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PHARMACOGNOSY AND PHYTOCHEMISTRY – I

UNIT 5

TOPIC :

- **Primary metabolites :**

General introduction, detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites:



Metabolites in Plants

1. Primary Metabolites

Primary metabolites are compounds directly involved in normal growth, development, and reproduction of an organism. They are essential for survival.

Characteristics:

- **Function:** Essential for growth and metabolism
- **Occurrence:** Found in all living cells
- **Time of Formation:** Produced during the active growth phase
- **Quantity Produced:** Produced in large amounts
- **Examples:** Amino acids, proteins, nucleic acids, carbohydrates, ethanol, organic acids
- **Uses:** Used in food, pharmaceuticals, and fermentation processes

2. Secondary Metabolites

Secondary metabolites are compounds not directly involved in growth or reproduction but help the organism interact with its environment (defense, attraction, protection).

Characteristics:

- **Function:** Not essential for survival; involved in ecological functions
- **Occurrence:** Found in specific organs or tissues of the plant
- **Time of Formation:** Usually produced in the late or stationary phase of growth
- **Quantity Produced:** Produced in small amounts
- **Examples:** Alkaloids, glycosides, terpenoids, flavonoids, essential oils
- **Uses:** Used in drugs, dyes, perfumes, pesticides, and herbal preparations

Difference Between Primary and Secondary Metabolites

Feature	Primary Metabolites	Secondary Metabolites
Function	Essential for growth and metabolism	Not essential; ecological functions (defense, attraction)
Occurrence	Found in all living cells	Found in specific organs/tissues
Time of Formation	During growth phase	Usually during late/stationary phase
Quantity Produced	Large amounts	Small amounts
Examples	Amino acids, proteins, ethanol, carbohydrates	Alkaloids, glycosides, terpenoids, flavonoids, essential oils
Uses	Food, pharmaceuticals, fermentation	Drugs, perfumes, dyes, herbal products