CHAPTER 1

INTRODUCTION
STANDARDIZATION AND ANTIMICROBIAL

ACTIVITIES ON SOME INDIAN MEDICINAL PLANTS

INTRODUCTION

India has rich flora of medicinal plants and these medicinal plants have been used in our traditional system of medicine, having very potent therapeutic activity but some of the medicinal plants used in our traditional system have not been fully investigated for therapeutic activity. Following three plants have been selected for the standardization and antimicrobial activities.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Plant part to be used for studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Tribulus terrestris</em> Linn.</td>
<td>Chotagokhru</td>
<td>Fruit</td>
</tr>
<tr>
<td>2.</td>
<td><em>Cichorium intybus</em> Linn.</td>
<td>Kasni</td>
<td>Seed</td>
</tr>
<tr>
<td>3.</td>
<td><em>Dolichos biflorus</em> Linn.</td>
<td>Kulthi</td>
<td>Seed</td>
</tr>
</tbody>
</table>

1. *TRIBULUS TERRESTRIS* LINN.

*Tribulus* is a genus of ascending or prostrate herb, belonging to the family Zygophyllaceae, distributed in the tropics and warm-temperate regions of the world. Three species which are found in India are *Tribulus terrestris*, *Tribulus cistoides* and *Tribulus alatus*. Among them *Tribulus terrestris* Linn. is an annual, upto 90 cm in length, commonly found throughout India upto, 5,400 m altitude\(^1\).

The plant is commonly known in *Hindi*: Chotagokhru; *Punjabi*: Bakhra; *English*: Small caltrops.
It is a procumbent, ascending or suberect herb; stems and branches pilose, young parts silky-villous. Leaves opposite, abruptly pinnate, one of each pair usually smaller than the other, sometimes wanting altogether; stipules lanceolate, hairy; leaflets 3-6 pairs, oblong, mucronate, villous on both the surfaces; base rounded oblique; petioles minute, hairy. Flowers axillary or leaf-opposed, yellow, solitary, hairy; pedicles filiform. Sepals lanceolate, acute, hairy. Petals oblongobloid, claw short, hairy; stamens 10, inserted on the base of the disk, alternately longer and shorter, the latter with a small gland outside, filaments filiform, naked ovary sessile, hirsute, 5-12 lobed and celled; style short; stigmas 5-12; ovules superposed. Fruit globose with 5-hairy woodyococci, each with 2 spines. Seeds many in each coccus, with transverse partitions between them. Flowering and fruiting-hot season and rainy season (Fig. 1).

Leaves are diuretic, tonic; increase the menstrual flow; cure gonorrhoea; a decoction is useful as a gargle for mouth trouble and painful gum and reduce inflammation.

The fruit is diuretic removes gravel from the urine and stone in the bladder. They are regarded as cooling, diuretic, tonic and aphrodisiac, and are used in painful micturition, calculous affections, urinary disorders and impotence. In some countries they are reputed tonic and astringent, used for coughs, scabies, anaemia and ophthalmia.

The root is good stomachic and appetiser, diuretic and carminative.

The entire plant, but more particularly the fruits are used in medicines. It was given a good trial in Bright’s disease with dropsy. The diuretic property of the drug is due to the presence of large quantities of nitrates present as well as the essential oil which occurs in the seeds\(^2\).
Fig. 1: *Tribulus terrestris* grown in a pot
2. **CICHORIUM INTYBUS LINN.**

*Cichorium* is a genus of thirteen species belonging to the family compositae. Two species, viz., *C. endivia* and *C. intybus*, are of common occurrence, cultivated throughout India, also grows wild in Punjab, north west India and Hyderabad in areas up to 6000 ft. elevation, waziristan, Baluchistan, W. Asia and Europe. It is grown either for fodder or as is more often the case, for the roots which form an article of commerce. The plant appears to grow on any type of soil. The dried root after roasting and powdering is used for mixing with coffee.

*Cichorium intybus* is an erect, glandular, perennial herb up to 90 cm in height, with tough, rigid, spreading branches; leaves radical and lower pinnatifid, lobes toothed, upper alternate, small, entire; flowers bright blue in ligulate heads, terminal, axillary and clustered; fruits smooth angled achenes, crowned with a ring of erect pappus scales (Fig., 2).

The plant is commonly known in Hindi: Kasni; Punjabi: Hand; Kannada: Kacani; Malayalam: Cikkari; Tamil: Kasini; Sanskrit: Kasani; English: Chichory.

*Cichorium intybus* Linn. has been described to be of great medicinal value. There are two varieties of this species:

1. **Cultivated-sweet-variety:** The plant is a good tonic; cooling; useful in thirst, headache, ophthalmia, throat inflammation, enlargement of the spleen, fever, vomiting, diarrhoea. The root is the best part of the plant; good stomachic and diuretic; enriches and purifies the blood; lessens inflammation and pain in the joints. The leaves are applied topically to lessen pain in the joints. The seeds are
Fig. 2: *Cichorium intybus* grown in a pot
tonic to the brain, alexiteric, appetite; good in headache, ophthalmia, biliousness, lumbago, troubles of the spleen and asthma.

2. **Wild-bitter-variety**: The plant is tonic, emmenagogue, alexiteric; astringent to the bowels; cures asthma, biliousness, inflammation; enriches the blood. The root has tonic, demulcent and cooling properties. The seeds are considered carminative and cordial. A decoction is used in obstructed menstruation and for checking bilious vomiting. Flowers made into sherbet are given in liver disorders.

3. **DOLICHOS BIFLORUS LINN.**

* Dolichos is a well known and wide spread genus of twining herbs of the family Leguminosae (Papillionaceae) occurring mainly in the tropical countries. It occurs all over India up to an altitude of 5000 ft. About 14 species occur in India, of which *D. biflorus* (Horse gram), *D. lablab* (Bean), *D. catjang* (Cow gram), *D. Pruriens* (Cow hedge) and *D. soja* (Soya bean) are extensively cultivated and its seeds are used as food and leaves and stem as fodder.

Several varieties of horse gram differing in the colour of seed coat and the period of maturity are known under cultivation. The seeds are brown, light red, grey, black or mottled. The cultivated crop is usually a mixture of several varieties.

The plant is commonly known in **Hindi**: Kulthi; **Sanskrit**: Kulastha; **Bengali**: Kulti, kurti kalai; **Marathi**: Kulith, Kulthi; **Gujarati**: Kulti; **Malayalam**: Kullu, kollu; **Telugu**: Wulavulu; **Tamil**: Kollu; **English**: Horse gram.

* Dolichos biflorus is a branched sub-erect or trailing annual, with small trifoliate leaves, bearing, when mature, narrow, fat, curved pods, 1½–2 in. long, tipped with a persistent style. The stems are very wide climbing slender, slightly pubescent, oblong blunt, subglabrescent leaflets on a petiole, lateral ones very unequal sided, stipullae minute and linear. Flowers are 1–3 on very short pedicels in
the axils of the leaves. Calyx slightly downy with upper teeth quite connate, the side lanceolate and the lowest one linear. Corolla yellow. Pods are linear, subsessile, nearly straight, glabrous, 6 - 8 seeded, tipped with a persistant style (Fig.. 3).

The seeds of *Dolichos biflorus* have been used in the indigenous system of medicine for a long time as astringent to the bowels, fattening, antipyretic, anthelmintic, nerve tonic, diuretic, appetizing, aphrodisiac, emmenagogue etc. and cures “Kapha” and “Vata”, tumours, asthma, bronchitis, urinary discharges, hiccough, abdominal complaints, heart troubles, diseases of the brain, eye diseases, piles, leucoderma, liver troubles, leucorrhoea, menstrual derangements and removes stones from the kidney\(^{7-10}\).

These medicinal plants are very much used in traditional system of medicine and many pharmacological properties have been attributed to various parts of these plants. The standardization of these plants parts are essential in order to prevent adulteration and admixture in the preparation of Ayurvedic medicine.

Hence the useful parts of these medicinal plants will be subjected for standardization and the extracts isolated from these plants parts will be screened for antimicrobial activities.
Fig. 3: *Dolichos biflorus* grown in a pot