

# RESEARCH ARTICLE

## Supplementary TABLE

### Traditional usage of common aquatic plants found in central valley of Manipur

Scientific name	Family	Local name	Traditional usage	Availability
<i>Acorus calamus</i> L.	Araceae	Ok-hidak	The rhizomes have a characteristic aromatic smell that is specially used by children during coughs and fevers by hanging them from their necks. During severe cough, piles, chest congestion, stomach ulcers, epilepsy, and glandular and abdominal tumors, 5-10 ml of the extracted rhizome juice mixed with honey is prescribed twice a day before food. Sometimes rhizomes are chewed to get relief from asthma and insect bites. During body pain, a steam-heated packet containing the rhizome and leaves of <i>Cannabis sativa</i> along with <i>Datura stramonium</i> is applied as a foment. The oil extracted from the rhizome is applied externally to the person with piles.	Not so common
<i>Alocasia cuculata</i> (L.) Schott.	Araceae	Singjupan	Petiole juice is applied externally on fresh cut and injuries for early healing. Corm cooked with fermented soybean is eaten or prepared as a traditional salad called 'Singju' (a mixture with fermented fish, chili, and other plants).	Not so common
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Chengkruk tingkhang panbi	The crushed root is applied externally as a poultice in early symptoms of leprosy, causing bruises. A steam-heated pack containing the plant and Mimosa pudica is applied to the person suffering from rheumatic pain as a foment. A boiled extract of the plant is recommended for constipation; an extract mixed with sugar is recommended for leucorrhea, jaundice, or hemorrhoids. Pounded shoot mixed with egg is applied in cases of skin burns, and pounded shoot mixed with lime is prescribed in cases of skin sores. Young shoots and tender leaves are incorporated in the preparation of traditional dishes like kangsoi.	Very common
<i>Cyperus haspan</i> L.	Cyperaceae	Kauthum	Boiled extract of the tuber is consumed to relieve thirst in a diabetic patient; extracted rhizomes with honey are used in fever and bronchitis. The tuber is used to make the popular local dishes "Eronba" and "Bora" (Pakora).	Not so common
<i>Enhydra fluctuans</i> Lour.	Asteraceae	Komprek tujombi	The crushed extract of the plant mixed with mustard oil is given to the person suffering from scabies and other skin diseases; 5–10 ml of a boiled extract of the plant is prescribed every day for diabetes. The boiled decoction of the plant is prescribed to a person suffering from urinary troubles, diarrhea, dysentery, and other bowel complaints. The fresh plant is given as an antidote to food poisoning by the local medicine man. To treat calculus, a plant cooked with little water is consumed twice a day. The whole plant is also cooked with rice and consumed, and it is also incorporated into other vegetable preparations.	Not so common
<i>Equisetum debile</i> roxb.	Equisetaceae	Lai utong	In dropsy and hysteria, the plant is boiled in water and applied to the body. A boiled extract of the plant is given in haematuria, and the extract obtained by boiling the plant along with the bark of <i>Terminalia arjuna</i> and <i>Caesalpinia pulcherrima</i> is applied to aching body parts, backaches, rheumatic pain, and sciatica. The boiled plant, along with the root of <i>Carica papaya</i> and the extract obtained, contributes to diabetes.	Not so common
<i>Eryngium foetidum</i> L.	Apiaceae	Awa-fadigom	The crushed leaf extract is prescribed orally and applied externally to people suffering from rheumatic pain. The paste made by crushing the plant along with the bulbs of <i>Allium sativum</i> , <i>Allium ascalonicum</i> , or <i>Allium cepa</i> and the root of <i>Plantago erosa</i> is applied externally in cases of muscular sprains and body pain. A boiled extract of the plant mixed with sugar gives protection against kidney stones. Leaves of the plant with the inflorescence of <i>Elsholtzia</i> bland are cooked together with a little amount of salt used in gargling for tonsillitis. To lower blood pressure, pills were made by crushing the leaves and bulbs of <i>Allium sativum</i> , and locally fermented fish ngari was consumed. The paste was made by crushing the plant along with the rhizome of <i>Zingiber officinale</i> , bulbs of <i>Allium sativum</i> , seeds of <i>Brassica juncea</i> , and local fermented fish ngari, also used as massage in cases of paralysis. For epilepsy and paralysis, 4-5 grammes of the plant's leaves are consumed daily with vegetables.	Very common
<i>Euryale ferox</i> Salisb.	Nymphaeaceae	Thangjing	The rhizome of the plant is used for the treatment of dropsy, jaundice, and gonorrhea. The rhizome is boiled with a piece of alum for the treatment of scabies. The petioles and seeds are cooked and used as a vegetable. The crushed juice of the petiole is applied externally in cases of burns and inflammation and is also consumed raw in cases of abdominal inflammation. Seeds are tonic and astringent. Fresh fruit is prescribed for diabetes patients; leaf petiole paste is applied to burns and boils. Seed flour is a good arrowroot substitute that is also easily digestible. It is useful in burns, leucorrhoea, and postpartum weakness.	Very common
<i>Hedychium coronarium</i> Koenig.	Zingiberaceae	Loklei	Rhizome paste is served as an appetiser and is used to treat coughs and fevers. Rhizomes are crushed or extracted and given to the person having bronchitis, and the decoction of rhizomes is used for gargling in tonsillitis or as a mouthwash to avoid bad breath. The rhizome paste applies to bruises and sprains.	Not so common

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**Received:** 16-Nov-2022, Manuscript No. AGBIR-22-79945; **Editor assigned:** 21-Nov-2022, Pre QC No. AGBIR-22-79945 (PQ); **Reviewed:** 13-Dec-2022, QC No. AGBIR-22-79945; **Revised:** 20-Dec-2022, Manuscript No. AGBIR-22-79945 (R); **Published:** 03-Jan-2023, DOI:10.35248/0970-1907.23.39.449-456



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<i>Hedyotis auricularia</i> Roxb.	<i>Rubiaceae</i>	Langban-koukha	The extracts of the leaf juice are prescribed to the person with jaundice. The banana leaf-wrapped plant is warming up on the burning charcoal and being used as a bandage against muscular sprain.	Very common
<i>Houttuynia cordata</i> Thunb.	<i>Saururaceae</i>	Toningkhok	The crushed leaf extract of about 5–10 ml is prescribed to the person having diarrhoea and dysentery. The crushed rhizome is used in the treatment of stomach ulcers and skin diseases. A boiled extract of the rhizome is consumed orally in cases of muscular pain due to overstretching. 4-5 fresh leaves should be given to the person suffering from measles, dysentery, gonorrhea, hemorrhoids, eye, and skin troubles. 4-5 leaves crushed together are applied externally as a poultice on boils and skin sores. Leaf decoction obtained from the boiling of about 5–10 ml is advised to be consumed for the treatment of many ailments, including cancer, coughs, dysentery, enteritis, and fever. It is also eaten raw to strengthen the immune system. Externally, the crushed leaves are used for the treatment of snake bites and skin disorders. The plant is consumed as a spice for curries and salads.	Very common
<i>Hydrocotyle sibthorpioides</i> Lam.	<i>Apiaceae</i>	Lei/Lai-peruk	Fresh leaf extract treats cough, fever, and jaundice. The crushing plant, weighing approximately 100 g, is soaked in 1 litre of lukewarm water for 1-2 hours. The filtrate obtained is given in a glass daily to treat cough, fever, and jaundice.	Very common
<i>Ipomea aquatica</i> Forsk.	<i>Convolvulaceae</i>	Kolamni	The plant is eaten raw to cure cardiovascular diseases and paralysis. The decoction of the plant obtained by boiling it with water is advised to be consumed for proper blood circulation, to treat debility, and to be used as a purgative. The crushed extract of the plant juice obtained from mixing with salt applies in the case of ringworm. The smashed plant is applied externally as a poultice on swelling joints, insect bites. In acne, the extracted juice of the leaves is massaged onto the face, causing pimples. The extract of tender shoot obtained by boiling is prescribed to ease the thirst of diabetic patients. The plant is incorporated in the preparation of various traditional dishes, viz., salad (Sinju), eronba, kanghou, etc. When the plant's leaves are rubbed on the site of insect bites, they help to relieve pain. The plant is thought to be beneficial to females suffering from nervousness or general weakness. A decoction of fresh shoots and leaves is used as droplets against otorrhoea and retinitis. Sometimes a boiled extract of the root mixed with honey is given to the person suffering from severe fever and malaria. The tender shoot cooked with lata fish ( <i>Chana orientalis</i> ) is given for diarrhoea and dysentery. The extract obtained by crushing the plant with <i>Drymaria cordata</i> is applied externally to decrease the high body temperature of the child.	Common
<i>Jussiaea repens</i> L.	<i>Onagraceae</i>	Ising kundo	The boiled extract of the plant is prescribed to people with diabetes and menstrual disorders. A crushed extract of the fresh plant is applied externally to the body to treat pain and inflammation. The juice obtained by crushing the plant is prescribed to the person having urinary trouble. The plant is used in the preparation of a traditional dish called singju. Crushed leaves apply to ringworms and other parasitic skin infections. The paste obtained from fresh leaves is applied externally in the case of boils and burns as a coolant. To avoid strangulation, the cooked shoot is consumed on an empty stomach. In times of weakness, the tender shoot cooked with lata fish ( <i>Chana orientalis</i> ) is prescribed as an energizer.	Very common
<i>Leucas aspera</i> Spreng.	<i>Lamiaceae</i>	Mayang lembum	The crushed extract of the plant is prescribed to people with piles and menstrual disorders. The crushed extract of the plant is also applied externally for the treatment of scabies and body pain, and the same extract is consumed by people with diarrhoea and dysentery. The tender shoots of the plant, <i>Chana orientalis</i> , cooked with lata fish, are recommended to treat menstrual disorders; the tender shoot paste is applied externally on the forehead to relieve headaches. The boiled extract of the plant is given orally for the healing of piles, bronchitis, asthma, and body pain. The leaves, flowers, and young stems are used to purify the blood. The leaf juice is applied externally to the poisonous insect bite. Raw flower is consumed to alleviate cough and cold symptoms. Leaf juice is given to people who have skin eruptions and painful swellings.	Not so common
<i>Marsilea minuta</i> L.	<i>Marsileaceae</i>	Ishing-yensang	Fresh plant decoction is taken twice daily for 10-12 days to treat stranguria. The root paste is applied externally to the person suffering from eczema. The aerial parts of the plants are used in the preparation of traditional dishes like ooti and kangsoi.	Common
<i>Nasturtium indicum</i> L.	<i>Brassicaceae</i>	Uchi-hangam	The whole plant is cooked and eaten regularly for the treatment of diabetes and dysentery. For a week, a fresh shoot decoction on an empty stomach is advised against stranguri.	Very common
<i>Nelumbo nucifera</i> Gaertner.	<i>Nelumbonaceae</i>	Thambal	Diabetes patients consume plant leaves cooked with prawns ( <i>Palaemon malcolmsonii</i> ) twice or three times per day. A spoonful of rhizome paste mixed with a little honey is recommended for diabetics every day for about two weeks. The extract obtained by boiling the tender shoot along with <i>Phyllanthus frutuosus</i> is prescribed for the treatment of diabetes patients. The decoction obtained by boiling the flower is used for blood purification. The roots, flowers, and seeds of the plant are used as a remedy for the treatment of various ailments, viz. diarrhea, cholera, liver complaints, piles, bleeding, and leprosy. The seeds can be eaten raw or in the form of chutney. Sometimes the seed kernel is consumed fresh to improve eye vision. Rhizomes, roots, seeds, and young leaves of the plant are consumed as vegetables by incorporating them into various traditional dishes. Rolled tender leaves are consumed raw or as a salad (sinju) for the treatment of stranguria. The petiole is consumed regularly for the treatment of stomach ulcers. The smashed root is applied externally to ringworms and other skin infections. The pounded leaves are applied externally on the forehead to reduce headaches. Leaf petiole is eaten raw for the treatment of stomach problems and for better urination. Leaf and seed core extracts are thought to help with insomnia and hematemesis.	Common

# Traditional usage of underutilized aquatic plants found in the Imphal valley of Manipur

<i>Neptunia oleracea</i> Lour.	Mimosaceae	Eshing ikaithabi	The extract of the plant, boiled with a little bit of common salt, is prescribed to the person who has stomach ulcers and other stomach complaints. The leaf of the plant is consumed raw to treat dysentery and intestinal infections. Alternatively, a decoction made by crushing the plant's leaves with little water is prescribed twice daily to the person with an intestinal infection until cured. The same decoction is also given to people with parasitic worm infections twice a day for three days. The plant's crushed extract is used as an eardrop in cases of otitis and to treat glandular swellings on the neck. The decoction obtained by boiling the stem along with sugar candy, <i>Centella Asiatica</i> , and the inflorescence of <i>Elsholtzia blanda</i> is prescribed for the treatment of worm infection in children. A paste made by crushing the leaves of the plant <i>Mimosa pudica</i> is applied externally and overboils; the extract obtained applies to other skin diseases. The young stem and leaves are consumed as vegetables in the preparation of local dishes such as salad (sinju), <i>chagem-pomba</i> , <i>kanghou eromba</i> , etc. The juice of the stem is used to treat earaches. The pounded leaves and stem of the plant are applied over the nose to treat syphilis ulcers or necrosis of the nose.	Common
<i>Nymphaea stellata</i> Willd.	Nymphaeaceae	Thariktha	The paste obtained from fresh petioles of the plant, mixed with seed powder of <i>Cuminum cyminum</i> , common salt, milk, butter, and honey, is prescribed to the person having dysmenorrhoea twice a day for 2-3 days.	Not so common
<i>Nymphoides indicum</i> O. Kuntze.	Gentianaceae	Tharo-macha	The plant's paste is used as an external bandage for cuts and injuries. Dried rhizome paste, along with a little honey, is consumed in diuresis.	Not so common
<i>Oenanthe javanica</i> DC.	Umbelliferae	Komprek	Leafy greens are eaten as an appetiser and as a digestive. 1/3 of a glass of whole plant extract is given to the person to lower high blood pressure and diabetes. In cases of liver disease and abdominal pain, a half-glass of fresh leaf juice is prescribed. 5–10 ml of fresh shoot decoction or shoot cooked with rice are consumed in diuresis. Droplets of 5-10 mL filtrate are used to treat otorrhoea. In dyspepsia, 4-5 leaves are taken as a salad. Since ancient times, it has been consumed as a vegetable in salads, fresh or boiled chutney, and locally as Singju and Eromba. All the plant parts are aromatic and have a unique, specific aromatic taste and flavour in local food habits. It is available all year and provides a good source of vegetables for the majority of the locals.	Not so common
<i>Plantago erosa</i> WalL.	Plantaginaceae	Yempat	The boiled extract of the leaves and root mixed with sugar is prescribed to the person for better flow of urine, elimination of stones in the kidney and gall bladder, colic, cough, inflammation of the kidney and urinary bladder, fever, and constipation. The leaves and roots of the plant are prescribed to the patient for the treatment of chronic fever. The paste obtained from the crushing of the plant, along with the bulbs of <i>Allium sativum</i> , <i>Allium ascalonicum</i> , and <i>Eryngium foetidum</i> , is used in massage for the treatment of body pain, muscular sprains, and also in rheumatism. A leaf extract mixed with honey is given orally to people who have high body temperatures, stomach ulcers, or other stomach complaints. The seed is given to people who have diarrhea, dysentery, constipation, or genito-urinary tract problems. The plants' tender leaves are used to make vegetables.	Not so common
<i>Polygonum barbatum</i> L.	Polygonaceae	Yelang	The plant's leaves are used in local healing after being slightly warmed on a charcoal fire; a half-glass decoction of leaves and shoots is consumed as a stimulating wash for ulcers. A leavened paste of about 5 g is used externally for the treatment of cutaneous infections. Every day, a boiled extract of the leaves (about one glass) is prescribed to a person suffering from diarrhea, dysentery, colic, or stomach complaints. The vegetable believes that its regular use will clear up the intestinal tract. The roots of the plant are astringent and cooling. The plant's seed powder, soaked in water, is consumed on a regular basis to prevent strangulation. Tender leaves and young shoots are commonly taken as vegetables in curry form, viz., kangsoi, eromba, singju, etc.	Not so common
<i>Polygonum perfoliatum</i> L.	Polygonaceae	Lilhar	The warmed plant wrapped in banana leaf is used externally to treat wounds and injuries, as well as to heal muscular sprains. The paste obtained from seed powder was used externally as an antidote to snakebite.	Common
<i>Polygonum posumba</i> Ham.	Polygonaceae	Phakpai	The leaves of the plant are cooked with a local fish, Ngakha meingangbi ( <i>Puntius phutunio</i> ), for the treatment of diarrhoea and other stomach complaints. The crushed extract of the plant is applied externally to treat skin allergies. The juice obtained by crushing the plant with <i>Eryngium foetidum</i> and <i>Leucas aspera</i> is used to treat muscle weakness and paralysis both internally and externally. Young shoots of the plant are advised for the management of hypertension. Crushed leaves of plant juice dissolved in a glass of warm water are prescribed to the person having gastric problems once or twice a day. The leaves are eaten as vegetables in the preparation of eromba and salad (singju).	Not so common
<i>Ranunculus scleratus</i> L.	Ranunculaceae	Kakyl-khujil	A plant wrapped in a banana leaf and slightly burned in the burning charcoal is applied externally to the person suffering from gout.	Common
<i>Sagittaria sagittifolia</i> L.	Alismataceae	Koukha	A boiled extract of the rootstock is applied externally for the treatment of scabies, itches, and other skin diseases. The powdered leaves are used to reduce itchiness. The powdered leaves mixed with honey are prescribed to a person who has a sore throat and inflammation of the breast. Vegetative parts of the plant are boiled with water and consumed to control hypertension.	Not so common
<i>Trapa natans</i> L.	Trapaceae	Heikak yetli	Fruits cooked are eaten or consumed raw; petioles are consumed as vegetables in the preparation of traditional dishes such as eromba and singju. The plant consumes blood to improve circulation and treat leucorrhoea. Fresh, tender kernels are sweet, delicious, nutritious, and a good source of minerals and carbohydrates. The fruits are astringent and used as cooling agents; they are consumed for the treatment of constipation and are also used as an appetiser and tonic. The fruit is prescribed to relieve thirst, urinary disorders, and general weakness.	Common

<i>Zizania latifolia</i> turez.	<i>Poaceae</i>	Eshing kambong	Culms, rhizomes, and grains of the plant are prescribed to the person having anaemia and fever, heart, kidney, and liver troubles, and the paste obtained is applied externally to burns and injuries for early healing. Infected culms form galls filled with innumerable spores like cocoa powder, which are eaten raw as a digestive and incorporated into the preparation of vegetables. Infected fruit is prescribed to people with protein deficiencies as it is rich in protein.	Common
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