SOURCES OF DRUGS

Unit -1 (Part –b)

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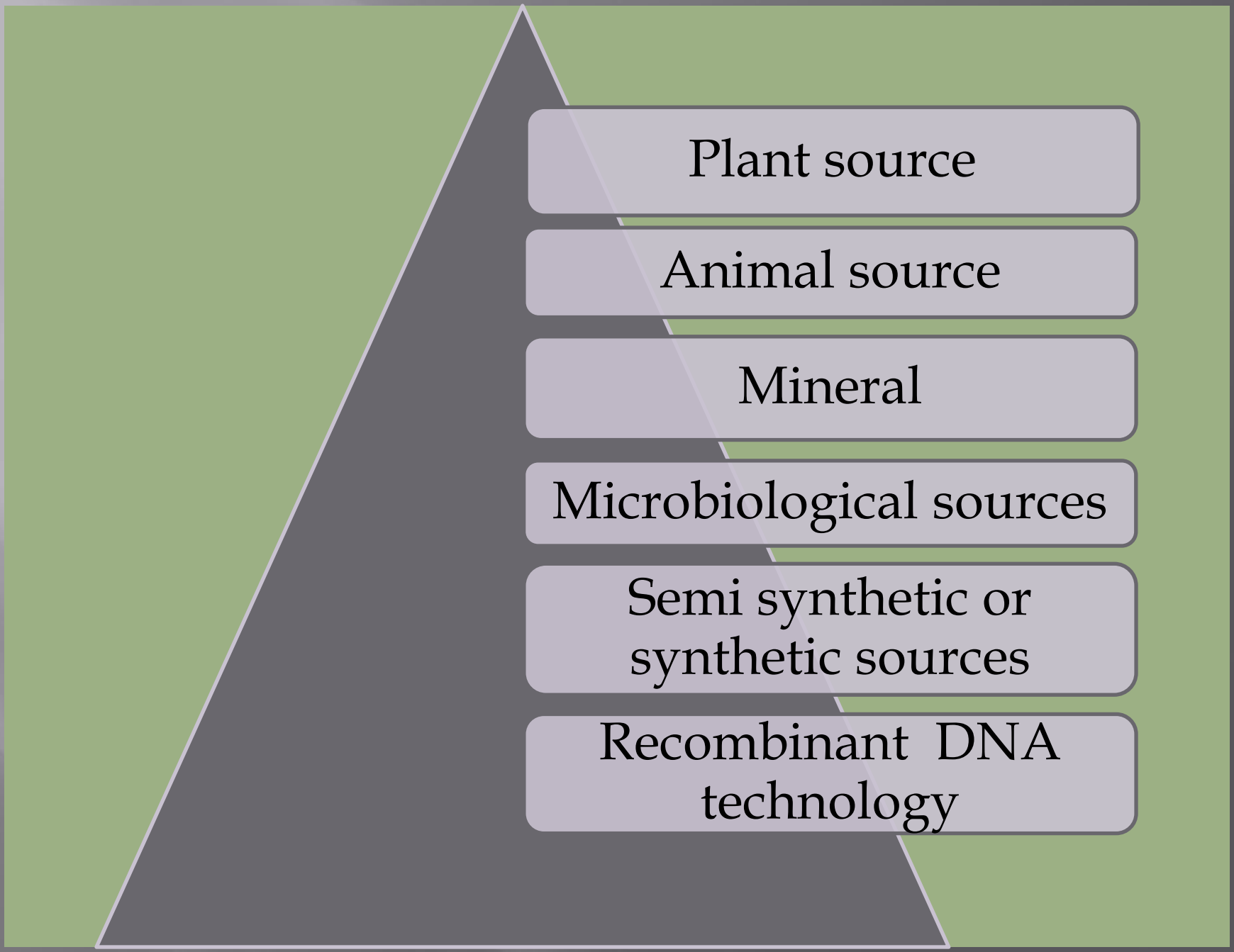
Plant source
Animal source
Mineral
Microbiological sources
Semi synthetic or synthetic sources
Recombinant DNA technology

Plant Sources:

- Plant source is the oldest source of drugs. Most of the drugs in ancient times were derived from plants. Almost all parts of the plants are used i.e. leaves, stem, bark, fruits and roots.

1. Leaves:

- a. The leaves of **Digitalis Purpurea** are the source of **Digitoxin** and **Digoxin**, which are cardiac glycosides.
- b. Leaves of **Eucalyptus** give oil of **Eucalyptus,** which is important component of cold & cough syrup.
- c. **Tobacco** leaves give **nicotine**.
- d. **Atropa belladonna** gives **atropine**

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- 2. Flowers:
- **Poppy papaver somniferum** gives **morphine** (opoid)
- **Vinca rosea** gives **vincristine** and **vinblastine**
- **Rose** gives rose water used as tonic.

3. Fruits:

- **Senna pod** gives **anthracine**, which is a purgative.
- **Calabar beans** Give physostigmine, which is cholinomimetic agent.

4. Seeds:

- Seeds of **Nux Vomica** give strychnine, which is a CNS stimulant.
- **Castor seeds** give castor oil.
- **Isabgol**.

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- Roots:

- Ipecacuanha root gives Emetine, used to induce vomiting as in accidental poisoning. It also has amoebicidal properties.
- Rauwolfia serpentina gives reserpine, a hypotensive agent.
- Reserpine was used for hypertension treatment.

- Bark:

- Cinchona bark gives quinine and quinidine, which are antimalarial drugs. Quinidine also has antiarrythmic properties.
- Atropa belladonna gives atropine, which is anticholinergic. Hyoscyamus Niger gives Hyosine, which is also anticholinergic.

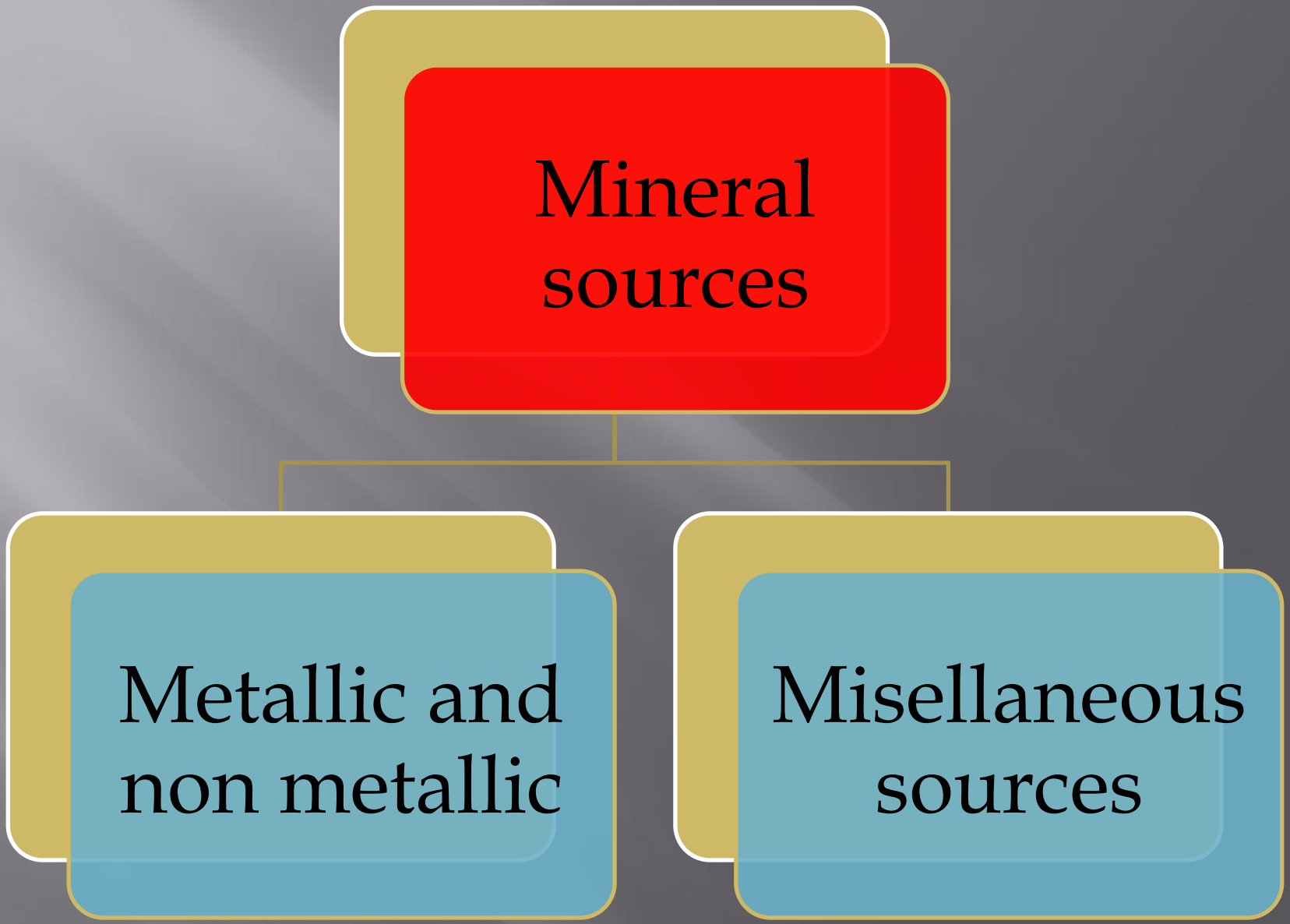
- Stem:

- Chondrodendron tomentosum gives tuboqurarine, which is skeletal muscle relaxant used in general anesthesia.

Animal sources

Sources	Product	Used for disease
Pancreas	insulin	diabetes
Urine of pregnant women	hCG	infertility
Sheep thyroid	thyroxin	hypertension
Cod liver	Vit-A and Vit-D	

Mineral sources



Metallic and Non metallic sources:

- Iron is used in treatment of iron deficiency anemia.
- Mercurial salts are used in Syphilis(bacterial inf.).
- Zinc is used as zinc supplement. Zinc oxide paste is used in wounds and in eczema.
- Iodine is antiseptic. Iodine supplements are also used. Gold salts are used in the treatment of rheumatoid arthritis

ii. Miscellaneous Sources:

- Fluorine has antiseptic properties.
- Borax has antiseptic properties as well.
- Selenium as selenium sulphide is used in anti dandruff shampoos.
- Petroleum is used in preparation of liquid paraffin.

Synthetic and semisynthetic sources

When the nucleus of the drug from natural source as well as its chemical structure is altered, we call it synthetic.

- Examples include Emetine Bismuth Iodide

When the nucleus of drug obtained from natural source is retained but the chemical structure is altered, we call it semi-synthetic. • eg Apomorphine, Diacetyl morphine, Ethinyl Estradiol, Homatropine, Ampicillin and Methyl testosterone.

Microbiological Sources:

- PenicilliumNotatum is a fungus which gives penicillin.
- Actinobacteria give Streptomycin.
- Aminoglycosides such as gentamicin and tobramycin are obtained from streptomycis and micromonosporas.

Recombinant DNA technology

- Recombinant DNA technology involves cleavage of DNA by enzyme restriction endonucleases. The desired gene is coupled to rapidly replicating DNA (viral, bacterial or plasmid). The new genetic combination is inserted into the bacterial cultures which allow production of vast amount of genetic material.
- Advantages:

1.Huge amounts of drugs can be produced.

2.Drug can be obtained in pure form.

3. It is less antigenic. (induce immune system).

- Disadvantages:

1.Well equipped lab is required.

2.Highly trained staff is required.

3.It is a complex and complicated technique