

# *HOUTTUYNIA CORDATA*: AN UNDER EXPLOITED MEDICINAL HERB

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BIOINGENE.COM/PSJ

Article No. :

D4MAY21R22

Article type: Mini  
Review

Accepted: March 2021

Online: May 2021

## KEYWORDS

*Houttuynia cordata*,  
Saururaceae,  
Ethnobotanical,  
Fish Mint.

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Conflict of interest: No

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## ABSTRACT

*Houttuynia cordata* is an under-exploited but widely used herb in the North- East region of India. It is also known as fish mint in English. It has various ethnobotanical uses. The leaves and rhizomes are used as vegetable, condiments and spices (both cooked and raw). The herb is used as folk medicine for antiviral, antibacterial, anticancer, diuretic and anti-inflammatory effects. The brew made from dried herb is considered effective for hypertension, constipation, pulmonary tuberculosis and diuretics. The plant also serves as a soil binder to prevent soil erosion on hilly slopes. It grows well in moist and wet climatic conditions on a wide range of soil having a pH of 6.0. It favours shade and low light intensities for its luxuriant growth. It is mainly propagated through rhizomes. One and half month old plants are ready for consumption and marketing purposes. The herb contains varieties of flavonoids, glycosides, pyridine alkaloids and essential oils. The herb has disagreeable odour which is due to the presence of  $\beta$  myrcene and 2-dicaneone. The protein content in leaves and rhizomes are 8.3 % and 11.5 % respectively. After harvesting, the plants are sold in small bundles in local markets. Since it is extensively used by the local population, systematic cultivation practices and post harvest management need to be studied scientifically to explore this under-exploited medicinal herb.

## Citation:

Yarin, T. and Dutta, B. (2021). *Houttuynia cordata*: an under exploited medicinal herb. *Bioingene PSJ*, Issue 1, Volume 2, Article D4MAY21R22, Page 1-4. <http://bioingene.com/wp-content/uploads/2021/06/D4MAY21R22.pdf>

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## INTRODUCTION

This review paper is an attempt to give a glimpse of the medicinal plant *Houttuynia cordata* Thunb, indigenous to North-East India and China. The plant belongs to the family Saururaceae and is commonly known as fish mint, fish wart, chameleon, Chinese lizard tail etc. It is a perennial herb with white flowers, and alternate dark green leaves that are broadly heart-shaped, 4-9 cm long and 3-8 cm broad. The proximal part of the stem is trailing and produces adventitious roots, while the distal part of the stem grows vertically, and the underground part has white thin rhizome (Singh, 2011). It is a spreading type herb that prefers to grow in a moist and shady place as well as in forest areas. In India it is found mostly in North Eastern states and known by different names. In Arunachal Pradesh it is known as Siiya or hiiya hamang, muchandariin, Hmar-Ai thang, Pnar-Jarmendo, Ashunday etc.; Toning in Assam, Khokin in Manipur, Ja-myrda or Jmyr-doh in khasi, Machha-turi in Garo, Uithingthang in Mizo, Nuicchu or Nokana in Nagaland and Ghandhy jhar in both North Bengal and Sikkim (Rathi *et al.*, 2013). The leaf has an unusual taste that is often described as 'fishy' (earning the nickname "fish mint"), therefore it cannot be enjoyed universally unlike basil, mint, or other more commonly used herbs. In Japan, the plants were reported to have an orangy scent, and in China its smell resembled coriander leaves (Bown, 1995). The herb is collected by tribals from the adjacent forest areas for using it both as vegetable as well as for medicinal purposes like for curing dysentery and asthma. Nowadays, the plant is gaining importance due to its vigorous medicinal properties especially in southeast Asian countries, though China is assumed to be the first country to discover the medicinal properties of *H. cordata*.

## NUTRITIONAL AND -

## CHEMICAL COMPONENTS

It has been reported by researchers that *H.cordata* possesses important nutritional components like amino acids, vitamins viz. vitamin C (68.47-83.57 mg/100g),  $\beta$ -carotene 2.59-3.45 mg/100g, and trace elements such as potassium, iron, zinc, and copper as well as a number of biochemical properties, beneficial and essential for health (Yang and Jiang, 2009). The experiment carried out by Das *et al.* (2013), revealed that this herb also contains some important components like flavonoids, volatile oils and alkaloids. The flavonoids present in it are rutin, quercetin, quercitrin, isoquercitrin and hyperin that provide a wide range of pharmacological activities including antiviral, anti-microbial, antioxidant, anti-inflammatory, anti-leukemic, anticancer, and immune modulatory effects. The maximum amount of flavonoids is present in the flower, followed by leaf, fruit and stem whereas no flavonoid was found in rhizomes. Similarly, the alkaloid components demonstrated significant potential having anti-platelet and cytotoxic activities (Fu *et al.*, 2013). The volatile oil present in the herb contains components like decanoyl acetaldehyde, myrcene, lauric aldehyde,  $\alpha$ -pinene, d-limonene and methyl nonyl ketone -



**Figure 1:** *Houttuynia cordata* (Source: [https://en.wikipedia.org/wiki/Houttuynia\\_cordata](https://en.wikipedia.org/wiki/Houttuynia_cordata), accessed on 1 December 2020)

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(Li *et al.*, 2004; Chen *et al.*, 2004; Cao and Wang, 2005).

## ETHNOBOTANICAL AND CULINARY USES

Owing to its medicinal properties, *H. cordata* is generally consumed as a whole in the form of salad for lowering blood sugar level and as leaf juice for the treatment of dysentery, cholera, curing of anemia and purification of blood. Reports reveal that due to its strong antioxidant properties, it has been used pharmacologically as anticancer agent, antimicrobial, antitumor promoting agents for the production of an antibiotic substance by a strain of gram-positive, spore-bearing bacilli; the Apatani tribes of Arunachal Pradesh from the Eastern Himalayan region of India believe that eating the plant shoot can make one feel rejuvenated, bring good sleep, and keep away heart disorders (Kumar *et al.*, 2014). In recent studies it has been revealed that in China it is used for the treatment of severe acute respiratory syndrome (SARS) (Lau *et al.*, 2008). Other than its medicinal uses, it is also used for making salad, chutney, as spices in meat and the dried leaves are used as herbal tea. In Korea and Japan, *H. cordata* is frequently used as a cosmetic with the combination of herbal medicines for preventing or treating wrinkles, chapped skin, anti-aging, improving skin conditions, removing freckles and as skin-whitening.

## HARVESTING AND POST-HARVEST HANDLING OF H.CORDATA

Post-harvest handling of *H. cordata* varies from place to place depending on its uses. It has been observed that in Arunachal Pradesh, one of the North-Eastern states of India, the entire plant or leaves are collected from the field or forest area and washed thoroughly to remove soil or any adhering dirt particles. Leaves are separated -

from roots and kept under shade to remove the moisture. Most of the tribal people use fresh leaves to make chutney by cutting leaves into small pieces mixed with green chillies, pumpkin seed powder, sesame seed powder etc. To remove the astringency of the leaves, a small amount of solution is made of ash, dried banana peels, orange peels and water, locally known as "tach chola" by the Nyishi tribe and "tapio" by the Apatani tribe of Lower Subansiri district. It is then mixed with the fish mint leaves to make a chutney. The roots can be refrigerated to keep fresh and consumed with food or in salad form. However, according to the study carried out by Fu *et al.* (2013), volatiles, flavonoids and essential oils of *H. cordata* were extracted by various methods such as supercritical CO<sub>2</sub> extraction, steam distillation, petroleum ether extraction, solid-phase microextraction, flash evaporation and simultaneous distillation-extraction, isolated by preparative HPLC and analyzed qualitatively and quantitatively by GC, GC-MS, GC-MS with on-column derivatization procedure, flash GC, combined gas-liquid chromatography and mass spectroscopy.

## COMMERCIAL IMPORTANCE

Realizing the importance of *H. cordata*, some people of the North-East started to grow it in their kitchen gardens and sell bundles of whole plant or root and leaves separately. Each bundle of fresh leaves and roots are sold at the price of Rs. 20 in local markets of Arunachal Pradesh whereas in the market of Manipur, the retail price of whole herb ranges from Rs. 75-110 per Kg (Yonzone and Bhujel, 2012). Since this plant can be kept fresh for two to three days in dry and shade condition, in Manipur state its marketing prospect is becoming quite high and people are viewing *H. cordata* as a new livelihood aspect. As per the survey carried out by Singh (2011) the total income of the retailers

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and sub-retailers from the hill districts of Manipur from *H. cordata* per day during the peak season are Rs. 2750 ± 770 and Rs. 3980 ± 620 respectively and the total income earned by plant gatherers, wholesalers, retailers and sub-retailers on *H. cordata* per day in Manipur was Rs (72422 ± 10518) approximately which leads to the conclusion that the level of utilization of the plant is high and has the potential for agricultural and commercial exploitation.

## FUTURE PROSPECTS

Commercial cultivation of the plant is not yet done because farmers prefer the cultivation of cash crops that support their livelihood instead of indigenous food plants. The traditional uses and values of this plant lie with older generations, there is limited enthusiasm from the younger generation on exploitation of this medicinal herb. There is limited awareness among people regarding the medicinal benefits of this herb. Awareness and knowledge regarding the nutritional and health values of indigenous food plants can help improve their agriculture and save the plants from possible biodiversity loss. Researcher, focused on the advanced technology for cultivation and value addition of this crop, can prove profitable for the farmers.

## FUNDING

None

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