SELECTION OF POTENTIAL MEDICINAL PLANTS

FOR

7DAYS ONLINE CERTIFICATE COURSE

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ON

VISTAS OF MEDICINAL PLANTS IN BOOSTING IMMUNITY

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- WHY SUCH PLANTS CALLED AS MEDICINAL PLANT?
- Plants utilized in any recognized form of medicinal value.
- A medicinal plant is any plant which ,in one or more of its organs, contain substances that can be use for therapeutic purposes ,or which are precursors for chemo-pharmaceutical semi-synthesis (WHO).
- A total of 250,000 species of flowering plants are referred to as medicinal plants but WHO enlisted only some21,000 plants species as medicinal plant.

MAJOR SELECTION METHODS OF POTENTIAL MEDICINAL PLANTS

- **USE OF ETHNOBOTANY**
- FIELD OBSERVATIONS
- TAXONOMIC CONSIDERATIONS
- RANDOM SELECTION

How to identify medicinal plants ?

- On the basis of growing condition ⟹

  In gravel- works as stone breaker in body parts like gallbladder , kidney .

  Grow in wet soil- for respiratory problems .

  In running water- for removing toxins and wastes from body.

On the basis of colour of flowers ⟹

Reddish- skin disorders , antibiotics .

Purple- blood purifier, treating muscles, stress .

Yellow-urinary problems, liver, gallbladder.

- On the basis of texture…

  Thorny herbs- for acute pain , hairs…

  Soft texture- for chest disorders, and colds….

  Climbing herbs- for nervous and blood systems…

- On the basis of root systems..

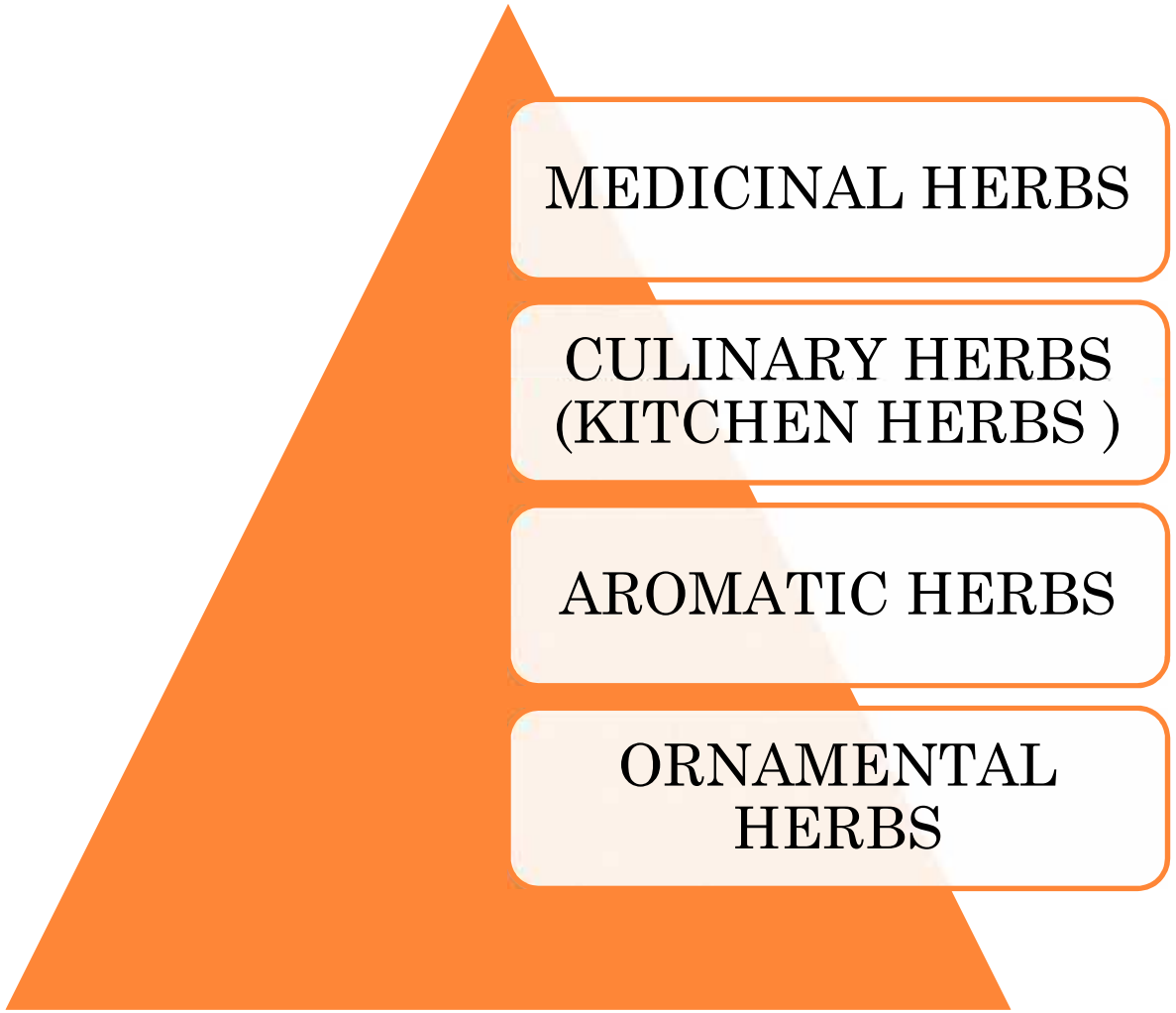
  Thread like root- veins in skin…

  Vein like root- for nerve and blood disorders.

TOPICS-

- Classification according to their uses
- Classification according to their active constituents
- Classification according to their period of life
- Botanical classification of medicinal and aromatic plants
- Classification according to natural product

ACCORDING TO USES-



ACCORDING TO ACTIVE COMPOUNDS-

- NUTRITIVE HERBS
- AROMATIC HERBS
- BITTER HERBS
- ASTRINGENTS
- MUSCILAGINOUS HERBS

ACCORDING TO USE OF THE HERBS-

- MEDICINAL HERBS- have therapeutic potential and are used in making medicines because of healing capacity.
- CULINARY HERBS- mostly used in cooking because of strong flavour like Parsley, Mint etc.
- AROMATIC HERBS- commonly used because of their pleasant smelling leaves, flowers and other parts. Oils from these herbs used in making perfumes, soap and various other such products.
- ORNAMENTAL HERBS- used in decoration.

ACCORDING TO ACTIVE CONSTITUENTS-

AROMATIC HERBS- Divided in to two subcategories: stimulants and nerving herbs.

- STIMULANT HERBS: increases activity and energy of the body e.g. Ginger, lemon, fennel, garlic…
- NERVING HERBS: heal and sooth the nervous system, often affect the respiratory, digestive and circulatory system of body e. g. ginger.

ASTRINGENT (CONTRACTILE) HERBS-

- These herbs have tannins, which have ability to precipitate proteins and contract or tones living tissues.
- These herbs are abortive, antiseptic and astringents.
- They are also affect urinary, circulatory and digestive systems, large doses are toxic for liver, e.g. peppermint.

BITTER HERBS-

- These herbs are named as because of the presence of phenols, phenol glycosides, alkaloids and saponins and are divided as follows-
- DIURETIC HERBS
- LAXATIVE HERBS
- ALKALOID CONTAINING HERBS
- SAPONIN-CONTAINING HERBS

MUCILAGINOUS HERBS-

- These herbs contain polysaccharides, which are responsible for slippery mild taste that is sweet in water.
- Since most mucilage are not broken down by the human digestive system, but absorb toxins from the bowel and give bulk to the stool.
- Mucilaginous herbs are most effective as compressing agents.

NUTRITIVE HERBS-

- Have nutritive value
- True foods and provide some medicinal effects as mucilage, fiber and diuretic action.
- They provide nutrition of protein, carbohydrates, fats, vitamins and minerals

  e.g. nuts, carrot, papaya….

ACCORDING TO PERIOD OF LIFE-

- ANNUALS
- BIENNIALS
- PERENNIALS

CLASSIFICATION OF NATURAL PRODUCTS-

- BASED ON THEIR CHEMICAL STRUCTURE
- BASED ON THEIR BIOGENESIS
- BASED ON PHYSIOLOGICAL ACTIVITY
- BASED ON THEIR TAXONOMY

2.5 Classification of natural Products

A. Natural Products classification based on their chemical structure:

➢ It is based on the type of chemical skeleton. So there are

1. **Aliphatic or non aliphatic** fatty compounds of open chain as: fatty acids, sugars and a great amount of amino acids.
2. **Acyclic and cycloaliphatic** compounds as terpenoids, steroids and some alkaloids.
3. **Aromatic or benzoic** compounds as phenols, quinones, etc.
4. **Heterocyclic** compounds such as alkaloids, flavonoids and nucleic acid bases.

2.5 Classification of natural Products

B. Natural Products classification based on their physiologic activity:

- Approximately one half of the medicines used today are natural products, i.e. alkaloids, antibiotics or synthetic alternative.

- For that it is usually employed a classification that represents the physiologic activity, such as hormones, vitamins, antibiotics ad mycotoxins.

2.5 Classification of natural Products

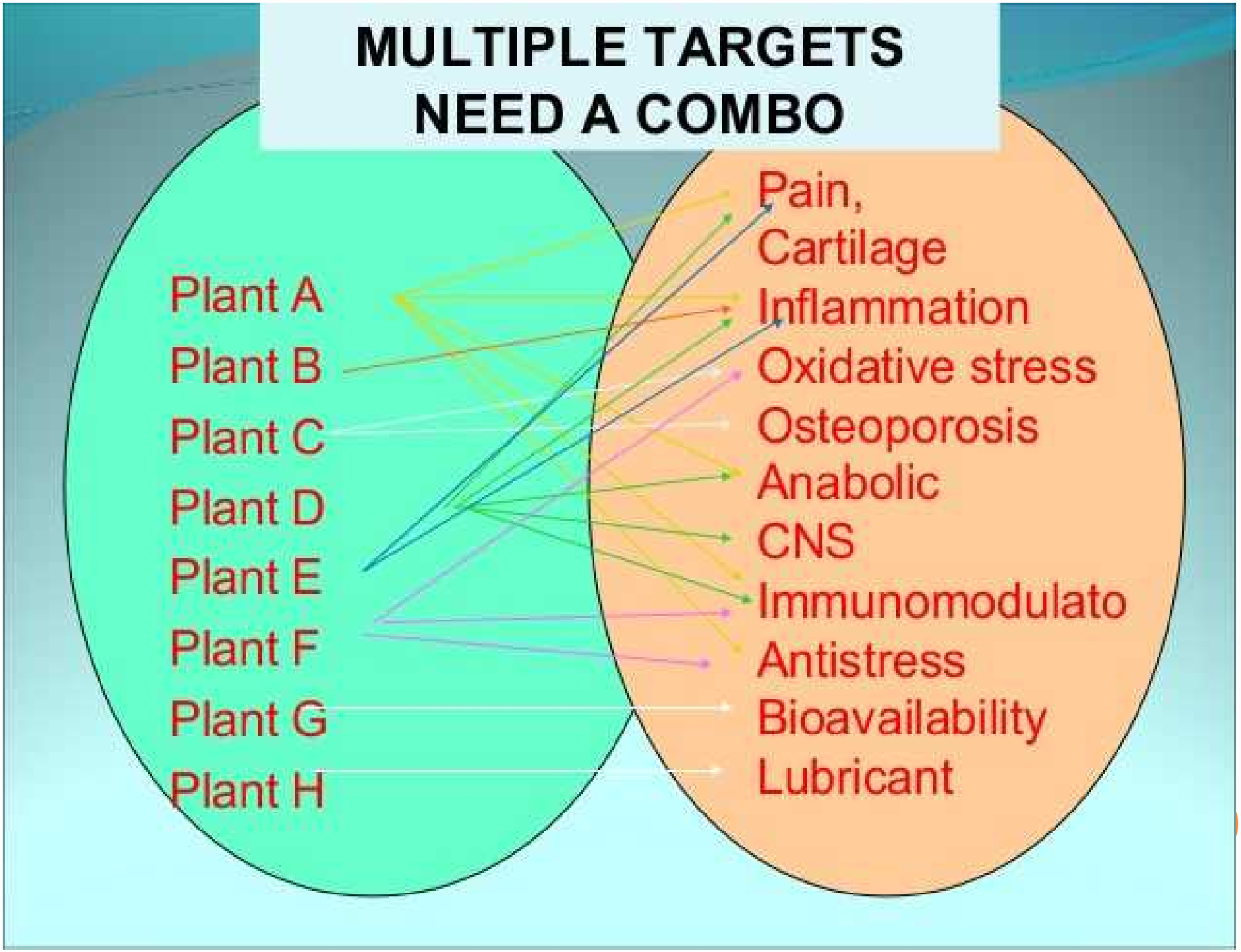
D. Natural Products classification based on their biogenesis:

There are at present three known major routes or routes that enable key biosynthesis of the vast majority of different types of natural products known:

- **Mevalonic acid route**: from it, prenyl units are formed, an after successive links they led to isoprenoids (terpenoids, steroides, carotenoids)
- **Shikimic acid route**: From it, amino acids are formed and from them, and other aromatic compounds more complex (phenylpropanoids, flavonoids, alkaloids)
- **Acetate – Malonate Route** (polyketide route): From malonate and acetate are formed polyketides (Ketogenines) and fatty acids are formed.

WHY HERBAL MEDICINE

- It is being used by about 80% of the world population primarily in the developing countries for primary health care.
- SAFETY, EFFICACY, CULTURAL ACCEPTABILITY AND LESSER SIDE EFFECTS.
- Ancient literature also mentions herbal medicines for age-related diseases namely Memory Loss, Osteoporosis, Diabetic Wounds, Immune And Liver Disorders, etc. for which no modern medicine or only palliative therapy is available.


MULTIPLE TARGETS
NEED A COMBO
Plant A
Plant B
Plant C
Plant D
Plant E
Plant F
Plant G
Plant H
Pain,
Cartilage
Inflammation
Oxidative stress
Osteoporosis
Anabolic
CNS
Immunomodulato
Antistress
Bioavailability
Lubricant

TRADITIONAL MEDICINES

- Middle of 19th century, 80% of all medicines were herbal
- Even today 25% of drugs are derived from plant source
- Most of these drugs came from traditional lead, folk knowledge etc.
- Some of these still could not substituted despite the enormous advancement in synthetic chemistry eg. Reserpine, taxol, vincristine etc.

TRADITIONAL MEDICINE HISTORICAL BACKGROUND

- Earliest recorded use of a medicinal plant has been mentioned in 'Rigveda'
- one mentioned in the modern texts is that of the herb called "Ma huang" a species of Ephedra used medicinally in China for over 5000 years
- Cinchona was used by local south American tribes long before before the isolation of quinine for treating malaria
- Source of aspirin was used as pain killer for long time before being identified

HERBAL DRUGS IN INDIA

- More than 70% of INDIA'S 1.1 billion population is still using non-alopathic .
- In India,nearly 9,500 registered herbal industries and a multitude of unregistered cottage-level herbal units depend upon the continuous supply of medicinal plants for manufacture of herbal medical formulations based on Indian Systems of Medicine.
- It is estimated that more than 6,000 plant species forming about 40% of the plant diversity of the country are used in its codified and folk healthcare traditions.


GLOBAL USE OF ALTERNATIVE OR TRADITIONAL MEDICINES
25-50%
50-75%
60%
40%
55%
70%
15%
33%
40%
25%
75%
>80%
~60%
>80%
>90%
>80%
60-70%
40-70%
~50%
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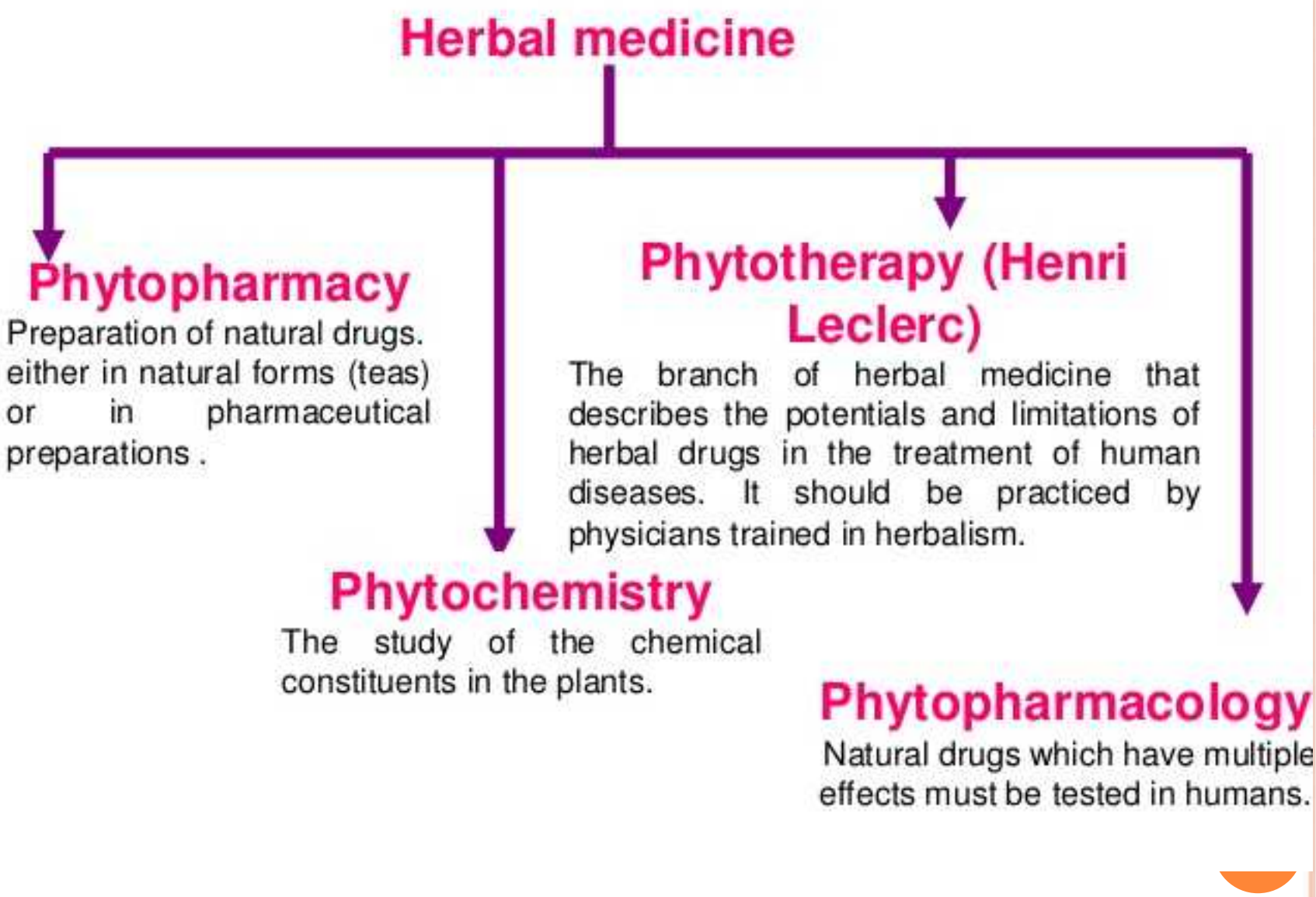
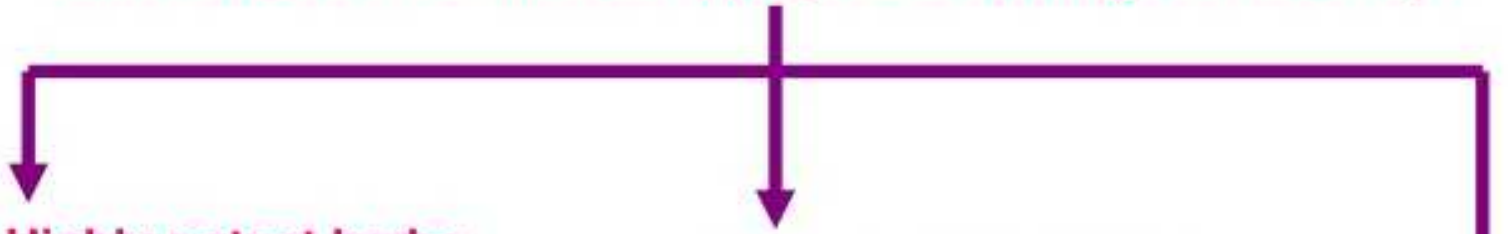

Herbal medicine
Phytopharmacy
Preparation of natural drugs. either in natural forms (teas) or in pharmaceutical preparations .
Phytotherapy (Henri Leclerc)
The branch of herbal medicine that describes the potentials and limitations of herbal drugs in the treatment of human diseases. It should be practiced by physicians trained in herbalism.
Phytochemistry
The study of the chemical constituents in the plants.
Phytopharmacology
Natural drugs which have multiple effects must be tested in humans.

Classification of Herbal Drugs According to Potency



Highly potent herbs

1-**Toxic**:e.g. Aconite and *Nuxvomica*.
These are not used at all.

2-Those containing **useful but toxic constituents** e.g. cardiac glycosides containing herbs such as Digitalis, Strophanthus and Squill. They should be prescribed by specialist (cardiologists).

Intermediately potent

e.g Solanaceous herbs

Gentle or mild herbs

Highly safe and constitute the majority of herbal medicine.
They are safe, non toxic and suitable for self-treatment.

Characteristics of Herbal Drugs:

1-The pharmacologically active compounds in herbal drugs are present in lower concentrations than the conventional tablets and capsules. This fact generally means that **risks** associated with crude herbal drugs **are minimal** with moderate use. Many herbal drugs have been safely used for centuries.

2-They contain a wide **variety of different compounds**, some pharmacologically active (2ry metabolites) and some not (such as cellulose, starches and sugars).

Characteristics of Herbal Drugs :(cont.)

3-Herbs contain mixture of **components that may have synergistic or antagonistic effects** e.g. Rhubarb (anthraquinone & tannin).

4-Plants may also **contain active and toxic compounds** such as pyrrolizidine alkaloids which are converted in the liver into hepatotoxic and carcinogenic metabolites.

5- Herbal medicines are **less expensive** i.e. cheaper than conventional medicines. In fact the WHO is encouraging developing countries to develop their own herbal formula, from local herbs within each country.

❑How do herbs work?

❑For most herbs, the specific ingredient that causes a therapeutic effect is not known. Whole herbs contain many ingredients, and it is likely that they work together to produce the desired medicinal effect.

❑Many factors determine how effective an herb will be.

For example, the type of environment (climate, bugs, soil quality) in which a plant grew will affect its components, as will how and when it was harvested and processed.

❑How are herbs used?

Herbal supplements are classified as **dietary supplements** by the U.S. Dietary Supplement Health and Education Act (DSHEA) of 1994.

The **FDA** defines a dietary supplement as "...any product taken by mouth that contains a so-called 'dietary ingredient' and its label clearly states that it is a dietary supplement." Per the provisions of DSHEA, herbal supplements --, herbal supplements must be manufactured according to good manufacturing practices.

Standardized herbal supplements are the best way to ensure proper dosages and effects similar to human clinical trials.

Several herbs are often used together to enhance effectiveness and synergistic actions and to reduce toxicity. Health care providers must take many things into account when recommending herbs. For example, **the species** and **variety of the plant**, **the plant's habitat**, **how it was stored** and **processed**, and **whether or not there are contaminants (including heavy metals and pesticides)**.

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Ask your doctor or pharmacist about which herbal supplements are the best choice for your health concerns

Some commonly used Standardized herbal supplements.

Ginkgo (*Ginkgo biloba*) standardized extract improves awareness, judgment, and social function in people with Alzheimer's

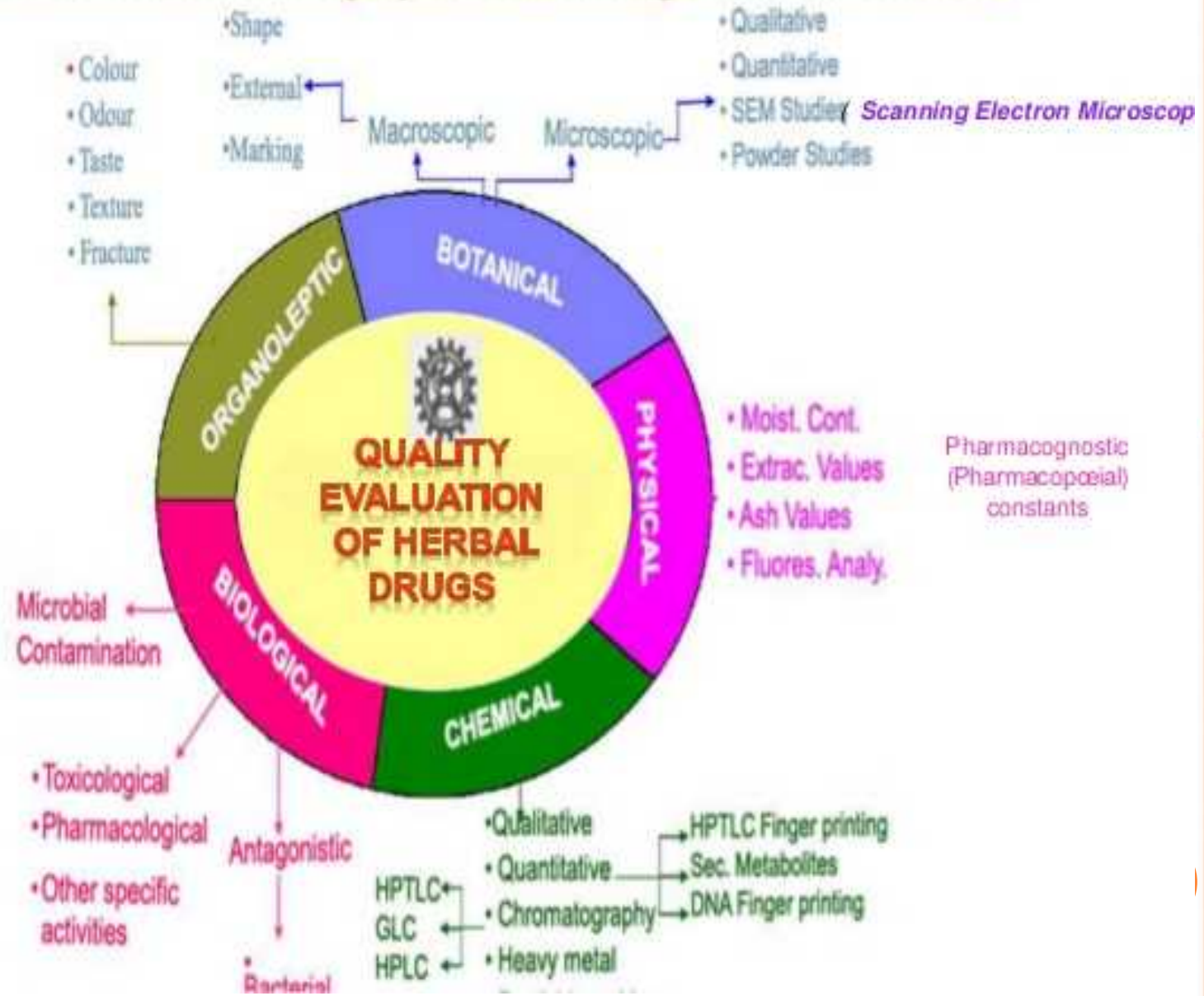
Saw palmetto (*Serenoa repens*)
for the treatment of benign prostatic hyperplasia (BPH) improvement in urinary symptoms and flow compared to finasteride (Proscar), a pharmaceutical drug used in BPH.

St. John's wort (*Hypericum perforatum*)
antidepressant effects

Valerian (*Valeriana officinalis*) a sleep-inducing agent, (no hangover feeling the next day)

Echinacea (*Echinacea purpurea*) and other Echinacea species) may improve the body's natural immunity.

STANDARDIZATION &QUALITY EVALUATION OF HERBAL DRUGS



HOW DO HERBS AND DRUGS DIFFER?

- Potency
- Side effects
- Cost
- Target

ANY..?

THANK YOU….