Evaluation of Anti-Arthritic Activity of Some Herbal Plants

1. INTRODUCTION

1.1 Herbal drugs and evaluation of herbal drug

History of medicine goes back practically to the existence of human being. The current accepted Modern Medicine or allopathy has gradually developed over the years of scientific and observational efforts of scientists—however, the basis of its development remains in the roots of traditional medicine and therapies. Plants are the most exclusive source of drugs for the majority of World's population. Global estimate indicates that 80% of about four billion populations are using traditional medicines, which are mainly derived from medicinal plants listing over 20,000 species. Even in the allopathic medicine 25% of the prescription, substances are derived from higher plants. India is perhaps the largest producer of medicinal herbs and is rightly called the "Botanical Garden of the World". Except very few, all medicinal herbs of commercial importance are collected or cultivated in this country. Medicinal herbs have been of use for thousands of years in one form or another under the indigenous systems of medicine like Ayurveda, Siddha and Unani. Since independence in 1947, India has made tremendous progress in Agro technology, process-technology, standardization, quality control, and research and development etc. The WHO also appreciated the importance of medicinal plants for public health care in developing nations and evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicine and to study their potential usefulness including evaluation, safety and efficacy.

1.2 PLANTS PROFILES:

I. VITEX NEGUNDO LINN.

Botanical name - *Vitex negundo* Linn.

Synonym - Five-leaved chaste tree, Sinduvara

Family - Verbenaceae
**Hindi**  - Sambhalu  
**Marathi**  - Nirgundi  
**Sanskrit**  - Indrani  
**English**  - Indian privet  

**Habitat**  - It is also distributed in Bengal, South India, Burma and in hilly regions of Uttar Pradesh, also found in Sri Lanka and Malaysia.  

✓ **Morphology of *Vitex negundo***:  

The **leaves** are 3-5 foliate, leaflets are lanceolate with entire margin, are 5-10 cm in length and 1.6-3.2 cm in width. Lateral are smaller and glabrous above with white tomentose beneath. **Colour**-Upper side greenish and lower is silvery. **Odour**-aromatic and **Taste**-bitter, pungent or acrid.  

**Barks** are thin with longitudinal cracks externally and yellowish grey colour.  

**Flowers** are bluish purple, smaller and compound at base; with triangular calyx.  

**Fruits** are drupe type-globular shape, and 5-6 mm in diameter, when ripened shows black colour.  

**Roots** are cylindrical, woody, tortuous with greyish brown colour, are 0.25-5.0cm in diameter and **fracture** is irregular.  

**Woods** are pale yellowish and hard or tough nature.  

**Chemical Constituents:-** The leaves of *Vitex negundo* Linn. contains alkaloids nishindine \((C_{15}H_{21}ON, m.p. 266^\circ)\) and hydrocotylene \((C_{22}H_{33}O_8N)\). It also contains amorphous glucoside \((C_{20}H_{26}O_{11}, m.p 93-95^\circ)\), tannic acid, vitamin ‘C’, β-sitosterol and carotene..  

Uses:- Antiseptic, Stimulant, Tonic, Anthelmintic, Astringent, inflammation, asthma and acute rheumatism and headache.  

**II. JATROPHA CURCUS LINN.**  

**Introduction to family Euphorbiaceae:**
The euphorbiaceae is a large family of about 300 genera and 6000 or more species. Most numbers are trees or shrubs, a few herbs. Some genera (e.g. Euphorbiaceae) xerophytic. The genera includes *euphorbia* (about 200 species), *phyllanthus* (about 550 species), *mallotus* (2 species), *ricinus* (1 species), *croton* (750 species), *hevea* (12 species), *jatropha* (175 species), *manihot* (170 species), *sapium* (170 species), *poranthera*, (10 species), *securinega* (25 species), *aleurites* (2 species) and *hippomane* (5 species).

**Botanical Name:** *Jatropha curcas* Linn.

**Synonym:** Physic nut, Janglierandi, Mogalierandi,

**Family:** Euphorbiaceae.

The plant is known by various names in different languages as:-

- Sanskrit - Kananaeranda, parvataranda.
- Hindi - Bhagbherenda, Jangalierandi.
- Bengali - Erandagachh
- Marathi - Mogalieranda
- Gujarathi - Ratanjyota
- Telugu - Nepalamu
- Tamil - Kadalamanakku
- Kannada - Adaluharalu
- English - Physic nut

**DESCRIPTION:**

A genus of large shrubs, 3-4 m high, with three species, commonly found in the tropics, *J.curcas*, linn., (Physic nut) *J. Gossypifolia* Linn. (Bellyache bush) and *J.glandul fera*. Found wild in tropical America it is now wide spread. Now cultivated in tropical and sub-tropical parts of the world for its seeds.

**Occurrence and Distribution:**
A glabrous erect branched shrub of the Euphorbiaceae family is reported to have been introduced into Asia and Africa by the Portuguese as an oil yielding plant. It is cultivated to a certain extent as an oil seed crop in Cape Verde Island. In Madagascar and parts of French West Africa, where plant is grown as a support for the vanilla plant.

In India, *J. curcas* is found in India in a semi-wild condition in the vicinity of villages. It is reported to be cultivated in central and western parts in India like Madhya Pradesh, Maharashtra, Rajasthan, and Gujarat similarly there are reports of its cultivation in southern states like Andhra Pradesh and Tamilnadu. Gradually its area is increasing day by day in different parts of country.

**Morphology of *Jatropha curcas*:**

**Leaves** are orbicular-ovate, angular or somewhat three or five lobed, 10 to 15 cm long, acuminate, base cordate with long petioles.

**Flowers** in loose panicles of cymes, yellowish green, c. 7 mm across.

**Fruits** 2.5 cm long, ovoid, black, breaking into three 2 valved cocci.

**Seeds** are ovoid, oblong dull brownish black.

**Chemical Constituents:** The leaves of *Jatropha curcas* Linn. Contain apigenin, vitexin and isovitexin. α amyrin, stigmasterol, sigmasterenes along with two flavonoids found in the leaves and twigs.

**Uses:** Purgative, antiseptic, rubefacient, insecticidal and are used in foul ulcers and tumors. It is successful local remedy for scabies ringworm, rheumatism and headache.

1.3 **Advantages of Herbal drug**

- Their effectiveness, easy availability, low cost, and comparatively being devoid of serious toxic effects (time tested) popularized herbal remedies.

1.4 **Rationale of Herbal Medicine**

The traditional medicine is larger popularity over allopathic medicine because of the following reasons:

- Rising costs of medical care.
- As these are from natural origin, so free from side effects.
• Goes to root cause and removes it, so that the disease does not occur again.
• Cure from many obstinate disease.
• Easy availability of drugs from natural sources.

1.5 **Role of a Pharmacognosist in promoting herbal drugs**

• Although the roots of herbal medicine or drug have been traced back to thousands of years and most of its history, herbalist has been linked with religion, astrology, and superstition, but there is also a purely scientific approach to the world of herbs known as ‘Pharmacognosy’.

• A pharmacognosist has an expert knowledge of chemical constituents of plants, how to go about identifying new chemicals and even molecules that occur in plants, and how various cultures use plants for their benefits, with particular interest in their medicinal applications. Being a rationalist, only a pharmacognosist is interested in isolation, purification, characterization and describing the active ingredients, or bioactive molecules of plants. And only his or her investigations might lead to synthesis of bioactive molecules, or to achieve certain desired effects, such as increased activity, less toxicity or greater stability.

1.6 **Steps necessary for isolating herbal drugs**

Phytochemistry or natural product chemistry research is the backbone of herbal industry and directly or indirectly responsible for both failure and success of herbal drugs. For promoting the use of herbals in modern medicine, phytochemistry should be envisaged for:

• Isolation, purification and characterization of new phytoconstituents.
• Use of newly isolated phytoconstituent as “lead” compound for the synthetic design of analogues with either improved therapeutic activity or reduced toxicity.
• Conservation of lead phytoconstituents into medicinally important drugs.

1.7 **Problems and Challenges for Herbal Drugs**

One of the major barriers to the successful outcome of drug discovery program from plants is the periodic need to obtain recollections of plant material, whether for structural confirmation of
active constituents found in very low concentration in the plant part under study, or for the
generation of larger quantities for biological or clinical testing. A typical example, wherein the
generation of continued supplies of an active plant secondary metabolite is both crucial and
uncertain is that of ‘taxol’. It has been estimated that 25,000 lbs (11,354 kg) of bark from 2500
trees are needed to supply one kg of taxol. Taxol has so far proven to be refractory to total
synthesis, which is not surprising since it has 11 stereo centers, although the partial synthesis of
this compound has been accomplished from several precursors. A potential approach towards
solving the supply problem of taxol and other natural compounds obtained from threatened
species are the selection and propagation of high yielding phenotypes and plant tissue cultures
(PTC). In addition, it is also possible that less structurally complex taxol analog will be
discovered having the same type and potency of antineoplastic activity as the parent compound
and can then be synthesized.

The current alarming rate of species extinction is rapidly depleting the natural product treasury,
with potentiality disastrous consequences. Hence, the need of the hour is to develop herbal
gardens throughout the country, through individual and organizational efforts. On the other hand,
the problem of obtaining a large-scale supply of promising plant-derived compounds may be
overcome by plant tissue cultures.