

THE FASCINATION OF HIBERNATION

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I guess that to most herpetologists (certainly those interested in temperate-zone species) winter is a pretty boring time. However, it has gradually dawned on me over the years that some odd things go on during this quiet period of a herptile's life. In particular, I've realised that species differ quite a lot in what they actually do in winter. Here, then, is an account of a few observations I've either made myself or heard about from friends and colleagues; it would be nice to know the reasons for the variations in winter "strategies", but I think many more systematic studies (obviously difficult at this time of year) would be needed to do that.

AMPHIBIANS

For some years now I have kept several specimens each of the European Green Toad (*Bufo viridis*) and the Natterjack (*B. clamita*), the latter as part of a licensed captive-breeding programme. The Green Toads live throughout the year in a greenhouse, whereas the Natterjacks spend spring and summer in an outdoor vivarium but are put in the greenhouse, with the Green Toads, each autumn for hibernation. A striking difference in overwintering behaviour between these two species (at least, in relation to my specimens – it may be dangerous to generalise!) has become apparent. Both types of toad burrow into a large pile of sand to make their winter retreats; and over several years I have not lost a single specimen of either species during the winter. However, once the Natterjacks "go down" (usually in late October or early November) they are never seen again until mid-late March the following year. This has been an absolute rule – I check the greenhouse, which is bare in winter and easy to search, on a regular basis all year round. Even a very mild winter (like the present one) will not tempt them out before March. The Green Toads could hardly be more different; not only do they come out regularly in mild weather (at night), but even when temperatures are only a degree or two above freezing they can be found under stones etc away from their sand pile. Only in really frosty weather do they disappear completely; on mild January evenings they can be seen prowling around, just like when they are hunting insects in midsummer. Again it's a very general rule – all my Green Toads do it every winter.

Which pattern do other species follow? European Tree Frogs (*Hyla arborea*) also live in the green house, and behave much like the Green Toads. So, it seems, does *Bombina orientalis* (though I am judging on the basis of only a single winter in this case; I was given a pair last autumn). Common Toads, on the other hand, seem to be deep-sleepers in the Natterjack mould. Common Frogs can become active very early, of course, depending on the part of the country in question; even so, I believe they are basically "British" in their wintering behaviour. Certainly in my garden they tend to disappear during the autumn and can be found holed-up deep in compost, or sometimes on the bottom of the ponds. They are very sluggish, and do not emerge to prowl about in mild spells until migration to the breeding ponds gets underway. This is definitely the case with Green Frogs (*Rana esculenta*), which I obtained years ago from the established UK colonies around Newdigate in Surrey; a number of these live wild in, and hibernate in, my garden ponds. They are almost never seen between October and April, unless a sleepy female is dragged out of the bottom mud by an ardent male Common Frog in February or March (This has happened at least once every year in my pools). By this winter behaviour test, these Green Frogs are true Brits!

It would be nice to add something about newts, but I don't have a clear view of what they do on winter. I do know that they never hibernate in my ponds, but like frogs all 4 species in my garden (the 3 natives + Alpines) accumulate in compost heaps in autumn. Also like frogs, the three native newts can start their migrations very early in a mild winter; this time around I had Commons, Palmates and Crested Newts coming in on December 30th though this degree of earliness is very exceptional. Alpines make an interesting comparison; they never come to the ponds before March no matter how mild the winter. My Alpine Newt colony

is now more than 10 years old and the founders were from the Continent, so the “rule” apparent with my anurans (i.e. that British species hibernate more deeply than their European relatives) doesn’t appear to operate on newts – just the opposite in fact!

REPTILES

My experience with reptiles is much more limited but there seem to be different strategies here, too. For more than 10 years now I have kept British Sand Lizards (*Lacerta agilis*), again as part of a conservation captive-breeding programme, in an outdoor vivarium where they spend the entire year. They breed annually and mortality rates have been very low (almost nil in winter); to hibernate they dig deep burrows into the sandy substrate provided. Adults normally disappear during late August or early September – remarkably early, and irrespective of how warm the weather is. Interestingly, “new” adults put in the enclosure in August always stay up longer—often well into October – showing they don’t need to start hibernating as soon as most choose to do. Like Natterjacks, these Sand Lizards never come out mid-winter; the first males reappear early – mid March in most years, followed by females up to a month later. Contrast this behaviour with the wild colony of Wall Lizards (*Podarcis muralis*) established a few miles away at Shoreham, originating from European specimens more than a decade ago. Geoff and Beth Haslewood live “among” this population, and individuals are seen regularly throughout the winter whenever there is a sunny day; very much the “Green Toad” pattern. However, no clear rule is emerging here: I also have a pair of Green Lizards (*Lacerta viridis*), of European origin, that have lived and hibernated in my greenhouse for several years. These animals are sound hibernators just like the British Sand Lizards.

It would be interesting to know about more reptile species, including snakes. Certainly there is no shortage of anecdotal accounts of Common Lizards and Adders above ground in winter – but are these the exceptions or the rule? And who has ever seen a grass snake out in winter?

WHAT’S GOING ON?

Although the observations are still rather few, I strongly suspect that at least some of these differences are real and warrant explanation. It could be that British species have adapted not to emerge in mild weather, thus avoiding wasting energy and exposing themselves to predators at a time when food is unlikely to be available; such mild spells are presumably much less frequent in central European winters, so animals there may be unadapted to mildness and “tricked” into coming out in British winters. However, though the above anuran observations fit that idea, it is evidently not a good explanation for the newts or lizards. I’d be interested to hear of other members’ ideas or observations on overwintering by herps.