

Characters, Distribution & Affinities
of subclass Prototheria (Part-I)

By
Dr. Sumita Kumari
Sharma
A.P. & Head (Zoology)
P.O. Dept. of Zoo.
Maharaja College
Ara

Subclass: Prototheria

Systematic Position & Distribution: Prototheria is the subclass of class Mammalia and includes egg-laying mammals. It is distributed only in Australia and the neighbouring islands of Tasmania and New Guinea. Prototheria includes a single order, Monotremata. This includes the duck-bill platypus and one species of Echidna or Spiny ant-eater, Tachyglossus from Australia and two species of Zaglossus from New Guinea. Both are basically similar to each other but too different from other mammals. Monotremes derive from an early stock on the principal mammalian line of descent.

Distinctive Characters :-

1. Habit and Habitat — The Platypus is highly modified for aquatic life and spiny ant-eater are terrestrial. Both are burrowing in habit.

and make nests for rearing their young. Both are insectivorous, nocturnal, warm-blooded, quadrupedal and oviparous. [19-2]

2. External Features — Body of Platypus is flattened and covered with a dense, soft under-fur protected by harsher outer fur. Body of Spiny-ant-eater is covered above with strong pointed spines, between which are coarse hairs, while the lower surface the body has only hairs. In Platypus, jaws are produced into a depressed beak covered with soft but tough skin. In spiny ant-eater, jaws are produced into a long sensitive pointed rostrum. External ears or pinnae are absent. Tail flat and elongated in Platypus and vestigial in spiny ant-eater. Mammary glands devoid of nipples. Mammary pouch on the abdomen of female is present in which milk is secreted through a large number of specialised sweat glands, but the ducts of these glands are not united to open as central nipples. In Platypus, fore legs are short and powerful. The fore digits are webbed and end in strong claws. Hind limbs are

less specialized. In the male, a hollow ^(pg-3) spur is connected with a small cranial gland whose secretion is poisonous. This gland is well-developed in duck bill platypus and less developed in Spiny ant-eaters.

Digestive System

In Spiny Ant-eaters, teeth are absent in all stages of development. In Young Platypus flattened, rigid teeth are present and these are replaced by horny structures formed by an ingrowth of epidermis beneath them and used for breaking the cells of molluscs. Spiny Ant-eaters have a tiny round mouth at the end of long beak. In Spiny Ant-eaters, posterior part of tongue is beak with horny serrations which grind the food against corresponding ridges on the palate. Sub-masillary, parotid and sublingual glands are present whose secretions help to neutralise formic acid discharged by their prey. Stomach of monotremes is almost globular, intestine is differentiated into small and large caecum is also present. Rectum opens into anal position to the ureters. Liver is large and

duct which traverses the pancreas and joins the pancreatic duct.

Respiratory System

Respiration is pulmonary (by lungs). Larynx is also present.

Circulatory System

Heart is four-chambered. Right auriculo-ventricular valve is incomplete and partially muscular. They have no chordae tendinae. Left auriculo-ventricular aperture is guarded by tricuspid valve, not by bicuspid valve as in other mammals. Single left aortic arch resembles those of other mammals. There are no portal veins. In Spiny Ant eaters, an anterior abdominal vein arising on the bladder and distributed to the liver. Erythrocytes are small, circular and non-nucleated. In monotremes, heat regulation is imperfect though far advanced over that of living reptiles, in absence of sweat glands, heat reduction by vasodilation occurs. The temp. of spiny ant eater rises with that of surround only above 30°C and dips at 37°C. The liver has few sweat glands but it is water or in a cool burrow. Custid is part II Custid