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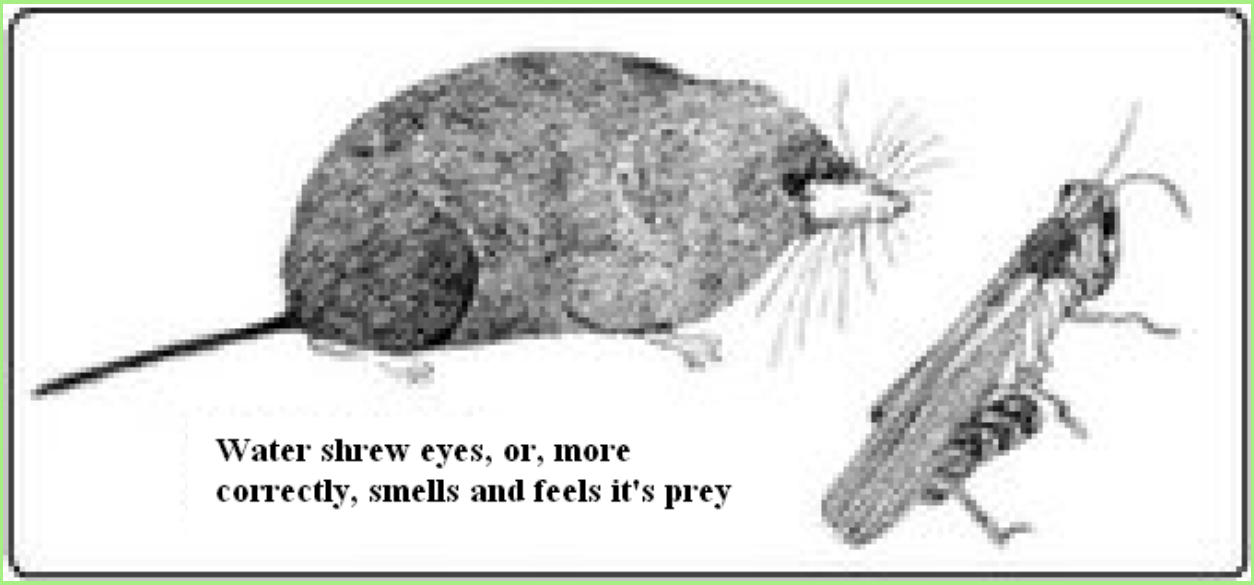
Finding food in the dark

The water shrew must eat more than half its weight every day to stay alive, says S.Ananthanarayanan.

This makes it vital that the animal find enough food all the time because even short deprivation can be dangerous.

Shrews and metabolism

Shrews are tiny, mouse-like animals, often with tails half their body length and a large proportion of their weight. They have powerful muscles and webbed hind feet, to help them move swiftly in ponds and streams to hunt for prey, of worms, insect larvae, snails, crustaceans, spiders, fish, frogs and tadpoles. As they depend on water bodies for food, they are threatened by reduction of access to rivers, streams, lakes, ponds, marshes.



A particular feature of the animals is that they burn calories so fast – over half their body weight every day! The rate at which the body burns fat, or calories, is called the metabolic rate. This is a property of the body of great interest to people who are weight conscious. If we have a low metabolic rate, even moderate eating (or drinking soft drinks) would add kilograms faster than we like. And sadly, if we go on a diet, the body is signaled that there is famine and it sets the metabolic rate to slow down further! The answer for the weight conscious is to exercise and build muscle.

The shrew, unlike many of us, has evolved to feed very efficiently in its preferred habitat but has little defense against food shortage. A shrew, typically, would die if starved for just half a day!

Shrews and hunting

In contrast to their dependence on the right habitat, shrews are fiercely efficient predators, both in the day and in the night. They spend most of their waking hours in finding and ingesting food, all in the process of burning it up as soon as they find it. While the food is inside the water, shrews are mammals and need to come up to breathe. Shrews thus have furry bodies, to trap air and help when under water. But for all that, shrews need to get the prey fast and continuously, be it night or day.

The shrew, in fact, can launch an underwater attack in less than a 50th of a second after detecting a fish, and get ready to take a bite within a 20th of a second! For many years it was thought that shrews must rely on a kind of ‘echolocation’, like the bat, because the shrew can act this fast during night hours or in deep shade. But recent studies have shown that there is no evidence of echolocation – the method used is a combination of scent and tactile detection.

The shrew’s arsenal

Keneth Catania, a biologist in Nashville, Tennessee and researchers in University of Manitoba observed the shrew’s action through high speed infra red cameras. As the shrew’s prey is cold blooded, the shrew has no use for sensitivity to infra red. A beam of infrared can thus be used to watch it in motion without disturbance.

The findings revealed three distinct ways the shrew finds its prey.

Smell: Mammals usually follow scents carried in the air, but lose sensitivity when they adapt to water, like whales or dolphins. But the shrew makes do by releasing bubbles of air and then breathing them right back – to get a whiff of aromatics in the water! High speed ‘polling’ of surrounding water would show the ‘scent gradient,’ or the direction of increasing scent and hence the direction of the source.

Movement: The second trick is detecting movement. Any motion of the prey causes disturbances in the water, which move at thousands of feet a second for the shrew to pick up,

through its sking. The researchers used water jets to mimic movement of prey and observed that shrews directed sharp attacks at sudden water pulses.

Touch: The third device the shrew uses is shape detection with the help of its whiskers. When the prey is near enough, the whiskers, in addition to the skin, touch or feel water disturbance and direct the final offensive.

The prey thus has little chance before the predator – if it moves it will give itself away and if it stays motionless, it will be sniffed out, with still lesser chance of escape!