



Government of Tamilnadu

Department of Employment and Training

Course : TNPSC Group I Exam
Subject : Botany
Topic : **Excretion of Metabolic Waste**

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**Commissioner,
Department of Employment and Training.**

EXCRETION OF METABOLIC WASTE

- ❖ Animals excrete metabolic wastes because they are not useful, but plants have the ability to transform some of these wastes into useful substances.
- ❖ Compared to animals, Plants do not have a well developed excretory system to throw out nitrogenous waste materials. This is because of the differences in their Physiology. Therefore, Plants use different strategies for excretion.
- ❖ The gaseous waste materials produced during respiration (carbon dioxide) and Photosynthesis (oxygen) diffuse out through stomata in the leaves and through lenticles in other parts of the plant.
- ❖ Excess water evaporates mostly from stomata and also from the outer surface of the stem, fruits etc throughout the day.
- ❖ The waste products like oxygen, water and carbon dioxide are the raw materials for other cellular reactions. The excess of carbon dioxide and water are used up in this way. The only major gaseous excretory products of plants is oxygen.
- ❖ Many plants store organic waste products in their permanent tissues that have dead cells, eg. in heartwood. Plants also store waste within their leaves or barks. These wastes are periodically removed as the leaves and barks fall off.
- ❖ Some of the waste products are stored in special cells or cellular vacuoles. Various waste products such as tannins, essential oils, gums, resins etc are produced during catabolic processes. Tea leaves, amla and betel nuts (supari) contain tannin. Tannins are found also in the barks of trees.

Some Plants Excretory Products and their Uses

Some Plants Excretory Products and their Uses		
1.	Latex	Making rubber products
2.	Tannin	Making ink
3.	Resin	Making Varnish, Paint and Gum
4.	Quinine	Making Medicine to Treat Malaria
5.	Opium	Making Morphine as Medicine

BOTANY

- ❖ The Leaves of many plants like Eucalyptus, lemon, sacred basil (tulsi) etc contain essential oils. The rind of oranges and lemons and the petals of flowers like rose and jasmine also contain oils. Some plant wastes are stored as a thick, white fluid. You may have seen white fluid ooze out when you pluck a papaya or a fig or the leaves of yellow oleander (Pila Kaner). This white fluid is called latex.
- ❖ Gums are a group of sticky, water-soluble wastes found in the common gum tree (babul). Resins are another group of wastes found commonly in the stems of conifers. (Eg. Pine, fir)
- ❖ Alkaloids are a group of toxic waste products. But some of these are useful to us. Quinine and morphine are medicines derived from alkaloids stored in cinchona bark and opium poppy flowers respectively. Caffeine found in coffee seeds and nicotine in tobacco leaves is also alkaloids.
- ❖ Organic acids, which might prove harmful to plants, often combine with excess cations and precipitate out as insoluble crystals that can be safely stored in plant cells. Calcium oxalate crystals accumulate in some tubers like yam (Zamikand)
- ❖ Aquatic plants lose most of their metabolic wastes by direct diffusion into the water surrounding them. Terrestrial plants excrete some waste into the soil around them.