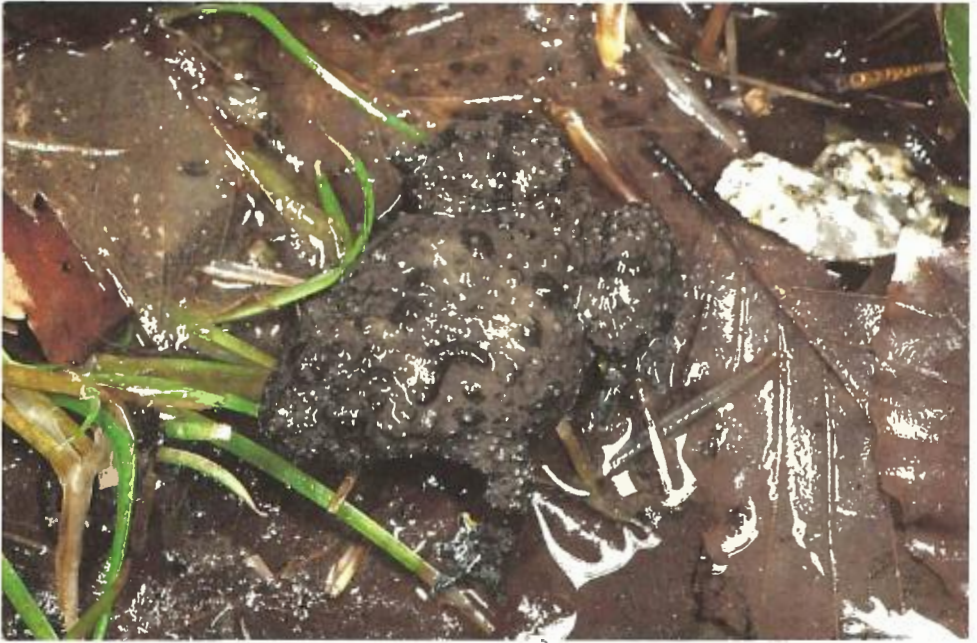


Plate 1: Adult female *Bombina variegata pachypus*, Aspromonte, Calabria, Italy

Photo: Georgio Di Cesare



Plate 2: Underside of *Bombina variegata pachypus*, showing typical ventral colour and pattern of this subspecies. Adult female from mountains of Abruzzo, Central Italy.

Photo: Georgio Di Cesare



Plate 3: Pair of *Bombina variegata pachypus* at breeding site in wheel rut in road through Silver Fir (*Abies alba*) forest near Serra San Bruno, Calabria, Italy. May 1987. Photo: Georgio Di Cesare

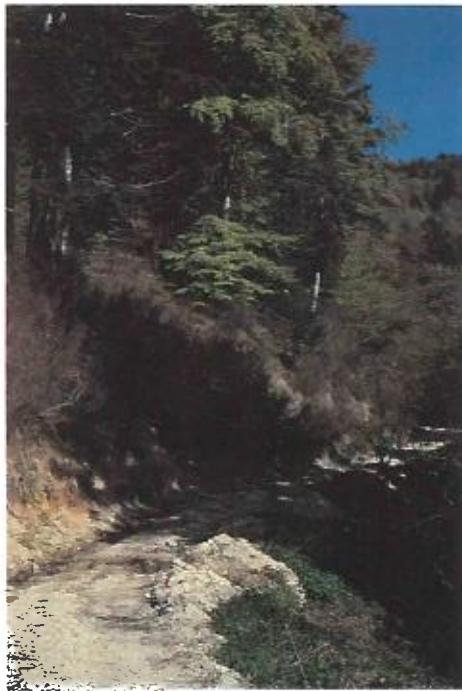


Plate 4: Characteristic habitat of *Bombina variegata pachypus* in southern Italy. Puddles and wheel ruts along the road are used for breeding. *Bombina* of all ages are found in these small bodies of water and beneath rocks around tiny roadside streams, springs, and water seepages. Photo: Georgio Di Cesare

and would be significant predators, are avoided by the habit of *variegata* of occupying only the very smallest water bodies which are never used by the other species (at least this is the case in those localities I know of in Italy).

More problematical are snakes, specifically the Grass Snake, *Natrix natrix*, which I would think is a potentially serious predator of *Bombina*, being both a specialist feeder on amphibians, common throughout the range of *B. variegata*, and an active, wandering animal. However, perhaps even in this case the chosen habitat of *variegata* affords some defence: it is often found in densely wooded areas – in fact woodland tracks and roadsides are characteristic habitats of *pachypus* in Italy – and *Natrix* does not establish itself in dense woodland, though it may wander into wooded country occasionally and is at home in open woodland. On a densely forested mountain ridge in Calabria, *pachypus* was very common, but there were no snakes. Elsewhere, it is difficult for me to conceive how *Bombina variegata* survives in the presence of *Natrix*. Unlike *Rana* and *Bufo*, which form the main prey of *Natrix natrix*, *Bombina variegata* is not prolific with comparatively large and widespread populations. Its small colonies, reproducing on a modest level, could easily be severely and rapidly depleted by a few *Natrix*, especially since *Bombina* by its habits is easy prey for such a snake: it is active during the day, not secretive, and not rapid of flight. I would welcome any observations on this by readers who have more field experience of the species.

Though its enemies are not well known, its friends are more obvious. We often think of man's effect on nature as being a wholly negative one, but this is not so in the case of *Bombina variegata pachypus*. Most of its breeding sites have been created, directly or indirectly, by human activity: roadside ditches, wheel ruts, livestock drinking troughs, etc. "Natural" breeding sites are by comparison few. At least in this case, the works of Man have been beneficent.

The mode of life of the species and its distribution do not make it vulnerable to catastrophic changes of land use, in the way that *Bombina bombina* has suffered from intensive agriculture in its lowland habitat. Its dispersed and irregularly distributed colonies in upland country, suited only to pastoralism and woodlands, are fairly safe from widespread destruction. This primitive, inconspicuous animal, though nowhere occurring in vast numbers, is in its lowly way successful, and will doubtless survive indefinitely.