Ethnobotanical notes on *Houttuynia cordata* Thunb. in North-eastern region of India

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*Houttuynia cordata* Thunb. (Family-Saururaceae) is an ethnobotanically important plant of North eastern region of India. It is a potential source of antioxidants and used extensively in treating number of diseases such as cancer, coronary heart disease, diabetes, severe acute respiratory syndrome, blood deficiency, dysentery, etc. This herb is sensitive to severe cold and remains dormant during winter and propagated through rhizomes. It is a good soil binder due to spreading nature of roots and leaves. The herb is generally collected from wild and occasionally cultivated as homestead plant. This has resulted great pressure on the populations occurring in the natural habitats and the plant has become endangered in many parts of North-east India. This calls for sustainable management and conservation of wild and cultivated resources of *H. cordata*.

**Keywords:** *Houttuynia cordata*, Saururaceae, Medicinal plant, North-east India.

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**Introduction**

*Houttuynia cordata* Thunb(a). is one of the important plant of the family Saururaceae\(^1\). It is native to mountainous region of Eastern Asia and occurring up to an elevation of 2500 m asl. It is assumed that the ancient people in China were the first to discover the medicinal properties of this plant and they used the herb both for edible and medicinal purposes. It is widespread in North-eastern (NE) region of India and is known with different local names, viz. *Fish mint*, *Fish wort*, *Chameleon*, *Lizard’s tail* in English; *Ja-myrdra* or *Jmyr-doh* in Khasi; *Machha-turi* in Garo; *Ashundary*, *Tengalai*, *Dimasa - Mojoukmo*, *Hmar -Ai thang* and *Pnar-Jarmendo* in Assam; *Mumbre*, *Siya hamang*, *Muchandariin* in Arunachal Pradesh; *Toning khokin* in Manipur; *Uithinthang* in Mizo; *Nuichua* or *Nokana* in Nagaland; *Gandhi Jhar* in Nepal and *Ohandhay jhar* in North Bengal and Sikkim. The entire North-eastern region of India represents a unique set of topography, economic, sociological, diversity and cultural conditions which differ mostly from the rest of the country. It is inhabited by more than 150 tribes with variegated systems. These tribal people living in the remote forest areas still depends to a great extent on the indigenous traditional systems and gather different plants/herbs from the forests and use in different ways. The tribes of NE region collect *H. cordata* from the wild habitats both for consumption and for selling in local markets.

The leaves and rhizomes of *H. cordata* are used as vegetable, condiments and spices either cooked or raw. The roots and leaves are also consumed as salad\(^2\). The herb is used as folk medicine as it has antiviral, antibacterial, immune-stimulant, diuretic, anti-cancer and anti-inflammatory effects\(^3\). The Japanese people use the leaves for preparing a beverage called *Dokudami cha*. It is considered as a good blood purifier. Leaves are used to cure stomach ulcer and boiled extract of rhizomes for muscular pains. The brew made of dried herb is considered very effective for detoxification, hypertension, constipation, pulmonary tuberculosis and diuretics. Besides, it is a good soil binder to protect soils from erosion in hilly slopes. Considering the importance of this plant, we have collected plant materials from Nagaon (Assam), W. Kemeng, Lower Subansiri and Kurung Kumey (Arunachal Pradesh) which are being conserved in field gene bank at Umiam.

**Distribution and Habitat**

It is distributed in Bhutan, China, Indonesia, Japan, Korea, Myanmar, Nepal, Thailand, Taiwan, Vietnam, North-West Himalayan region and NE Region of India. It was introduced in European countries and...
gained popularity due to various medicinal properties. It grows well in moist and wet climatic conditions on wide range of soils such as sandy loam, clay loam and even on rocky places, with an average pH of 5.9 and 78% moisture. It is a shade loving plant, thus can be cultivated easily in areas, which has very low light intensity and are shady. Generally grow in ditch banks, thicket field margins, forests, wet meadows, slopes, streams sides, ravines, rocky hills or mountains parts and river banks.

**Botanical description**

Perennial herb attained 30 to 60 cm height with creeping and thin rhizomatous in nature (Plate 1a). Basal part of stems creeping rooted in whorls at nodes, apical part erect, glabrous/pubescent on nodes and sometimes purplish-red in colour. Stipular sheath is 1-2.5 cm in length and one fourth to half as long as petiole, usually ciliate, base enlarged and slightly clasping. Petiole is 1-3.5 cm in length and glabrous. The leaf blade broadly ovate to cordate, 4-10 cm long, 3-6 cm wide, densely glandular, usually glabrous, sometimes pubescent at vein axils, generally purplish abaxially, apex shortly acuminate; veins 5-7, basal or innermost pair arising ca. 5 above base. Inflorescences are yellow in colour with 1.5-2.5 cm long and 3-6 mm wide; peduncles are 1.5-3 cm in length and sub glabrous; involucral bracts oblong to ovate, 10-15 mm long, 5-7 mm wide with rounded apex. Bracts are whitish, linear and inconspicuous (Plate 1b). Stamens are 3 times longer than ovary and having 2-3 mm capsule with persistent style. Seed are dicotyledons, sterile and sometimes produce false plants and the 1000 seed weight is around 0.04g. Its rhizomatous root spreads under the soil up to 90 cm on the sides in a year. Roots start sprouting after winter months.

**Propagation**

It is propagated through rhizomes (Plate 1c), root ball and seeds; however, the plants produced from seeds are usually sterile. The root balls/rhizomes are sliced in to small pieces and placed 5 cm below the surface of soil with a spacing of 15×100 cm. It is planted early in the month of February. It starts flowering in the month of April and continued up to November and fruiting occurs between May to December. One and half month old plants are suitable for consumption and marketing.

**Biochemical properties**

The herb contains a variety of flavonoids, glycosides, pyridine alkaloids and essential oils. Four flavonoids, viz. rutin, hyperoside, quercitrin and quercetin, have been reported from *H. cordata*. The protein contents in leaves and rhizomes are 8.13% and 11.5%, respectively. The herb has disagreeable odour which is due to the presence of β-myrcene and 2-decanone. The fatty acid content of the essential oil is about 81%. Among the methylated fatty acids, capric acid methyl (43.66%), methyl laurate (16.15%), methyl hexadecanoate (9.27%), undecanoic acid methyl (5.62%), methyl oleate (1.98%) and methyl linoleate (1.40%) are predominant. Other major constituents were β-myrcene (1.62%), 1-terpinen-4-ol (1.59%), decanal (1.49%) and 2-decanone (1.47%). The roots contain crude fat (2.07±0.06%), protein (12.22±0.22%), carbohydrate (23.45±2.11%) and minerals such as Na (1.30 mg/g), K (49.65 mg/g), Ca (8.25 mg/g), Mn (0.08 mg/g) and Fe (0.98 mg/g). The micronutrient profile of this herb was also observed by Murugkar (2006) on the basis µ% fresh weight and it has Ca (89.7 %), Fe (3.3%) and β-carotene (28.6). The herb also contains...
significant amount of water soluble polysaccharides such as galacturonic acid (29.4%) and galactose (24.0%), rhamnose (17.2%), arabinose (13.5%), glucuronic acid (6.8%), glucose (5.3%), xylose (2.1%) and mannose (1.8%)\(^{15}\).

**Ethnobotanical uses**

The herb has many health benefits and it acts against allergies, asthma and bacterial infection and removes free radicals (toxins) from the body. It has strong antioxidant properties which act against stress related diseases such as cancer, coronary heart disease, diabetes\(^{14}\) and infections\(^{15}\). Leaves have been used to treat the measles, dysentery and gonorrhoea\(^{16}\). This plant is proven to have antibacterial effects against many bacteria such as, *Trichophyton*, *Staphylococci*, *Gonococci*, *Tubercle bacilli*, etc. The whole plant is dried/brewed and used for treatments in antipyretics, diuretics, pus removal, constipation, colds, detoxification, swelling, hypertension, tuberculosis and para-nasal sinusitis. The injection prepared from this plant is a traditional Chinese medicine used in severe acute respiratory syndrome (SARS), a life-threatening form of pneumonia owing to the effect of curbing inflammation\(^{17,18}\). It is antidotal astringent, anti-inflammatory, analgic and slow laxative. The root juice is applied on skin to treat wounds and other skin problems by the inhabitants in the North-east region\(^{10}\). Externally it is used for abscesses, anal prolapsed, bone growth stimulation, injuries, snake bites\(^{15}\), swelling, urinary troubles and detoxification\(^{16}\). It is found that the leaves of *Houttuynia cordata* and *Psidium guajava* with stalk of *Lasia spinosa* possess a profound anticestdodal efficacy\(^{20}\). The excess consumption also causes anti-fertility and itching as perceived by the people in this region.

In NE region, the Assamese people collect and prepared ‘Chuttney’ from the leaves of this herb. The Manipuri people eat both raw and cooked leaves and stems, while local healer (*Maiba*) use the herb to cure dysentery, muscular sprain and stomach ulcer\(^{21}\) and anemia, gastritis and tuberculosis\(^{22}\). Juice extracted from root is taken in indigestion by the inhabitants in North-eastern region of India. The tribes in North Cachar hills of Assam eat leaves and stems to control the dysentery\(^{23}\). In parts of North Bengal and Sikkim states leaves are used as anthelmintic and used in the traditional medicine by Naga and Manipuri tribes to treat intestinal worm infection\(^{24}\). The Apatani tribe of Zero valley in Arunachal Pradesh use this herb for freshness, deep sleep and cardio-vascular disorders\(^{25}\). Tender young shoots and leaves juice is taken in case of cholera, dysentery and curing blood deficiency by Khasi, Jaintia and Garo and other tribes in Meghalaya\(^{26}\).

**Market importance**

It is sold in small bundles in the local markets of Assam and Meghalaya and one bundle of approximately 50 g of weight costs about Rs.3-5. The retail price in plain and hilly areas of Manipur range between Rs.75-110 per kg. The aerial parts of herb have been sold @ Rs.10-15 per bundle (250-300g) in retail market of North Cachar Hills area of Assam\(^{22}\).

**Conclusion**

*H. cordata* is extensively used as leafy vegetable, salad and to cure various ailments by the natives of NE region of India. It contains water soluble polysaccharides which are useful for medicine and food industry. Realizing the importance of this species, a systematic management and utilization needs to be initiated.

**References**