

Egg-laying Mammals

Fact Sheet



Short-beaked Echidna. Image: QM, Gary Cranitch.

Introduction

In 1791, early European explorers of Australia astounded scientists with reports of furry creatures that laid eggs. When skins were sent back to England, naturalists thought they were hoaxes and suspected a clever taxidermist made each specimen using a duck's bill, a beaver's tail, otter's feet and fur from a seal. They were, in reality, skins of the platypus.

Today, the Platypus, the Short-beaked Echidna and several species of long-nosed echidnas from New Guinea are the only living representatives of a primitive group of mammals known as the monotremes. Ancestors of the monotremes first appeared on Earth while the dinosaurs and other reptiles still dominated the land and sea. However, little else is known about the evolution of the group.

In 1985 a small opalised lower jaw from Lightning Ridge was described. Teeth in the jaw indicate a close relationship with the modern day platypus. This 100-million-year-old platypus-like creature is one of Australia's oldest known fossil mammals. More recent fossils suggest that the platypus has changed little over the last one million years.

The platypus and echidna lay eggs very similar to those laid by reptiles. The shell is composed of a tough, leathery substance called keratin. Keratin also covers the eggs of most reptiles and is present in the shells of birds' eggs. Monotreme eggs are round and less than 2 cm in diameter. Like those of reptiles, they have a large yolk to provide food for the developing embryo.

Despite these and other reptilian characters, the monotremes are classed as mammals, for they have hair rather than scales and they maintain a constant body temperature, rather than having an internal temperature that fluctuates with the surroundings. Most importantly, they secrete milk to nourish their young. However, they do not have nipples as do all other mammals. Instead, milk is secreted by rows of specialised glands down the female's belly. By nuzzling the mother the young stimulate a flow of milk, which they then lick from the fur of her belly.

The absence of nipples and the fact that the developing embryo is nourished by yolk within the egg, rather than

obtaining nourishment directly from the mother's uterus, are the main differences between monotremes and other mammals.

The Platypus

The platypus (*Ornithorhynchus anatinus*) is a semi-aquatic animal of freshwater lakes, creeks and rivers of eastern mainland Australia and Tasmania. It is a shy and secretive animal that shelters in short burrows near the water's edge. It usually comes out to feed in the water around dawn and dusk, but may be seen at any time during day or night (depending on local conditions). It prefers secluded bodies of still water and may be seen with only its snout and the top of its head above the surface.



Platypus

An adult platypus can reach 45 to 60 cm in length and weigh up to 2 kg. The front feet are used for swimming and each has a large web of skin extending between the toes and beyond the nails. The web is folded back under the sole when the platypus walks on land or digs in the ground. The hind feet, although webbed, are used mainly for stability when swimming in the water and are trailed behind the body. The flat tail serves as a rudder.

The platypus closes its eyes, ears and nostrils underwater. The flat, rubber-like, leathery bill is very sensitive as it has many nerve endings that can detect minute electrical impulses generated by crustaceans, insect larvae, tadpoles and other animals in the bottom silt.

Just how the platypus manages to find prey, avoid obstacles and move about underwater is not completely understood. Food is collected and stored in cheek pouches and carried to the surface to be eaten. Horny grinding plates in the mouth break up the food ready for swallowing.

The male platypus has a hollow spur on the inside of the ankle of its hind leg. This is connected to a venom-secreting gland higher up the leg. Spurs and venom may be used in defence and in competition with other males. The spurs may also be used to hold the female during mating.

Platypuses breed in spring. Egg-laying, incubation and hatching take place in a chamber at the end of a long, winding nesting burrow. These are usually 5 to 10 m long although old nesting burrows may extend as far as 30 m. There can be more than one entrance to a burrow, each 1 to 2 m above water level.

At the end of the burrow the female excavates a breeding chamber in which she builds a nest of damp grass and leaves. When the female platypus lays her eggs, she curls her body around them to keep them warm. When she goes on feeding forays she plugs the burrow with earth at intervals along its length. As she pushes through the narrow plugs on her return, she squeezes water from her fur making it dry and suitable for incubating the eggs.

Females usually lay two eggs that hatch within 7 to 14 days. The young have an 'egg-tooth', enabling them to break their way out of the shell. They develop milk teeth early in life, but these are lost shortly before they leave the breeding burrow. The young will be fully mature at 4 or 5 months.

Last century the platypus was heavily hunted for its beautiful, soft, thick fur and consequently its numbers declined. However, it has been protected since 1905 and this timid creature, although rarely seen, is now quite common.

The Short-beaked Echidna

The Short-beaked Echidna (*Tachyglossus aculeatus*) has the widest distribution of any native Australian mammal. It is distributed throughout the Australian mainland, Tasmania and New Guinea, occupying habitats as diverse as wet rainforests, dry deserts and alpine regions. Although the species has disappeared from densely settled regions, it is not endangered.

This distinctive mammal has a long tubular snout, coarse reddish-brown or black fur interspersed with yellowish spines and a short spiny tail. The echidna also has short sturdy limbs with long claws used for digging. It is a powerful and rapid burrower. Each hind foot has one elongated claw specially adapted for scratching between its spines.

The echidna's armour of spines protects it from most predators. Only humans and dingoes are known to eat adult echidnas. The mummified remains of a monitor lizard that died trying to swallow an echidna are in the collection at Queensland Museum's South Bank campus.

If an echidna cannot escape by digging into the soil it will curl into a spiky ball or, by using its spines, wedge itself very firmly into a hole or crevice, presenting its spiny back to the attacker.

Adult echidnas are up to 30 cm long and males may weigh 6 to 7 kg. Females are usually lighter. The male has a spur on its hind foot, similar to that of the male platypus, but it

does not connect to a venom gland.

The echidna is sometimes known as the 'spiny anteater', because its diet consists mostly of ants and termites. The echidna uses its powerful digging claws to tear open insect nests and mounds. It then pushes its snout into the hole. Its mouth, situated at the front end of the snout, opens just wide enough to allow the long sticky tongue to flick in and out rapidly to gather up hundreds of insects.

Both juvenile and adult echidnas lack teeth, but the back of the tongue is covered with horny serrations that can rub against a hard palate to grind food. Large amounts of dirt are taken in with the prey and this also helps grind the food and aid digestion.

Echidnas mate in late winter and the female lays an egg about 14 days later. The egg is probably laid directly into a pouch on the belly of the female. The young hatches about 10 days later and is carried in the pouch for 12 to 14 weeks. By then it will have a covering of short spines. Little is known about reproduction and parental care in echidnas, but the female continues to care for the young for 7 to 8 months after it leaves the pouch.

Further Information

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