



Noteskarts

— Smart Notes, Bright Future —

BP105T

INTRODUCTION TO PHARMACOGNOSY

UNIT I — SHORT NOTES

Rapid Revision Edition

Fundamentals of Pharmacognosy — condensed for fast last-minute revision

B.Pharm — Semester I • PCI Regulations, ER-2020

Smart Notes, Bright Future

www.noteskarts.com

This Is the Short Notes Edition

Built for a fast, last-minute pass through Unit I — not for first-time learning.



Want the FULL Detailed Notes?

This short edition strips Unit I down to the facts you need to recall in an exam. The full **Noteskarts Prime** edition of this unit runs **30+ pages** and additionally includes:

-  **Worked examples and case studies**
(e.g. the Withering/foxglove and Rauwolfia chemotaxonomy stories)
-  **Complete merits/limitations discussion**
for every classification system
-  **The biopiracy case timeline**
-  **A full Imp-terms glossary**
-  **Extra practice MCQs**



**UNIT I
COMPLETE
DETAILED NOTES**

30+ Pages

*More Knowledge
Brighter Future*

*Study Smarter
with Noteskarts*

-  **High-Quality Notes**
-  **Exam-Oriented Content**
-  **Trusted by Pharmacy Students**
-  **Learn Today Lead Tomorrow**

**LEARN
PRACTICE
EXCEL**

 **Get Noteskarts Prime** 



• Your Pharmacy Study Companion

Noteskarts Prime



Play Store

Website



noteskarts.com

YouTube



@Noteskarts

Telegram



Free Notes Group

1. Definition, History, Scope and Development

- **Pharmacognosy** = Greek *pharmakon* (drug) + *gnosis* (knowledge) → “knowledge of drugs.”
- Study of **crude drugs** from natural sources: plants, animals, microbes, marine organisms, minerals.
- **Crude drug** = natural substance with only simple processing (drying/cutting/grinding), no chemical alteration. e.g. Senna leaves, Cinchona bark, raw opium.
- **History — Imp names/dates:**
 - **Dioscorides** (1st c. CE) — *De Materia Medica*, ~600 plants — “father of pharmacognosy.”
 - **J.A. Schmidt** (1811) — first used the word “pharmacognosy” (*Lehrbuch der Materia Medica*).
 - **C.A. Seydler** (1815) — *Analecta Pharmacognostica* — gave it its modern meaning.
 - **Charaka Samhita / Sushruta Samhita** — parallel ancient Indian tradition.
 - **Sertürner** (1806) — isolated morphine, first plant alkaloid — began the alkaloid-chemistry era.
 - **Jonathan Pereira** — founder of British pharmacognosy; **Daniel Hanbury** — applied/trade approach.
 - **1950s+** — phytochemical analysis (chromatography, spectroscopy). **1990s+** — biotechnology era (tissue culture, fermentation) + **reverse pharmacognosy**.



Development of Pharmacognosy Through the Ages

Plants
People
Better Health

From Traditional Knowledge to Modern Therapeutics

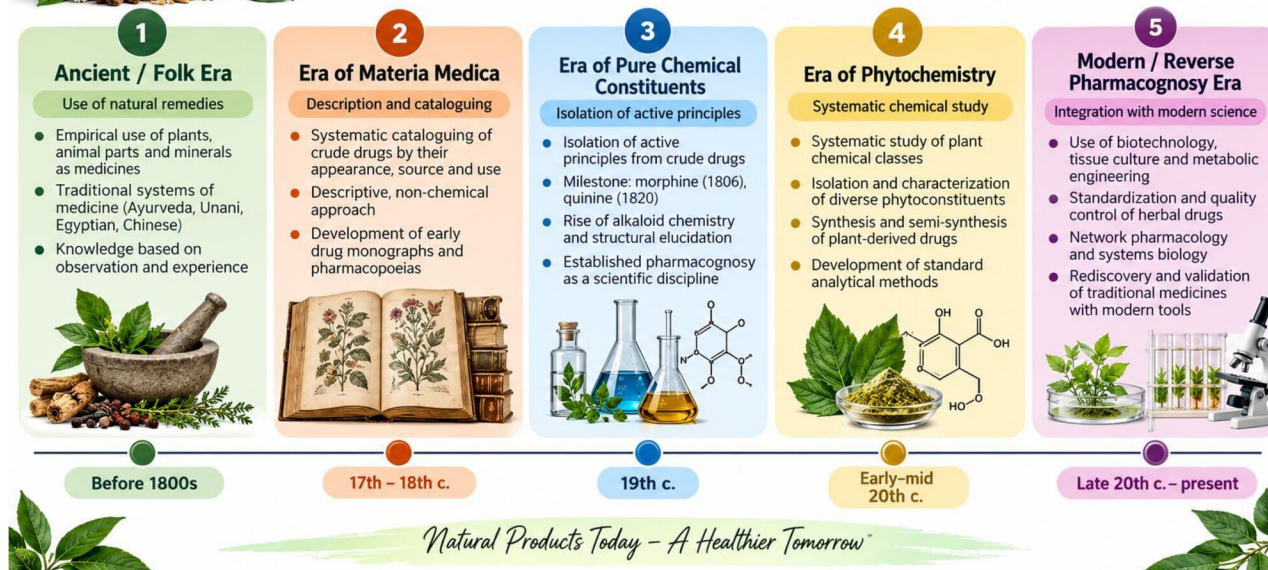


Figure 1 — Development of pharmacognosy through the ages.

- Present status:** traditional systems (Ayurveda/Unani/Siddha/TCM) + modern QC (HPTLC, HPLC, GC-MS, DNA barcoding). IP 10th edn (Jan 2026) — ~3,340 monographs.
- Scope:** botany & cultivation • collection/storage • phytochemistry • standardisation/QC • pharmacology • biotechnology • regulatory/commercial.
- Biopiracy:** patenting traditional knowledge without consent/benefit-sharing. Turmeric patent (US, 1995) revoked 1997 after CSIR challenge; Neem patent (EPO, 1994) revoked 2000, upheld 2005 → led to India's **TKDL** (Traditional Knowledge Digital Library).

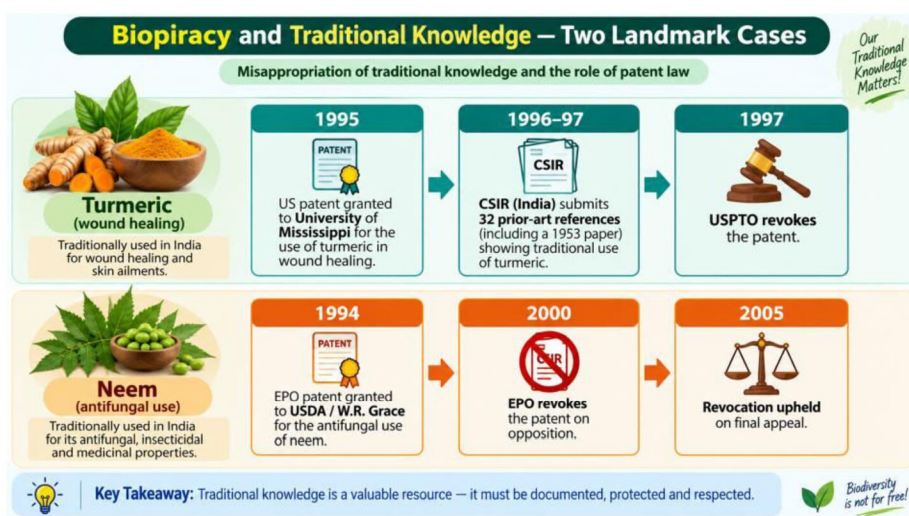


Figure 1B — Turmeric and neem biopiracy disputes, patent grant to final revocation.

2. Sources of Drugs

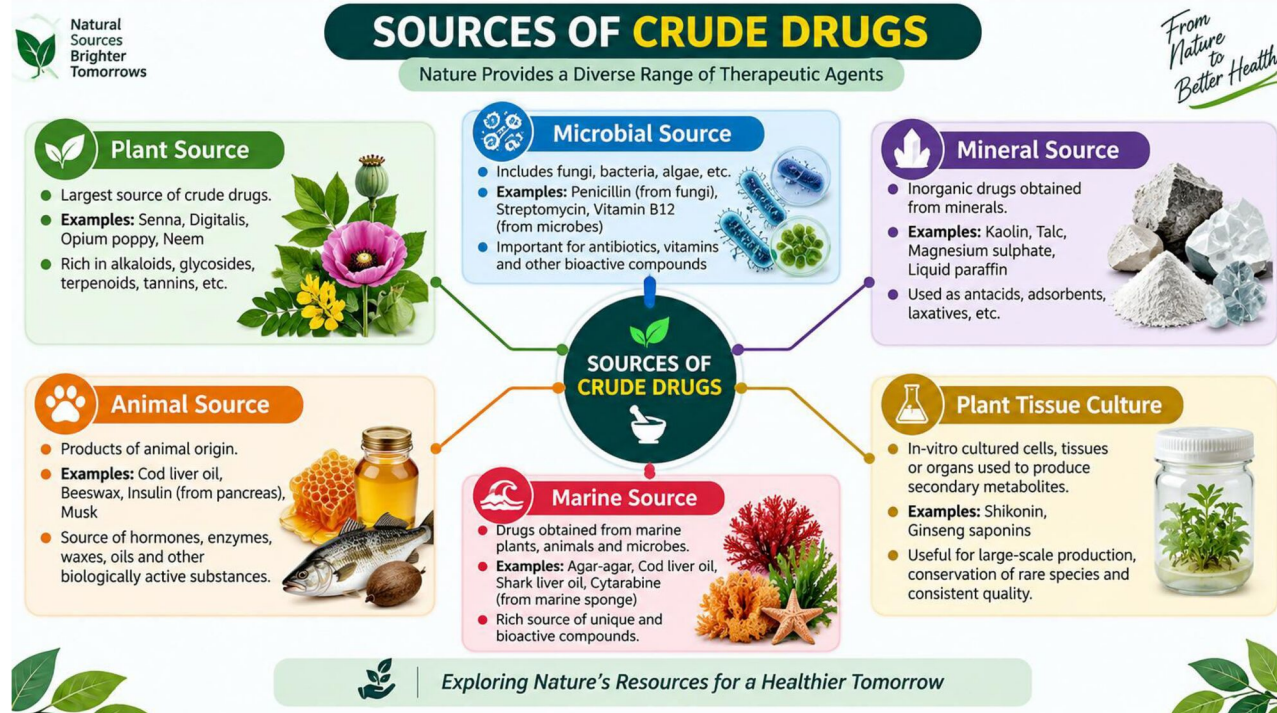


Figure 2 — The six sources of crude drugs.

- **Plant** — Senna (laxative), Digitalis (cardiotonic), Opium (morphine/codeine), Neem (antimicrobial). Largest, oldest, most-used source.
- **Case:** Withering (1785) learned of a Shropshire folk remedy for dropsy (heart-failure swelling), identified foxglove as its active ingredient, and documented benefits/toxicity across 156 cases in *An Account of the Foxglove* — basis of modern Digitalis therapy, decades before digoxin was isolated.
- **Animal** — Cod liver oil (vit. A/D), Insulin (pancreas), Beeswax, Musk, Lanolin.
- **Microbial** — Penicillin (*P. notatum*), Streptomycin (*S. griseus*), Vitamin B12, Cyclosporine.
- **Marine** — Agar-agar (red algae), Cytarabine (sponge-derived), Shark/cod liver oil.
- **Mineral** — Kaolin, Talc, Magnesium sulphate, Liquid paraffin.
- **Plant tissue culture** — based on **totipotency**. Explant → callus → cell suspension/organ culture → elicitation → extraction. e.g. Shikonin, Ginseng saponins. Advantages: season-independent, protects wild populations, elicitation can boost yield.

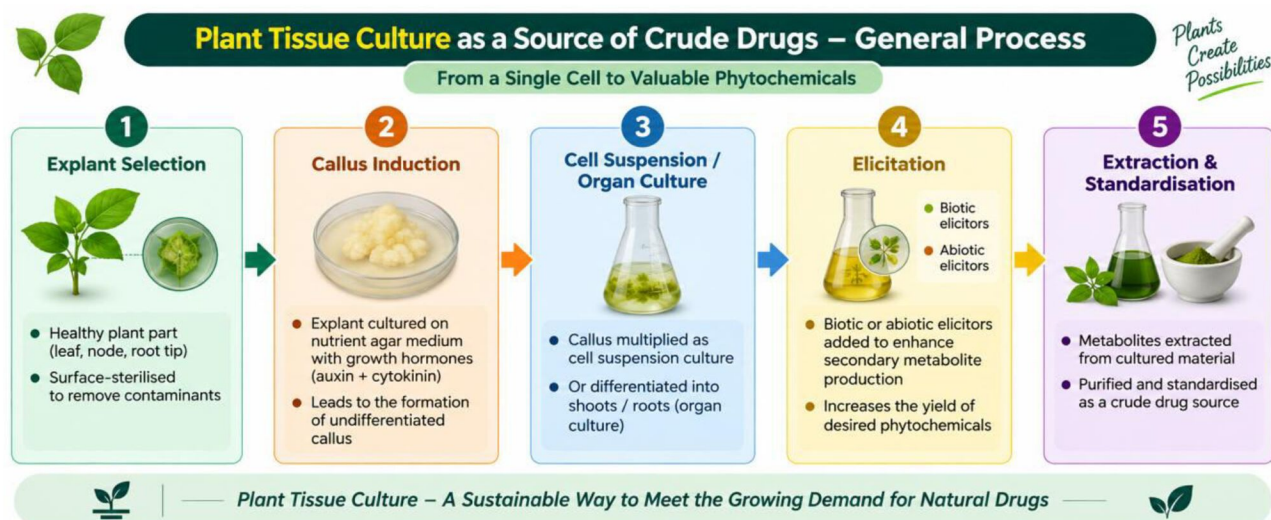


Figure 2B — General workflow for producing a secondary metabolite through plant tissue culture.

Source	Imp examples	Part / product used
Plant	Senna, Digitalis, Opium	Leaf, leaf, latex
Animal	Cod liver oil, Insulin	Liver oil, pancreatic extract
Microbial	Penicillin, Streptomycin	Fermentation metabolite
Marine	Agar-agar, Cytarabine	Algal polysaccharide, sponge nucleoside
Mineral	Kaolin, Talc	Refined mineral
Tissue culture	Shikonin, Ginseng saponins	Cell-culture metabolite

3. Historical Milestones in Drug Discovery

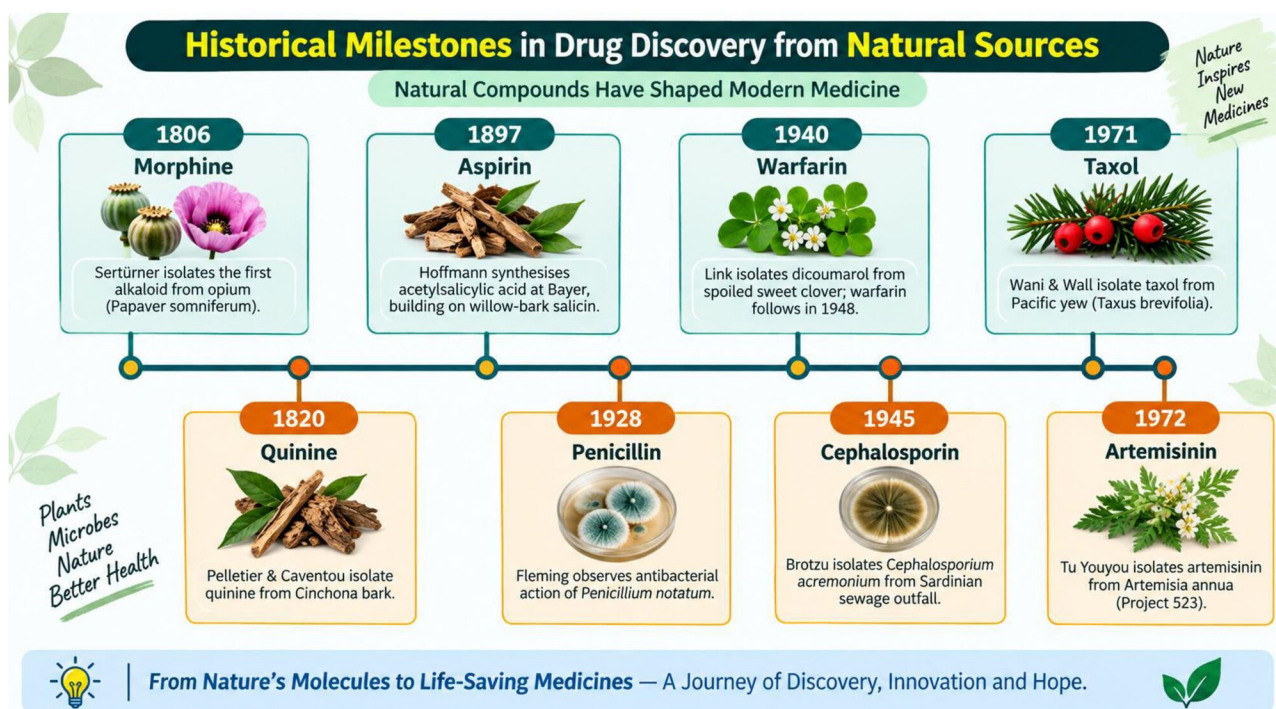


Figure 3 — Timeline of eight landmark natural-product discoveries.

- **Morphine (1806)** — Sertürner — opium (*Papaver somniferum*) — first plant alkaloid isolated. *Legacy*: codeine, heroin, oxycodone all built on its morphinan skeleton.
- **Quinine (1820)** — Pelletier & Caventou — Cinchona bark — antimalarial. *Legacy*: quinidine (antiarrhythmic), chloroquine (synthetic antimalarial template).
- **Aspirin (1897–99)** — Hoffmann (Bayer) — acetylsalicylic acid from salicin (willow bark) — first major semi-synthetic drug. *Legacy*: Vane (1971) showed COX inhibition → low-dose antiplatelet/cardiovascular use.
- **Penicillin (1928)** — Fleming — *Penicillium notatum* — first antibiotic; purified by Florey & Chain (1940s). *Legacy*: ampicillin, amoxicillin (broader-spectrum semi-synthetic penicillins).
- **Warfarin (1940–54)** — Link — dicoumarol from spoiled sweet clover — rat poison (1948) → anticoagulant (1954).
- **Cephalosporin (1945)** — Brotzu — *Cephalosporium acremonium* (Sardinian sewage outfall) — grouped into “generations” by spectrum.
- **Taxol (1971)** — Wall & Wani — *Taxus brevifolia* (Pacific yew) — anticancer; supply problem solved by semi-synthesis from European yew needles; approved 1992.
- **Artemisinin (1972)** — Tu Youyou — *Artemisia annua* (Project 523) — antimalarial; basis of ACT (WHO first-line malaria therapy); Nobel Prize 2015.

Drug	Source organism	Discoverer(s) / Year	Chemical class
Morphine	<i>Papaver somniferum</i>	Sertürner, 1806	Alkaloid
Quinine	Cinchona bark	Pelletier & Caventou, 1820	Alkaloid
Aspirin	Willow bark salicin	Hoffmann, 1897	Salicylate derivative
Penicillin	<i>Penicillium notatum</i>	Fleming, 1928	Beta-lactam antibiotic
Warfarin	Spoiled sweet clover	Link, 1940/1948	Coumarin derivative
Cephalosporin	<i>Cephalosporium acremonium</i>	Brotzu, 1945	Beta-lactam antibiotic
Taxol	<i>Taxus brevifolia</i>	Wall & Wani, 1971	Diterpene
Artemisinin	<i>Artemisia annua</i>	Tu Youyou, 1972	Sesquiterpene lactone

4. Herbal / Traditional Pharmacopoeias

Herbal / Traditional Pharmacopoeias — A Comparative View		
Different Systems, A Common Goal — Health Through Nature		
Pharmacopoeia	Publishing Body / Country	Scope
 Indian Pharmacopoeia (IP)	 Issued by Government of India (Ministry of Health & Family Welfare)	Official standards for allopathic and a growing number of herbal drugs used in India.
 British Herbal Pharmacopoeia (BHP)	 British Herbal Medicine Association, UK	Monographs on herbal drugs used in British herbal practice.
 USP – Herbal Medicines & Dietary Supplements	 United States Pharmacopoeial Convention, USA	Quality standards for botanicals and dietary supplements sold in the USA.
 Ayurvedic Pharmacopoeia of India (API)	 Government of India (Ministry of AYUSH)	Official standards for single and compound Ayurvedic drugs.
 Unani Pharmacopoeia of India (UPI)	 Government of India (Ministry of AYUSH)	Official standards for single drugs used in Unani medicine.
 American Herbal Pharmacopoeia (AHP)	 American Herbal Pharmacopoeia, USA (non-profit)	Detailed quality-controlled monographs for botanicals, widely used as a reference.
 “Traditional Knowledge, Global Standards, Better Health” 		

Figure 4 — Six major herbal and traditional-system pharmacopoeias.

Pharmacopoeia	Publishing body / country	Since	Notes
IP	Indian Pharmacopoeia Commission, India	1955	10th edn Jan 2026 (~3,340 monographs)
BHP	British Herbal Medicine Assoc., UK	1971	Classic 1983 edn covers 232 drugs
USP (Herbal)	US Pharmacopoeial Convention, USA	1820 (USP)	Section of USP–NF
API	Ministry of AYUSH, India	Late 1970s+	Single drugs (Pt. I), formulations (Pt. II)
UPI	Ministry of AYUSH, India	Alongside API	Single drugs used in Unani medicine
AHP	American Herbal Pharmacopoeia (non-govt.), USA	Mid-1990s	Detailed, non-statutory reference

- **Why it matters:** herbal drug composition varies by region/season — pharmacopoeias fix limits (moisture, ash value, marker-compound content) to control this.
- **Adulteration** is a persistent concern; **WHO's GACP guidelines + WHO monographs on selected medicinal plants** give an internationally shared benchmark.

- India is a major AYUSH/herbal exporter — export consignments must meet the *importing* country's standard, not just IP.
- **Two regulatory types:** government pharmacopoeias (IP, API, UPI) carry legal weight nationally; professional references (BHP, AHP) are authoritative but non-statutory.

5. Official/Non-Official; Codified/Non-Codified

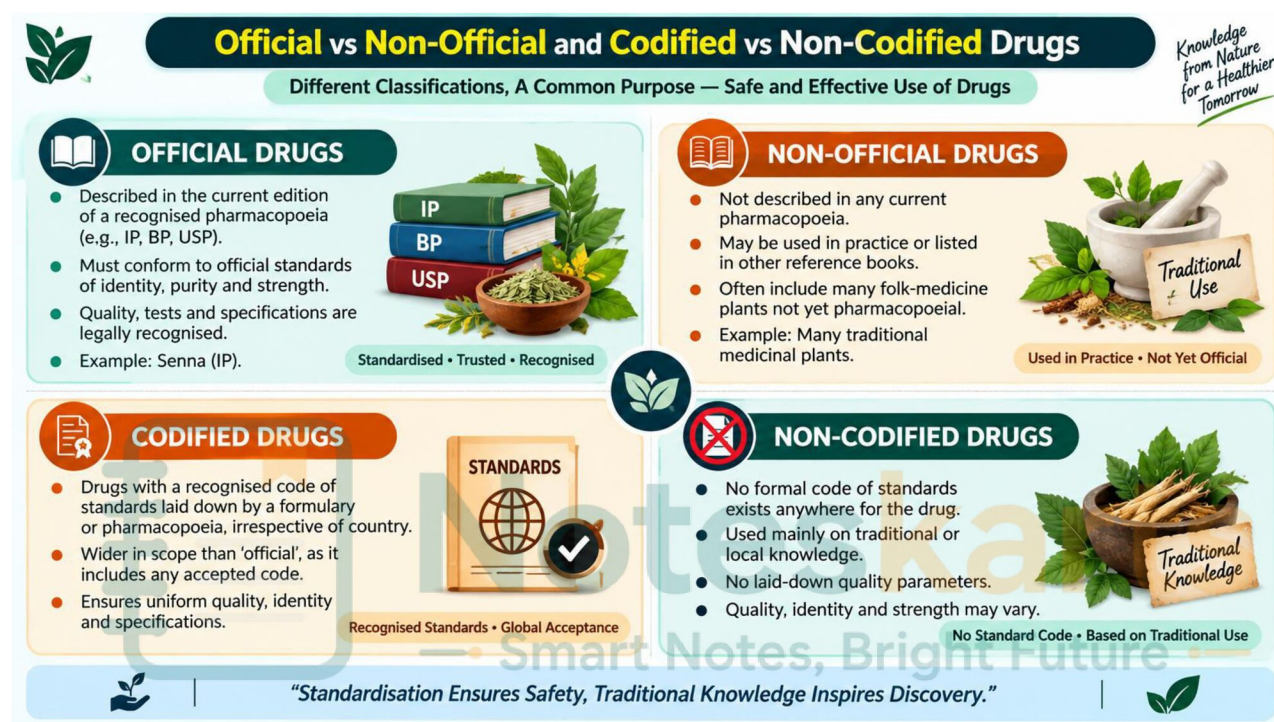


Figure 5 — Official vs non-official, codified vs non-codified.

- **Official** — described in the *current* pharmacopoeia of that country (e.g. Senna in IP). Legally enforceable standards.
- **Non-official** — not in any pharmacopoeia currently in force, though still used/sold.
- **Codified** — broader: recognised standard in **any** formulary/pharmacopoeia, **any** country.
- **Non-codified** — no formal standard anywhere; rests on traditional/local knowledge alone.
- **Exam tip:** Official/non-official asks — *is it in this country's current pharmacopoeia?* Codified/non-codified asks — *does a standard exist anywhere?* A drug can be non-official in India yet still codified (e.g. covered only by the BHP).

- **How a drug becomes official:** traditional/clinical use → pharmacological & phytochemical studies → pharmacopoeial committee drafts a monograph → expert review → adopted in the next edition.

Drug	Official (India)?	Codified?
Senna	Yes (IP)	Yes
Herb only in BHP, not IP	No	Yes (BHP)
Tribal plant, no monograph anywhere	No	No

6. Classification of Crude Drugs

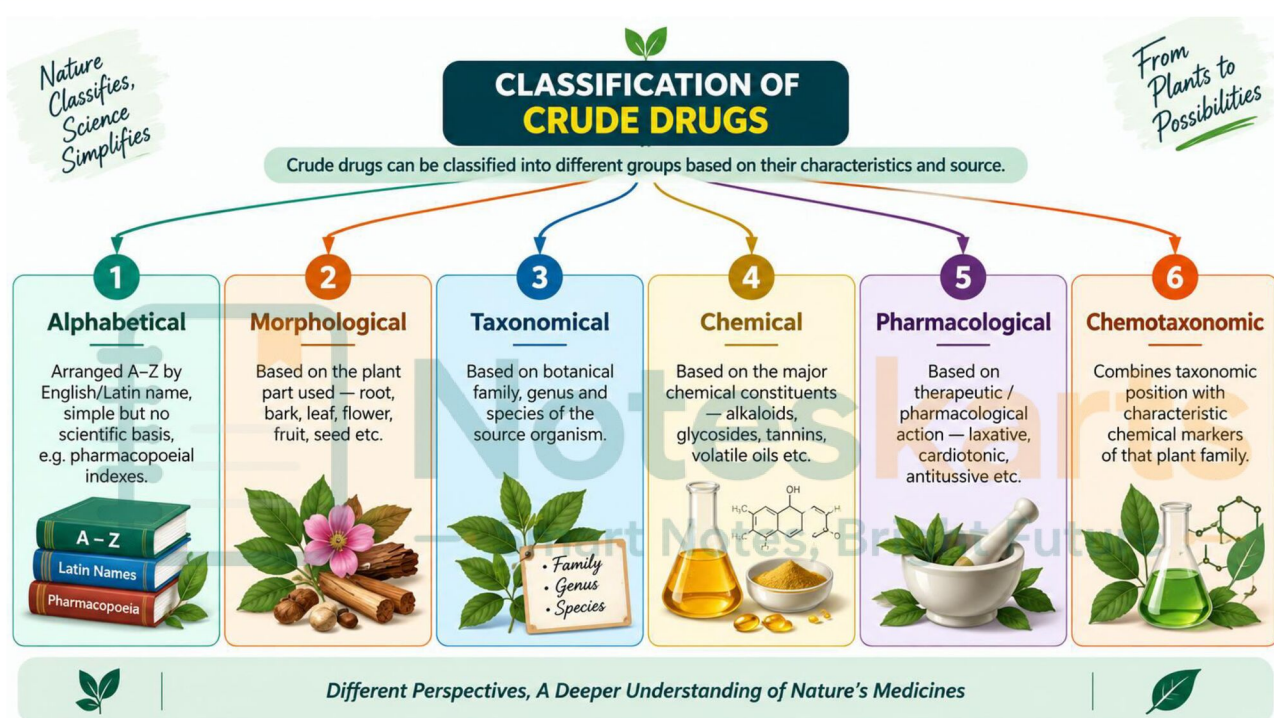


Figure 6 — The six classification systems for crude drugs.

System	Basis	Example	Imp limitation
Alphabetical	Name, A–Z	Pharmacopoeial index	No scientific basis
Morphological	Plant part used	Leaf / bark / root drugs	No chemical/action info
Taxonomical	Family / genus / species	Solanaceae drugs (belladonna, datura)	Needs taxonomy knowledge
Chemical	Major constituent class	Alkaloids, glycosides	Drug may span multiple classes
Pharmacological	Therapeutic action	Laxatives, cardiotonics	No source/chemistry info

System	Basis	Example	Imp limitation
Chemotaxonomic	Taxonomy + chemical markers	Rauwolfia species (alkaloid profiling)	Needs advanced analytical techniques

- **Imp point:** no single system is “correct” — exam questions often ask you to classify one drug in more than one way.

Worked example — Digitalis placed under all six systems at once:

System	Where Digitalis is placed
Alphabetical	Under “D,” wherever the index places it
Morphological	Leaf drug
Taxonomical	Family Plantaginaceae, genus Digitalis
Chemical	Cardiac glycoside (digoxin, digitoxin)
Pharmacological	Cardiotonic — heart failure, arrhythmias
Chemotaxonomic	Grouped with other cardenolide-producing genera

Worked example — one drug across four systems at once:

Drug	Morphological	Taxonomical (family)	Chemical	Pharmacological
Digitalis	Leaf	Plantaginaceae	Cardiac glycoside	Cardiotonic
Senna	Leaf / pod	Fabaceae	Anthraquinone glycoside	Laxative
Cinchona	Bark	Rubiaceae	Alkaloid (quinine)	Antimalarial
Opium	Dried latex	Papaveraceae	Alkaloid (morphine)	Analgesic
Clove	Flower bud	Myrtaceae	Volatile oil (eugenol)	Local anaesthetic



Stay Connected with Noteskarts

Noteskarts Prime  Play Store	Website  noteskarts.com	YouTube  @Noteskarts	Telegram  Free Notes Group
--	---	---	--

Smart Notes, Bright Future