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Morphological Study of Medicinal Plants

Experiment 1 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To identify the twenty listed medicinal plants and record botanical identity, drug part and visible distinguishing characters.

Principle

Macroscopic identification uses the correct plant part and a combination of shape, surface, arrangement and texture. A vernacular name alone is insufficient because different species can share a name. Families below use modern broad groupings; older teaching texts may place some plants in different families.

Requirements

- Authenticated teaching specimens or approved plant images, hand lens and ruler.
- Plant identity labels and notebook; a medicinal garden may support comparison.

Procedure

1. Confirm identity

Read the authenticated label and record botanical name, family and examined organ. Do not infer species solely from the local name.

2. Observe the whole plant

Where available, record habit and leaf arrangement. Use leaves, flowers or fruits that are present; note what is missing.

3. Examine the drug part

Record size, shape, surface, fracture where authorised and distinguishing characters. Use a hand lens for fine features.

4. Compare

Compare similar-looking materials using multiple characters. Distinguish husk from whole seed, stem from root, and inner leaf gel from latex.

5. Record

Complete an identification entry for each listed plant and retain its authenticated label or voucher association.

Introduction to Pharmacognosy

Plant Identification Guide

Common name	Botanical name / family	Drug part and visible cue
Ashwagandha	<i>Withania somnifera</i> Solanaceae	Root; tapering, pale brown, longitudinal wrinkles
Tulsi	<i>Ocimum tenuiflorum</i> Lamiaceae	Leaf; opposite leaves, toothed margin, aromatic
Amla	<i>Phyllanthus emblica</i> Phyllanthaceae	Fruit; rounded with six longitudinal grooves
Milk thistle	<i>Silybum marianum</i> Asteraceae	Fruits, often called seeds; hard, mottled surface
Kutki	<i>Picrorhiza kurroa</i> Plantaginaceae	Rhizome and root; narrow, jointed, wrinkled pieces
Garlic	<i>Allium sativum</i> Amaryllidaceae	Bulb; multiple cloves within dry outer coverings
Arjuna	<i>Terminalia arjuna</i> Combretaceae	Stem bark; curved pieces, grey-brown outer and reddish inner surfaces
Gymnema	<i>Gymnema sylvestre</i> Apocynaceae	Leaf; opposite leaves on a climbing plant
Fenugreek	<i>Trigonella foenum-graecum</i> Fabaceae	Seed; hard, yellow-brown, angular with a groove
Turmeric	<i>Curcuma longa</i> Zingiberaceae	Rhizome; branched fingers with yellow-orange interior
Boswellia	<i>Boswellia serrata</i> Burseraceae	Oleo-gum-resin; irregular pale-yellow to brown tears
Brahmi	<i>Bacopa monnieri</i> Plantaginaceae	Whole plant; creeping herb with small opposite fleshy leaves
Giloy	<i>Tinospora cordifolia</i> Menispermaceae	Stem; nodal pieces with surface lenticels
Neem	<i>Azadirachta indica</i> Meliaceae	Leaves and other specified parts; pinnate leaves with toothed leaflets
Andrographis	<i>Andrographis paniculata</i> Acanthaceae	Aerial parts; slender stems and opposite narrow leaves
Psyllium	<i>Plantago ovata</i> Plantaginaceae	Seed husk; thin, pale flakes that swell in water
Aloe	<i>Aloe vera</i> Asphodelaceae	Leaf; fleshy toothed leaves; inner gel is distinct from latex
Chasteberry	<i>Vitex agnus-castus</i> Lamiaceae	Fruit; small rounded dark fruits; palmately compound plant leaves

Introduction to Pharmacognosy

Common name	Botanical name / family	Drug part and visible cue
Shatavari	<i>Asparagus racemosus</i> Asparagaceae	Tuberous roots; clustered elongated pale roots
Vasaka	<i>Justicia adhatoda</i> Acanthaceae	Leaf; opposite lanceolate leaves with prominent venation

Names Commonly Seen in Older Texts

- Ocimum sanctum is a commonly used synonym for Ocimum tenuiflorum.
- Emblica officinalis is an older commonly used name for Phyllanthus emblica.
- Adhatoda vasica is commonly used for Justicia adhatoda; Aloe barbadensis is associated with Aloe vera.
- Gymnema was often placed in Asclepiadaceae, and Bacopa and Picrorhiza in Scrophulariaceae. Retain the institution's accepted naming convention consistently.

Observations and Record

Plant / specimen	Examined part	Observed identifying characters
_____	_____	_____
_____	_____	_____
_____	_____	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Completeness check: 20 named plants are covered in the guide. If 16 are physically observed and 4 studied from approved images, record those two sources separately.
- Illustrative dimension record: three root pieces measure 4.2, 4.8 and 5.0 cm; mean length = $14.0 \div 3 = 4.67$ cm. This does not establish identity.

Result

The identification guide covers all twenty named plants. I examined ____ authenticated specimens and ____ approved images, recording part and visible characters.

Precautions

- Do not taste an unknown plant or drug.
- Do not collect protected or privately owned plants without permission.
- Use morphology with authentication; one visible feature does not guarantee purity or therapeutic quality.

Viva Questions and Answers

1. Why record the organ?

Different parts of the same species have different identity and quality characteristics.

2. Why distinguish Bacopa from Centella?

Both may be called Brahmi locally, but they are different botanical materials.

3. What does authentication add?

It links the observed specimen to a verified identity rather than an assumed local name.

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