

Etruscan shrews, ferocity in miniature

Which is the tiniest micromammal, i.e. the smallest mammal on the planet? Up until almost half a century ago, it was Italian, or rather, Etruscan. The Etruscan shrew (*Suncus etruscus*) may look like a mouse but it is an entirely different species. Shrews belong to the order of insectivores that includes moles and hedgehogs, which are generally small animals but shrews beat them all. They resemble mice with soft grey fur, elongated snouts, round ears and tiny dark eyes. A particularly large adult is 6 centimetres long including the tail and weighs just over two grams – the equivalent of 10 grains of rice. The Etruscan shrew is the second smallest mammal on the planet. The champion of miniaturisation is a bat discovered in 1973 in Thailand, the bumblebee bat (*Craseonycteris thonglongyai*). It weighs one gram more than an Etruscan shrew but is only 3 centimetres long.



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Etruscan shrews are widespread in all countries bordering the Mediterranean and then eastwards to India and westwards to the Iberian Peninsula. They live all over Italy, including the islands but excluding the Alps (because it is too cold). They are not easy to spot, not only because they are so tiny, but also because their habits are secretive: they alternate moments of great activity with others of rest, well hidden in the vegetation, among the roots of a tree, under the leaves or in the hollows between rocks. Etruscan shrews breed several times from May to October. For each pregnancy, the females give birth to from two to five completely naked young, with closed eyes and ears and an appearance that makes them look like little pink caterpillars. They are tiny, just over a centimetre long, but in just twenty days they reach the size of an adult and begin to live independently. In nature, Etruscan shrews have a very short life span of up to two years.



Etruscan shrew distribution area. Credits: [Wikimedia Commons](#)

Etruscan shrews are very sensitive to temperature, below 15°C they die. A little cold weather is enough to put their survival in grave danger. In winter they reduce their activity by going into a kind of hibernation. One of the main problems caused by small size is the preservation of body heat, something that is common to all small animals. For Etruscan shrews and bumblebee bats this problem is particularly pronounced, precisely because they are extremely small. Their tiny size increases the surface area of their bodies and thus the possibility of heat loss.

There is a mathematical rule that describes this phenomenon. Imagine a wooden cube with sides one centimetre long. The surface of the cube is 6 square centimetres, the volume is one cubic centimetre. The surface area to volume ratio is therefore 6:1, i.e. 6. If we take 8 cubes and combine them to make a larger cube, we can calculate that the surface area is 24 and the volume is 8. Therefore the surface area to volume ratio is 24:8, i.e. 3. That is, the smaller the volume, the greater the surface area. As a result, while small animals have a problem of heat loss from their body surface, on the contrary, large animals lose little heat and become overheated. This is why elephants have large, flat ears like fans and often take cooling baths.

What solutions does nature offer to balance tiny size and heat preservation? For example, some animals are covered in thick fur, others, such as bats, nap when the temperature drops. Etruscan shrews, on the contrary, counteract loss of heat (i.e. energy) by eating constantly. It is estimated that shrews eat as much food per day as they weigh. It's as if a 60 kg person would need to eat 60 kg of food every day... he wouldn't have time to do anything else. Food provides Etruscan shrews with the energy they need to maintain their correct body temperature. That is why they are small but very fierce animals. They pounce on insects, spiders and molluscs and tear them apart, just as leopards do with gazelles. They are voracious little predators.

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