



Government of Tamilnadu
Department of Employment and Training

Course : TNPSC Group I Exam
Subject : Botany
Topic : **Bio Communication**

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BIO COMMUNICATION

Bio Communication:

- ❖ In the study of the biological sciences the general term biocommunication is used to describe more specific types of communication within (intraspecific) or between (inter specific) species of plants, animal, fungi and micro organisms.
- ❖ Bio communication of plants may include chemical signals between plants and animals (as in tannin production used by vascular plants to warn away insects) and chemically mediated communication between plants, and within plants.
- ❖ These communication processes are primarily sign-mediated interactions and not simple an exchange of information
- ❖ They involve active coordination and active organisation of a great variety of different behavioural patterns- mediated by signs.

Bio Communication of Plants within their Body:

- ❖ In contrast to the central nervous system of animals, which controls metabolism and reactions centrally, the control in plants is decentral.
- ❖ This enables plants to start independent growth or developmental activities in certain regions of their body, for example on how a particular branch should grow, depending on the wind, light angle and overall 'architecture' of the plant body.
- ❖ The cellular organization of the roots is determined during the plant's embryonic development and is controlled by intercellular communication.
- ❖ Biocommunication theory may be considered to be a branch of bio semiotics.

Bio Communication of Plants:

- ❖ Plants are also sessile organisms that actively compete for environmental resources both above and below ground. They assess their surroundings, estimate how much energy they need for particular goals, and then realize the optimum variant.
- ❖ They take measures to control certain environmental resources. They can distinguish between self and non- self. This capability allows them to protect their territory.
- ❖ They process and evaluate information and then modify their behaviour accordingly.

Communicative Competences of Plants:

- ❖ Highly diverse communicative competence of plants are possible due to parallel communication processes in the plant body (intraorganismic) between the same and different species (interorganismic) and between plants and non- plant organisms (transorganismic)
- ❖ Intraorganismic communication involves sign-mediated interactions in cells (intracellular) and between cells (intercellular).
- ❖ Intercellular communication processes are crucial coordinating growth and development, shape and dynamics.
- ❖ Physical communication takes place through electrical, hydraulic and mechanical signs.
- ❖ Chemical communication is either vesicular trafficking or cell-cell communication via the specify of plant tissue connections (plasmodesmata)

SUBSTANCES:**Auxin:**

- ❖ In is used in hormonal, morphogenic and transmitter signalling pathways.
- ❖ Auxin is detected as an extracellular signal at the plant synapse in order to react to light and gravity.

RNAs:

- ❖ Micro RNAs play an important role in intracellular communication during plant development, either in cleavage during translation / transcription or in preventing transaction.
- ❖ Micro RNAs are apparently necessary for meristem function, organ polarity, Vascular development, floral patterning and hormone response

Interpretation of Abiotic Influences:

- ❖ Mechanical contact has an influence on the over organism and on the cell level, both in plants and in other eukaryotes.

Contact can cause plants:

1. To react aggeressively, for example, toward the animals that want to eat them.
2. To discard their pollen.
3. Can cause the plant stem to grow into the sunlight.

Symbiosis of Plant Roots with Bacteria, Fungi and Insects:

- ❖ Plants use their plant – specific synapses to conduct neuronal – like activities and establish symbiotic relationship with bacteria and mycorrhizal fungi

Intercellular Communication of Plants:

- ❖ Plant cells are connected by specific connecting channels (“plasmodesmata”). These connecting channels enable the flow of small molecules as well as ions, metabolites and hormones and allow the selective exchange of macromolecules such as proteins, RNAs and even cell bodies.

Intercellular Communication of Plants:

- ❖ Intracellular communication in plants takes place between the symbiotically assimilated unicellular ancestors of the eukaryotic cell, mainly between the cell body and cell periphery.

