

Chapter: - 3 | Pharmacognosy

# Quality control of crude drugs

# Adulteration

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Adulterations are defined as admixture of genuine articles with spurious or harmful substances.

The action of making something poorer in quality by the addition of another substance is also known as adulteration.

Example:-

- Mixture of Papaya seed with black pepper.
- Mixture of power of brick into red chili powder.

## Methods of adulterating the drugs.

- The extent of adulteration depends upon whether the drug is obtained from other countries.
- An adulteration of a drug may be accidental.
- Adulteration is very common with drugs which are sold illegally.

Following are the various methods used for drugs adulteration.

- A. Substitution with manufactured materials
- B. Substitution with Inferior material
- C. Substitution with Exhausted material.
- D. Substitution with cheap natural substance.
- E. Adulteration with non- plant material.
- F. Excessive adventitious matter.

### A. Substitution with manufactured materials:-

This is done with artificially manufactured material which resembles various drugs in form and appearance.

**Example:** - Paraffin wax has been colored yellow to substitute bee wax.

### B. Substitution with Inferior material:-

Drug are sometimes adulterated and substituted with standard commercial material. The common example of substitution is adulteration of cloves by mother cloves.

Saffron is adulterated with dried flowers of Carthamus tinctorius (Safflower).

### **C. Substitution with Exhausted material.**

Exhausted material the vegetable residues which remain after the original material has been used for drug preparation.

#### *Example*

- The substitution of Alexandrian Senna with Arabian Senna.
- Used of exhausted Clove and ginger for adulteration.

### **D. Substitution with cheap natural substance.**

Sometimes drugs are adulterated with cheaper natural substance which has no relation to the genuine article.

*Example:* - Japan wax for bees wax and sterculia gum for Tragacanth.

### **E. Adulteration with non- plant material.**

Plant materials are sometimes adulterated with worthless non-plant materials.

## **Evaluation of crude drugs:-**

Evaluation of drugs means identify of its quality and purity.

It also includes the detection of the nature of adulteration in the crude drugs.

The morphological character may suffice the need of detection but in case of powdered drugs the microscopic characters, while in case of liquid drug chemical tests and one of the physical standards such as specific gravity, optical rotation solubility etc. May be helpful in detection of adulteration.

The methods are employed in detecting adulteration is genuine drugs.

The crude drugs can be identified on the basis of their morphological, histological and chemical studies.

**The different techniques involved in standardization of crude drugs are as follow.**

**1. Physical Evaluation:-** Physical standards are to be determined for drugs wherever possible. They may help in evaluation, specifically with reference to specific gravity, density, optical rotation refractive index, melting point, viscosity and solubility in different solvents.

**2. Chemical Evaluation:-** Chemical comprises of different chemical tests and chemical assays. The isolation, purification and identification of active constituents are chemical methods of evaluation Quantitative chemical tests such as Acid value, Saponification value etc.

It also help in proper identification of various of the crude drugs.

**3. Biological Evaluation:-** The estimation of potency of crude drugs is done by means of its effect on the living organism like bacterial, fungal growth or animal tissue or entities animal, it is called as bioassay

Bioassay is the measure of sample being tested capable of producing the biological effects as that of the standard preparation.

**4. Morphological Evaluation (Organoleptic):-** It is refers to evaluation of drugs by colour, odor, teste, size, shape and special features like touch, texture and sound etc.

The study of form of crude drugs is morphology while description of the form is morphography.

The adulteration of seeds of strychnos nux-vomica with the seed of strychnos nux-blanda or Strychnos potatorum, caraway with Indian dill, Alexandrian Senna with dog Senna is identified by morphological techniques.

**5. Microscopic Evaluation:-** The microscopic evaluation also covers study of constituents by application of chemical tests to small quantities of drugs in powdered form or to histological sections of the drug (micro-chemistry)

This method allows more detailed examination of a drug and its can be used to identify organised drugs by their know histological characters.

Histological studies are made from very thin sections of the drugs.

Microscope by virtue of its property to magnify permits the minute structure under study to be enlarged and can be used to confirm the structural details of the drugs from plants origin.