

# **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**

**D.PHARM/ I YEAR**

**TOPIC 9: ALKALOIDS**

## DESIGN THINKING STAGES IN CLASSIFICATION

**Empathize:** Understand the users — in this case, students, pharmacists, or researchers who use the alphabetical classification system.

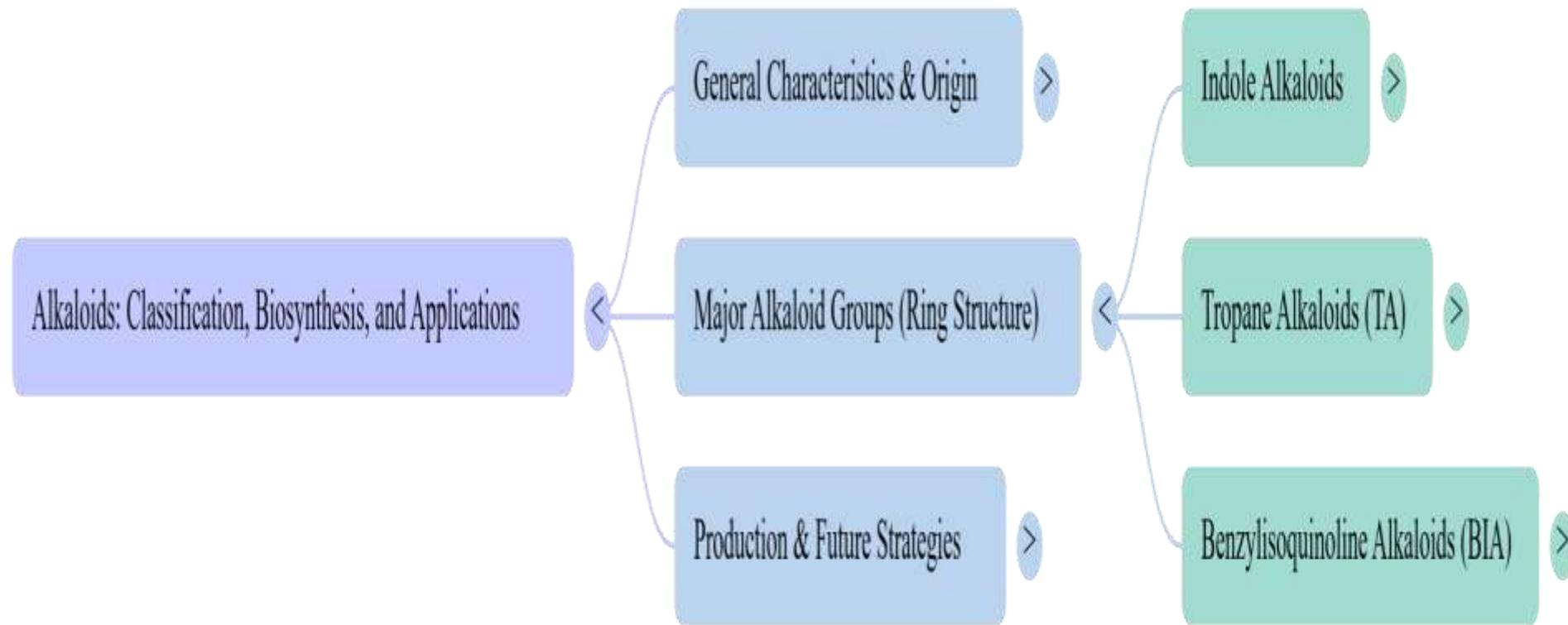
**Define:** Clearly define the problem based on the insights from the empathize stage.

**Ideate:** Generate possible solutions or improvements.

**Prototype:** Create a tangible version of your solution

**Test:** Evaluate the prototype with real users.

## MINDMAP



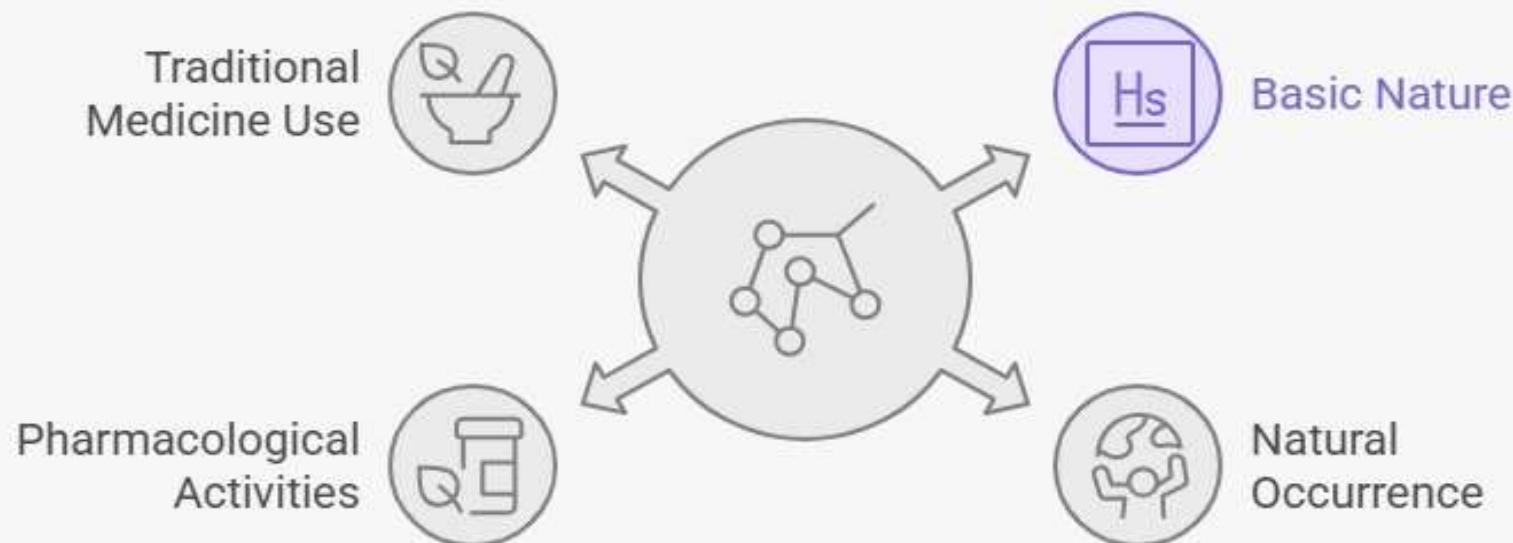
# Unveiling the Multifaceted Nature of Alkaloids



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## INTRODUCTION

### Alkaloid Characteristics and Sources



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# Properties of Alkaloids

## Chemical Properties

Reactions and interactions  
with other substances

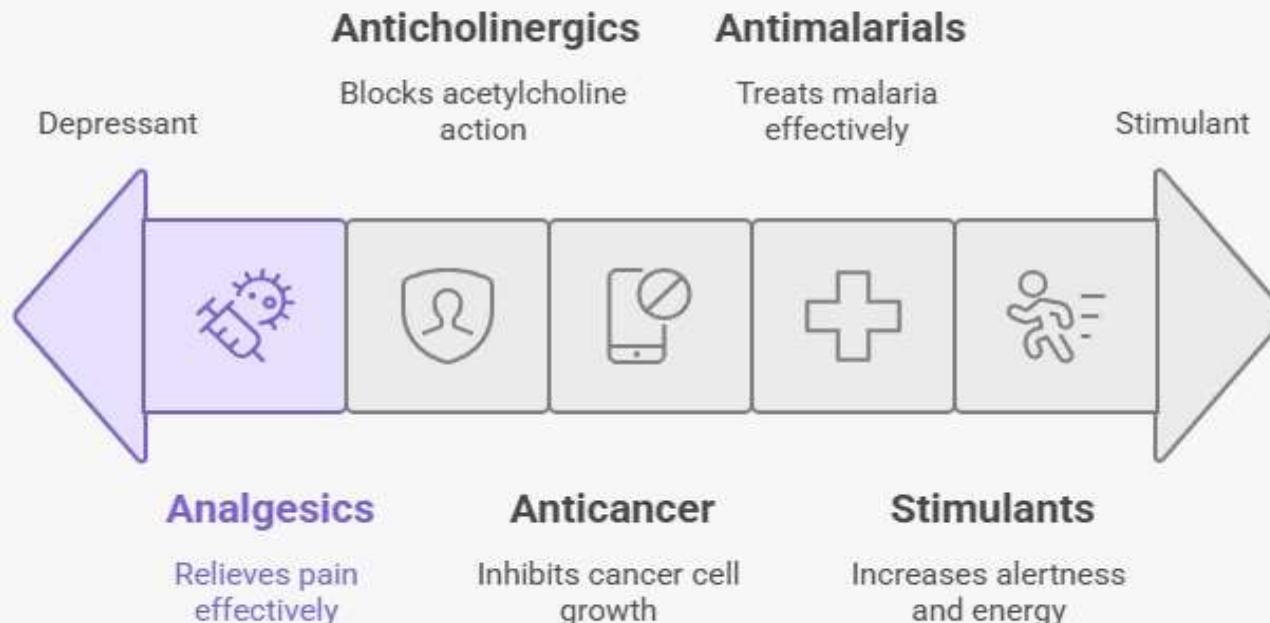


## Physical Properties

Characteristics like state,  
color, and solubility

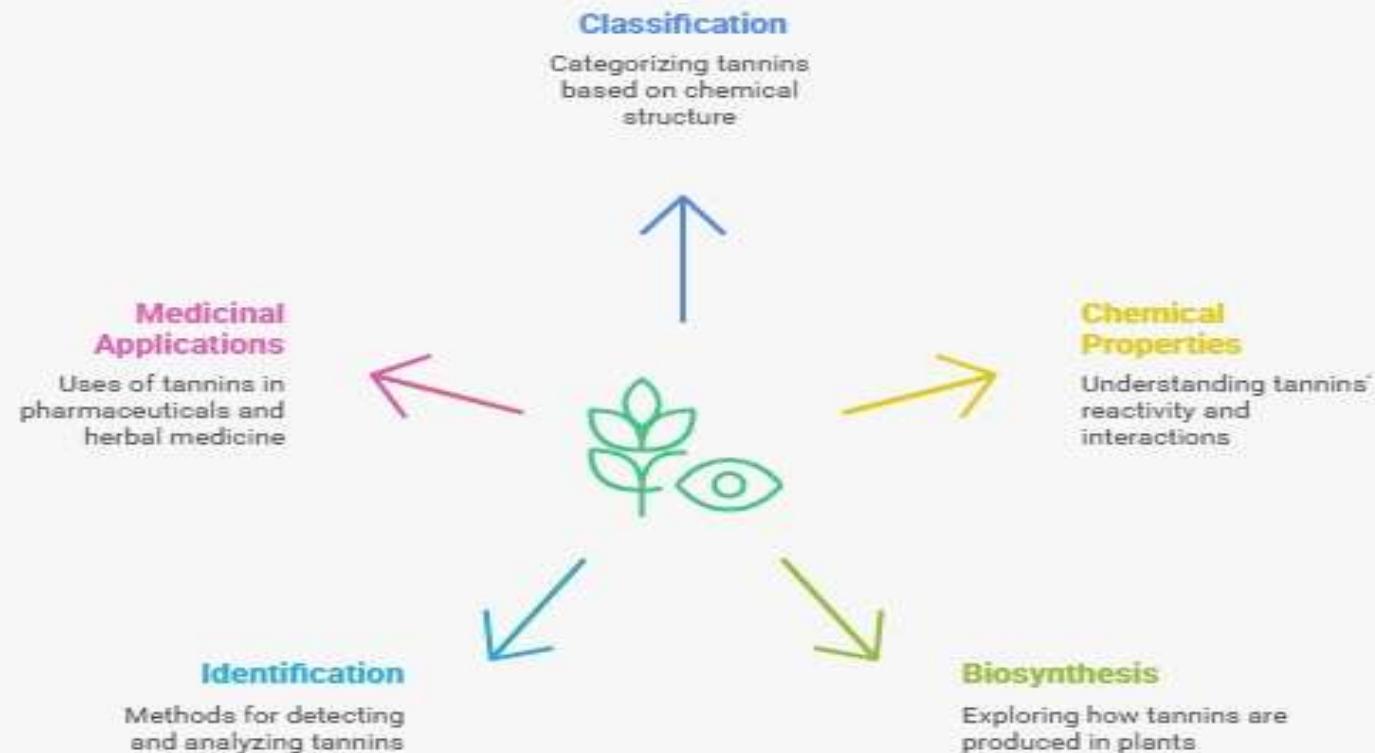
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## Alkaloid pharmacological activity ranges from pain relief to stimulation.



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## Tannin Research Areas



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## How to classify alkaloids?

**Chemical Structure**  
Classify based on the heterocyclic ring system.



**Pharmacological Activity**  
Classify based on the effects on the body.

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## Tannin Biosynthesis



### Initial Precursors

Shikimic acid and phenylalanine

### Hydrolyzable Tannins

Gallic acid esterified with glucose

### Condensed Tannins

Flavonoid units are polymerized

### Final Tannins

Hydrolyzable and condensed tannins

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## What are the physical properties of alkaloids?

### State

Most are crystalline solids, but some are liquids like nicotine.

### Color

Generally colorless, but some are colored like berberine.

### Melting Point

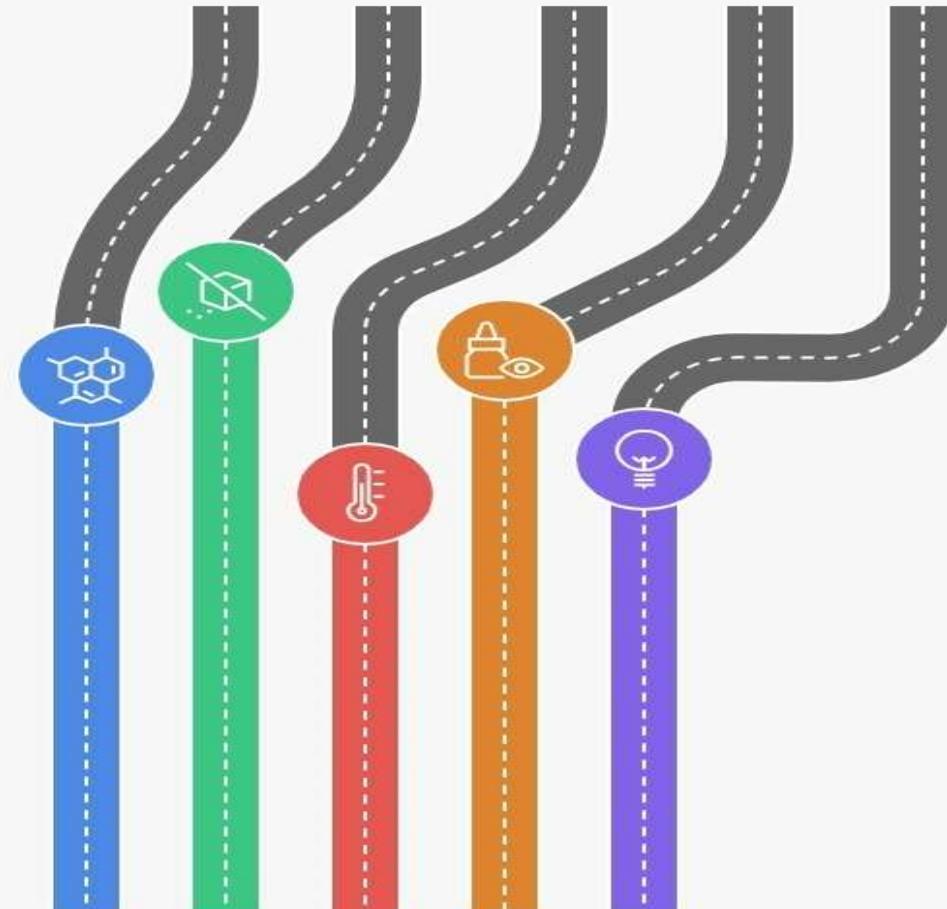
Definite melting points aid in identification.

### Solubility

Soluble in organic solvents, sparingly in water. Salts are water-soluble.

### Optical Activity

Most are optically active, rotating plane-polarized light.



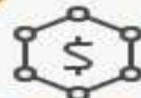
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## Alkaloid Biosynthesis



### Amino Acid Precursors

Amino acids are the main building blocks for many alkaloids.



### Other Precursors

Acetate and mevalonate also contribute to the structure of alkaloids.



### Pathway Variation

The specific biosynthetic pathway differs based on the alkaloid type.

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## Alkaloid Drug Classes



### Analgesics

Pain relievers like morphine.



### Anticholinergics

Block acetylcholine, like atropine.



### Antimalarials

Treat malaria, like quinine.



### Anticancer agents

Fight cancer, like vinblastine.

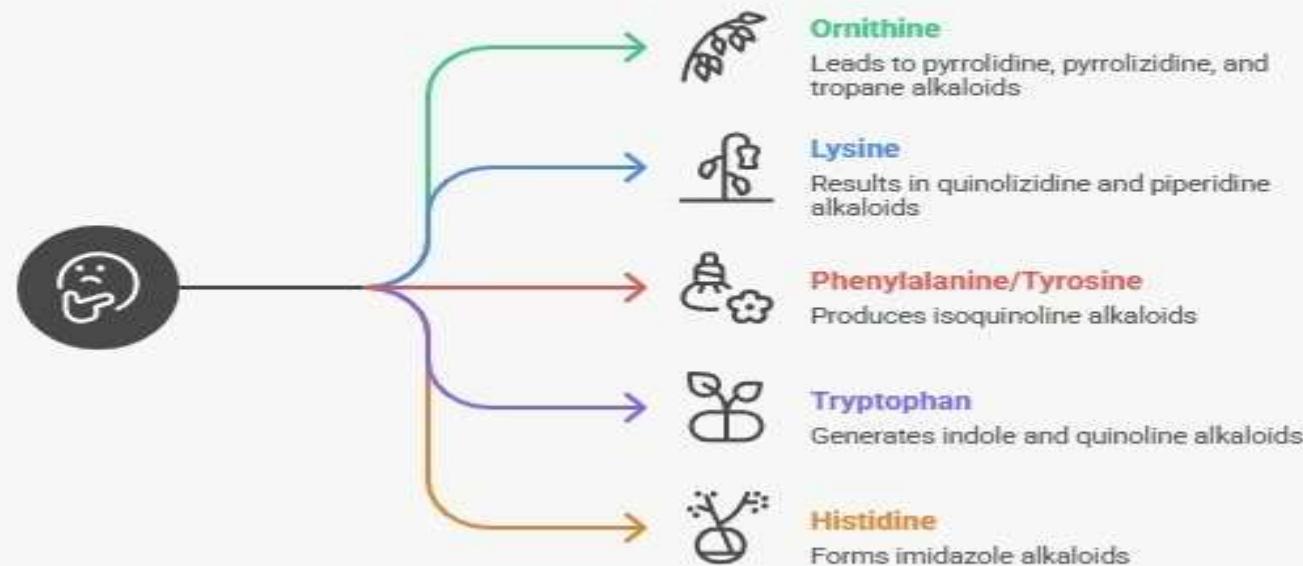


### Stimulants

Increase alertness, like caffeine.

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## Which amino acid precursor is the alkaloid derived from?



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## Alkaloid Classification Based on Ring Structure



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## Unveiling the Dimensions of Alkaloid Categorization

### Pharmacological Properties

Categorizing alkaloids by their medicinal effects.



### Chemical Composition

Grouping alkaloids by their chemical makeup.



### Biosynthetic Source

Classifying alkaloids by their origin in nature.



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## Alkaloid Characteristics



### Nitrogen Atom

Alkaloids contain at least one nitrogen atom.



### Heterocyclic Ring

Nitrogen is usually in a heterocyclic ring.



### Basic Nature

Alkaloids are typically basic in nature.



### Natural Production

Alkaloids are produced by plants and other organisms.



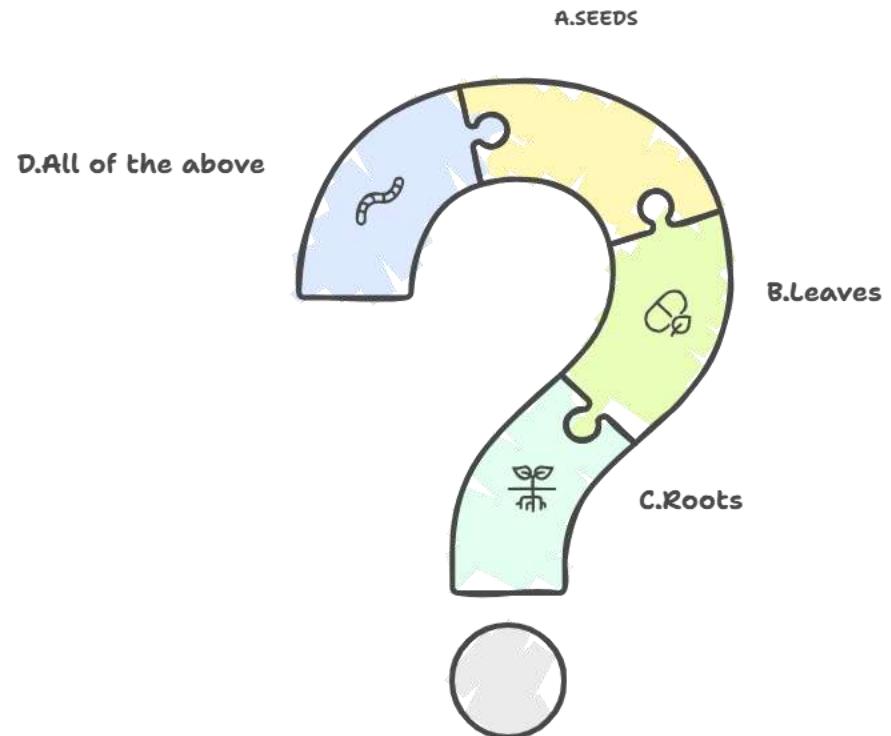
### Pharmacological Activities

Alkaloids have potent pharmacological activities.

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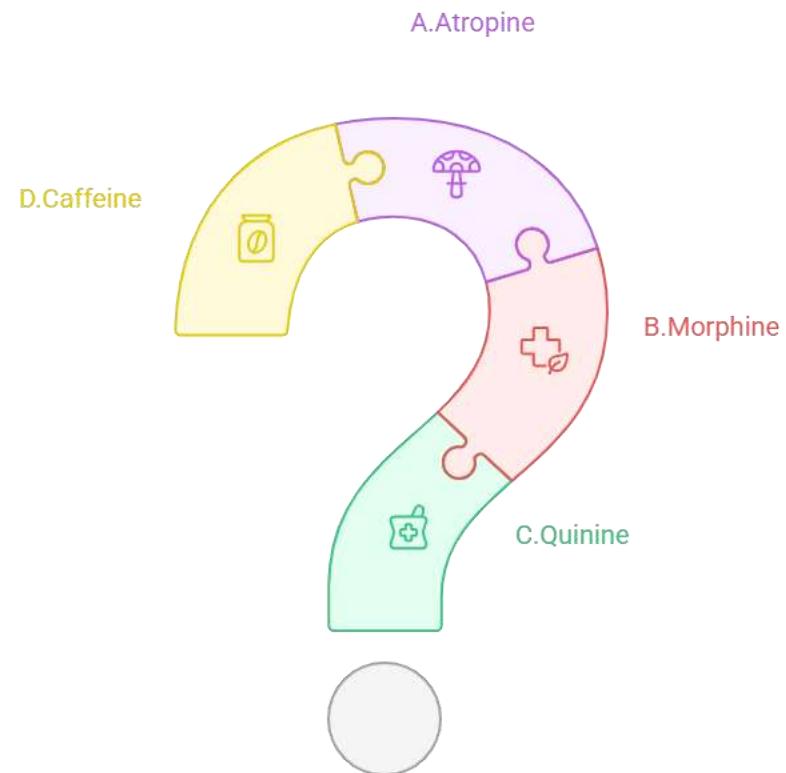
# ASSESSMENT

Where are alkaloids commonly found in plants?



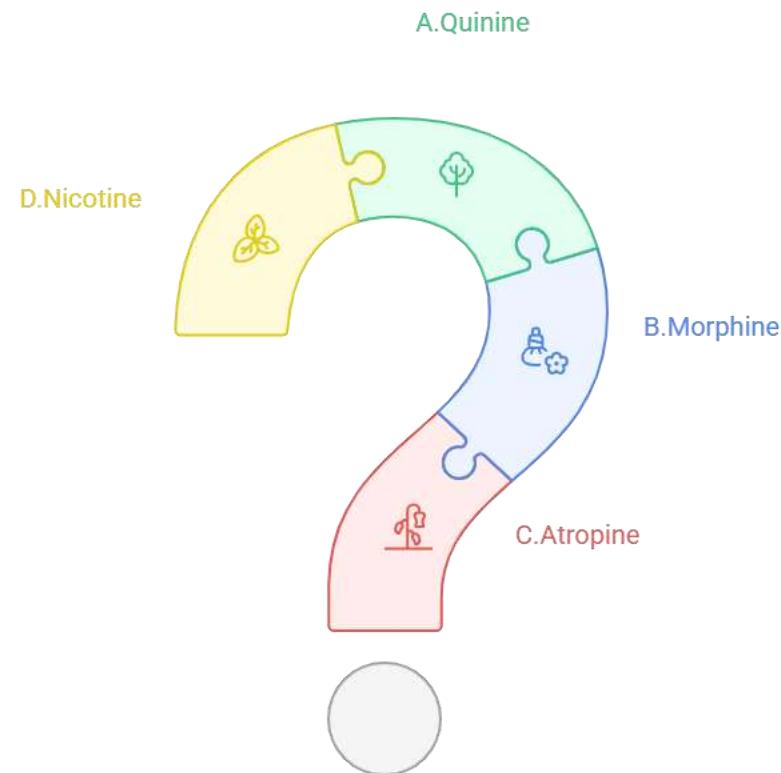
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Which alkaloid is obtained from **\*Papaver somniferum\***?



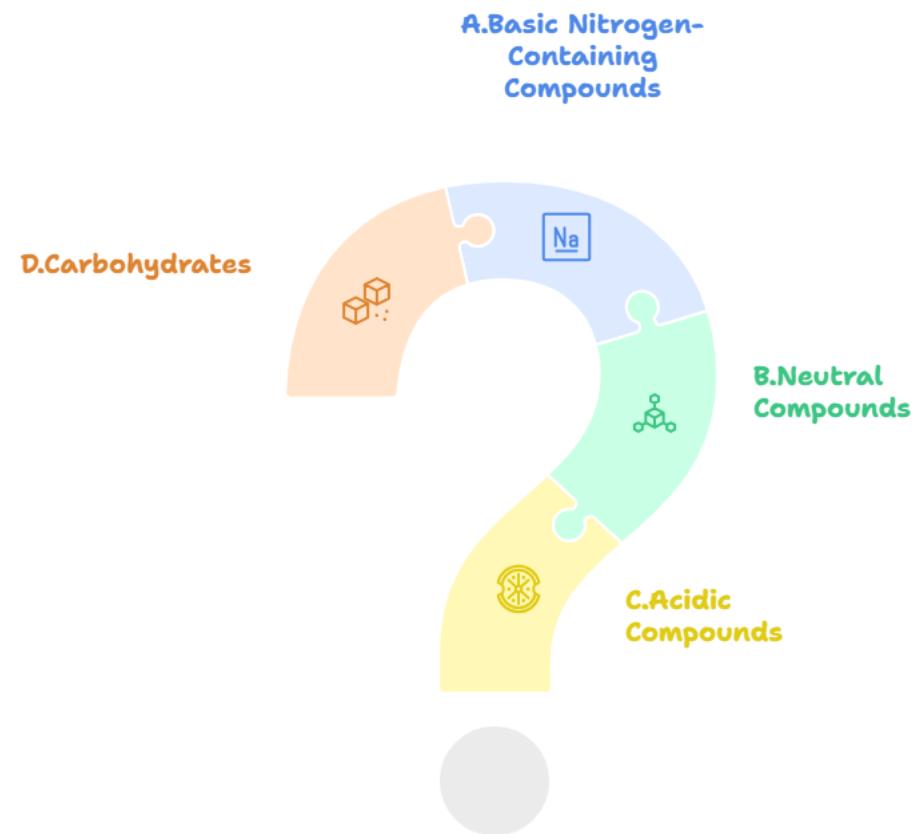
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Which alkaloid is used as an antimalarial drug?



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What is the primary chemical property of alkaloids?



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# Thank You