Limnocharis flava 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Alismatales	Limnocharitaceae

Common name

cebolla de chucho (Spanish), cu neo (Vietnamese), kalmi (Bangla), paku rawan (Malay), yellow bur-head (English), sawah-lettuce (English), kengkong (Bangla), velvetleaf (English), keo neo (Vietnamese), limnocharis (English), sawah-flower rush (English), manja payal (Malayalam)

Synonym

Alisma flava , Linn. Sp. Pl.1 (1753) 343.
Limnocharis plumieri , Rich., Mem. Mus. Hist. Nat. Paris 1 (1815) 370, t.19, f.11, t.20
Damasonium flavum , (L.) Mill. Gard. Dict. ed. 8. (1768)
Limnocharis laforesti , Duchas. ex Griseb. Bonplandia 6:11 (1858)
Limnocharis mattogrossensis , O. Ktze. Rev. Gen. 3:324 (1893)
Limnocharis emarginata , H.B. & K.Pl. aequin. 1(1807)116, t.34; Micheli. In DC. Mon. Phan.3 (1881) 89.

Similar species

Summary

Limnocharis flava is a clump-forming, emergent aquatic plant that is native to the American continent. The Greek words \"Limno\" and \"charis\" mean \"pond\" and \"grace\", respectively. The attractiveness of this plant, with its inflourescenes of pale yellow flowers, has lead to its cultivation in gardens, which has facilitated its dispersal to new locations.

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Species Description
L. flava has triangular-shaped leaf and flower stalks and produces 'octopus-like' inflorescences consisting of up to 15 three-lobed yellow flowers. Its fruits are spherical and made up of cresent shaped segments that eventually split off, carried by water currents to disperse seeds to new locations (CRC for Australian Weed Management, 2003). The botanical specifics are noted as follows. It is glabrous (lacks hairs and is smooth), scapigerous (produces leafless flowering stalks) and lactiferous (contains a milky substance). It has a short stout rhizome (which measures about 3cm long and 3cm in diameter) and numerous fibrous roots. The leaves are erect, sheathing and curvinerved, and rise in clusters above the water. The petioles are thick, triangular , 90cm long and contain numerous lacunae (air spaces). The leaf sheaths narrow towards the top and the leaf blade is papery, light green, variable in shape (rounded, ovate or broad elliptic) and 6 - 20cm long (and almost as equally wide). The leaf apex is generally apiculate with a small hydathode at the tip; the leaf base is cuneate to repand-cordate; the leaf margin is undulate. There are four to six pairs of main nerves and a marginal one (sub parallel and converging towards apices), numerous secondary nerves (parallel to each other and nearly perpendicular to the midrib) and dense fine reticulations. There are about one to four peduncles (flower stalks), which are axillary, erect, triangular, flattened at the base and 120cm long. Penduncles bear, at the apex, a cluster of flowers, a ramet (vegetative plant) or both. Inflorescences are umbellate (consisting of flowers springing from a common center and arranged in a cluster), with between two to 15 flowers supported by an involucre of bracts; sometimes one or two leaves are present between the flowers. The bracts are roundish to broad-elliptic with (usually) emarginated tops. The flowers are pedicelled, actinomorphic, hermaphrodite and 2 - 4cm in diameter. The pedicel (stalk of a flower in an inflorescence) is 2 - 7cm long (3-gonous, 3-winged above, enlarging upwards and much elongated in fruit). The perianth is 2-seriate. The three sepals are persistent, imbricate (overlapping), green, obtuse in shape, 1.5 - 2cm long by 1 - 1.5cm wide, and enlarge and enclose the fruit. The three petals are pale yellow with a darker base, thin, caduceus (tend to fall off early), imbricate and broad-ovate to orbicular in shape with a rounded apex and are 2 - 3 longcm by 1 - 2cm wide. There are numerous stamens surrounded by a whorl of staminoides (filaments flattened, free, anthers basifixed, 2-celled, dehiscing longitudinally). There are 15 to 20 carpels (verticillate, laterally compressed, free, densely set, seemingly forming one superior ovary, ovules many, placentation superficial, styles wanting, stigmas sessile). The fruit are composed of fruitlets (as many as there are carpels) which are scarcely cohering, semicircular, membranous, opening along the adaxial (inner or ventral) side and having a thick abaxial (outer or dorsal) wall. There are numerous very small, horseshoe-shaped seeds, which are densly crowded together. The testa (hard outer covering or integument of a seed) is brown and spongy. Endosperm: 0 (Abhilash, 2004).

Notes
The Chromosome number for this species is 2n = 20 (Sunder Rao, 1953).

Lifecycle Stages
Where moisture is present year-round *L. flava* is a perennial herb; in ephemeral water-bodies and sites with pronounced dry seasons it is an annual (van Steenis, 1954).

Uses
L. flava is valued as an ornamental plant in some countries and cultivated in botanic gardens or private homes. Known introductions of the species for ornamental use has been documented in the USA, Singapore, Sri Lanka and Indonesia (Abhilash, 2004; Corlett, 1988; van Steenis, 1954; Senartana, 1940). In some South-East Asian countries *L. flava* is used as a source of food. For example, in Java the plant is a much-esteemed vegetable, which is cultivated in rice fields and sold in markets for its young leaves, stems and flower clusters (Abhilash, 2004). In Vietnam, *L. flava* occurs naturally in many bodies of water and is used as a vegetable in dishes; it is particularly popular in the Mekong Delta. Known as *keo neo* or *cu neo*, it is frequently gathered by ethnic Vietnamese (*Kinh*) women and sold in local markets and by boat vegetable vendors. The young leaves and tops of the plant are boiled or cooked in mixed soups. The vegetable contains relatively high levels of Ca, Fe and ß-carotene, which are minerals that are frequently insufficient in the diets of women in low-income countries (Ogle *et al.* 2001). The leaves of *L. flava* are also collected for household consumption in Bangladesh by women (Sultana *et al.* ICLARM).
It is also reported to be used as pig or cattle fodder (in Sumatra), and as green crop manure for fertilising paddies (Abhilash, 2004).

Habitat Description
L. flava inhabits shallow swamps, ditches, pools and wet rice fields, occurring usually in stagnant fresh water (Abhilash, 2004).

Reproduction
Flowering and fruiting takes place throughout the year, with a single fruit producing about 1000 seeds, and a single plant producing about 1000 fruits per year (Senartana, 1940). The flowers open in the morning and close by mid-day, after which the stamens and petals disintegrate into a mucilaginous mass (van Steenis, 1954). There are no known pollinators for the plant in either South America or South east Asia. Spherical shaped fruit develops and ripens, opening along the adaxial (inner) wall; this is due to the thick curving abaxial (outer) wall. Each fruit consists of individual cresent shaped segments, known as fruitlets; the fruit and fruitlets may float for several days, scattering the numerous tiny seeds as they float downstream. The plant may also propagate clonally. A vegetative plantlet, known as a ramet, develops in the centre of an inflorescence. After the fruit has fallen, the penduncle (stalk of the inflorescence) bends over and the ramet eventually reaches the surface of the water. It then sends out its own rhizome and roots, which take root in the mud below. Alternatively, ramets may break off and float away, forming new infestations downstream (Abhilash, 2004; CRC for Australian Weed Management, 2003).

General Impacts
If allowed to grow unchecked, *L. flava* may become a very invasive environmental weed of streams and wetlands. It has become a serious weed in rice fields, irrigation canals and wetlands in South-East Asia (Waterhouse, 2003). Clumps of the weed provide a congenial breeding sites for disease-vectors, including mosquitoes, which encourages the spread of diseases such as Japan fever and dengue fever (Abhilash, 2004).

Management Info
Strategies employed to control *L. flava* should emphasis public education. The effects of the invasive weed should be outlined, and the practices necessary for limiting its spread should be made clear. For example, plants should be uprooted and burnt (or deep-buried) to prevent them from re-establishing and the plants should be (preferably) removed before the weed flowers and sheds its seeds. An increased understanding of the life cycle of the weed should be attempted through ecological studies; these may highlight the most vulnerable stages of the life cycle and eventually lead to more effective control measures. The use of the plant as a leafy vegetable, green manure, medicine, or in other applications should be documented so that the social and economic factors contributing to the spread of the plant can be addressed (and potentially reduced).
Preventative measures: In general, early detection of any invasive weed species provides the best opportunity for intervention. This is because eradication or control programs implimented at an early stage of an invasion have a higher chance of success and are more cost-efficient. To encourage early detection, the Northern Australian Quarantine Strategy (NAQS - a sub-program of the Australian Quarantine and Inspection Service) have undertaken a survey of the distribution of known weeds (and the occurance of new weeds) in northern Australia. Field surveys such as this provide current distribution records of weeds in an area and are necessary for fast detection of a new invasive weed. Detection is also hindered by the under-representation of weeds in herbaria (collections of preserved plants). This is due to the fact that botanical collectors rarely document introduced species. To address this, botanists working under the NAQS collect naturalised species in addition to native taxa, providing an opportunity to consolidate knowledge of weed flora in the region (considered to be essential for prioritising weed management in any area) (Waterhouse, 2003).

Pathway
It is thought that the introduction of *L. flava* into India may have been due to contaminated imports of rice from rice paddies in South East Asia infested with the weed (Abhilash, 2004). It is thought that the introduction of *L. flava* into India may have been due to contaminated imports of rice from rice paddies in South East Asia infested with the weed (Abhilash, 2004). As well as unintentional spread of the seed via agricultural imports its use and cultivation as a food source may result in intentional spread of the plant into new countries. The latter is thought to be the cause of its spread from Java to Papua (Waterhouse, 2003).The plant was introduced into Singapore for ornamental purposes (Corlett, 1988) As well as unintentional spread of the seed via agricultural imports its use and cultivation as a food source may result in intentional spread of the plant into new countries. The latter is thought to be the cause of its spread from Java to Papua (Waterhouse, 2003). Movement of *L. flava* from Irian Jaya (Papua) to Papua New Guinea as a source of food is inevitable (if it isnt there already). This is also thought to be the reason for its introduction into Papua from Java (Waterhouse, 2003).

Principal source: Abhilash, P.C, School of Environmental Sciences, Mahatma Gandhi University, Kottayam, Kerala, India.
Waterhouse, 2003. Know your enemy: recent records of potentially serious weeds in northern Australia, Papua New Guinea and Papua (Indonesia).

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ALIEN RANGE

[1] AUSTRALIA
[1] BANGLADESH
[1] INDIA
[3] INDONESIA
[1] MALAYSIA
[1] MYANMAR
[1] PAPUA NEW GUINEA
[1] SINGAPORE

[2] SRI LANKA

[1] THAILAND

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ITIS (Integrated Taxonomic Information System), 2005. Online Database *Limnocharis flava*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from:
http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Limnocharis+flava&p_format=&p_ifx=plglt&p_lang= [Accessed March 2005]

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