Lec 2 \ Principles of Medicinal Plants

قسم علوم التقنيات الاحيائية الطبية
المرحلة الاولى

اعداد

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الايميل :
رمز الصف :

قصة (“الصدفة التي أنقذت آلاف المرضى”)

- في إحدى القرى القديمة، كانت امرأة مسنّة تعاني من ارتفاع شديد في ضغط الدم وتشعر بدوخة مستمرة. اعتادت الجلوس تحت شجرة صغيرة ذات أزهار أرجوانية، وكانت تُحضّر من أوراقها منقوعًا اعتقدت أنه “مهدئ طبيعي”. وبمرور الأيام، لاحظ أهل القرية أن حالتها الصحية تحسّنت بشكل واضح، لم تعد تعاني من الدوخة، وأصبح نبضها أكثر انتظامًا. لم ينتبه أحد في البداية...إلا أن طبيبًا زائرًا للقرية سمع بالقصة وبدأ يتساءل: هل يمكن أن يكون هذا النبات أكثر من مجرد علاج شعبي؟

- أخذ الطبيب عيّنة من النبات إلى المختبر، وبدأ العلماء بدراسته. كانت الصدفة أن هذا النبات يحتوي على مركبات تؤثر مباشرة في عضلة القلب وتنظم ضرباته. بعد سنوات من البحث، تم عزل مادة فعّالة أصبحت أساسًا لدواء يُستخدم اليوم في علاج بعض أمراض القلب. ذلك النبات كان يُعرف لاحقًا باسم: Digitalis (قفاز الثعلب)

Introduction

- Many of the modern medicines are produced **indirectly** from medicinal plants, for example **aspirin**.

- Plants are **directly** used as medicines by a majority of cultures around the world, for example Chinese medicine and Indian medicine , for example **Aloe Vera**.

- Many food crops have medicinal effects, for example **garlic**

What Is Medicinal plants

Medicinal plants, medicinal herbs, or simply herbs have been identified and used from prehistoric times. **Plants make many chemical compounds for biological functions**, including defence against insects, fungi and herbivorous mammals. Over 12,000 active compounds are known to science.

These chemicals work on the human body in exactly the same way as pharmaceutical drugs, so herbal medicines can be beneficial and have harmful side effects just like conventional drugs. However, since a single plant may contain many substances, the effects of taking a plant as medicine can be complex.

Botanical Basics: Plant Identification and Classification

- **Scientific Classification:** Medicinal plants are classified according to their genus, species, and family. Knowing the classification helps in identifying active compounds, understanding their chemical properties, and ensuring proper usage.

- **Parts of the Plant Used:** Different parts of plants (roots, leaves, bark, flowers, seeds, etc.) may contain different medicinal properties. For example, the leaves of Eucalyptus have essential oils that are antiseptic, while the bark of Willow الصفصاف contains salicin, a precursor to aspirin.

plant resources for new medicine

Bryophytes (nonvascular plants, e.g. liverwort and moss) have about 15,350 species.

Seedless vascular plants (commonly called fern) are estimated about 12, 157 species

Gymnosperm has about 760 species.

Angiosperm is estimated to have more than 250,000 species.

Medicinal Plants You Can Use to Benefit Your Health

Ginger

is best known for its antinausea effects but also has broad-spectrum antibacterial, antiviral, antioxidant, and anti-parasitic properties, to name just several of its more than 40 scientifically confirmed pharmacological actions. It is anti-inflammatory, making it valuable for pain relief for joint pain, menstrual pain, headaches, and more.

Medicinal Plants You Can Use to Benefit Your Health

Garlic

Reducing inflammation (reduces the risk of osteoarthritis and other disease associated with inflammation)

Boosting immune function (antibacterial, antifungal, antiviral, and antiparasitic properties)

Improving cardiovascular health and circulation (protects against clotting, improves lipids, and reduces blood pressure)

Toxic to at least 14 kinds of cancer cells (including brain, lung, breast, gastric, and pancreatic)

The Principle of Phytotherapy

The medicinal effects of plants are due to metabolites especially secondary compounds produced by plant species.

Plant metabolites include: primary metabolites and secondary metabolites.

Plant metabolites:

Plant primary metabolites	***Plant Secondary metabolites (Plant natural products)***
1. Organic compounds produced in the plant kingdom 2. Have metabolic functions essential for plant growth and development 3. Produced in every plant 4. Include carbohydrates, amino acids, nucleotides, fatty acids, steroids and lipids	1. Organic compounds produced in plant kingdom 2. Don't have apparent functions involved in plant growth and development 3. Produced in different plant families, in specific groups of plant families or in specific tissues, cells or developmental stages throughout plant development. 4. Include terpenoids, special nitrogen metabolite (including, non-protein amino acids, amines, cyanogenic glycosides, glucosinolates, and alkaloids), and phenolics.

سؤال للمناقشة

لماذا لم نعد نعتمد فقط على جمع النباتات من الطبيعة؟

حماية التنوع الحيوي

زيادة الإنتاج

التحكم بالجودة

تقليل التلوث

Herb and medicinal herb:

A herb, in botany, is a plant that does not form a woody stem , and in temperate climates usually dies, either completely (annual herb) or back to the roots (perennial herb) by the end of the growing season. Examples for perennial herbs include bulbs, Peonies, Hosta, grasses and Banana.

A medicinal herb is different from botanic term “herb”. It refers to any plants used for medicinal purposes. For example, a medicinal herb can be a real herbal plant, a shrub, other woody plant, or a fungus. The used part may be the seeds, berries, leaves, barks, roots, fruits, or other parts of a plants, or mushroom, which may be considered "herbs" in medicinal or spiritual use.

Pharmacological Properties: الخصائص الدوائية

- **Phytochemicals** المواد الكيميائية النباتية: The chemical compounds produced by plants that have medicinal effects. They interact with the body in various ways, such as:
- **Antioxidant**: Combat free radicals, **preventing cell damage**.
- **Antimicrobial**: Combat bacteria, viruses, fungi, etc.
- **Anti-inflammatory**: **Reduce inflammation**, which is at the root of many chronic diseases

- **Mechanisms of Action**: Active compounds may work in different ways, such as:
- **Receptor Binding**: Some plant compounds bind to receptors in the body (**like morphine binding to opioid receptors**). مثل ارتباط المورفين بمستقبلات الأفيون

- **Enzyme Inhibition**: Many medicinal plants work by **inhibiting or activating** specific enzymes (e.g., garlic and its effect on reducing cholesterol by inhibiting HMG-CoA reductase).

حَيَّاكُمُ اللهُ أَحيوا العِلمَ وَالأَدَبا

إِن تَنشُروا العِلمَ يَنشُر فيكُمُ العَرَبا

وَلا حَياةَ لَكُم إِلّا بِجامِعَةٍ

تَكونُ أُمّاً لِطُلّابِ العُلا وَأَبا

حافظ ابراهيم