

## On Some Potential Medicinal Plants Having Natural Diuretic Properties

Saumya Mishra<sup>1</sup> Shruti Mishra<sup>2</sup> Ratnesh Kumar Soni<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Botany, KN Govt. PG College ,Gyanpur, Bhadohi.

<sup>2</sup>Assistant Professor Department of Botany, Handia PG College, Handia, Allahabad.

<sup>3</sup>Assistant Professor, Department of Zoology, KN Govt. PG College ,Gyanpur, Bhadohi.

**Abstract-** The present paper describes for the first time an illustrated enumeration of some diverse potential herbal plants having natural diuretic properties. In the present study, nearly 20 diuretic plant species belonging to 17 families and 19 genera collected and documented. Their taxonomy, ecology and means of conservation have been discussed in great detail for the first time.

**Keywords :** Diuretics, Kidney, Conservation.

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**Introduction-** The plants are known as one of the most important sources for the medicines since ages (Agharkar 1954, Chopra 1982, Jain 1996, Mishra et al 2016, 2017). Medicines in contemporary India is a unique fusion of traditional system with conventional one and often been used. Even though the rate of medicinal plant utility is ever increasing, very little is known about its use patterns. In spite of enormous progress in modern medical system, about 80% of the world population still depends on traditional systems of medicine for primary health care, which is true in Indian scenario also. Medicine in contemporary india is a fascinating blend of traditional system with conventional one and often been used for various historical, cultural and ecological and socio economical reasons. Even though the rate of medicinal plant utility is ever increasing, very little is known about its patterns. It is very important to document, analyze and evaluate this knowledge not only for their cultural reasons, but also for their commercial value, as ethnomedicinal uses of plants is one of the most successful criteria used by the pharmaceutical industry in finding new therapeutic agents (Anonymous 2000). The traditional system of medicine, especially the herbal medicine, in india is directly linked to its rich floral diversity. Several attempts have been made to document the vast ethnobotanical information from the region in the form of general documentation. Only handful of reference are available, which have attempted to study and understand medicinal plants used in treatment of various ailments. The present work is an effort to document and analyze the traditional knowledge regarding the practice and use of diuretic plants in treatment of various diseases. Diuresis is a physiological process that involves the increased production of urine by the kidneys. It occurs when the kidneys excrete more water and electrolytes from the body than usual. This process plays a crucial role in maintaining fluid balance, regulating blood pressure, and eliminating waste products from the body. Diuresis can be influenced by various factors, such as hydration status, hormonal signals, and the presence of diuretic substances. Diuretic substances are compounds that enhance diuresis by promoting the excretion of water and electrolytes through the kidneys. These substances work by altering the function of specific transporters in the renal tubules, which are

responsible for reabsorbing water and electrolytes back into the bloodstream. By blocking or inhibiting these transporters, diuretic substances prevent the reabsorption of water and electrolytes, leading to increased urine production. There are different classes of diuretic substances, including thiazide diuretics, loop diuretics, and potassium-sparing diuretics. Thiazide diuretics, such as hydrochlorothiazide, act on the distal convoluted tubules of the kidneys to enhance sodium and water excretion. Loop diuretics, such as furosemide, target the thick ascending limb of the loop of Henle to inhibit sodium, potassium, and chloride reabsorption. On the other hand, potassium-sparing diuretics, like spironolactone, work in the collecting ducts to reduce sodium reabsorption while promoting potassium retention. Diuretic substances are commonly used in medical practice to treat conditions such as hypertension, edema, and congestive heart failure. They help to reduce fluid retention, lower blood pressure, and alleviate symptoms associated with these conditions. However, it's important to note that the use of diuretics should always be guided by a healthcare professional, as they can have side effects and interact with other medications.

Bhadohi represents as one of the eastern district of Uttar Pradesh. It is one of the largest carpet industry of India. This District has huge geographical significance and position attached to it, due to its location between two culturally important and rich heritage cities of Prayagraj and Varanasi. Ganges Varuna and Morva are the main rivers of the Bhadohi. It is surrounded by Jaunpur district to the north, Varanasi district to the east, Mirzapur district to the south, and Prayagraj district to the west. With an area of 1055.99 km<sup>2</sup> Bhadohi is the smallest district of Uttar Pradesh area wise. This district is divided into three tehsils, viz. Aurai, Bhadohi and Gyanpur tehsil ( Fig – 1), with six blocks, Bhadohi, Suriyawan, Gyanpur, Deegh, Abholi and Aurai.

### **Material and methods**

The diuretic plant species have been collected from different parts of Bhadohi district, namely Bhadohi, Suriyawaan, Gyanpur, Deegh, Abholi and Aurai covering three seasons, summer, winter and rainy season. Collected plants were processed and their herbaria were prepared by standard Lawrance methods (Lawrance, 1951) with slight modifications. Plants were properly dried up by changing a number of newspapers and poisoned with mercuric chloride solution in alcohol. Later on, the dried specimens were mounted on standard herbarium sheets, labelled properly and arranged alphabetically according to their botanical names. These plant specimens have been identified with the help of Keys and regional Floras and confirmed with the authentic herbarium specimens at BSI Prayagraj and Duthie herbarium at University of Allahabad, Prayagraj. The voucher specimens were deposited in the Deptt of Botany KN Govt. PG college Gyanpur, Bhadohi District.

**Observation** - In the present study, nearly 20 diuretic plant species belonging to 17 families and 19 genera collected from various parts of the Bhadohi district, have been enumerated and documented, see Table –1. Some of the significant plants are described and illustrated below with their botanical name, vernacular name, family, habit, phenology and taxonomical description. See Plate- 1

**Abutilon indicum**( L.) Sweet, **Malvaceae** Juss, **Kanghi**- A robust shrub or undershrub, branches many, leaves ovate to orbicular- cordate, soft. Flower buds drooping. Floowers orange- yellow on long pedicels. Ripe carpels 15-20, black at maturity, reniform, short beaked, seeds black, tubercled. Flowering & Fruiting Sept-Mar

**Phytochemicals:** Gossypetin-8 and 7-glucosides, cynadin 3- rutinoside, alkanol, b-sitosterol, tocopherol, asparagines and p-coumaric acid. Pharmacological uses- stones of urinary bladders.

**Acacia arabica auct.non(Lam.)Willd. ,Fabaceae, Babul**- Small tree, straight 4-10m tall, bark blackish, rough, deeply fissured. Pinnae 3-7 pairs, 2-5 cm long; leaflets 8-20 pairs, subsessile, 3-7x1-1.6m m,

linear- oblong, apex obtuse, base oblique. Spines 1.5-3.5 cm long, straight polished white. Pods 8-15x1.2-1.7 cm, beaked. Flowering & fruiting feb-nov.

**Phytochemicals:** octacosanol, betulin, flavonoids, a-amyrin and B-sitosterol, enzyme, arabin, tannic and gallic acids, cresol, methyl salicylate, complex salts of calcium. Pharmacological uses: whole plant is used as diuretic

***Achyranthes aspera* L. Amaranthaceae Juss Chirchita, Apamarg-** Erect annual herb, leaves large, ovate, acute or acuminate, glabrous. Flowers greenish white, deflexed, in terminal spikes elongating in fruits, bracts and bracteoles persistent, ending in a spine, utricle oblong, seeds sub cylindrical, brown

**Phytochemicals:** achyranthin, saponin A&B, ecdysterone, ecdstone, inokosterone and aminoacids. Pharmacological uses: plant is diuretic

***Acorus calamus* L., Araceae Juss Vach-** Perennial herb, with a creeping, rhizomatous rootstock. Leaves sessile, equitant, linear- gladiate, acute, suboblique at apex. Spadix long- peduncled. Spathe linear, foliaceous, narrowed in to an unequal, shortly acuminate apex. Spadix straight or slightly curved, obtuse.

**Phytochemicals:** B-asrone, calamen, calamenol, calameon, glucoside, acorin, a-asarone, galagin, 2.4.5-trimethoxy benzaldehyde, b-asarone, calamendiol and spathulenol. Pharmacological uses: diuretic

***Adhatoda vasica* Nees, Acanthaceae Juss, Adusa**

A diffused, branched, ever green shrub, internodes short, leaves upto 20x6 cm, ovate or elliptic-lanceolate, acuminate. Flowers white, with pink or purple stripes, in dense, axillary, spikes at the ends of branches, bracts conspicuous, capsules 2.6- 3cm long, clavate, seeds sub orbicular, rugose. Flowering and fruiting nov- mar.

**Phytochemicals**

Vasicol, vasicinolone, vasicine, vasicinone, 1- vasicinone, deoxyvasicine, maiontone and vasicinol, adhatonine, daucosterol, triterpenes a-amyrin, apigenin, astragalin, kaempferol, quercetin and vitexin.

Pharmacological uses: plant is diuretic

***Allium cepa* L. Liliaceae Juss. Pyaaz**

Erect annual herb, bulbs large, leaves radical, hollow, bifarious, flowers many, white in colour in dense umbels with both flowers and bulbils, subtended by 2 or 3 reflexed bracts, stamen exerted. Flowering & fruiting oct- March

Phytochemicals: organic sulphides, catechol, kaempferol, quercetin, diosgenin, essential oil, N-trans-feruloyl tyramine, beta- sitosterol-3-beta-glucopyranoside-6-palmitate, sitosterol, dauco- sterol, tryptophane and adenine riboside.

Pharmacological uses: bulbs are used as diuretic

***Allium sativum* L. Liliaceae Juss., Lahsun**

Annual herb, bulb short, with bulblets enclosed in a white or pink envelope, leaves flat, flowers often displaced by bulbils, pinkish in a lax umbels on a long, terete scape exceeding the leaves, anthers and style exerted. Flowering & fruiting Sept- Mar.

Phytochemicals: xylitol, allicin, allisatin 1& 11, D-galactan, stigmasterol, stigmast-7-en-3 beta-ol, s-propyl-cysteine sulfoxide, satiomen, tuliposide A,B,C & D, quercetin, prostaglandin and kaempferol. Pharmacological uses: it is used diuretic

***Anthocephalus cadamba* (Roxb.) Miq. Rubiaceae Juss., Kadamb**

Medium size or large tree upto 40m high. Trunk erect, bark smooth, peeling off rectangular scales. Leaves petiolate, elliptic- oblong or ovate, upto 30cm long, pubescent beneath; stipule

caduceus. Ball terminal, upto 6cm across. Bracts lanceolate, hairy. Calyx tubular, 5 lobed, persistent. Corolla orange, tube long, funnel shaped, glabrous. Ovary 4-celled above, 2-celled below; stigma white, much exerted. Pseudocarp yellow when ripe. Flowering & fruiting April-Oct.

Phytochemicals: kadambine and 3-alpha di hydrocadambine, glycosides, iso di- hydrocadambine, beta sitosterol, quinovic acid, pentacyclic try terpinic acid, cadambagenic acid, quinoric acid and saponin.

Pharmacological uses: plant is used antidiuretic

#### ***Argyria nervosa* Sweet., Convolvulaceae Juss., Vidhara**

A large climber with white tomentose stems. Leaves ovate, cordate, glabrous above, densely white- tomentose beneath. Flowers rosy- purple, in sub capitate cymes; bracts large, foliar. Flowering & fruiting: July- Sept.

Phytochemicals constituents: eragine, isoeragine, penniclavine, 1-triacontanol, epifriedelinol acetate, epifriedelinol, B-sitosterol, quercetin, kaempferol, kaempferol3-o-L-rhamnopyranoside and 7,8,3,4,5 pentahydroxyflavone.

Pharmacological uses: root is diuretic

#### ***Asparagus racemosus* Willd. Liliaceae Juss Satavar**

A straggling or scandent, much branched, spinous shrub, stem woody, grey white. Spine suberect or subrecurved. Cladodes 2-6 together, narrowly oblong – linear, falcate. Flowers small, white, in solitary or fascicled, simple or branched racemes, berries globose. Flowering & fruiting Aug-Feb

Phytochemicals: shatavarin 1, II, III, IV, diosgenin, quercetin, rutin, sitosterol, stigmaterol, glucosides, b-sitosterol and a-amyirin

Pharmacological uses: root is diuretic

#### ***Boerhaavia diffusa* L. punarnava, Nyctaginaceae**

Plant description – diffuse herb, stem prostrate, divaricately branched, slender, purplish, swollen at nodes, spreading to 30-60 cm. leaves opposite, in unequal pairs, at each node. Larger 3-4 cm, the smaller 1-2 cm, broadly ovate, obtuse, base rounded, margins pink, undulate, petioles 2-4 cm, flowers dark pink, funnel shaped, very small, sessile, 4-10 in umbels 5-8 mm diameter, arranged in terminal panicles. Perianth 5 lobed, stamens 2-3, exerted.

**Phytochemicals-** punarnavine, sterol, beta- sitosterol, stearic acid, palmitic acid, minerals, sodium sulphate, potassium nitrate

**Pharmacological uses-** leaves and roots helps in scanty urine, helps in urination. The root is used in diseases of kidneys

#### ***Borassus flabellier* L., Arecaceae Juss., Taad**

Tall, stout, dioecous trees, reaching upto 25m tall. Stem gradually narrowed upwards, with many rootless near the base. Leaves flabelliform, upto 1.5m across, very tough, chartaceous; segments linear- lanceolate, spine- tipped; petiole long, compressed, very stout. Male flowers very small, clustered in cavities, sunken in the flowering branches, mixed with scaly bracteoles. Female flowers upto 2.5 cm across, scattered on simple or sparingly branched spadix. Fruit is a fibrous drupe; seeds 3, in hollows, pulpy fleshy, hardening at age. Flowering & fruiting Mar- July.

**Phytochemicals:** 2-furanmethanol, propane, 1-(1-methylethoxy), 2-cyclopenten-1-one, 2-hydroxy-, 2,4 -dihydroxy-2,5-dimethyl-3-furan-3-one, glycerin, 1,3-propanediamine, 1,2-propanediol 2 -acetate, butane, 1-ethenyloxy)-3-methyl.

Pharmacological uses: root is diuretic

***Cajanus cajan* (L.) Millsp. Fabaceae Lindl. Toor, Arhar**

An erect shrub, 2.5m in height. Leaflets 3, oblong- lanceolate. Flowers yellow, in corymbose, racemes. Pods narrowed at ends, torulose. Flowering and fruiting Aug- April.

**Phytochemicals:** globulin, cajanin, concajanin-a,b, &  $\gamma$ -selinenes, copaene, eudesmols, cajanone, cajaflavone and phytosterol

Pharmacological uses: leaves are diuretic

***Cannabis sativa* L., Cannabinaceae Auctt., Bhang**

A robust annual herb, leaves 3-8 foliate, long petioled; lobes lanceolate, plants flowers dioceous, male plant flowers are axillary, short paniced cymes, and the female plant flowers crowed with leafy bracts, style arms 2, filiform, nuts crustaceous. Flowering and fruiting Nov-April.

**Phytochemicals:** cannabidiolic acid, canabidiol, cannabinol, tetrahydro-cannabinol, trans-cinnamic acid, n-nonacosane, eugenol and guaiacol.

Pharmacological uses: plants have antidiuretic

***Carica papaya* L., Caricaceae Dum., Papita**

A rapidly growing tree, 4-5 m in height, weak, succulent trunk and milky sap. Leves palmately lobed. Flowers creamy yellow. Male flowers in long, drooping panicles and female in short clusters. Flowering and fruiting Aug- Nov.

**Phytochemicals:** papain, carpain, carposide, glycoside, carpaine and chymopapain.

Pharmacological uses: ripe fruit is diuretic

***Centella asiatica* (L.) Apiaceae Brahmi**

Plant description – small trailing herb with reddish stem, rooting at nodes, leaves kidney shaped, margin creanate with long petiole, flowers pink in fascicled umbels. Plant parts used- whole plant, seeds and leaves

**Phytochemical constituents-** plant contains herpestin, Brahmin, bacosides, stigmasterol, becogenine, centallic acid, centoic acids, ascorbic acid, volatile oil, beta-sitosterol, arabinose

Mode of action- diuretic

***Chenopodium album* L. Chenopodiaceae , Bathua**

Erect, branched herb, upto 1m or sometimes more tall. Stems angular, ribbed with dark green and red streaks densely covered with powdery vesicles on younger parts. Leaves ovoid rhomboid; coarsely dentate or lobulated in lower parts; upper leaves smaller, elliptic oblong almost entire. Flowers pentamerous, arranged in paniced cluster. Perianth lobes connate at base, concave. Stamen slightly exerted. Ovary depressed- globose stigmas 2. Utricle enclosed between perianth lobes, finally pappilose, seed lenticular. Flowering and fruiting: Sept- May.

**Phytochemicals:** ecdysteroids, b-edysone, polypodine, ascorbic acid, b-carotene, catechins, caffeic acid, p- coumaric acid, ferulic acid, b-sitosterol, stigmasterol.

Pharmacological uses: plants are used as a diuretic

***Cicer arietinum* L., Fabaceae Lindl., Chana**

A much branched, glandular – pubescent herb, leaflets 5-8 pair; flowers very small, whitish. Corolla hardly exerted. Pods oblong-rhomboid, black, about 1x 0.5 cm. flowering and fruiting Dec-Mar.

Phytochemicals: vanillic acid, p-hydroxybenzoic acid, oxalic acid, acetic acid, malic acid, arginine, tyrosine, lysine, cysteine, kaempferol, quercetin, isorhamnetin and cicerin.

Pharmacological uses: juice of leaves is diuretic

### ***Coriandrum sativum* L., Apiaceae Lindl., Dhania**

Erect, glabrous, strongly smelling annual herb, stem terete, striate, leaves decomposed, palmatilobed- partite; middle one pinnate, upper ones 1 to 2 pinnate; ultimate segments linear-lanceolate. Umbels terminal and axillary, on 4-8cm long peduncles 3-5 rayed involucre absent; flower purplish or white, in compound umbels; outer ones zygomorphic; fruit subglobose, ribbed. Flowering and fruiting Feb- July.

**Phytochemicals:** B- sitosterol, D-mannitol, glycosides, rutin, umbelliferone, scopoletin, a-pinene, borneol, limonene, b-phellandrene and citronellol.

Pharmacological uses: diuretic activities.

### ***Curcuma domestica* Roxb., Zingiberaceae Lindl. Haldi**

Erect, perennial herb, with a short, globose root stock, which emit long ellipsoid- tuber bearing, club shaped, fleshy roots. Leafy stems are very short or absent, leaves erect, lanceolate-oblong, acute or acuminate, glabrous. Flowers appear after leaves inflorescence on leafless shoots arising from the base of leafy shoots. Bracts ovate, oblong, with cordate base, obtuse, bracteoles shallowly lobed, densely pubescent, calyx 3 lobed, densely hairy, corolla white; tube hairy outside. Capsule ovoid, appressed hairy, 1cm long. Seeds reddish brown, 0.35- 0.4x4 cm. flowering and fruiting Sept- April

**Phytochemicals:** stigmasterol, campesterol, b-sitosterol, cholesterol and curcumin.

Pharmacological uses: rhizome is diuretic.

### **Results and Conclusion:**

In the present study, medicinal properties of twenty natural potential diuretic plants growing in various habitats of the Bhadohi region documented. Their taxonomy, botanical names, vernacular names, family, parts used have been studied in great detail. The diuretic medicinal property of these plants is due to the presence of organic chemicals in the plant tissues that produce a definite physiological action on the human body. In conclusion, diuresis is a natural process that helps maintain fluid balance in the body. Diuretic substances can enhance diuresis by promoting the excretion of water and electrolytes through the kidneys. These substances play a vital role in the treatment of various medical conditions, but their use should be carefully monitored and prescribed by healthcare professionals. The most important of these substances are essential oils, glucosides, resins, mucilages, tannins, steroids and alkaloids. Increased human activities, large scale deforestation, road constructions, biodegradation in Gyanpur, and its adjoining areas of Bhadohi are hub of carpet industries, more and more carpet industry are mushrooming which is responsible for the depletion of diuretic plant diversity of that region and other ecological pressures are posing a direct threat to the medicinal plants of Gyanpur, if suitable measures are not taken immediately, some of the rare forms will vanish soon. Proper planning is needed to conserve the natural resources. State government should take urgent initiative to conserve the biodiversity by developing botanical gardens, reserve areas etc. In present scenario there is urgent need to conserve these diuretic medicinal plants and in view of this, suitable measures for their ex-situ and in-situ conservation should be taken.

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### **References**

**Agharkar, S. P. 1954.** *Medicinal Plants of Bombay Gazetteer of Bombay*, Government of Maharashtra

**Anonymous 2000.** WHO Traditional Medicine Strategy 2002-2005. World Health Organization, Geneva, Switzerland.(WHO/ EDM/ TRM/2002.1)

**Chopra et al .1956.** Glossary of Indian Medicinal Plants. Publication and information Directorate CSIR, New Delhi: 1- 323.

**Lawrence, G.H.M (1951)** *Taxonomy of Vascular Plants*, Publ. The Macmillan Company, New York, Pg- 1-823

**Mishra et al. 2016 a.** *Phytomedicodiversity of Some Plants Of Gyanpur Region*, . Conservation of Medicinal plants Conventional and Modern Approaches, Omega publications New Delhi Pgs 174-180

**Mishra et al. 2016 b.** *On Some Pharmaceutical Angiosperms Having Hypoglycemic Properties*. Journal of the Andaman Science Association. 21(1): Pgs 86-89

**Mishra et al. 2017.** *On the diversity Of Some Medicinal Plants Of Allahabad District*. Geophytology, vol 47(2): Pgs 121-129

**Table 1- Showing List of Diuretic plants**

| S.No | Botanical name                             | Vernacular Name    | Family         | Habit   | Parts used |
|------|--|--------------------|----------------|---------|------------|
| 1    | <i>Abutilon indicum( L.) Sweet,</i>        | Kanghi             | Malvaceae      | herb    | leaf       |
| 2    | <i>Acacia arabica auct.non(Lam.)Willd.</i> | Babul              | Fabaceae       | tree    | stem       |
| 3    | <i>Achyranthes asperaL.</i>                | Chirchita, Apamarg | Amaranthaceae  | herb    | leaf       |
| 4    | <i>Acorus calamus L</i>                    | Vach               | Araceae        | tree    | leaf       |
| 5    | <i>Adhatoda vasica Nees</i>                | Adusa              | Acanthaceae    | tree    | tem        |
| 6    | <i>Allium cepaL</i>                        | Pyaz               | Liliaceae      | herb    | bulb       |
| 7    | <i>Allium sativum L</i>                    | Lahsun             | Liliaceae      | herb    | leaf       |
| 8    | <i>Anthocephalus cadamba(Roxb.) Miq</i>    | Kadamb             | Rubiaceae      | tree    | fruit      |
| 9    | <i>Argyria nervosa Sweet</i>               | Vidhara            | Convolvulaceae | Climber | leaf       |
| 10   | <i>Asparagus racemosus Willd</i>           | Satavar            | Liliaceae      | shrub   | root       |
| 11   | <i>boerhaavia diffusa L</i>                | Punarnava          | Nyctaginaceae  | herb    | root       |
| 12   | <i>Borassus flabellier L</i>               | Taad               | Arecaceae      | tree    | stem       |
| 13   | <i>Cajanus cajan (L.)</i>                  | Toor, Arhar        | Fabaceae       | herb    | seed       |
| 14   | <i>Cannabis sativa L</i>                   | Bhaang             | Cannabinaceae  | herb    | leaf       |
| 15   | <i>Carica papaya L</i>                     | Papita             | Caricaceae     | tree    | fruit      |
| 16   | <i>Centella asiatica (L.)</i>              | Brahmi             | Apiaceae       | herb    | leaf       |
| 17   | <i>Chenopodium albumL</i>                  | Bathua             | Chenopodiaceae | herb    | leaf       |

|    |                                |        |               |      |         |
|----|--------------------------------|--------|---------------|------|---------|
| 18 | <i>Cicer arietinum L.</i>      | Chana  | Fabaceae      | herb | seed    |
| 19 | <i>Coriandrum sativum L</i>    | Dhania | Apiaceae      | herb | leaf    |
| 20 | <i>Curcuma domestica Roxb.</i> | Haldi  | Zinziberaceae | herb | rhizome |

Plate- 1

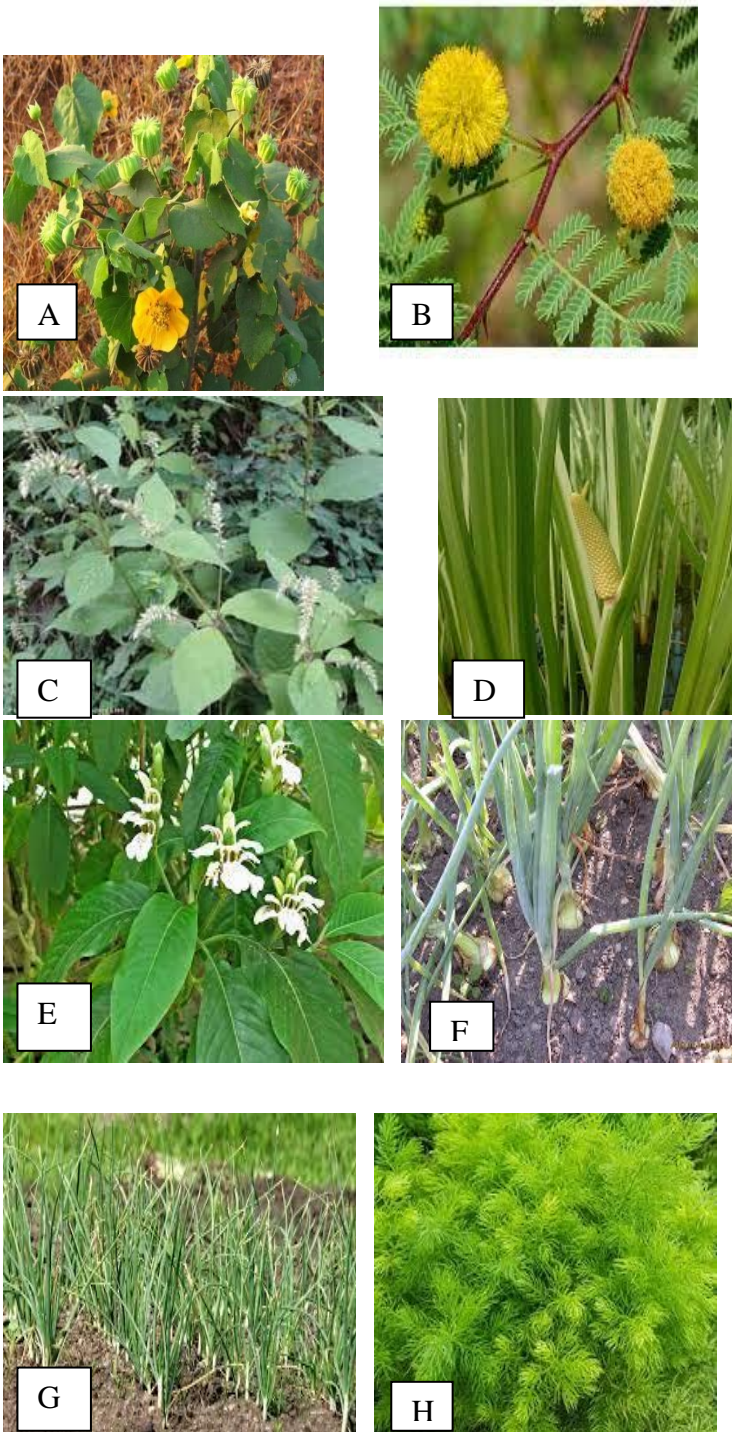


Plate-1 A.*Abutilon indicum*. B. *Acacia spp* .C..*Achyranthus aspera*. D.*Acorus calamus*. E.*Adhatoda vasica*  
F.*Allium cepa*.G.*Allium sativum*. H. *Asparagus racemosus*