

OSMOREGULATION IN TERRESTRIAL ANIMALS

Terrestrial animals have developed a number of strategies to maintain osmoregulation of their body fluid:

1. WATER PROOF EXTERNAL COVERING

To prevent water loss through external surfaces, vertebrates like reptiles, birds and mammals have waterproof keratinized epidermis. Similarly the insects have developed external water proof layer called cuticle.

The waterproof body covering may be of horny scales (as in certain reptiles), feathers (as in birds) and hair or fur (as in mammals).

2. ABSORPTION OF WATER

The loss of water through urine and faeces is checked by various mechanisms. In reptiles and birds the water from the faeces is absorbed by rectum and cloaca.

Further, in birds and mammals the water from urine is absorbed by Henle's loop in uriniferous tubules of the kidneys.

The terrestrial animals such as birds, snakes and lizards excrete a semisolid urine containing uric crystals, thus minimizing water loss.

Uric acid is quite insoluble in water, and it can be excreted without the use of much water. The amount needed is the necessary to flush the uric acid into cloaca. Within the cloaca most of the water is reabsorbed and waste is given off in paste form.

USE OF METABOLIC WATER

The animals of extreme terrestrial habitat, the dry hot desert, have developed special means of water conservation.

They have adopted a lack of drinking water as they obtain water entirely from the metabolic reactions of which the water is by product, and the water contained in foods. e.g kangaroo rat is found in some of the hottest and driest region of the south western United States.

It only eats dry seeds and never drinks water. It has no sweat glands, so loses no water in sweat, but it must remain in cool burrows during the day to minimize the loss of moisture through the lungs.

It produces very dry faeces and excretes a concentrated urine. With such adaptation, oxidative metabolism supplies all the water needed.