

INVASIVE SPECIES AND WILD FLOWER FOUND IN FOUR DISTRICTS OF SIKKIM

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Abstract: Sikkim, a land of incredible variations, from the tropical to the alpine, this small state is one of the most valuable biodiversity hot spots in the country. A study was conducted in four districts of Sikkim viz., North (Kabi Tingda, Mangan, Phudong, Chungthang, Lachung), East (Bulbule, Phangthang, Tshongu, Chandmari, Pakyong), South (Dhamthang, Namchi, Chimche) and West (Rabongla, Gyalshing, Rabdantse, Yuksom, Chung, Tashiding) Sikkim for a period of two years (January 2013 to December 2015) in order to explore wide biodiversity available in Sikkim which will help the researchers in knowing the wild flora for performing the research in various aspects.

Key words: biodiversity, invasive, wild flower.

Introduction: Sikkim, located in the Eastern Himalayas has a geographic area of 7,096 km², supporting a little over half a million population, the Sikkim state has an altitudinal range varying from 300m to 8586m above sea level, representing tropical, sub-tropical, temperate and alpine regions and a small portion of cold desert. The annual rainfall ranges from less than 5 mm to nearly 4000 mm. The state has about 80% of its geographical area under forest cover, with an estimated over 4500 species of flowering plants. The rich floral diversity of Sikkim has fascinated a wide range of scholars from all over the world. Besides 39% area occupied by alpine pastures and snow, the state supports an immensely rich reservoir of biological diversity as tremendously useful genetic resource pool.

Invasive species are defined as organisms (plant, animal, fungus, or bacterium) that are not native and has negative effects on a region's economy, environment, or public health. Not all introduced species are invasive. In simple word "a non-indigenous species that spreads from the point of introduction and becomes abundant". Invasive species cause loss of biodiversity including species extinctions, changes in hydrology and ecosystem function. Wild species are available throughout Sikkim which has economic important. Hence, a study was conducted using survey to know about its economic value.

Objective:

- To know about some of the invasive species found in Sikkim.
- To know about the wild flora found in Sikkim.

Material and Method: The study was conducted among in four districts of Sikkim North, East, South and West among invasive species and wild flower species for a period of two year (January 2013 to December 2015). Primary data was collected through survey while secondary data were obtain from books (library of Sikkim university), Booklets, Various web and Pamphlet.

Result: Invasive species and wild flower found in four districts of Sikkim.



Common name: big-sage, wild-sage, red-sage, white-sage and tickberry.

Botanical name: *Lantana camara* **Family:** Verbenaceae

Synonyms: *Lantana aculeata* L, *Camara vulgaris*.

Lantana camara, a beautiful plant often planted in gardens, has spread from its native Central and South America to around 50 different countries, where it has become an invasive species. *Lantana camara* is a small perennial shrub which can grow to around 2 m tall and form dense thickets in a variety of environments. *Lantana camara* has small tubular shaped flowers which each have four petals and are arranged in clusters in terminal areas stems. Flowers come in many different colours including red, yellow, white, pink and orange which differ depending on

location in inflorescences, age, and maturity. After pollination occurs the colour of the flowers change (typically from yellow to orangish, pinkish, or reddish), this is believed to be a signal to pollinators that the pre-change colour contains a reward as well as being sexually viable, thus increasing pollination efficiency. The leaves are broadly ovate, opposite, and simple and have a strong odour when crushed. The fruit of *L. camara* is a berry-like drupe which turns from green to dark purple when mature. Both vegetative (asexual) and seed reproduction occur.



Common name: Daisy Fleabane, Hairy Fleabane, Erigeron **Botanical name:** *Erigeron bellidioides* **Family:** *Asteraceae* (Sunflower family) **Synonyms:** *Aster bellidioides*. Daisy Fleabane are carpeting plants which spontaneously bloom in hill-stations, on the ground with wild grass, peering from wall cervices, and almost any place available. This evergreen perennial with green foliage, produces an abundance of yellow centered, small daisy-like flowerheads in summer. The outer petals are initially white, maturing to pink. Native to the Indian Subcontinent: Himachal Pradesh, Jammu and Kashmir, Meghalaya, Sikkim, Uttarakhand, Nepal, Pakistan, Bhutan.



Common name: Double-Spotted Swertia. **Botanical name:** *Swertia bimaculata*. **Family:** *Gentianaceae* (Gentian family) **Synonyms:** *Ophelia bimaculata*. Double-Spotted Swertia is a very pretty wildflower,

native to eastern Himalayas and China. Flowers are borne in lax panicles of cymes, spreading branched, many flowered, up to 50 cm. Flowers have parts in fives. Sepals are narrowly oblanceolate to narrowly elliptic, 3-6 mm. Flowers are yellow or white, with purple spots, to 2.5 cm in diameter. Petals are oblong to elliptic, 1-1.5 cm long, with base narrowed, tip pointed. Each petal has two yellow-green spots, which are actually nectaries. Filaments are 5-6.5 mm long, and anthers are ellipsoid, 2.5 mm. It is an annual herb, growing to 1-4.5 ft tall. Roots are yellow and fibrous. Stems are erect, branched, slender, 2-6 mm in diameter. Basal leaves wither away at maturity. Stem leaves are almost stalkless, broadly elliptic to ovate-lance-shaped, 3.5-9 cm long, 1-4 cm wide. Leaf base is narrowly tapered to obtuse, and the tip is tapering. Style is not distinct; stigma lobes are capitate. Capsules are narrowly ovoid, up to 2.3 cm. Double-Spotted Swertia is found beside streams, swamps, meadows and forests, at altitudes of 200-3000 m. Flowering: June-November.



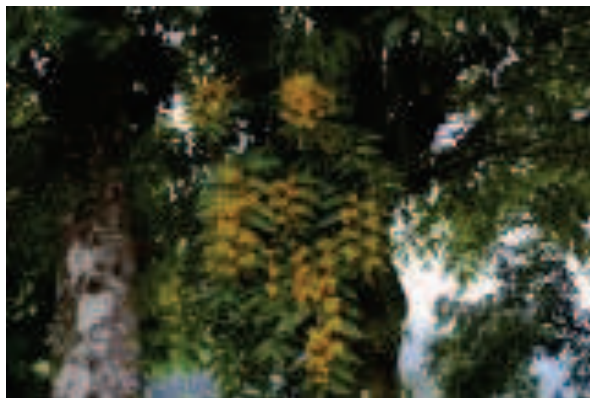
Common name: Slipper Flower, Slipperwort, Gold Purse **Botanical name:** *Calceolaria tripartite*. **Family:** *Scrophulariaceae* (Dog flower family) **Synonyms:** *Calceolaria gracilis*, *Calceolaria mexicana*. Native to Mexico, Slipper Flower is a small and showy annual with divided leaves and spikes of puffy, pale yellow flowers. Flowers are about 1 cm or more, long-stalked, in branched leafy clusters. It makes a very multi-branching plant with the brightest lemon-drop little yellow "balloons" evenly spaced throughout the fresh green foliage. Leaves quite often vary in shape and form. They are pinnate or pinnately lobed, or entire and coarsely toothed, stalked hairy. Leaf blade is 2.5-5 cm long. The generic name is derived from *Calceolarius*, meaning shoemaker in Latin and describes the flowers, whose shape of the lower lip reminds people of a lady slipper. This plant has escaped cultivation in many area in India, and can be seen growing wild, even in the Himalayan region. Flowering: April-December.



Common name: Golden Flowered Dendrobium.
Botanical name: *Dendrobium chrysanthum*.
Family: *Orchidaceae* (Orchid family). Golden Flowered Dendrobium is a large sized, cool to warm growing epiphyte, lithophyte on limestone cliffs. Its is widespread through the Himalayan foothills of the western Himalayas, Assam India, China, Nepal, Bhutan, Sikkim, Myanmar, Thailand, Laos and Vietnam in humid, mossy, mixed and coniferous forests and primary, broadleaved, evergreen, lowland forests at an elevation of 350-2200 meters. The plant has pendulous, many noded, grooved stems. to 5 ft long. These stems carry ovate-lanceolate, acuminate, bright shiny green leaves. It blooms from April till November on an axillary, very short, opposite of leaves, few to several flowered, racemose inflorescence that arise on the nodes on the upper portion of an immature leafed pseudobulb. The inflorescence arises opposite of the leaves with 1 to 3 fragrant, fleshy flowers. This species is best placed in a wire basket with well-draining media to accommodate their pendant growth habit.

Common name: Violet Wishbone Flower. **Botanical name:** *Torenia violacea* **Family:** *Linderniaceae* (False-Pimpernel family) **Synonyms:** *Mimulus violaceus*, *Torenia peduncularis*

Wishbone Flower is an annual herb, 8-35 cm tall. Stems are erect or somewhat creeping, branched near base. Leaves are decreasing in size upward. Leaf-stalks are 0.5-2 cm long. Leaves are ovate to narrowly ovate, 2-4 X 1-2 cm, hairy, base wedge-shaped to somewhat flat, margin shallowly toothed, tip long-pointed. Flowers are borne in fascicles at branch ends or singly in leaf axils, rarely in racemes. Flower-stalks are about 1.5 cm long, up to 3 cm in fruit. Sepal tube is 5-winged, oblong-fusiform, 1.0-1.7 cm X 6-8 mm, up to 2 X 1 cm in fruit, base rounded and slightly decurrent. Wings are up to 2.5 mm wide, lobes 5. Flowers are bluish violet, 1.5-2.2 cm, 2-lipped, exceeding the sepal-tube by 1-2 mm. Lower lip is 3-lobed, lobes circular, about 3 X 4 mm, nearly equal. Upper lip is nearly erect, circular, about 5 mm in diameter. Stamens are 4. Capsule is oblong, 0.8-1.4 cm, enclosed by persistent sepal tube. Violet Wishbone Flower is found on grassland on mountain slopes, forests, along trails, in the Himalayas, from Kumaon to Bhutan, China, Cambodia, Indonesia (Java), Laos, Malaysia, Philippines, Thailand and Vietnam, at altitudes of 200-2000 m. Flowering: July-October.



Common name: Blue oxalis, Shamrock pea.
Botanical name: *Parochetus communis*.
Family: *Fabaceae* (pea family). Blue oxalis is a brilliant blue flower from the Himalayas. From the leaves one could be forgiven for thinking it is a clover but the pea-like flower sets it apart. This little creeper covers itself with bright blue pea-like flowers during the flowering months. The three-part leaves have leaflets which are inverted heart-shaped. Flowers, 1.3-2.5 cm long, stand erect above the leaves. Sepal cup is bell-shaped. This is a tuberous, prostrate perennial that is dormant during the winter. Flowering: May-November.



Common name: Four-Leaf Peperomia. **Botanical name:** *Peperomia tetraphylla*.

Family: *Piperaceae* (Pepper family).

Synonyms: *Piper tetraphyllum*, *Piper pusillum*, *Peperomia reflexifolia*. Four-Leaf Peperomia is a small decumbent or erect herb, with stems 5-20 cm long. Leaves occur in whorls of 4, elliptic to broad-ovate, 6-12 mm long, 5-10 mm wide, tip blunt to pointed, base wedge-shaped to rounded, margins entire, glossy above, venation obscure, stalk 1-3 mm long. Flowers are borne in spike-like inflorescence at branch ends, flowers tiny, crowded, axis 1-3 cm long, about 1 mm wide and enlarging to 2 mm wide during fruit formation. Ovary is partly immersed in floral axis. Drupes are partly immersed in axis. Four-Leaf Peperomia is found in the Himalayas, from Kashmir to Bhutan and SE Asia, at altitudes of 1000-2500 m.

Common name: Chameleon Plant, lizard tail, heartleaf, fishwort. **Botanical name:** *Houttuynia cordata*. **Family:** *Saururaceae* (Lizard-tail family). **Synonyms:** *Houttuynia foetida*, *Polypara cordata*. Chameleon Plant is a herbaceous perennial plant growing to between 20 and 80 cm. The proximal part of the stem is trailing and produces adventitious roots, while the distal part of the stem grows vertically. The leaves are alternate, broadly heart-shaped, 4-9 cm long and 3-8 cm broad. Flowers, growing usually in summer, are greenish-yellow, borne on a terminal spike 2-3 cm long with 4-6 large white petal-like bracts. It is grown as a leaf vegetable, particularly in Vietnam, and is used as a fresh herbal garnish. The leaf has an unusual taste that is often described as 'fishy' (earning it the nickname "fish mint"), so it is not enjoyed as universally as basil, mint, or other more commonly used herbs. In NE India, particularly Meghalaya, it is locally known as ja mardoh and used in salads or cooked with other vegetables. In Manipur, it is known as *toningkok* and used as garnish over eromba and singju, ethnic side dishes.

Medicinal uses: Leaf-extract is used in dysentery, rhizome is used in stomach ulcers. Boiled extract of rhizomes is taken for muscular pains due to overstrain.



Common name: False-Nettle Leaved Pepper.

Botanical name: *Piper boehmeriaefolium*.

Family: *Piperaceae* (Pepper family).

Synonyms: *Chavica boehmeriaefolia*, *Piper boehmeriaefolia*?

False-Nettle Leaved Pepper is an erect subshrubs 1-3 m tall, hairless to uniformly hairy, most parts usually drying black. Stems are round to thickly ridged when dry, minutely papillate to smooth, usually hairless. Leaf-stalks are 3-10 mm. Leaves, toward base of stem, are elliptic, narrowly elliptic, oblong, oblong-lanceolate, or ovate, 11-24 × 4-9.5 cm, papery to thinly papery, densely finely glandular, smooth above, base oblique, 1 side rounded, other side tapered and acute, bilateral difference 2-3 mm, tip pointed to long pointed, veins 6-10, usually 1 more lateral vein on wider side. Flower-spikes are mostly leaf-opposed, often at branch ends in male plants. Male spikes are

10-16 cm × 2-3 mm, carried on 1-3.5 cm long stalk. Female spikes are 6-12 cm. Fruits are densely clustered, round, distinct, 1.2-3 mm in diameter. False-Nettle Leaved Pepper is found in Eastern Himalayas, from Bhutan to NE India, Malaysia, Myanmar, Sikkim, Thailand, N Vietnam and parts of China, at altitudes of 500-2200 m. Flowering: December-July.



Common name: Sikkim Cobra Lily. **Botanical name:** *Arisaema utile*. **Family:** *Araceae* (Arum family)

This very intriguing plant has a flower that is shaped like an extended hood of a Cobra. The leaves of Sikkim Cobra Lily are divided into three large leaflets. The middle one is rhombic to almost circular. The flower has large outer bract enclosing the flower-head, known as the *spathe*. The spathe is purple in colour with white stripes. A thread-like appendage, 15-22 cm long, longer than the spathe, extends forward from within the bract. Flowering: June July.



Common name: Slender Anthogonium. **Botanical name:** *Anthogonium gracile*.
Family: *Orchidaceae* (Orchid family).
Synonyms: *Anthogonium griffithii*, *Anthogonium corydaloides*.

Slender Anthogonium is a deciduous, miniature to medium sized terrestrial orchid found in eastern Himalayas in semi-deciduous and deciduous dry lowland forests. The plants have ovoid pseudobulbs carrying 1-3, deciduous, stalked, narrowly lance-shaped leaves. The plant blooms in fall season on an erect, slender, very long (up to 45 cm), branched or simple, raceme with 10-12 flowers that do not open well. The flowers are pink-purple in color and a strongly remind of *Corydalis*.



Common name: Clustered Coelogyne. **Botanical name:** *Coelogyne corymbosa*.

Family: *Orchidaceae* (Orchid family).

Synonyms: *Pleione corymbosa*.

Clustered Coelogyne is an epiphytic orchid distinguished by its small pseudobulbs, and its erect clusters of only 2-4 white fragrant flowers each up to 5 cm across. Sepals and petals are white, broadly lanceshaped, lip oblong with broad blunt erect lateral lobes, the central lobe triangular-ovate, brown at base with two yellow blotches and with a white terminal part. Leaves are oblong-elliptic, 10-18 cm long. Pseudobulbs are 2.5-4 cm, borne on a thick rhizome. Clustered Coelogyne is found in Eastern Himalayas, from C. Nepal to NE India and SW China, at altitudes of 2200-3300 m. Flowering: April-June.



Common name: Pineapple Orchid, Densely Flowered Dendrobium. **Botanical name:** *Dendrobium densiflorum*

Family: *Orchidaceae* (Orchid family).

Synonyms: *Callista densiflora*, *Callista clavata*, *Dendrobium clavatum*

Pineapple Orchid is a spectacular orchid which is easily identified by the densely packed clusters of flowers hanging down, looking like pineapples. Flowers are yellow with a rich orange lip which is funnel shaped below and expands outwards into a rounded hairy and toothed top. Flowers are 3.5-4 cm across, densely packed into large dense hanging clusters. When in bud, the clusters looks like cones. Leathery leaves, borne towards the tip of the pseudo-bulb, are oblong-elliptic, 10-15 cm long. Pseudo-bulbs are club-shaped, 1-1.5 ft long, with prominent

internodes. Pineapple Orchid is native to C. Nepal to NE India and Burma. Flowering: April-May.



Common name: Forked Habenaria. **Botanical name:** *Habenaria furcifera*.

Family: *Orchidaceae* (Orchid family).

Synonyms: *Habenaria ovalifolia*, *Habenaria modesta*, *Habenaria hamigera*.

Forked Habenaria is a terrestrial orchid, 1-2 ft tall. Stem is sheathed in lower part, with 3-6, large, elliptic, acute, up to 15x5 cm leaves, crowded below the middle, above with appressed linear-lanceolate sheaths. Inflorescence is 12-30 cm long, narrowly cylindrical, rather lax. Bracts are lanceolate-long-pointed, as long as ovary. Flowers are green, sepals nearly equal in length, the dorsal one ovate-oblong, concave, 5 mm long, the lateral sepals falcately oblong, usually slightly longer. Petals are oblong, blunt, 5-6 x 2 mm. Lip is parted in three, with threadlike side-lobes, slightly diverging, 9 x 1 mm, longer than the straight, narrow- lanceshaped mid-lobe. Spur is slender, longer than ovary, 2 cm, narrow- cylindrical, prominently widened at base. Forked Habenaria is found in the region from NW Himalayas to Sikkim, Bhutan and Assam, at lower

altitudes, 150-1800 m, and in Western Ghats. Flowering: July-August.



Common name: Low Growing Pleione, Ground Growing Pleione. **Botanical name:** *Pleione humilis*. **Family:** *Orchidaceae* (Orchid family). **Synonyms:** *Epidendrum humile*, *Dendrobium humile*, *Coelogyne humilis*.

Low Growing Pleione is an orchid found from Nepal to Sikkim at elevations of 1100-3500 m, growing on moss or the smooth trunks of rhododendron trees. It is a small sized terrestrial or epiphyte orchid with ovoid-conical pseudobulbs, carrying a single, apical, deciduous, inverted-lance-shaped, somewhat pointed leaf. The plant blooms on a basal, 3-5 inches long, single flowered inflorescence enveloped by a green sheath, with a slightly fragrant, color variable flower. Flowers are generally pure white, with the lip strongly marked in blood red.



Common name: Comb Trudelia. **Botanical name:** *Trudelia cristata*. **Family:** *Orchidaceae* (Orchid family). **Synonyms:** *Vanda cristata*, *Aerides cristatum*, *Luisia striata*.

Comb Trudelia is a forest orchid with stout stems that are 7.5-15 cm long. It grows on other plants. Leathery recurved leaves, 7.5-12.5 cm long and 1.2-1.8 cm broad are borne in two ranks along the stem. The

leaf tips looked as if they have been torn off, with three irregular teeth. Short inflorescences carry 2-6 waxy, fragrant flowers on long twisted stalks close to the stem. The flowers are 4-5 cm across and have uniform yellow to green, narrow incurved sepals and petals. The thick, fleshy prominent lip is yellow, cream or white, striped with purple to maroon or red-brown. Its tapered lip mid-lobe bears two slender elongate processes or horn-like processes at the end, which look like tusks. Lip shape and color varies greatly. Not only does it vary from flower to flower on the same inflorescence but also markedly year to year on different flowerings of the same plant. Comb Trudelia is found in the Himalayas, from Uttarakhand to Arunachal Pradesh, at altitudes of 1000-2300 m. Flowering: May-June.



Common name: Orange Daylily. **Botanical name:** *Hemerocallis fulva*. **Family:** *Liliaceae* (lily family).

Orange daylily is a popular ornamental that has escaped and is invaded natural and disturbed areas throughout the United States. Leaves are long, grass-like, and bright green in color. Flowers are large, showy, and orange in color. Flowers may have spots or stripes. Daylilies are clump forming perennials with arching, grasslike or straplike leaves 10-40 in long, depending on the cultivar. All the leaves arise from the base of the plant in two opposing ranks, resulting in a fanlike appearance which becomes obscured as the clump enlarges. A leafless stalk, called a scape, extends above the leaves and bears the flowers. Most scapes have two or more branches, each with several flower buds. In most varieties the flowers open one at a time, and last only one day, but the blooming period may extend for weeks, even months. There are hundreds of societies dedicated to the cultivation of daylilies and the propagation of new cultivars.



Common name: Wandering Dew-Grass. **Botanical name:** *Cyanotis vaga*.
Family: *Commelinaceae* (Dayflower family).
Synonyms: *Cyanotis barbata*, *Commelina hirsuta*, *Tonningia barbata*.

Wandering Dew-Grass is a slender sparsely-branched plant, with narrow-lance-shaped leaves often with long woolly hairs on the sheaths. Flowers are small dark-blue, subtended by long straight or curved bracts. Flowers are about 1 cm across, in clusters in leaf axils or at branch ends. Stamen filaments have long white or blue hairs. Bracts are hairy with enlarged rounded bases. Leaves are 3-7.5 cm long, variably hairy. Stem is usually 8-30 cm long, often tufted and rooting at the nodes. Wandering Dew-Grass is found in the Himalayas, from Pakistan to SW China and Burma, at altitudes of 800-2700 m. Flowering: July-September.



Common name: Himalayan Mayflower. **Botanical name:** *Maianthemum purpureum*.
Family: *Asparagaceae* (Asparagus family).
Synonyms: *Smilacina purpurea*, *Smilacina pallida*, *Smilacina purpurea f. albiflora*.

Himalayan Mayflower is a leafy erect plant, with alternately arranged, large elliptic leaves in two ranks. White or purple flowers arise in a narrow spike-like cluster, often pendulous, at the end of the stem. Petals are oblong or elliptic, 4-6 mm long. Stamens are shorter than the petals. Inflorescence sometime has one or two branches below. Leaves are 3-9, usually 5-12 cm long, with fringe hairs on the margin. Leaves are stem-clasping. Stem is often hairy, unbranched, 20-40 cm tall. Young plants are used as boiled vegetable. Himalayan Mayflower is found in the forest of the Himalayas, from Himachal Pradesh to SW China, at altitudes of 2400-4200 m. Flowering: April-June.



Common name: Black Cardamom, hill cardamom, Bengal cardamom, greater cardamom, Indian cardamom, **Botanical name:** *Amomum subulatum*.
Family: *Zingiberaceae* (Ginger family).
Synonyms: *Cardamomum subulatum*.

Black Cardamom is an evergreen plant that grow up to 5 ft tall. Leaves are found on the upper portion of the stem. The old stems die down after a few years. The rhizomes are a dull red colour. Flower buds appear in spring from the base of the rhizome. The peduncle is short and the buds encased in tight red bracts. Flowers appear from spring through mid summer. Individual flowers stay open for three days and more and new ones open successively. An inflorescence stays in flower for over a month. Its seed pods have a strong camphor-like flavor, with a smoky character derived from the method of drying. The pods are used as a spice, in a similar manner to the green Indian cardamom pods, but with a different flavor. Black Cardamom is farmed in the Eastern Himalayas in Nepal, Sikkim and Bhutan at an altitude of 500-2000m, This species inhabits cool forest areas near mountain streams and damp forest floors.



Common name: Spiked Shade Ginger, Chinese Butterfly Ginger, Hardy Shade Ginger. **Botanical name:** *Cautleya spicata* **Family:** Zingiberaceae (Ginger family). **Synonyms:** Roscoea spicata.

Spiked Shade Ginger is an attractive ginger found in the Himalayas, from Himachal Pradesh to Sikkim, at altitudes of 1800-2800. Flowers are yellow, few or many, crowded in an erect spike, 13-23 cm long, at the top of the stem. The yellow flowers are covered with dark red bracts, as long as the sepal tube. Leaves are narrow-elliptic, 13-25 cm long, 5-8 cm broad. The plant grows up to 1-2 ft tall. It sometimes grows on another plant as an epiphyte. Flowering: July-September.



Common name: Wild turmeric, Aromatic turmeric. **Botanical name:** *Curcuma aromatic.* **Family:** Zingiberaceae (Ginger family).

Wild turmeric is an aromatic and pretty ginger with stout underground rhizomes. Foliage dies down in late in autumn and the rhizomes remain dormant in winter. The inflorescence appears in early spring from the base of the rhizome. Flowers are pinkish white in color, with an orange lip. The stalk grows to about 8 to 10 inches tall, and is crowned with enlarged colored bracts tipped with pink. Leaves appear after the flowers. When in full growth the plants can reach a height of about 3ft tall. Leaves are broad and very decorative, elliptic, 3-4 ft long, and 20 cm wide, leaf-stalk being as long as the blade. Good for cut-flower use with a vase life of about 10 days for a fresh stem. This species is found in the eastern Himalayas and inhabits warm forest areas. **Medicinal uses:** Wild turmeric is recognized as a medical herb with strong antibiotic properties. It is believed to play a role in preventing and curing cancer in chinese medicine. In an effort to remove cell accumulations such as a tumors, curcuma is often utilized. There are two species commonly used in cancer therapy that, like ginger, have a spicy taste. It contains aromatic volatile oils that help to remove excessive lipids from the blood, reduce aggregation of platelets (sticking of the blood cells to form masses), and reduce inflammation.



Common name: Dancing Girl Ginger. **Botanical name:** *Globba schomburgkii.* **Family:** Zingiberaceae (Ginger family).

Dancing Girl Ginger is a beautiful ginger, native to E. India, Myanmar, Thailand, Vietnam, and S. China. Pseudostems are 30-50 cm long. Leaves are 5 or 6, carried on stalk about 5 mm long. Leaves are elliptic-lanceshaped, 15-20 × 3-4.5 cm, hairless, base blunt, apex falling off. Beautiful yellow flowers are borne in a pendulous raceme or thyrses, 3-11 cm long. Bracts are lanceshaped, 0.6-1.2 cm. Cincinni, if present, 1-2.5 cm, laxly 2- to many flowered. Bulblets are present, globose or ovoid, 2-4 mm in diameter, tuberculate. Flowers are yellow or wholly reduced. Sepal cup is bell-shaped, 4-5 mm. Flower tube is 0.8-1 cm long,

with ovate petals. Lateral staminodes are lanceolate, curved. Lip is yellow, orange spotted at base, narrowly cuneate, tip 2-cleft. Filament is curved, about 1 cm, anther with 2 winglike appendages on each side. Ovary is tuberculate. Flowering: June-September.



Common name: Orange Ginger lily, Orange ginger.
Botanical name: *Hedychium coccineum*.
Family: Zingiberaceae (ginger family).
Synonyms: *Hedychium aurantiacum*, *Hedychium carneum*, *Hedychium roscoeii*.

Orange Ginger lily is a plant found in the Himalayas which produces beautiful orange bottle-brush like spikes of orange flowers. Flowers are very showy, bright orange-red, many in a long upright spike up to a foot long, each with a long-projecting stamen. The stamen has bright red filament, twice as long as the linear petals. Leaves are sheathing at the base, with long lance-shaped blade, 5-8 cm broad and up to 45 cm long. Stem can grow to 2 m. Orange Ginger lily is found growing wild in the Himalayas and in the NE India, at altitudes of 450-2000 m. Flowering: July-August.



Common name: Yellow Ginger Lily, Cream ginger.
Botanical name: *Hedychium flavescens*.

Family: Zingiberaceae (Ginger family).
Synonyms: *Hedychium coronarium* var. *flavescens*.

Yellow Ginger Lily is a coarse perennial herb with leafy shoots 1.5-2 m tall. It is found in the East Himalayas, at altitudes of 1200-2000 m. Rhizomes are 3 cm in diameter, branched, internally pale and fragrant. Leaves are oblong to lance-shaped, 20-45 cm long, 5-10 cm wide. Flowers are fragrant, borne in erect inflorescences, 15-20 cm long, 8 cm wide, primary bracts green. Sepal cup is cylindrical, 4-5 cm long, velvety or rarely smooth. Flowers are yellow, on the paler side. The flower tube is slender, 8-9 cm long, petals linear to linear-lance-shaped, 4-5 cm long. Lip is often centrally flushed with dark yellow, broadly obovate. Stamen is yellow, about as long as the lip or slightly longer. Lateral sterile stamens are white, spatula-shaped to lance-shaped 4-6 cm long. Flowering: July-October.



Common name: Kahili Ginger, Himalayan ginger, Wild ginger, Yellow ginger.
Botanical name: *Hedychium gardnerianum*.
Family: Zingiberaceae (Ginger family).

Kahili Ginger is a beautiful perennial herb with leafy stem, up to 1.5 m tall. Leaves are oblong, long-pointed, white-powdered on the underside. Flowers are bright lemon-yellow, erect densely-flowered spikes, 20-45 cm long. The name Kāhili (in Hawaiian) comes from the shape of the flower cluster which resembles a large feather topped staff carried by the king's escorts. Bracts are large, oblong, as long or longer than sepals. Flower tube is a little longer than the bracts with petals, 3.5-5 cm long, turned back. Lip is centrally tinged orange, 2.5-3 cm long. Stamen are bright reddish orange, far exceeding the lip, about 6.5 cm long. Lateral staminodes are yellow, 3 cm long. Kahili Ginger is found in the Himalayas, from c. Nepal to NE India, at altitudes of 1900 m. It is widely cultivated in many countries for its showy flowers. Flowering: August-September.



Common name: Roscoe's Lily. **Botanical name:** *Roscoea auriculata*.

Family: Zingiberaceae (Ginger family)

Synonyms: *Roscoea purpurea* var. *auriculata*

Roscoe's Lily is usually 20-40 cm tall, with 3-7 leaves. The leaf blade is 7.5-20 cm long by 2-2.5 cm wide. The leaf sheath is smooth and purple in colour. At the base of the leaves, there are ear-shaped (auriculate) outgrowths. The stalk of the flower spike does not emerge from the leaf sheaths. Several purple or white flowers are produced. Membranous bracts are 2-2.5 cm long subtending the flowers. Each flower has the typical structure for *Roscoea*. There is a tube-shaped outer calyx, about 3.5 cm long. Next the three petals form a tube longer than the calyx, terminating in three lobes, each about 3-3.5 cm long: an upright central lobe and two slightly shorter side lobes. Inside the petals are structures formed from four sterile stamens (staminodes): two lateral staminodes form what appear to be small white petals, about 1.5-2 cm long, upright and hooded; two central staminodes are fused at the base to form a lip or labellum, about 3.3-4.8 cm long by 3 cm wide. This is bent backwards and split at the end into two lobes. Roscoe's Lily is found in the Himalayas, from Uttarakhand to SE Tibet, at altitudes of 1500-3000 m. flowers between June and August.



Common name: Crimson Seeded Sedge. **Botanical name:** *Carex baccans*. **Family:** Cyperaceae (Sedge family)

Crimson Seeded Sedge is an unusual sedge native to India, Sri Lanka and China, known for its bright, showy, seed heads. It is a clumping and evergreen herb, which produces dark green leaves, 1-2 cm wide and 2-3 ft long. Its flower spike arches up and out from the clump, carrying greenish, flowering seed clusters that grow 6-12 inches long and 3 inches wide. As they mature, they turn a bright orange-red. It also makes a good cut flower. Grows best in fertile loamy soil with regular water.



Common name: Jadwar • Hindi: Jadwar, Judwar, Nirbishi, Nirbisi, Nirvisi. **Botanical name:** *Delphinium denudatum*.

Family: Ranunculaceae (Buttercup family).

Jadwar is critically endangered Himalayan herb, which was once commonest species. It is distinguished by its relatively small blue or violet flowers, borne in a widely branched inflorescence with a few spike-like clusters. Flowers are about 2.5 cm, with the upper outer petals about 1.2 cm and a spur 1.4-1.5 cm. Upper inner petals are white, the others blue. Leaves are 5-15 cm across, rounded in outline, cut into 3-5 broadly obovate segments, segments pinnately cut into oblong lobes or teeth 2-3 mm wide. Jadwar is found in the Himalayas, from Pakistan to C. Nepal, at altitudes of 1500-2700 m. Flowering: June-August.

Medicinal uses: It is one of the important drugs used as indigenous medicine in India, especially in Unani medicine. The roots of the plant are reported to be useful in a variety of ailments such as aconite poisoning, brain diseases, fungal infection, piles and toothache as analgesic and astringent. A number of studies have been done on its phytochemical and pharmacological properties. Its use in opium addiction is mentioned in some classical literature,

which has been verified and validated in morphine induced physical dependent de-addiction studies.



Common name: Cutleaf Buttercup. **Botanical name:** *Ranunculus brotherusii*.
Family: *Ranunculaceae* (Buttercup family).
Synonyms: *Ranunculus affinis* var. *dasycarpus*
 Cutleaf Buttercup is a perennial herb with erect branched 1-4 stems, usually 2.5-12 cm tall. Flowers are borne solitary at branch ends, 0.6-1.3 cm across. Sepals are 5, ovate, 2.2--3.2 mm, whitish pubescent below. Petals are 5, obovate or elliptic-obovate, 3-8 x 2.5-4 mm, nectary pit without a scale, tip rounded. Stamens are numerous, anthers oblong. Basal leaves are 5-15, stalk 1.2-3.5 cm, blade 3-parted or 3-time cut, circular-ovate or pentagonal in outline, occasionally circular and then broadly 3-lobed. Stem leaves are 2-4, lower ones similar to basal leaves, upper ones stalkless, palmately cut. segments linear. Aggregate fruit is ovoid, rarely spherical, 3-6 x 2-4 mm. Achene are slightly bilaterally compressed, obliquely obovoid, 1-1.5 x about 0.8 mm, style persistent, 0.3-0.5 mm. Cutleaf Buttercup is found in the Himalayas, from Pakistan to W China. at altitudes of 3300-5000 m. It is common in Lahaul. Flowering: May-August.



Common name: River Astilbe. **Botanical name:** *Astilbe rivularis*.
Family: *Saxifragaceae* (Saxifrage family).
Synonyms: *Astilbe indica*, *Astilbe speciosa*
 River Astilbe is a herb 1-1.5 m tall. Leaves are compound, lower leaflets usually further divided. Leaflets are 3-5, 3-8 cm long, ovate, long-pointed, base sometimes heart-shaped, stalked to stalkless, rough, especially on the veins. Leaf-stalks and rachis are covered with long hairs, tufted at the base of leaflet-stalks. Stipules are about 1 cm long, adnate to the leaf-stalk. Flowers are borne in long terminal branch pyramidal clusters of tiny greenish yellow flowers. Peduncle is glandular villous. Flowers are bracteate, bracts lanceshaped, about 2 mm long. Sepals are 5, 1.5 mm long, ovate, basally adnate to the ovary, persistent. Petals are absent. Stamens are 5, opposite the sepals, filaments 2.5 mm long. Carpels are connivent, oval, about 1.5 mm, each prolonged into a short style, less than 1 mm long. Capsules are about 4 mm long, splitting longitudinally into 2 valves. Seeds are numerous, 2 mm long, tailed at both ends. River Astilbe is found in the Himalayas, from Kashmir to Bhutan, Assam, S. Tibet, Thailand, N. Indo-China, W. China. **Medicinal uses:** In traditional medicine, the juice of the plant is applied to sprains and swellings. Root paste is mixed with honey and taken to control post-partum diarrhoea and dysentery.



Common name: Clustered Rhodiola. **Botanical name:** *Rhodiola fastigiata*.

Family: *Crassulaceae* (Sedum family).

Synonyms: *Sedum fastigiatum*, *Sedum quadrifidum* var. *fastigiatum*, *Rhodiola coccinea*

Clustered Rhodiola is a perennial herb, found on rocks, cervices and grassy slopes of the Himalayas, from Pakistan to China, at altitudes of 3600-5500 m. Flowering stems are many on each rhizome, all unbranched, erect, growing close and parallel to each other. The species name *fastigiata* means clustered and parallel. Old flowering stems are persistent, 6-17 cm long, 0.8-2 mm wide. Stem leaves are alternate, stalkless, entire, pointed or blunt, linear-ovate or narrowly ovate, 6-12 mm long 1-1.5 mm wide. Flowers arise on top of the stems, in compact corymblike cymes, 6-15 flowered. Bracts are like the stem leaves. Flowers are yellow or red, 4-5 parted, stalk 1-4 mm long. Sepals basally fused, entire, blunt, triangular-ovate or narrowly ovate, 2.5-3.5 x 0.5-1.5 mm. Petals are entire, blunt, narrowly elliptic, narrowly obovate, linear-oblongate, 3.5-6 x 1-1.8 mm. Flowering: June-August.



Common name: One-Stamen Elatostema. **Botanical name:** *Elatostema monandrum*.

Family: *Urticaceae* (Nettle family).

Synonyms: *Elatostema diversifolium*, *Elatostema surculosum*, *Elatostema laetum*

One-Stamen Elatostema is a herb 5-20 cm tall, with separate male and female plants. Stems are ascending or erect, usually simple, hairy, covered with flaky scales. Leaves are usually opposite, hairless or becoming hairless; nanophylls elliptic to lance-shaped, 2-6 mm; stipules obscure; leaf-stalk 1-2 mm, Leaf blade is obliquely wedge-shaped, obliquely elliptic, or

lance-shaped, 0.8-4 x 0.4-1.2 cm, herbaceous or membranous, major basal lateral veins both arising at base of leaf blade, cystoliths conspicuous, sparse or present only along margins; base obliquely wedge-shaped, margin toothed or pinnatifid, tip pointed to tapering. Male inflorescences solitary, simple, 1.5-2 mm in diameter; flower-cluster-stalk 0-1 mm; receptacle obscure; bracts fused, 2-2.5 mm; bracteoles lance-shaped to linear. Female inflorescences solitary, 2-5 mm in diameter, stalkless; receptacle small; bracts broadly ovate; bracteoles spoon-shaped-linear. Male flowers 4-merous. Achenes ellipsoid, 6-ribbed. One-Stamen Elatostema is found in the Himalayas, from Himachal Pradesh to Bhutan, Western Ghats, Ceylon, Burma, Indo-China, W. China, at altitudes of 800-3000 m. Flowering: June-October.



Common name: Himalayan Nettle. **Botanical name:** *Urtica ardens*. **Family:** *Urticaceae* (Nettle family)

Synonyms: *Urtica himalayensis*, *Urtica zayuensis*

Himalayan Nettle is an annual herb, growing up to 1.5 m tall, plentifully covered with stinging hairs. Leaves are carried on 0.5-6.5 cm long stalks. Leaf blade is elliptic to ovate-lance-shaped, 2.5-10 cm long, 2.5-6.5 cm broad, heart-shaped at the base, irregularly toothed or double-toothed. Greenish flowers are borne in panicle of cymes in leaf axils, as long as leaves, puberulous and covered with stinging hairs. Stipules are united. Sepals are hispid. Achenes minute, elliptic-round, brown. Himalayan Nettle is found in the Himalayas, from Pakistan to Sikkim and W. China, at altitudes of 1000-4500 m. Flowering: March-August.



Common name: Beej Karela. **Botanical name:** *Herpetospermum pedunculosum*. **Family:** *Cucurbitaceae* (pumpkin family).

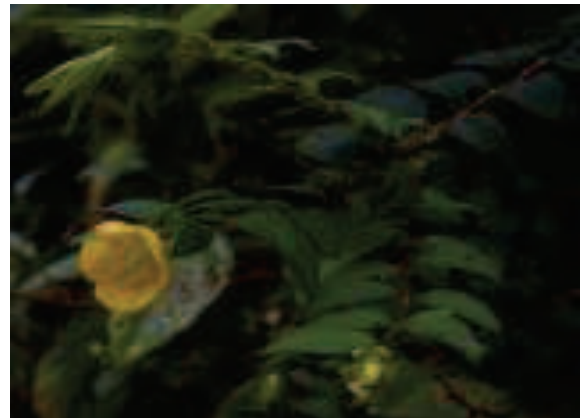
Beej karela is a large herbaceous climber on shrubs and banks, with long branched tendrils. Leaves ovate-heart-shaped, acute or long-pointed, often coarsely and shallowly lobed, rough-hairy, long-stalked. Flowers are large, bright yellow, unisexual. Male flowers clustered; female flowers solitary. The flowers are 4-5 cm across, and consists of a slender funnel-shaped tube and spreading elliptic petals. The fruit is ellipsoid, about 8 cm long, finely hairy.



Common name: Wood Sorrel, Broadleaf woodsorrel, Mexican oxalis. **Botanical name:** *Oxalis latifolia*. **Family:** *Oxalidaceae* (Wood sorrel family).

There are more than 800 species of woodsorrels or "shamrocks." Most have clover-like leaves with three leaflets, sour tasting foliage (from the oxalic acid), and flowers and leaves that close up at night. Broadleaf woodsorrel has distinctly triangular leaflets, white or pinkish flowers with green throats, and grows from a thickened, bulblike taproot. It has no stems at all. Instead, the 8-10 in leaf petioles and flower pedicels arise directly from the rootstock. The leaflets are like equilateral triangles, about 2 in on a side and smooth bright green. The five-petaled, funnel-shaped flowers are about 1 in across and borne in loose, open clusters throughout the whole summer and fall. Broadleaf woodsorrel spreads readily from

underground runners and forms a ground cover in moist, shady areas. Wood sorrels occur naturally on all continents.



Common name: Choisy's St Johns Wort. **Botanical name:** *Hypericum choisianum*. **Family:** *Hypericaceae* (St John's Wort family).

Choisy's St Johns Wort is a long-flowering, 0.3-2 m tall, evergreen, shrub native to the Himalayan region from Pakistan to Burma. Stems spreading; branches 4-lined and flattened at first, eventually terete. Leaves on 2-4 mm long stalks, are 2.5-8.8 cm long, 1-4.2 cm broad, ovate to lanceshaped or oblong-lanceshaped, apex acute or apiculate to rounded, base broadly cuneate to rounded, venation rather densely to scarcely reticulate. Flowers are borne in 1(2-7)-flowered corymb-like cymes. Flowers are 4-7 cm in diameter. Sepals are 7-18 mm long or sometimes longer and foliaceous, narrowly elliptic or lanceolate to broadly ovate or very broadly elliptic, acute to apiculate or more rarely obtuse, entire, spreading or ascending in bud and fruit. Petals are obovate, 1.6-3 cm long, 2.5-3 x longer than the stamens. Stamens are 60-80 in each fascicle. It is found in the Himalayas at altitudes of 1800-3600 m.



Common name: Starry Osbeckia. **Botanical name:** *Osbeckia stellate*. **Family:** *Melastomataceae* (Melastome family).

Synonyms: *Osbeckia sikkimensis*, *Osbeckia pulchra*, *Osbeckia rostrate*.

Starry *Osbeckia* is a herb or shrublet, 0.2-1.5 m tall, erect. Stems are 4-angled, sparsely or densely patently covered with short hairs. Leaves are opposite or 3 whorled; leaf-stalk 2-10 mm, covered with short hairs; leaf blade oblong-lance-shaped, ovate-lance-shaped, or elliptic, 4-9 x 2-3.5 cm, stiffly papery, both surfaces covered with short hairs; secondary veins 2 on each side of midvein; base blunt to somewhat heart-shaped, margin entire and fringed with hairs, tip pointed or tapering. Flowers are borne at branch-ends in racemes or paniced cymes, 4-22 cm; Flower-stalks are short or absent. Hypanthium usually purple to dark purple, 1-2.3 cm, with several rows of up to 2.5 mm setiform star-shaped trichomes on stalks. Sepals are 4, linear-lance-shaped to subulate, 0.8-1.2 cm, falling off in fruit, margin fringed with hairs. Petals are 4, pink to purple, obovate, 1.5-2 cm, margin fringed with hairs. Stamens are 8, inclined to one side; filaments equal to anther lengths; anthers narrowly lance-shaped, long-beaked; connective slightly inflated at base, below slightly inflated, above spurred. Ovary is ovoid, 4-celled, tip bristly. Capsule is long urn-shaped, contracted at middle, 1.0-1.6 x 0.5-0.8 cm, with rows of star-shaped trichomes on stalks, hairless in old specimens or basally bristly, apically hairless. Starry *Osbeckia* is found in Bhutan, Cambodia, Laos, NE India, Myanmar, Nepal, Thailand, Vietnam, at altitudes of 200-2300 m. Flowering: July-November.



Common name: Bristletips, Oxyspora. **Botanical name:** *Oxyspora paniculata*.

Family: *Melastomataceae* (Melastome family).

Synonyms: *Arthrostemma paniculatum*.

Bristletips is a shrub to 2 m tall, with spreading, drooping branches. Leaves are elliptic acute, with 5-7 prominent parallel veins and numerous fine cross veins. Leaves have rusty star-shaped hairs beneath. Flowers are to 2 cm long, occurring in long pendulous pyramidal clusters, with sepals petals and flower-stalk, all pinkish-purple. Elliptic petals fall soon. Stamens are 8 in number, with 4 longer with curved

filaments and purple anthers, and 4 shorter with yellow anthers. It is found in the Himalayas from Nepal through Bhutan, northeastern India, and Burma to southwestern China.



Common name: Pink Knotweed, Pink-head knotweed, Pink bubbles. **Botanical name:** *Persicaria capitata*. **Family:** *Polygonaceae* (Knotweed family).

Synonyms: *Polygonum capitatum*.

Pink knotweed is a mat-forming perennial herb from the Himalayas. The stems are prostrate, sometimes rooting at the nodes, 5-35 cm long, many-branched. Elliptic-ovate to elliptic leaves, 1-4 cm long, have a conspicuous purple V-shaped band, occasionally also tinged red or purple. Leaf margins have glandular hair. Light to dark flowers occur in nearly spherical or head-like spikes, at the ends of the branches. The stalk carrying the heads has purple glandular hairs.



Common name: Himalayan Hydrangea. **Botanical name:** *Hydrangea heteromalla*.

Family: *Hydrangeaceae* (Hydrangea family)

Himalayan Hydrangea is a large shrubs or small tree, 2-5 m tall or more. Leaf-stalks are purplish red, 2-4 cm, hairy. Leaves are broadly ovate, elliptics or

oblong-ovate, 6-15 × 3-8 cm, papery. They are densely gray-white on the underside, yellow-brown hairy to hairless above, secondary veins 7-9 on both sides of midvein, base shallowly heart-shaped, blunt or flat, margin densely toothed or doubly toothed, tip pointed to long pointed. Flowers are borne in flat-topped clusters 15-22 cm across. Sterile flowers with 4 white or yellowish sepals, elliptic, broadly ovate, or broadly round, 0.7-1.6 × 0.5-1.4 cm, sit on the outside of the clusters. Fertile flowers with calyx tube nearly funnellform to bell-shaped, 1-1.5 mm are in the center of the cluster. Petals white or yellowish, oblong-ovate, 1.8-2 mm. Stamens are 10, unequal. Capsules are ovoid-globose to globose, 2.5-3.5 mm in diameter, projected apical part conical, 0.8-1.2 mm, about 1/3 as long as capsule body. Himalayan Hydrangea is found in the Himalayas, from Uttarakhand to SW China and Myanmar, at altitudes of 2400-3300 m. Flowering: June-July.



Common name: East Himalayan Balsam. **Botanical name:** *Impatiens argute*.

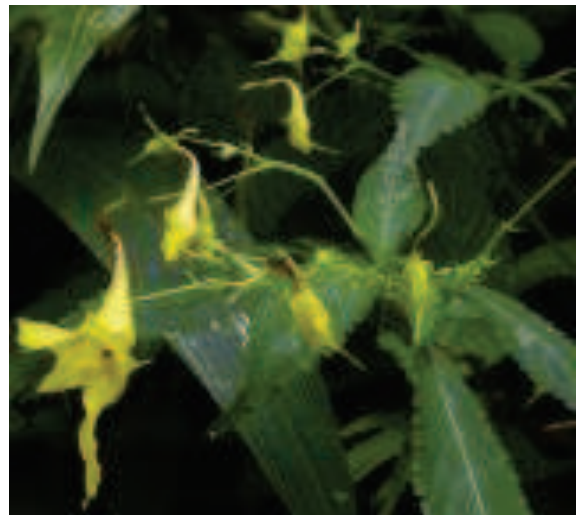
Family: *Balsaminaceae* (Balsam family).

Synonyms: *Impatiens gagei*.

East Himalayan Balsam is a beautiful wildflower found in the forests, thickets, grasslands in valleys, along canals and moist places, in East Himalayas, from E. Nepal to NE India, at altitudes of 1800-3200 m. It is a perennial plant, growing up to 70 cm tall. Erect stems are rigid and branched. Alternately arranged leaves, carried on 1-4 cm long stalks, are ovate or ovate-elliptic, 4-15 cm long, and 2-4.5 cm broad. Leaf margins are sharply toothed, and the tip is pointed or tapering. Flowers arise singly or doubly in leaf axils. Flower stalks are long, slender, often with 2 bracts at base. Flowers are pink or purple-red, large or medium-sized. Flowers are characterized by lower lobes of the lateral petals being divided into two. Lateral sepals are 4 - outer 2, with tip long cuspidate - inner 2, narrowly lanceshaped. Lower sepal is sac-like, narrowed into an incurved, short

spur. Upper petal is circular. Lateral united petals are not clawed, 2-lobed.

Medicinal uses: The flowers are used medicinally for dissolving clots, promoting diuresis, and treating abdominal pain, postpartum blood stasis, carbuncles, and difficulty in urination.



Common name: Long-Horned Balsam. **Botanical name:** *Impatiens dolichoceras*.

Family: *Balsaminaceae* (Balsam family)

Long-Horned Balsam is an annual herb, 50-80 cm tall. Stem is erect, robust, long naked in lower part, branched or simple, with few supporting roots. Leaves are alternately arranged. Leaf-stalks are winged. Leaves are pale green below, sometimes turning purple when dry, green above, oblong-ovate or oblong-lanceshaped, 8-15 cm long, 2.5-4.5 cm wide, membranous, both surfaces hairless, margin toothed. Lateral veins are 6-8 pairs, curved, base wedge-shaped, narrowed into leaf-stalk. Tip is long-pointed. Flowers are borne in upper leaf axils, in 5-7-flowered racemes. The stalks carrying racemes are longer than leaf-stalks, 8-12 cm long. Flower-stalks are 1.5-2.5 cm, slender. Bracts are persistent, green, ovate or ovate-lanceolate, 5-7 × 2-3 mm. Flowers are yellow, purple spotted, 2.5-3 cm deep. Lateral sepals are 2, ovate, 4-5 × 2 mm. Lower sepal is purple-red spotted, boat-shaped, gradually narrowed into an incurved spur. Spur is long, about 1.5 cm, slender. Mouth is abruptly curved, tip long-pointed. Upper petal is boat-shaped, shorter than lower sepal, tip rounded, midvein thickened, crested. Lateral united petals are spotted, longer than upper petal, 2-lobed. Basal lobes are round, distal lobes narrowly linear, tip long-pointed. Filaments are linear, anthers ovoid, apex obtuse. Capsule is about 2.5 cm long. Long-Horned Balsam is found in China, and Arunachal Pradesh. Flowering: July-September.



Common name: Curved-Fruit Rhododendron.
Botanical name: *Rhododendron campylocarpum*.
Family: *Ericaceae* (Heath family).
Synonyms: *Rhododendron campylocarpum* subsp. *campylocarpum*

Curved-Fruit Rhododendron is a small bush, averaging 6 ft in height, rounded in form, of a bright cheerful green hue. With its inflorescence of grace, has been regarded by some as the most charming of the Sikkim Rhododendrons. Flowers are horizontal and nodding, truly bell-shaped, delicate in texture, tinged of a sulphur hue and always spotless, nearly 5 cm long, broader across the lobes, which are finely veined. The plant exhales a grateful honeyed flavour from its lovely bells and a resinous sweet odour from the stipitate glands of the petioles, pedicels, calyx, and capsules. Leaves are borne on slender stalks, about 2 cm long, leathery but not thick in texture, 5-9 cm long, 4-5 cm broad, heart-shaped at the base, rounded and mucronate at the apex. In all characters, except the evanescent glandular hairyness and spherical buds, it is undistinguishable from Thomson's Rhododendron. The stalks of the capsules radiate horizontally from the apices of the ramuli, and the capsules themselves curve upwards with a semicircular arc. They are about an inch long, always loosely covered with stipitate glands. Curved-Fruit Rhododendron is found in the Eastern Himalayas, in Bhutan, NE India, Myanmar, Nepal and Sikkim, at altitudes of 3000-3900 m. Flowering: May-June.

Common name: Globe Primrose, Oxyspora.
Botanical name: *Primula glomerata*.
Family: *Primulaceae* (Primrose family).

Globe Primrose is distinguished by its compact spherical head of many blue flowers, carried on top of stem 10-30 cm tall. Oblong to lancelike leaves, with raggedly toothed margins and winged leaf-stalk, are arranged in a rosette. Flowers are funnel shaped with spreading, inverted heart-shaped petals. Petals are 6-10 mm long, and deeply notched. Globe Primrose is found high in the Himalayas, at altitudes of 3000-5000 m. Flowering: August-November.



Common name: Tibetan Blueberry. **Botanical name:** *Vaccinium vacciniaceum*.
Family: *Ericaceae* (Heath family).
Synonyms: *Vaccinium serratum*, *Agapetes serrata*
 Tibetan Blueberry is an evergreen shrub, terrestrial or epiphytic, about 0.5 m tall. Twigs are rounded, densely shortly setose, becoming, persistent bud scales few, oblong-lanceolate. Leaves appear to be 5-8-whorled, carried on stalks 1-4 mm. Leaves are oblong-lance-shaped, 3.5-5 x 0.9x1.4 cm, papery, hairless, secondary veins 7-11 pairs, spreading, base

wedge-shaped or broad to narrowly rounded, margin plane, sparsely toothed, tip narrowly pointed to tapering, up to 1 cm. Flowers are borne in racemes or corymblike racemes, 1.5-6 cm, hairless or sparsely glandular hairy, with persistent bud scales, many flowered. Bracts are narrowly triangular, about 3 mm, falling off. Flower-stalks are 5-9 mm, hairless, thickened upwards. Sepal-cup is 1-1.5 mm, hairless, sepals triangular, about 1 mm. Flowers are greenish yellow, urn-shaped, 4-6 mm, hairless, petals about 0.6 mm. Filaments are 1-2 mm, anthers about 4 mm, without spurs. Berry is somewhat 10-chambered. Tibetan Blueberry is found in Eastern Himalayas, at altitudes of 1200-2400 m. Flowering: April.



Common name: Himalayan Mussaenda. **Botanical name:** *Mussaenda roxburghii*.

Family: *Rubiaceae* (Coffee family)

Himalayan Mussaenda is a shrub up to 3 m tall, with stem usually hairy above. Leaves are oblong-lance-shaped, long-pointed, bristly hairy on midrib beneath, short-stalked. Flowers are borne in dense clusters about 5 cm across, at branch ends. Sepals are 5. Four sepals are small, but one is often enlarged into a white inverted-lance-shaped, stalked "leaf". Flower-tube is narrow, 3-3.5 cm long, silky. Petals are bright orange inside, white outside, with short pointed tip. Berries are oblong-ellipsoid, smooth, crowned with the sepals. Himalayan Mussaenda is found in East Himalayas, from C. Nepal to Bhutan, Assam and Burma, at altitudes up to 1600 m. Flowering: May-August.



Common name: Purple Stalked Gentian. **Botanical name:** *Gentiana pedicellata*.

Family: *Gentianaceae* (Gentian family).

Synonyms: *Ericala pedicellata*, *Gentiana pedicellata* var. *wallichii*.

Purple Stalked Gentian is a tiny annual lax herb, to 8 cm or shorter. It bears tiny blue flowers at the end of lateral branches. Flowers are tiny, 6-8 mm long, pale blue, with shallow-triangular petals, and a little shorter lobules in between them. Sepal tube is about half as long as the flower tube, with outcurved sepals. Leaves are lance-shaped, 5-20 mm long, the basal leaves, when present, are much larger and broader. Purple Stalked Gentian is found in the Himalayas, from Pakistan to Burma, at altitudes of 750-3800 m. Flowering: January-June.



Common name: Blue Dawn Flower, Oceanblue morning-glory, Blue morning-glory.

Botanical name: *Ipomoea indica*.

Family: *Convolvulaceae* (Morning glory family).

Synonyms: *Ipomoea learii*, *Ipomoea congesta*, *Convolvulus indicus*.

Blue Dawn Flower is a morning glory vine with a striking purple-blue color flowers. Origin of the plant is uncertain, but it is widespread throughout the tropical world. The flowers open in the morning and fade to magenta in the evening. Blue Dawn Flower is a perennial with heart-shaped or 3-lobed leaves and with flowers produced daily from a dense clustered inflorescence. Blue Dawn Flower is commonly found at hill stations like Nainital and Mussoorie, scrambling over fences and over woody plants, often to their detriment. It is also found in south India. It has been described as troublesome if left unchecked. But it is delight when in flower. This plant can produce hundreds a fragile flowers everyday and since it works on a 24 hour cycle it can leave a messy carpet below. The flowers are dark blue in the morning to purple/magenta at noon and pink in the evening. The next night they will curl fuchsia-shaped and fall to the ground the next day or two.



Common name: Sikkim Blushwort. **Botanical name:** *Aeschynanthus parviflorus*.

Family: *Gesneriaceae* (Gloxinia family).

Synonyms: *Aeschynanthus sikkimensis*, *Aeschynanthus maculatus*

Sikkim Blushwort is a shrub which grows hanging on bigger plants. It has green stems, growing up to 1 m long. Flowers are crimson, 3 cm long, curved, striped with black at the tip. They are borne in dense clusters at the end of branches. The tip of the tubular flowers has small rounded petals. Stamens are slightly protruding and the style is long-projecting. Sepal cup is short, about 5 mm. Oppositely arranged leaves are thick leathery, lanceshaped, long pointed, up to 12 cm long. Capsule is linear 30-50 cm, containing seeds with very long hairs. Flowering: May-June.



Common name: Himalayan Plantain Ashwakarn.

Botanical name: *Plantago himalaica*.

Family: *Plantaginaceae* (Isabgol family)

Himalayan Plantain is a perennial, stemless, hairless herb with short thick, up to 2 cm long rhizomes. It is characterized by a rosette of basal leaves, usually carried on a short stalk. Leaves are 2-6 cm long and 1.5 to 3 cm wide with 3 or 5 ribs, the margin may be more or less serrated. The inflorescence is an erect spike, 2-5 cm long, carried on a 10-17 cm long, leafless

flowering stem. *Plantago himalaica* is closely related to *Plantago major* in the form of leaves, scapes and spikes etc., but is distinguished by having a stipitate calyx and comparatively smaller, usually stalkless, sometimes shortly stalked leaves. Himalayan Plantain is found at altitudes of 2900 m and above in the Himalayas, from Kashmir to Nepal.

Medicinal uses: Leaves slightly bruised, are applied on wounds. Oil from the seeds is antimicrobial, for chronic diarrhoea and shigellosis, a bacillary dysentery.



Common name: Sikkim Clock Vine. **Botanical name:** *Thunbergia lutea*.

Family: *Acanthaceae* (Acanthus family).

Synonyms: *Thunbergia salweenensis*.

Sikkim Clock Vine is a creeper up to 5 m or longer, climbing. Stems are hairless except for a circle of trichomes on nodes. Leaf-stalks are 5-7.5 cm, hairless. Leaves are ovate to lanceshaped-ovate, 4-13 x 2-6 cm, hairless below, pubescent or setose above, base rounded to broadly wedge-shaped and flat onto the stalk. Margins are obscurely toothed to sometimes irregularly denticulate, tip tapering. Flowers are borne in leaf axils solitary. Bracteoles are elliptic, 2.1-2.4 x 1.5-1.7 cm, hairless below, gland-tipped hairy above, palmately 7-veined. Calyx is minute, 10-toothed. Flowers are pinkish or white; tube basally cylindrical for about 7 mm, throat about 3.5 cm, petals circular, about 1.2 cm in diameter, equal. Staminal filaments are hairless, about 1 cm. Ovary is hairless, style about 2.5 cm, hairless, stigma funnel-shaped, 2-cleft. Capsule is hairless, basal part about 1 x 1.8 cm, beak about 1.8 cm. Seeds are kidney-shaped, about 8 x 5 mm. Sikkim Clock Vine is found in Eastern Himalayas, from Nepal to Sikkim, at altitudes of 1800-2300 m. Flowering: August-December.

Conclusion: Sikkim endowed with rich natural resources and phytogeographically identified as hot spot of Biodiversity under Eastern Himalayas. It envy 0.2 % of total geographical area of country and eventually has tremendous potential valuable bioresources. Some of the species are having high

potential for breeding and for commercialization, through which the local people could earn money. From this study we found a numbers of invasive and wild species which can be helpful for the other researchers in their upcoming days.

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References:

1. Sonawane Shrikant, Shete Pranali, "Isolation of Prodigiosin Producers From Aquatic Environment and Study of It's Applications." ; Life Sciences International Research Journal , ISSN 2347-8691, Volume 2 Spl Issue (2015): Pg 205-210
2. Swapnil Lokegaonkar, Bela Nabar, Statistical Survey of Rural and Urban Population of Thane District for Putative Dental Plaque Risk Factors; Life Sciences International Research Journal , ISSN 2347-8691, Volume 2 Spl Issue (2015): Pg 211-218
3. O. Polunin, and A. Stainton, "Flowers of the Himalaya". Oxford University Press, New Delhi. 2009.
4. Reddy , Jv Patil , Sunil Gomashe , T Phani Krishna, Seed Setting Ability and Stigma Receptivity in P Sanjana; Life Sciences International Research Journal , ISSN 2347-8691, Volume 1 Issue 1 (2014): Pg 283-287
5. Bhuvaneswari,M.Subbarao,K.V.M.Krishna Murthy, P.Rajasekhar,Y.Koteswararao, Transmission Studies of Cucumber Mosaic Virus V. ; Life Sciences International Research Journal , ISSN 2347-8691, Volume 1 Issue 1 (2014): Pg 288-297
6. O. Polunin, and A. Stainton, "Concise of the Himalaya". Oxford University Press, New Delhi. 2013.
7. Hetal Parekh and I. R. Gadhvi, Accumulation of Heavy Metals in Feathers ; Life Sciences international Research Journal , ISSN 2347-8691, Volume 2 Issue 1 (2015), Pg 380-383
8. Mansi Goswami, Pranav Pandya, Hetal Parekh, Diversity and Ecology of Fish of Modhava and Salaya ; Life Sciences international Research Journal , ISSN 2347-8691, Volume 2 Issue 1 (2015), Pg 384-387
9. T. P. Sharma, and S. Sharma, "Medicinal Plants of Sikkim". Beracah Printing and Stationery, Deorali, Gangtok, East Sikkim. 2010.
10. Reddy P.B, Risk Assessment and Safety Evaluation of An Electronic Nicotine Delivery Device (E-Cigarette) As Substitutes of tobacco Cigarette; Life Sciences International Research Journal , ISSN 2347-8691, Volume 2 Issue 2 (2015): Pg 136-138
11. Jitendra Singh Pachaya, Navin Jain, Ethanobotanical Study of Different Flora in Tribal District of Alirajpur, M.P.India; Life Sciences International Research Journal , ISSN 2347-8691, Volume 2 Issue 2 (2015): Pg 139-143

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