



## جامعة الأنبار - مركز دراسات الصحراء



العلوم	الكلية
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Medicinal plants biotechnology	المادة باللغة الانجليزية
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Traditional Systems of Medicine	عنوان المحاضرة باللغة الانجليزية
	عنوان المحاضرة باللغة العربية
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### محتوى المحاضرة

## Introduction

Traditional systems of medicine (TSMs) are holistic health practices developed over thousands of years and passed through generations, primarily based on natural resources such as medicinal plants, minerals, and animal products. These systems encompass diverse cultural approaches to disease prevention, diagnosis, and treatment and continue to form the primary source of healthcare for a large portion of the world's population.

Understanding these systems is essential in medicinal plant biotechnology because:

- They offer ethnobotanical knowledge for bioprospecting.
- Many plant-based modern drugs originated from traditional remedies.
- They provide sustainable and culturally accepted models of healthcare.

## 2.2 Major Traditional Systems of Medicine

### 2.2.1 Ayurveda (India)

#### Overview

- Origin: >5,000 years ago; Sanskrit for "Science of Life"
- Key Texts: *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*
- Philosophy: Balance of three doshas—**Vata**, **Pitta**, and **Kapha**

#### Medicinal Plant Use

- Plants are classified based on **rasa** (taste), **guna** (qualities), **virya** (potency), **vipaka** (post-digestive effect), and **prabhava** (specific action).
- Formulations include **churnas**, **asavas**, **bhasmas**, and **lehyas**.



### Examples of Ayurvedic Plants

Plant Name	Common Name	Uses
<i>Withania somnifera</i>	Ashwagandha	Adaptogen, stress relief
<i>Tinospora cordifolia</i>	Guduchi	Immunity booster
<i>Terminalia chebula</i>	Haritaki	Digestive tonic

### 2.2.2 Traditional Chinese Medicine (TCM)

#### Overview

- History: >2,000 years
- Principle: Balance between **Yin** and **Yang**, flow of **Qi** (vital energy)
- Diagnostic methods: Tongue inspection, pulse reading, questioning

#### Therapeutic Approaches

- Herbal medicine
- Acupuncture
- Moxibustion
- Cupping

#### Examples of TCM Plants

Plant Name	Chinese Name	Use
<i>Panax ginseng</i>	Rénshēn	Tonic for Qi and fatigue
<i>Artemisia annua</i>	Qīnghāo	Antimalarial
<i>Scutellaria baicalensis</i>	Huángqín	Anti-inflammatory

### 2.2.3 Unani Medicine (Greco-Arabic)

#### Overview

- Based on teachings of Hippocrates and Galen; developed by Arab and Persian scholars
- Introduced to India during the Mughal era
- Concept of four humors: **Blood (Dam)**, **Phlegm (Balgham)**, **Yellow bile (Safra)**, **Black bile (Sauda)**

#### Medicinal Plant Applications

- Temperament-based prescription (hot, cold, moist, dry)
- Compound formulations called **Majoon**, **Khamira**, **Qurs**

#### Examples

Plant	Arabic Name	Use
<i>Nigella sativa</i>	Habbat al-barakah	Immune and digestive support
<i>Cassia angustifolia</i>	Sana Makki	Laxative
<i>Boswellia serrata</i>	Kundur	Anti-inflammatory, arthritis

### 2.2.4 African Traditional Medicine

#### Overview

- Deeply rooted in spiritual beliefs and ancestral practices
- Healing often involves herbalists, diviners, and spiritual leaders
- Diverse plant-based remedies based on local flora



## Examples

Plant	Region	Use
<i>Vernonia amygdalina</i>	West Africa	Antidiabetic, bitter tonic
<i>Securidaca longepedunculata</i>	Sub-Saharan Africa	Anticonvulsant
<i>Warburgia salutaris</i>	Southern Africa	Respiratory infections

## 2.2.5 Native American Medicine

### Overview

- Holistic approach combining physical and spiritual healing
- Emphasis on balance with nature and use of sacred plants

### Key Medicinal Plants

Plant	Use
<i>Echinacea purpurea</i>	Immune booster, wound healing
<i>Salvia apiana</i> (White sage)	Antimicrobial, used in purification rituals
<i>Rubus idaeus</i> (Red raspberry)	Female reproductive health

## 2.3 Comparison of Traditional Medical Systems

Feature	Ayurveda	TCM	Unani	African TM	Native American TM
Origin	India	China	Greece/Arab World	Africa	Americas
Philosophy	Tridosha	Yin-Yang, Qi	Humoral theory	Spiritual-physical balance	Nature-spirit harmony
Key Components	Herbs, diet, massage, detox	Herbs, acupuncture, Qi balancing	Herbs, regimens, dietetics	Herbalism, rituals	Sacred herbs, ceremonies
Diagnostic Tools	Pulse, tongue, dosha	Tongue, pulse, questioning	Temperament, signs	Intuition, observation	Spiritual visions

## 2.4 Role of Traditional Systems in Modern Medicine

- **Ethnobotanical basis for drug discovery:** e.g., *Artemisia annua* led to artemisinin for malaria.
- **Validated clinical use:** Many traditional medicines are now standardized, such as Ayurvedic and TCM formulas for inflammation, stress, and infection.
- **Bioprospecting platforms:** TSMs provide leads for screening secondary metabolites using biotechnological tools.
- **Phytopharmaceuticals:** New category of botanical drugs derived from traditional sources with scientific backing.



## 2.5 Challenges and Opportunities

### 2.5.1 Challenges

- Lack of standardized dosages and preparations
- Potential toxicity and herb-drug interactions
- Intellectual property rights (IPR) and benefit-sharing issues
- Need for scientific validation and regulation

### 2.5.2 Opportunities

- Integration with modern healthcare systems
- Expansion of the global herbal product market
- Use of molecular and biotechnological tools to identify active principles
- Cultivation and conservation of medicinal plants using tissue culture and genomics

## 2.6 Summary

Traditional systems of medicine offer a valuable reservoir of knowledge and plant-based therapeutic resources. Despite differences in origin, philosophy, and practices, they all converge on the use of medicinal plants as central to healing. Integrating this traditional wisdom with biotechnology and modern science can enhance drug discovery, conservation, and sustainable utilization of plant-based medicines.

## Key Terms

- **Ethnomedicine:** The study of traditional medical practice based on indigenous cultural beliefs and plant knowledge.
- **Qi:** Vital life force in TCM.
- **Dosha:** Functional energies in Ayurveda.
- **Humors:** Body fluids responsible for health in Unani medicine.

## Review Questions

1. Compare the philosophical foundations of Ayurveda, TCM, and Unani medicine.
2. List five medicinal plants used in traditional systems and their modern applications.
3. What are the major challenges in integrating traditional medicine with modern healthcare?
4. How can biotechnology contribute to the validation and development of traditional medicine?
5. Describe the role of ethnobotany in bioprospecting for new drugs.

## References

1. Patwardhan B, Warude D, Pushpangadan P, Bhatt N. Ayurveda and traditional Chinese medicine: a comparative overview. *Evid Based Complement Alternat Med*. 2005;2(4):465–73.
2. Tilburt JC, Kaptchuk TJ. Herbal medicine research and global health: an ethical analysis. *Bull World Health Organ*. 2008;86(8):594–9.
3. Fabricant DS, Farnsworth NR. The value of plants used in traditional medicine for drug discovery. *Environ Health Perspect*. 2001;109(Suppl 1):69–75.
4. WHO. WHO Global Report on Traditional and Complementary Medicine 2019. Geneva: World Health Organization; 2019.
5. Heinrich M, Ankli A, Frei B, Weimann C, Sticher O. Medicinal plants in Mexico: Healers' consensus and cultural importance. *Soc Sci Med*. 1998;47(11):1859–71.