

Victoria amazonica, plant native to Amazon,
recently introduced



Aquatic Plants of India – Part II

A SPECIAL CONTRIBUTION TO NATIONAL BIODIVERSITY AUTHORITY, GOVERNMENT OF INDIA
ON THE OCCASION OF INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY - 2013

➤ **Shallow waters of the Amazon River basin**

Ludwegia sedoides



- Ornamental aquatic plant
- Showy leaves

Ludwegia sedoides



Bladder of *Utricularia auria*



➤ Aquatic carnivorous plant

Cyanotis axilaris



- **Common in coastal regions**
- **Medicine for tympanites and asites**

Cabomba caroliniana



- **Submerged aquatic plant**
- **Aquarium plant**

Rotala macrandra



- **Streams, lagoons, temporary ponds and paddy fields**

Regnellidium diphyllum



- **Two leaflet water fern**
- **Non flowering plant with latex**

Spyrodella polyrrhiza schl.



- **Cosmopolitan**
- **An indicator of dirty water**

Limnophila indica



➤ **As an antiseptic and to cure dysentery**

Nymphoides krishnakesara



- **Shallow pools in laterite**
- **Flowers from August to November**
- **Endemic to Northern Kerala**

Nymphoides indica



- **Annual or perennial**
- **Fresh and brackish water**
- **Flowering and fruiting as long as enough water is available**

Eriocaulon madayiparense



Eriocaulon wynadensis
Vivek et al.



Acnthus ilicifolius



- **Along the banks of tidal streams and lakes**
- **Root are used in curing Asthma and Paralysis**
- **Leaves are used for rheumatism**

Pogostemon erectum



- **Found along the margins of ditches and ponds**
- **Frequently found in brackish water near to the coast**
- **Endemic to South India**

Pontederia cordata



- **Mostly found in shallow water, sometimes in brackish condition**
- **It is cultivated for ornament**

Special attraction of the garden

the WATER QUEENS

Nymphaea mexicana Zucc.



- **Reported from Mexico**
- **Flowers are bright yellow**
- **Flowering rare in low altitude**

Nymphaea marliacea var. *rosea*



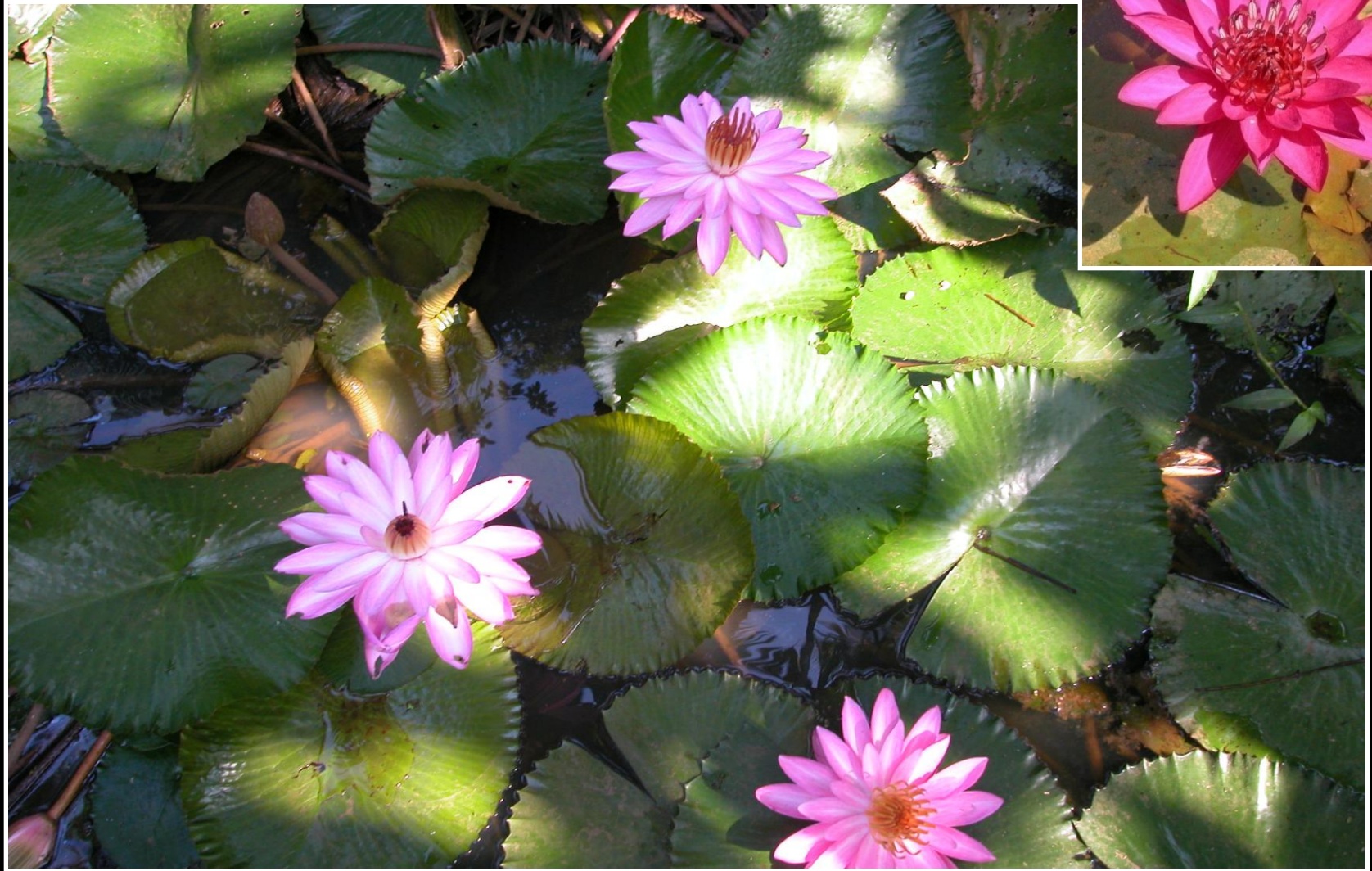
- **Throughout the plains and hills in India**
- **Flowers yellow**
- **This plant was originally reported as a hybrid of *N.alba* L. and *N.mercana* Zucc.**

Nymphaea micrantha



- **Throughout the plains in India**
- **Native of Africa**
- **Flowers purple**
- **Flowers blue-violet, open in the morning**

Nymphaea omrana var. *omrana*



- **A natural hybrid**
- **Occasionally set fruits**
- **Flowers red**
- **The flowers open at dusk & remain open up to 110.00 am**

Nymphaea omrana var. *rosea*



- **Common in both shallow and deep water**
- **Flowers pink**

Nymphaea pubescens



- **The tuberous rhizome and peduncles are eaten as vegetables**
- **Natural flower of Bangladesh**

Nymphaea rubra



- **Native of Bengal in India**
- **The single plant may bear even up to five flowers at a time**

Nymphaea caerulea



- **Native of Egypt**
- **Throughout the year**
- **Rhizomes are edible**

Nymphoides indica



- **Common and abundant in fresh and brackish water**

Nymphaea nouchali var. nouchali



- **Leaves reddish purple**
- **The national flower of Sri Lanka**
- **Flowers remain open during day time**

Nymphaea alba var. *rubra*



- Plains in India
- Perennial ponds
- Flowers carmine red, flowers open in the morning & close by evening

Nymphaea malabarica



- **Southern states of India and becoming rare**
- **Flowers are white, slightly fragrant**
- **Leaves green on both surfaces**

Nymphaea marlecia



- **Throughout the plains and hills in India**
- **In high altitudes**
- **Flowers flesh coloured**
- **Flowers open in night and close by noon**

Nymphaea alba



- **Native of Kashmir**
- **Flowers are white**
- **The rhizomes are edible**

Nymphaea omrana var. *rosea* R.Ansari & G.Jeeje



Nymphaeae nouchali var. *versicolor* R.Ansari & G.Jeeja



MALABAR BOTANICAL GARDEN
SAROVAR
AQUATIC PLANT CONSERVATORY
ജലസസ്യ സംരക്ഷണ വിദ്യാലയം
ENTRY RESTRICTED
പ്രവേശനം തീരെ അധികൃതരുടെ അനുമതിയില്ലാതെ.

Malabar Botanical Garden
Aquatic Plant Conservatory



Economic Importance

c) Native Aquarium plants

- **Cabomba caroliniara** – home aquarium – Exotic
- **Native plants**
 - **Thread like leaves** - *Eriocaulon setacous*
 - *Limnophila heterophylla*
 - *Najas graminea*
 - *Urticularia arrea*
 - **Narrow ribbon like leaves** - *Blyxa*
 - *Vallisnaria*
 - **Narrow dissected leaves** - *Ceratopteris thalictroides*
 - *Hydrophila difformis*
 - **Filiform branches with leaves** - **Rotala**
 - **Leaves in rosetts** - *Aponogeton appendiculatus*
 - *Ottelia alismoides*
 - *Sagittaria sagittifolia*
 - **Small floating plants with long narrow roots**
 - *Pistia stratiotes*

Economic Importance

b) Edible Aquatic plants.

- | | |
|---------------------------------------|---|
| <i>Centella asiatica</i>
vegetable | - Rexon and Coalts leafy
in Srilanka |
| <i>Acrostichum aureum</i> | - Vegetable in Nicobar islands |
| <i>Alternanthera sessilis</i> | - Vegetable in Tamil Nadu |
| <i>Aponegeton natans</i> | - Tuber edible |
| <i>Azolla pinnata</i> | - whole plat edible |
| <i>Ceratopteris thalictroides</i> | - Leafy Vegetable in asian
continents. |
| <i>Polygonum glabrum</i> | - Leafy vegetables in Rajasthan |
| <i>Sagittaria Sagittifolioa</i> | - Rhizomes as food in China |
| <i>Vallisneria spiralis</i> | - Leafy vegetable in Japan. |

Economic Importance

a) Aquatic Medicinal Plants

Acorus calamus - Maintaining health reducing obesity, stomach ache, piles

Bacopa monnieri - Heart and mental diseases, promote hair growth, improve memory, to clear voice.

Centella asiatica - Maintaining youth, Jaundice, improving intelligence

Eclipta alba - Better vision and hair growth

Monochoria vaginalis - Urinary complaints

Economic Importance

d) Aquatic plants as manure

- *Azolla pinnata*
- *Eichornia crassipes*
- *Hydrilla verticillata*
- *Pistia stratiotes*

Economic Importance

e) Aquatic horticulture

- *Coix lacryma – jobi*
- *Crinum viviparum*
- *Monochoria vaginalis*
- *Nymphoides ssp.,*
- *Pandanus spp.,*
- *Pistia stratiotes*
- *Trapa natans*
- *Utricularia spp.,*
- *Nelumbo nucifera*

Economic Importance

f) Bioremediation

- *Cyperus pangorei*
- *Eichhornia crassipes*
- *Hydrilla verticillata*
- *Lagenandra toxicaria*
- *Spirodela polyrhiza*

Ex-situ conservation is difficult

- Absence of adequate aquatic habitats with institutions
- Aquatic plants demand special basal substratum like laterite, clay, sand etc under water.
- Physical and chemical features of water in natural habitats to be maintained.
- Plants from temporary aquatic situations require a resting period during summer.
- Associated plants are important for developing suitable habitats.
- Limitation in introduction of plants growing in running water.
- Control of pests & snails under water.
- Excessive growth of weeds in aquatic ecosystems.
- Transportation of delicate live plants is difficult.

Ex-situ conservation at MBG





1. Free Zone (1 Acre)
2. Pathway
3. Mangrove Zone (1.5 Acres)
4. Open Auditorium
5. Marshy land (0.75 Acre)
6. Aquatic Plant Conservatory-Lake (5.62 Acres)
7. Boat Jetties
8. Model Ecosystem (3.125 Acres)
9. Lawn and Arboretum (2.5 Acres)
10. Ecoeducation Centre
11. Open Area (1Acre)
12. Aquagene (0.50 Acre)
13. Plant Breeding Station
14. Bryophyte Conservatory
15. Pteridophyte Conservatory
16. Algal Zone
17. Begonia House
18. Office (MBG)
19. private Pathway
20. Parking Area

LAYOUT OF MALABAR AQUATIC BIOPARK



Thank you