PHARM.D • YEAR 2

Pharmacognosy & Phytopharmaceuti

CHAPTER 16

Adulteration of Crude Drugs



PPT CHAPTER COVER

DOCTOR OF PHARMACY

Adulteration: loss of identity and quality

Crude drugs are natural materials used in a raw or minimally processed form.





Genuine



Adulterated



Adulteration lowers their identity, purity or quality through substitution, dilution or addition of unsuitable material.

It may be deliberate or arise through errors in collection and handling.

Consequences include reduced efficacy, unpredictable composition and possible toxicity or allergy.

Drivers include economic gain, high demand, weak quality control and difficulty identifying similar materials.







Authentication must establish the correct source and part, not merely an acceptable-looking sample.

Intentional and accidental adulteration

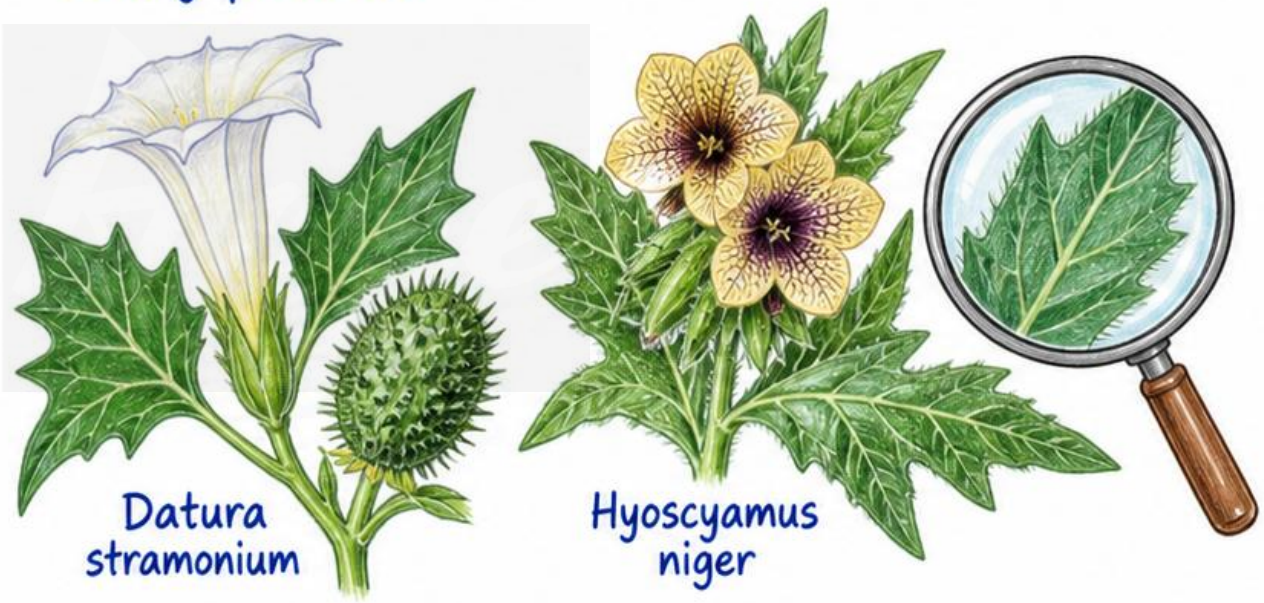
Deliberate adulteration intentionally replaces or dilutes a valuable material, usually for economic gain.

Examples include cheap fillers, added colour or previously exhausted drug material.



Unintentional adulteration can result from mistaken plant identity, ambiguous names, careless collection or poor handling.

A poisonous look-alike can create a serious safety problem.



Datura stramonium and Hyoscyamus niger both contain toxic tropane alkaloids; henbane is not a non-toxic substitute.

Intent explains how adulteration arose, while **testing** establishes what the sample contains.

Substitution: appearance can mislead

Inferior substitution replaces all or part of a genuine drug with a lower-quality or chemically different material.

Superficially similar substitution exploits resemblance in colour, size or shape.



Microscopic examination







Microscopic examination

Digitalis leaves and Plantago leaves illustrate why leaf appearance alone is insufficient; their chemical profiles are different.

Biological substitution uses another species, whether related or unrelated.

Morphological substitution emphasises the misleading external resemblance.

These categories overlap: one replacement can be both biological and morphological adulteration.

Artificial, chemical and economic methods

Artificial adulteration

uses manufactured materials that imitate the genuine drug, such as imitation resin or fabricated nutmeg-like material.



Genuine resin

Imitation resin

Chemical adulteration

adds dyes, metallic salts, fragrances or synthetic constituents to mimic colour, odour or activity.



Brick powder in chilli powder is an example of an added inorganic adulterant.

Economic adulteration

adds cheaper substitutes or bulking agents to increase saleable mass or apparent value.



A convincing colour or smell cannot demonstrate botanical identity or adequate constituent content.

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