

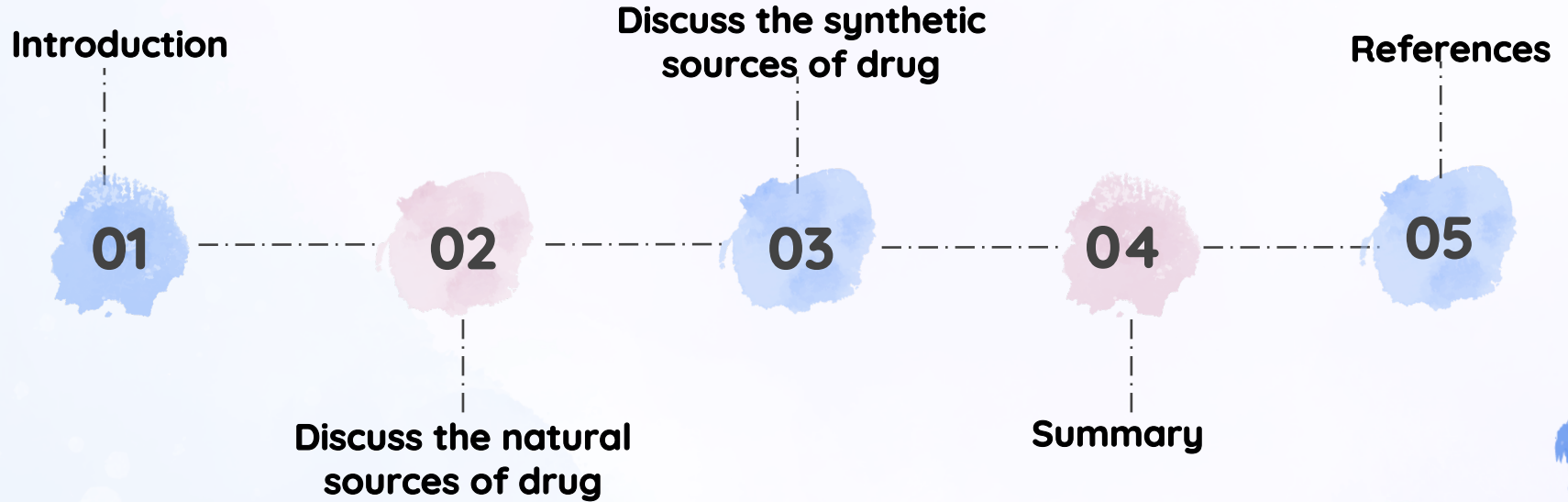


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Different Sources of Drugs

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Content:



Introduction

Crude drugs are the drugs, which are obtained from natural sources. They should be used as such as they occur in nature without any processing except, collection, drying and size reduction. Crude drugs are also defined as drugs that have not been advanced in value or improved in condition by grinding, chipping, crushing, extracting, artificial mixing with other substances. Crude drugs and their constituents are commonly used as therapeutic agents. Source of crude drugs are plant, animals and Minerals.





01

Natural sources

1. Plants

At least 118 are based on natural sources: 74 percent come from plants, The use of plants as medicines has a long history in the treatment of various diseases. Although the earliest plant source for drugs was the leaf, other parts of plants (e.g., barks, fruits, roots, stem, wood and seeds) where the product is used without further processing. 35,000-70,000 plant species have been screened for their medicinal use. The first commercial pure natural product introduced for therapeutic use is morphine marketed by Merck in 1826.





Digitalis purpurea
(Digitoxin)



Rauwolfia serpentina
(Reserpine)



Taxus brevifolia
(Paclitaxel)



Papaveraceae somniferum
(Morphine)



Catharanthus roseus
(Vincristine)

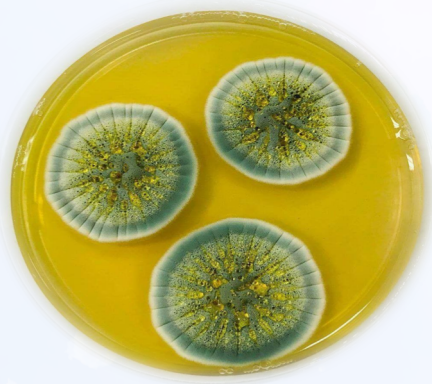


Salix alba (white willow)
(Aspirin)

2. Micro organisms

Several life-saving drugs have been historically derived from microorganisms.

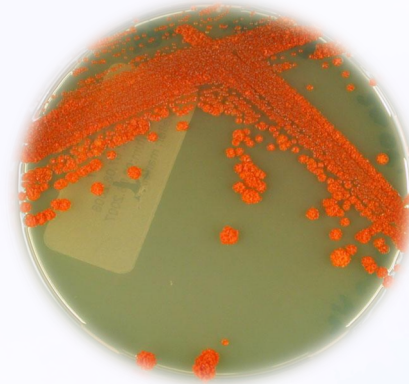
1. *Penicillium notatum* is a fungus which gives penicillin.
2. Actinobacteria give Streptomycin.
3. Aminoglycosides such as gentamicin and tobramycin are obtained from micromonosporas.



Penicillium notatum



Actinobacteria



Micromonosporas

3. Minerals

Minerals (both metallic and non-metallic minerals) have been used as drugs since ancient times. Our body requires trace elements of minerals in order to maintain homeostasis.

1. Iron is used in treatment of iron deficiency anemia.
2. Mercurial salts are used in Syphilis.
3. Zinc is used as zinc supplement. Zinc oxide paste is used in wounds and in eczema.
4. Iodine is antiseptic. Iodine supplements are also used.
5. Gold salts are used in the treatment of rheumatoid arthritis.



4. Animals

Many important drugs are derived from animal source. drugs from animal sources may be crude (unrefined) or refined material.

1. Pancreas is a source of Insulin, used in treatment of Diabetes.
2. Sheep thyroid is a source of thyroxin, used in hypertension.
3. Cod liver is used as a source of vitamin A and D.
4. Anterior pituitary is a source of pituitary gonadotropins, used in treatment of infertility.
5. Blood of animals is used in preparation of vaccines.
6. Stomach tissue contains pepsin and trypsin, which are digestive juices used in treatment of peptic diseases.



5. Marines

Bioactive compounds from marine flora and fauna have extensive past and present use in the prevention, treatment of many diseases. Coral, sponges and fish produce biologically potent chemicals with anti-inflammatory, anti-viral, and anticancer activity.



**Coral *Eleutherobia*
(Eleutherobin)**



**Marine sponge *Discodermia dissoluta*
(Discodermolide)**



02

Synthetic sources

1. Synthetic

A synthetic drug is produced using chemical synthesis, which rearranges chemical derivatives to form a new compound. At present, majority of drugs used in clinical practice are exclusively prepared synthetically in pharmaceutical and chemical laboratory. Synthetically manufactured drugs generally have higher yields that are significantly associated with quality, purity and low cost.



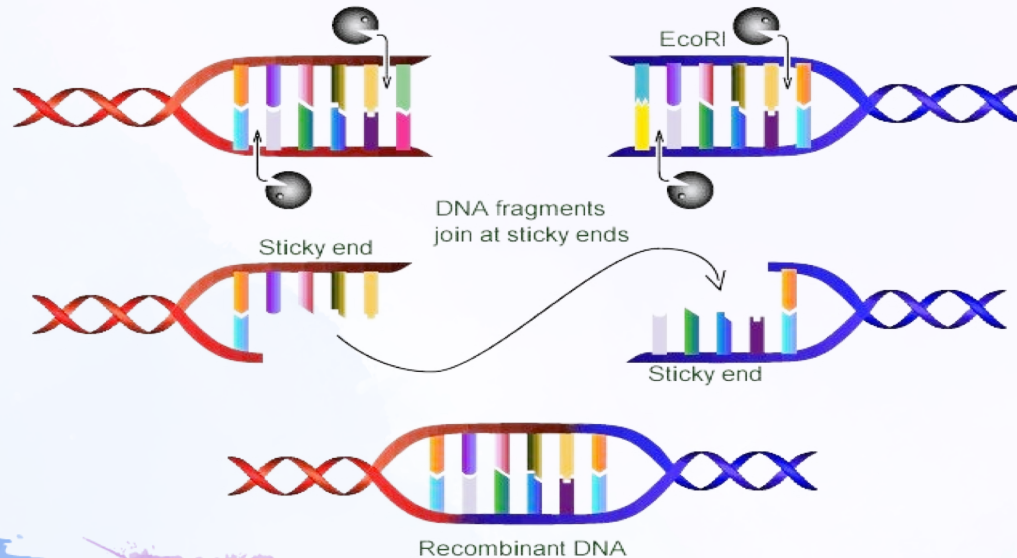
2. Semi-synthetic

Semi-synthetic drugs are neither completely natural nor completely synthetic. They are generally made by chemically modifying substances that are available from natural source to improve its efficacy and reduce side effects. Sometimes, semi-synthetic processes are used to prepare drugs when the natural sources may yield impure compounds or when the synthesis of drugs (complex molecules) may be difficult and expensive. Examples of semi-synthetic medicine include heroin from morphine and ampicillin from penicillin.



3. Biosynthetic

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.



Summary

❖ In conclusion we have covered:

- ✓ The definition of curd drugs
 - ✓ The sources of drug
 - Plant sources
 - Animal sources
 - Minerals sources
 - Microbiological sources
 - Semi synthetic sources/ Synthetic sources
 - Biosynthetic sources



References

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Thanks!