

# **SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES**

*Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai*  
*Approved by Pharmacy Council of India, New Delhi.*  
**Coimbatore -641035**

**COURSE NAME : PHARMACOGNOSY AND PHYTOCHEMISTRY II (BP504T)**

**V SEM / IIIYEAR**

**TOPIC 1 : ALKALOIDS - EXAMPLES**

## VINCA (Periwinkle):

What are the synonyms for VINCA?

Sadabahar and Catharanthus.

What is the biological source of VINCA?

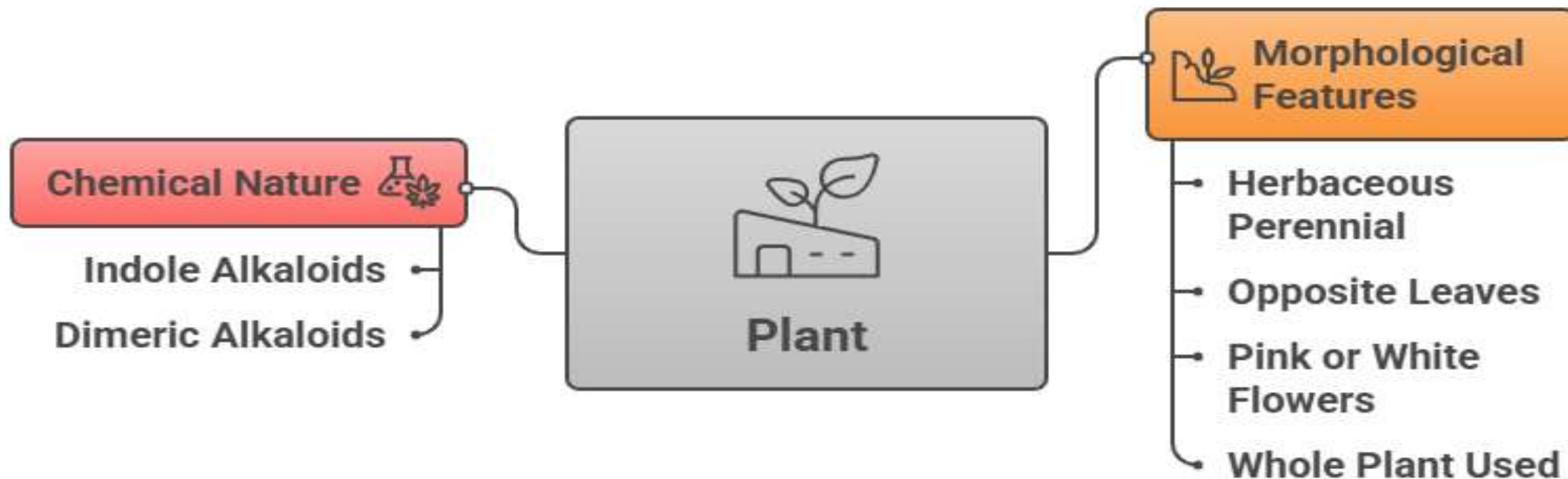
The dried entire plant of \**Catharanthus roseus*\* (L.) G. Don. (Family: Apocynaceae).

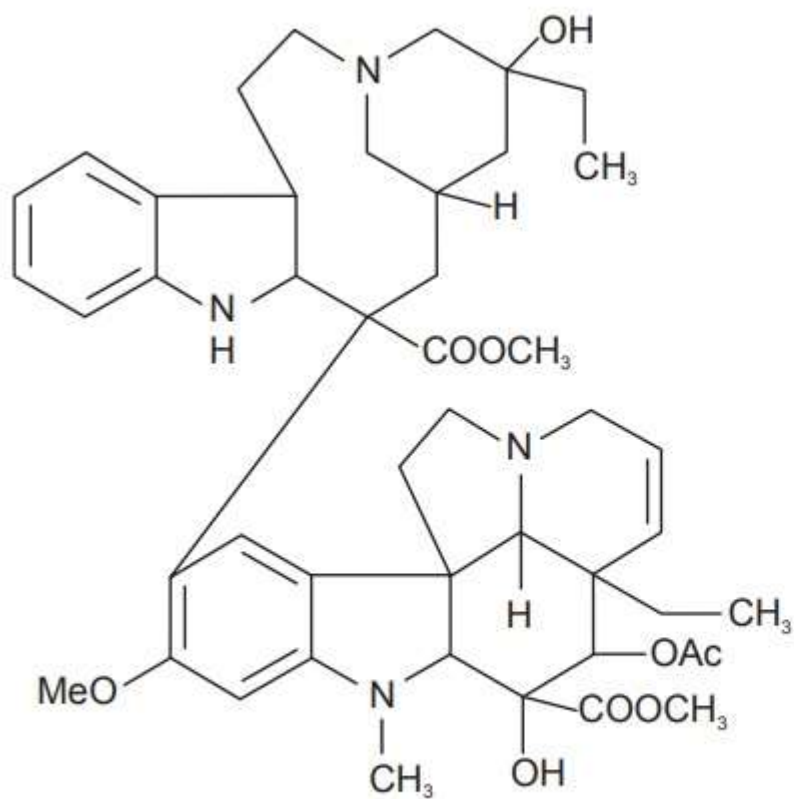
What is the geographical source of VINCA?

Widely cultivated in India, Madagascar, and parts of Africa.

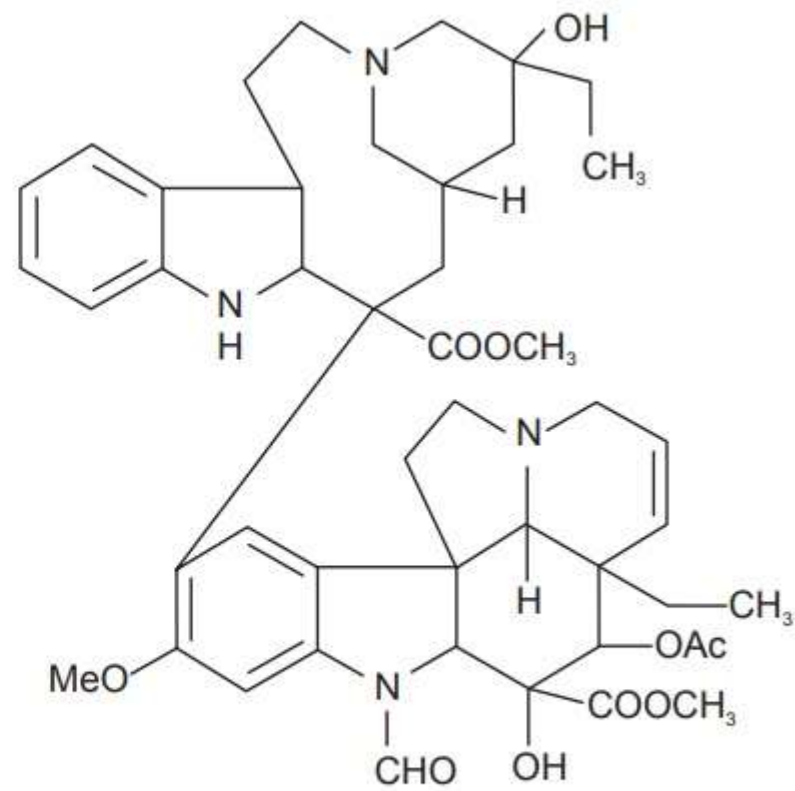


## Morphological and Chemical Features of the Plant





Vinblastine



Vincristine

# Chemical Nature and Biosynthesis of Vinca Alkaloids

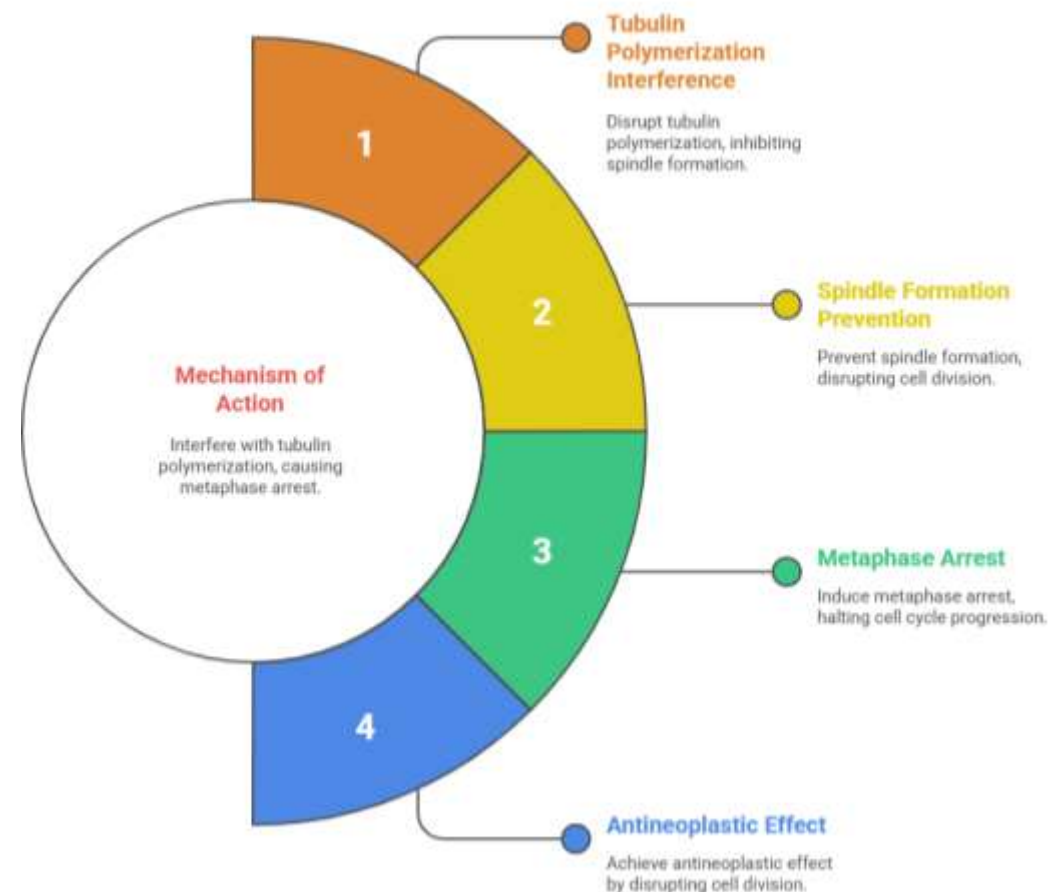
## Unveiling the Mechanism of Action

What is the chemical nature of Vinca alkaloids?

They contain over 100 indole alkaloids, with major dimeric indole-dihydroindole alkaloids like vincristine, vinblastine, vindoline, and catharanthine.

How are Vinca alkaloids biosynthesized?

They are derived from tryptophan (indole moiety) and secologanin (terpenoid moiety), forming terpenoid indole alkaloids.



## Vinca Alkaloid Uses



### Vincristine Uses

Treats acute lymphoblastic leukemia, lung cancer, and Hodgkin's disease.



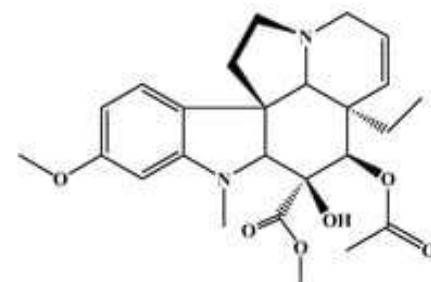
### Vinblastine Uses

Effective against Hodgkin's lymphoma and testicular cancer.

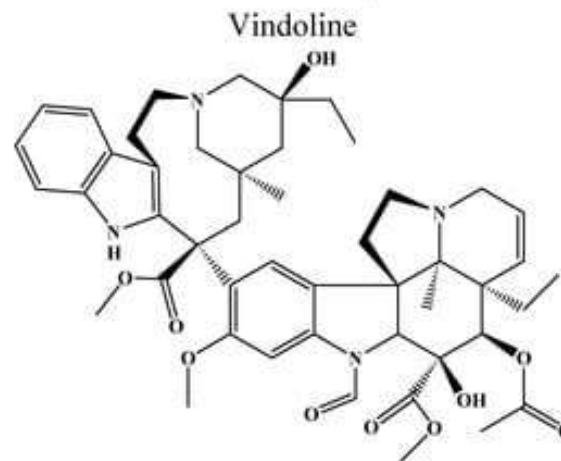


### Vincamine Uses

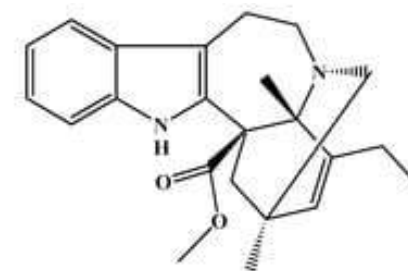
Acts as a cerebral vasodilator, beneficial in geriatric dementia.



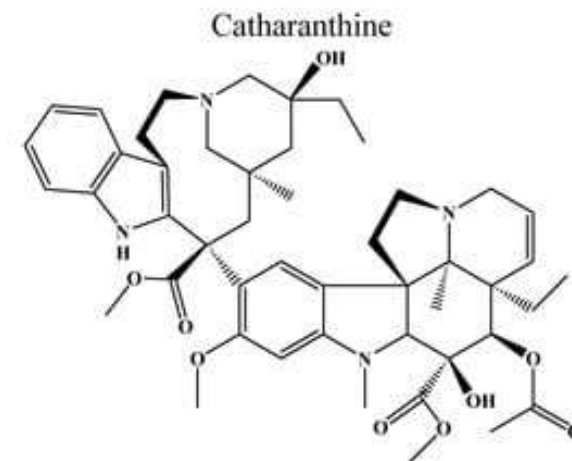
Vindoline



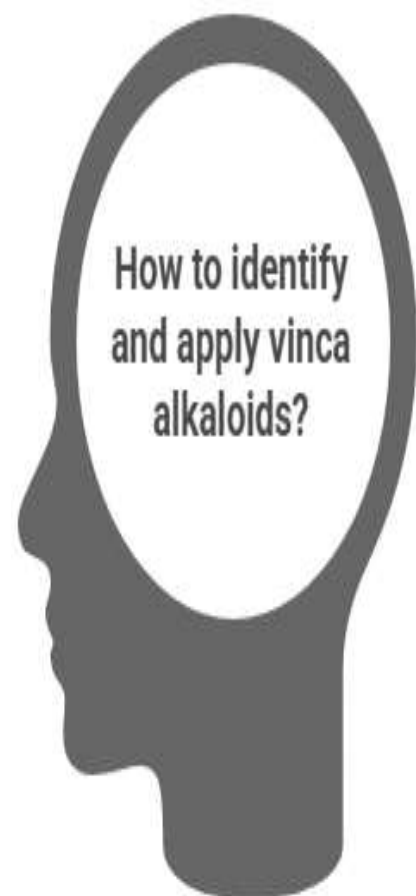
Vincristine



Catharanthine



Vinblastine



## Identification Tests



Use Vanillin-HCl to distinguish between Vinblastine and Vincristin based on color.



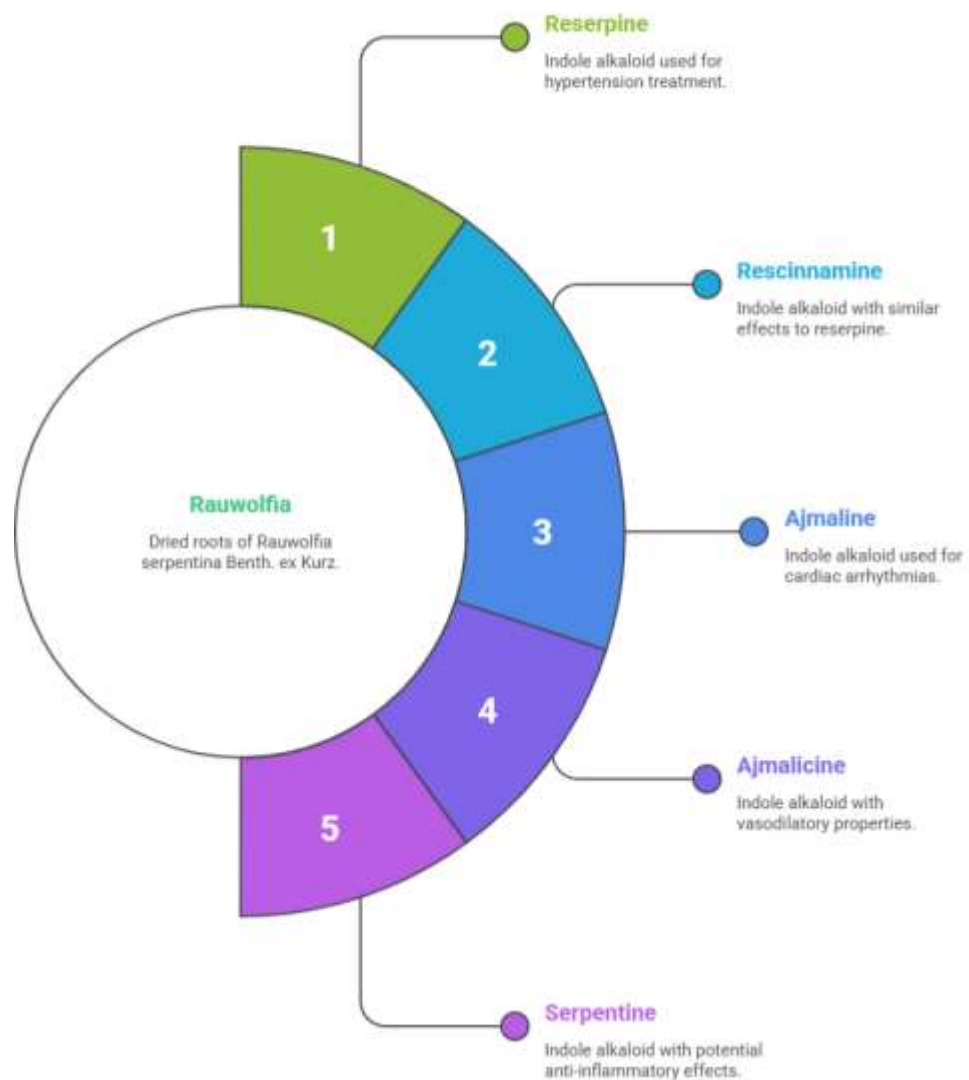
## Commercial Application

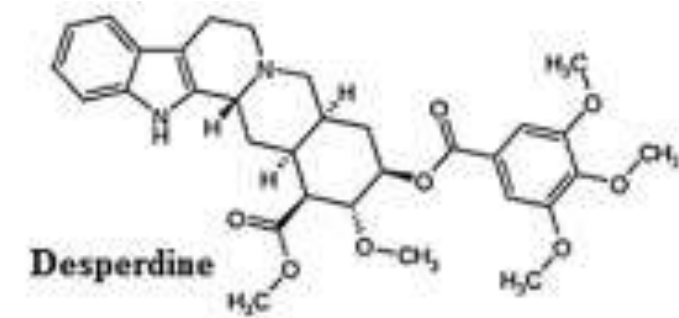
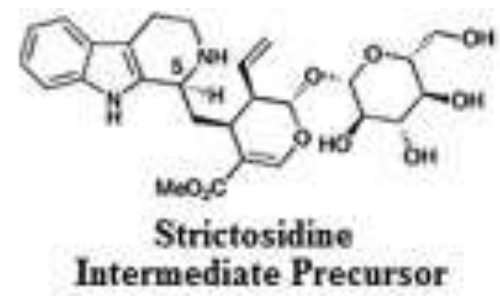
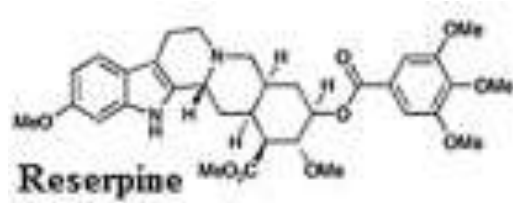


Utilize vinca alkaloids in chemotherapy or as raw materials for derivatives.

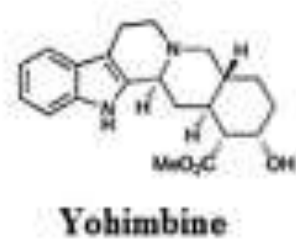
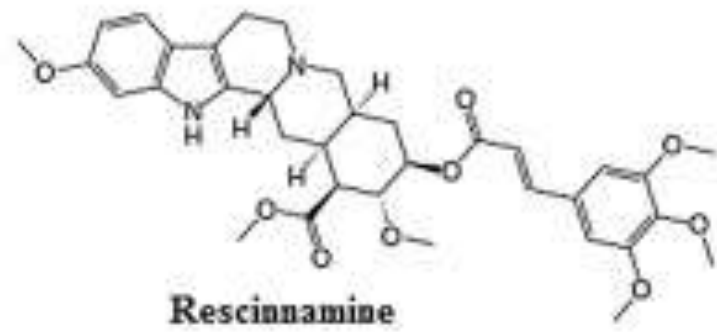


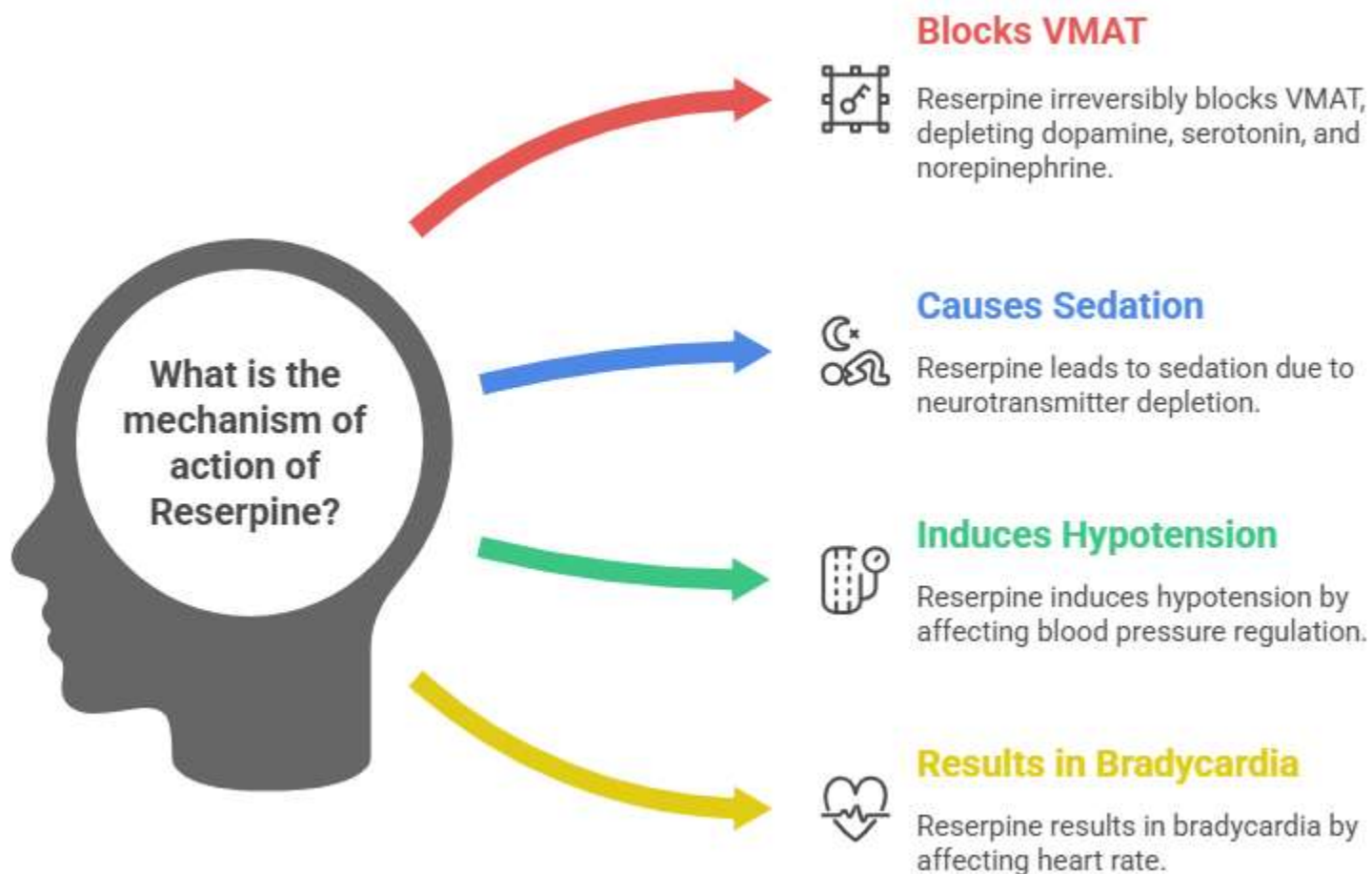
## Unveiling Rauwolfia's Chemical Complexity



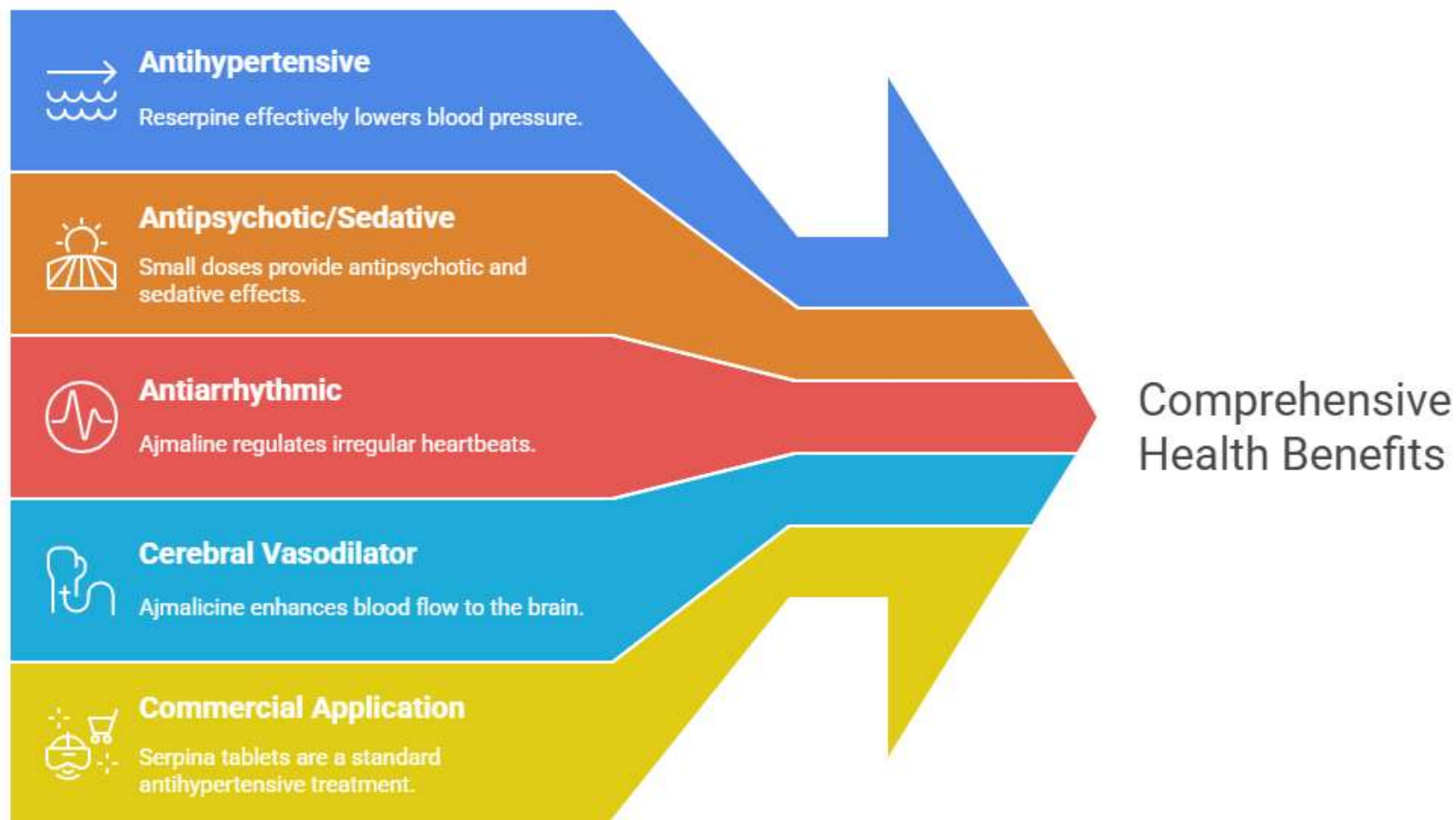


*Rauwolfia serpentina*

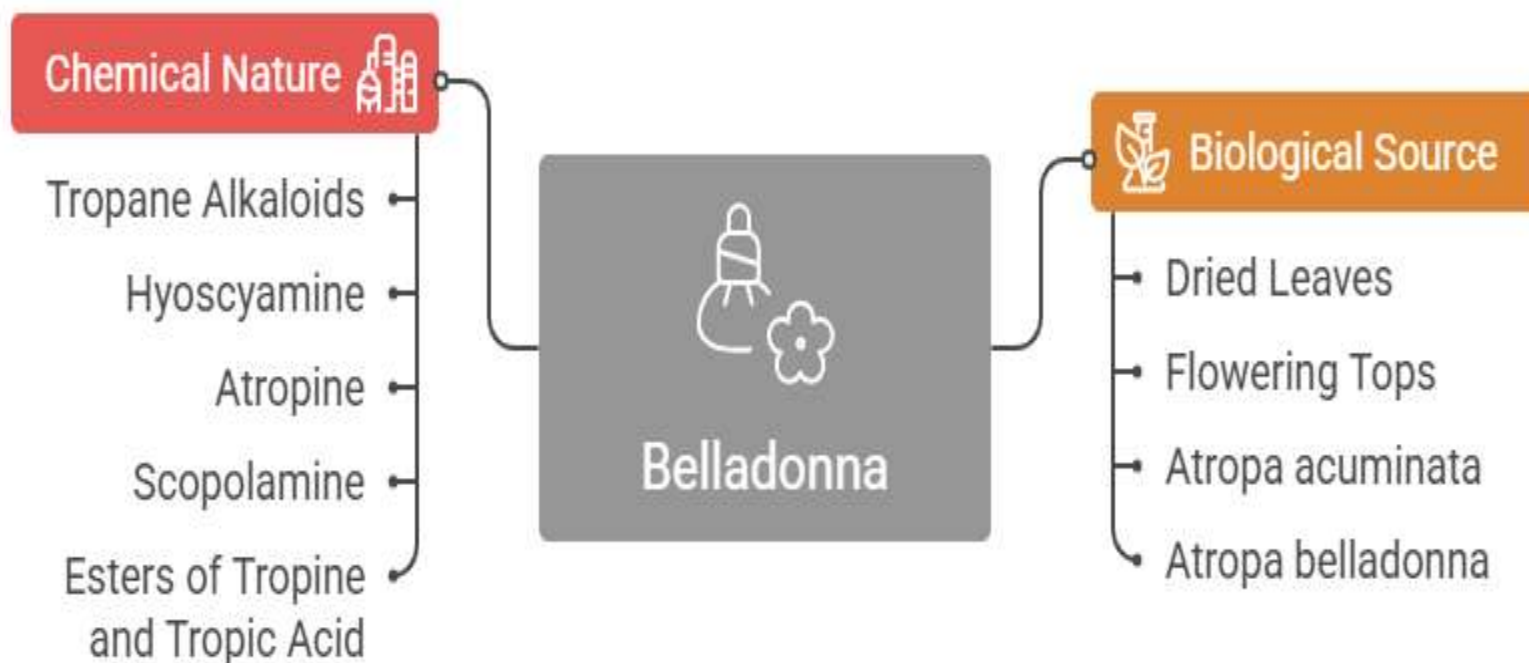


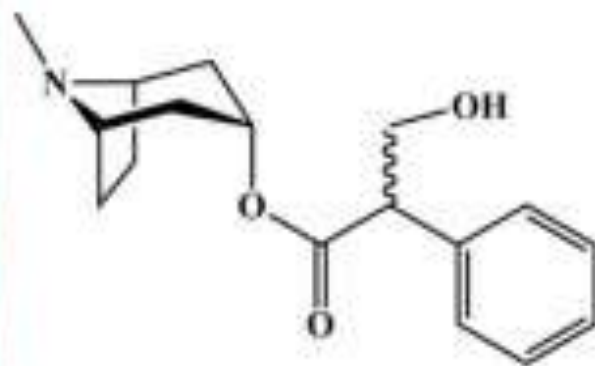


## Nature's Healing Power

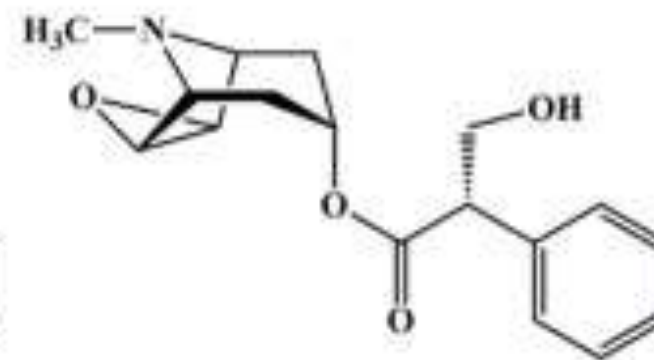


## Belladonna: Biological Source and Chemical Nature

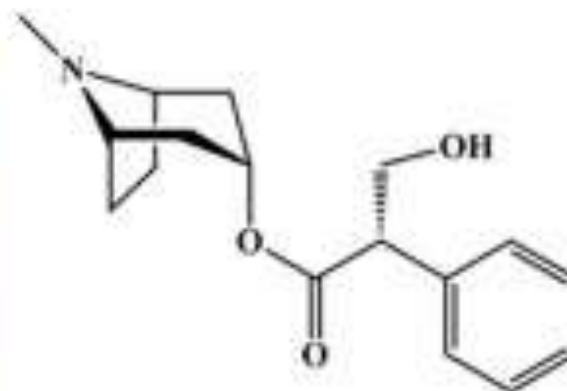




**Atropine**



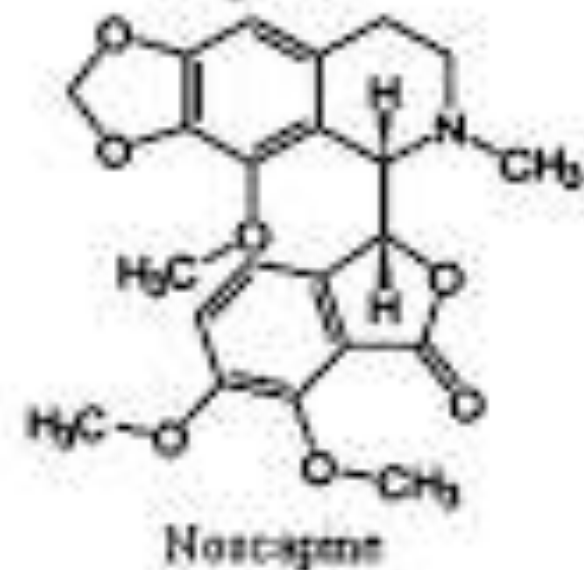
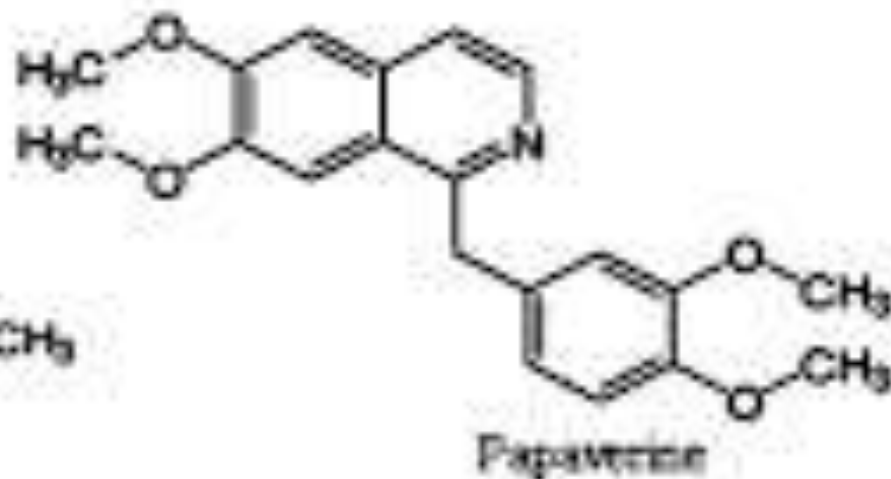
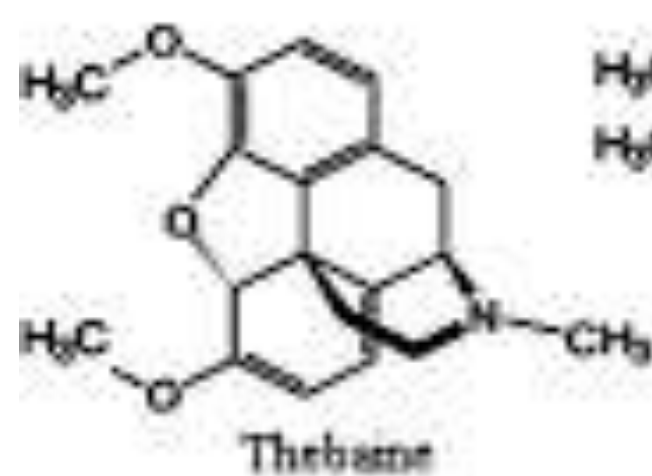
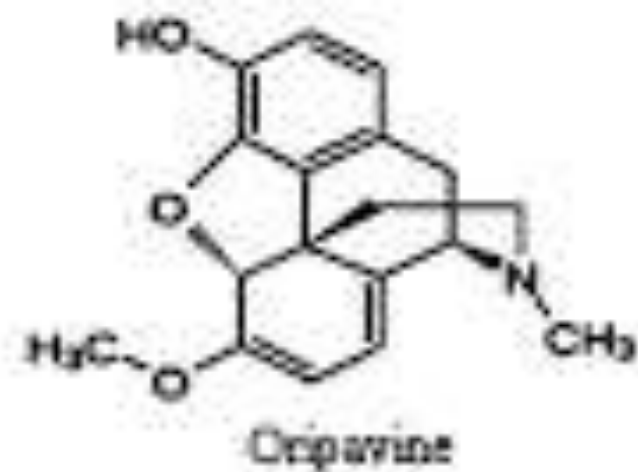
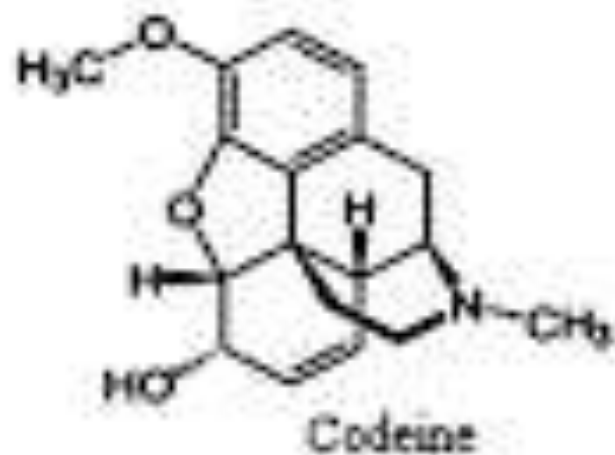
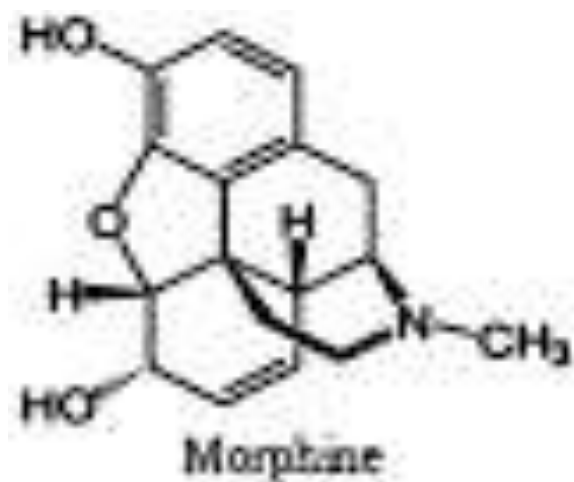
**Scopolamine**



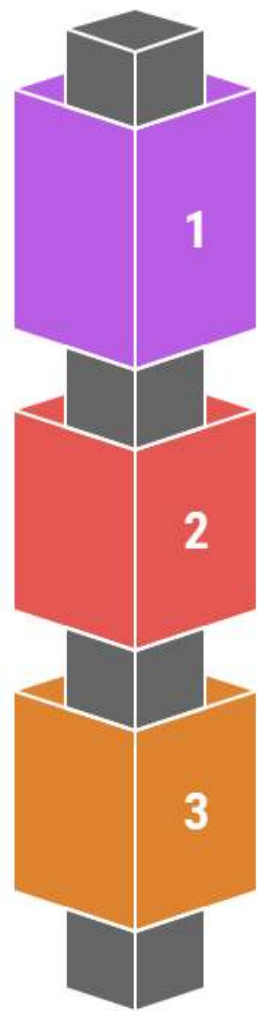
**Hyoscyamine**

## Composition of Opium





## Identifying Opium Compounds



### Marquis Test

Morphine reacts with sulfuric acid and formaldehyde to produce a violet color.



### Meconic Acid Test

Meconic acid reacts with ferric chloride to form a deep red color.



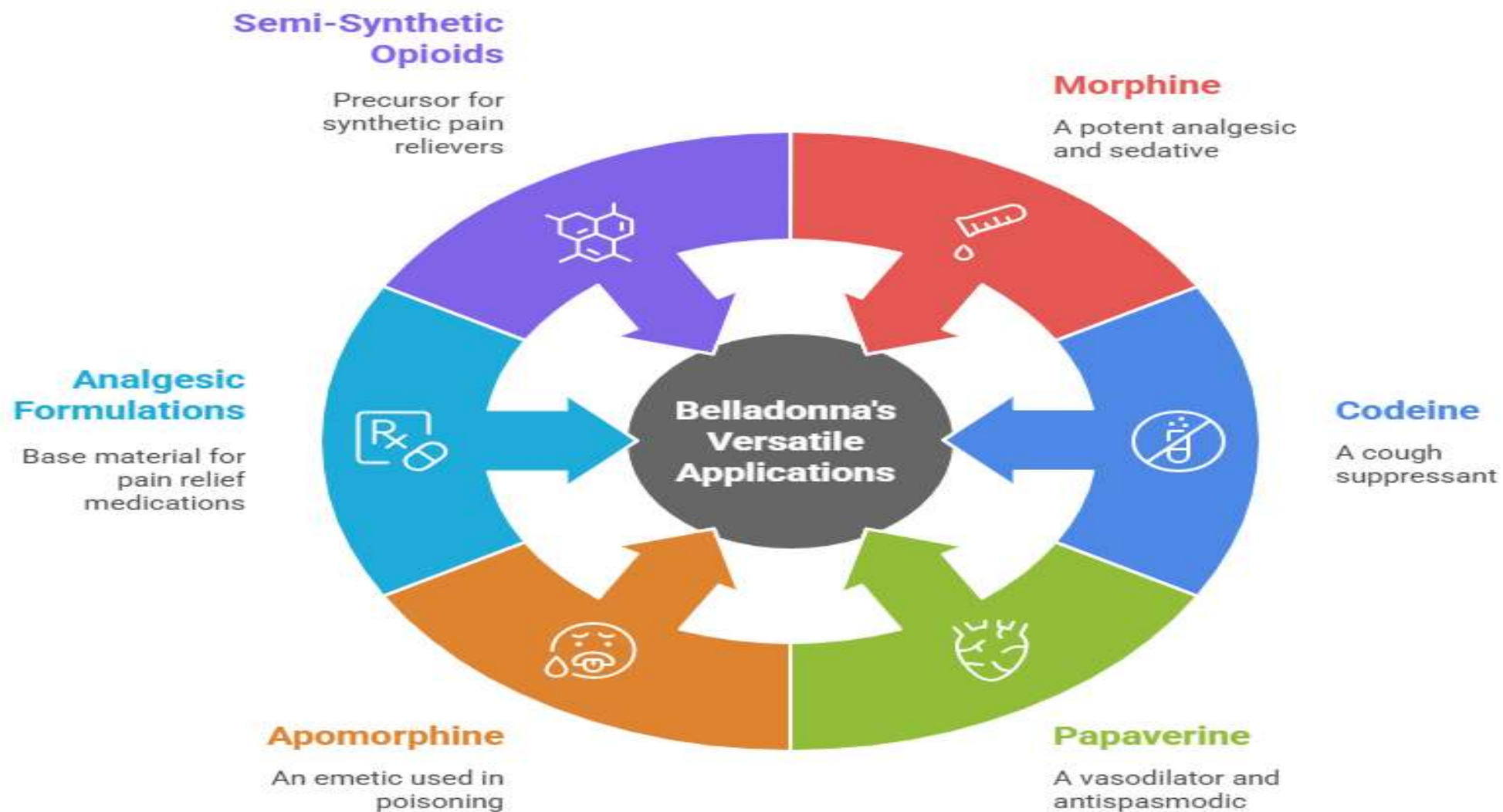
### Morphine + $\text{HNO}_3$ Test

Morphine reacts with nitric acid to create an orange-red color.

## Opium Alkaloid Actions



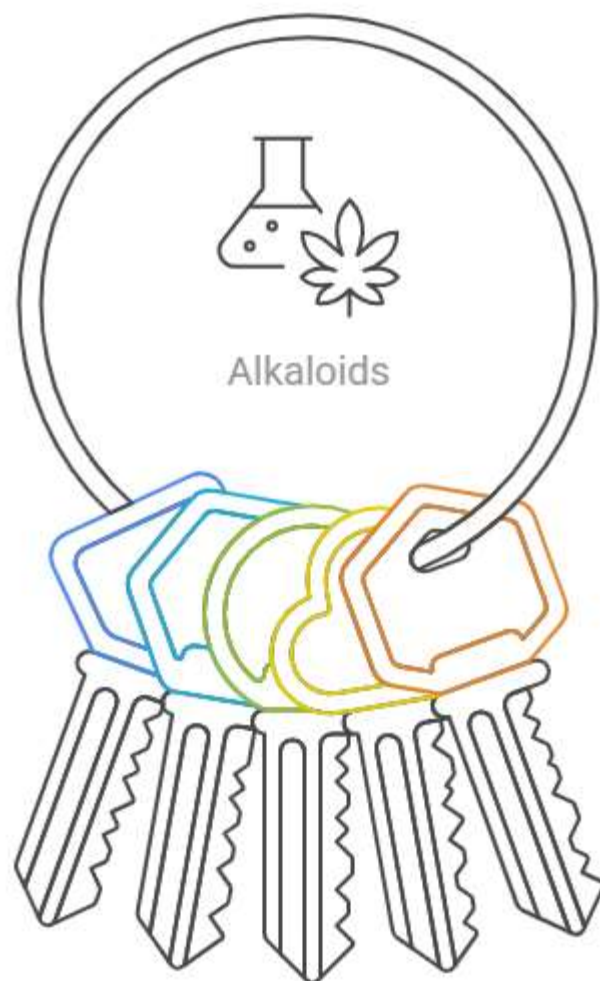
## Uses of Opioids



## SUMMARY TABLE

| Drug       | Source Plant         | Chemical Class            | Principal Alkaloids      | Therapeutic Uses                |
|------------|----------------------|---------------------------|--------------------------|---------------------------------|
| Vinca      | Catharanthus roseus  | Indole (Terpenoid indole) | Vincristine, Vinblastine | Anticancer                      |
| Rauwolfia  | Rauwolfia serpentina | Indole                    | Reserpine, Ajmaline      | Antihypertensive, Antipsychotic |
| Belladonna | Atropa belladonna    | Tropane                   | Atropine, Scopolamine    | Anticholinergic                 |
| Opium      | Papaver somniferum   | Isoquinoline              | Morphine, Codeine        | Analgesic, Antitussive          |

# Alkaloid Fundamentals



## Chemical Structure

Basic nitrogenous compounds with specific pharmacological actions



## Biosynthesis

Origin from amino acids, crucial for structural diversity



## Therapeutic Applications

Chemical basis of many therapeutic agents



## Identification

Microscopy and chemical tests for pharmacognostic identification



## Drug Development

Lead compounds for modern drug synthesis

