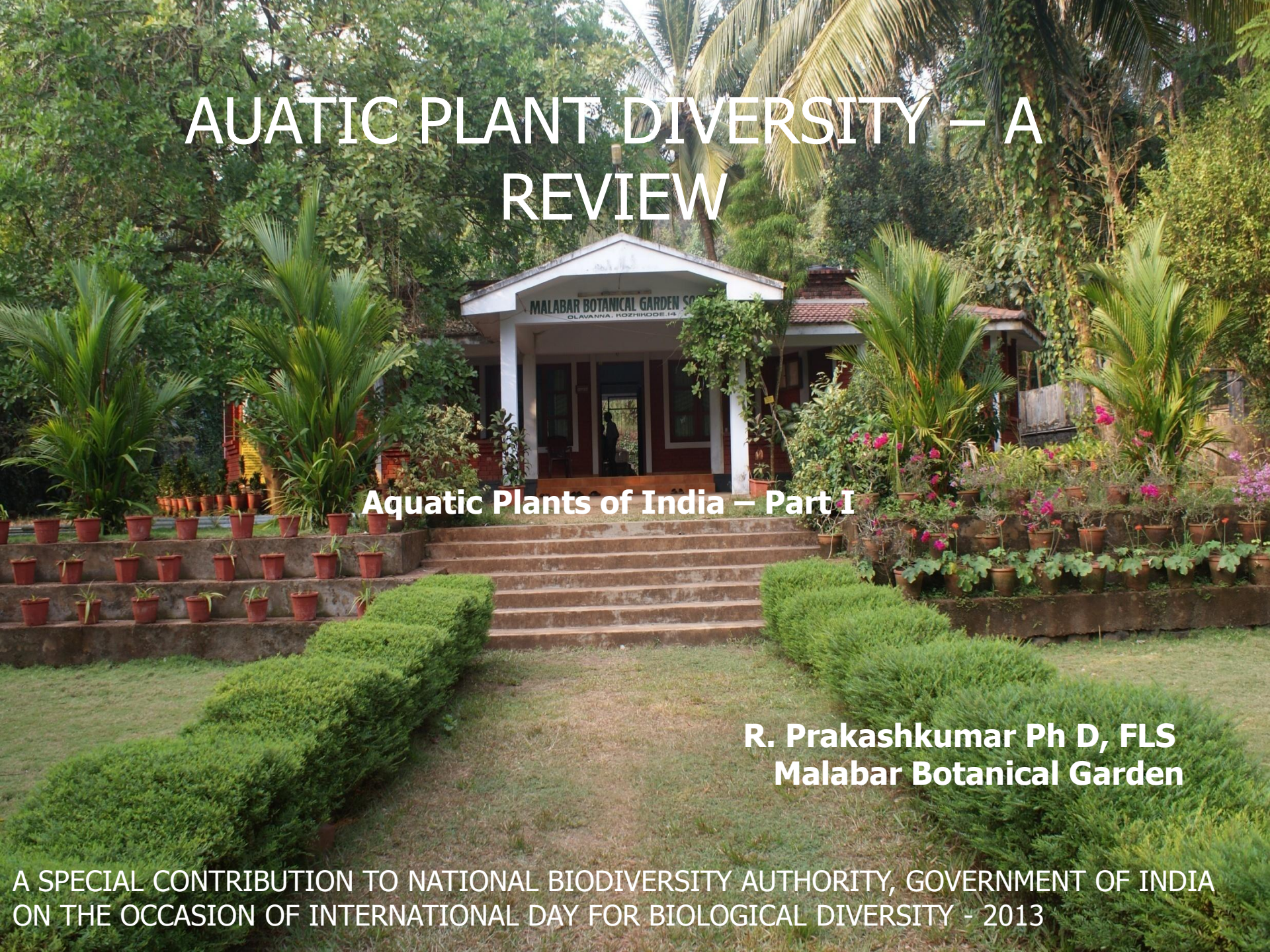
AUATIC PLANT DIVERSITY – A REVIEW



Aquatic Plants of India – Part I

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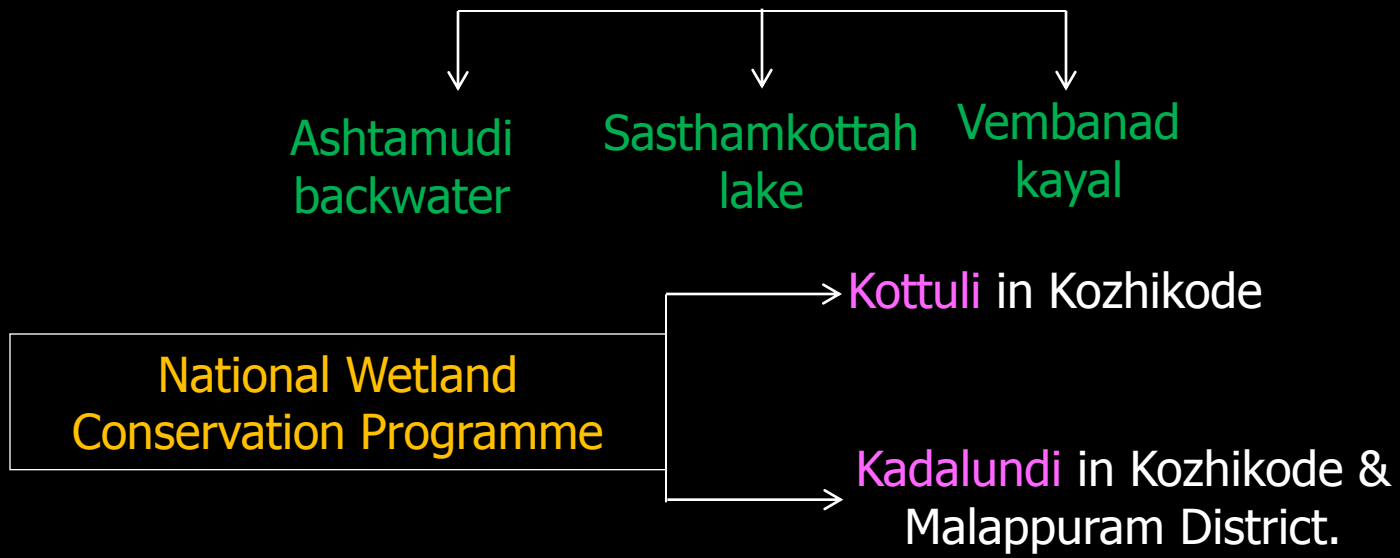
A SPECIAL CONTRIBUTION TO NATIONAL BIODIVERSITY AUTHORITY, GOVERNMENT OF INDIA ON THE OCCASION OF INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY - 2013

- Man depends on wetlands
- Human civilization around wetlands systems
- Prehistoric & historic temples situated near wetlands form remnants of such civilization
- Man depends for drinking water, agriculture, fishing water transport, tourism , water sports etc.
- Productive Ecosystem
  - Cradles of Biological Diversity

Kerala – 3,28,402 hectares wetlands

- 3 designated Ramsar sites



Plants of wetlands have played fascinating roles in life

- Rhizomes of *Nelumbo macifera*
- Fruits of *Nymphaea nouchali* — food
- *Bacopa monnieri*
- *Centella asiatica* — medicine
- *Eclipta alba*
- *Lagenandra toxicaria* - water purifier
- *Nelumbo nucifera* - worship
- *Typha angustata* - thatching
- *Pandanus fascicularis*
- *Cyperus pangorei* — mats & baskets

Aquatic Ecosystem

- Fast diminishing ecosystem
  - Filling
  - Industrial discharge
  - Heavy slitting
  - Exotic weeds
- Rich specialized aquatic biodiversity in fast disappearing

Plate - 1

Muthappan temple at Parassinikkadavu along the banks of Valapattanam river

A temple pond in Calicut (Sreekandeswaram temple)

Filling of a wetland for road construction

Excessive growth of the exotic weed *Eichhornia crassipes* in an aquatic situation

Pookot Lake: a water body being used for tourism in Wayanad

Fishing harbour at Chaliyam developed at the coast of rich mangrove vegetation

Dense mangrove vegetation at Valapattanam estuary in Kannur district

Dumping of inorganic city wastes into water sources: a view from Canoli canal

A timber yard at Kallai river developed damaging the mangrove system there

The much polluted water of Canoli canal. A patch of *Mariscus javanicus* which tolerates the toxic substances is seen growing in it.

Pandanus odorattissimus forming prohaline type of estuarine vegetation

A dense riparian vegetation at Kalikkadavu in Kasaragode district

Aquatic Vegetation – Based on habitats

1) Free - floating hydrophytes
   - Live on the surface of water, in contact with air, stagnant water
     - *Eichhornia crassipes*
     - *Hygroryza aristata*
     - *Lemna perpusilla*
     - *Pistia stratiotes*
     - *Spirodela polyrhiza*
     - *Wolffia globosa*

Aquatic Vegetation – Based on habitats

2) Suspended hydrophytes

- plants anchored and submerged in young stage but later get detached from their roots and lie below the surface of the water, can not survive in fast flowing water, restricted to stagnant ponds, tanks.
  - *Ceratophyllum demersum*
  - *Eriocaulon setaceum*
  - *Hydrilla verticillata*
  - *Utricularia aurea*

Aquatic Vegetation – Based on habitats

3) Submerged - anchored hydrophytes
   - Plants well below the surface of water usually anchored. Found both in stagnant and running water.
     - *Aponogeton appendiculatus*
     - *Blyxa auberii*
     - *Cabomba caroliniana*
     - *Ottelia alismoides*
     - *Vallisnaria natans*

Aquatic Vegetation – Based on habitats

4) Anchored hydrophytes with floating leaves
   - Plants usually met within shallow stagnant waters. Tide over un favourable periods by perennial organs like rhizome, tubers, stolens etc. Characterized by dimorphic leaves – *juvenile submerged and mature floating.*
     - *Aponogeton natans*
     - *Nelumbo nucifera*
     - *Potomogeton nodosus*
     - *Sagittaria guayanensis*

Aquatic Vegetation – Based on habitats

5) Anchored hydrophytes with floating shoots
   - plants attached to substratum, branches trail or creep along water surface, often rooting at nodes, stagnant waters
     - *Geissaspis cristata*
     - *Ipomoea aquatica*
     - *Ludwigia adscendens*
     - *L. sedoides*
     - *Neptunia prostata*
     - *Trapa maximowiczii*

Aquatic Vegetation – Based on habitats

6) Emergent - Anchored hydrophytes

- Plants anchored to substratum under water, but produce aerial shoots projecting well above water. Inhabit shallow stagnant water.
  - *Acorus calamus*
  - *Aeschynomene aspera*
  - *Bacopa monnieri*
  - *Eleocharis spiralis*
  - *Hydrocera triflora*
  - *Limnocharis flava*
  - *Limnophila aromatica*
  - *L. heterophylla*
  - *Monochoria vaginalis*

Pandanus grove at MBG

Wetland at MBG

Preparation of data sheet -

On distribution, flowering time ,local uses.

- Field Exploration trips.
- Information on local names, uses, digital images.
- Water samples - P^H value recorded.
- Plant specimens – Processed into herbarium species.
- Live seedlings of non weedy/RET – Collected and introduced in garden.
- Delicate aquatic plants – Primarily introduced in special germination pots for adjusting P^H - shifted to conservatory.
- Plant specimens identified under stero dissection Microscope.

Collection Trips

Lagenandra nairi

- **Endemic to South India**

Bruguiera gymnorhiza

Monochoria vaginalis Presl.

- **For burning sensation of body**
- **Gastropathy, asthma, scurvy & haemorrhage**

MONOCHORIA VAGINALIS

Murdania loriformis

- **Wetland and moist places**
- **asthma**

Trapa natans var. *bispinosa*

- **Photosynthetic root**
- **Haemorrhages, diarrhoea**

Neptunia prostrata

- **Shoots are edible**
- **Earache and syphilis**

NEPTUNIA -- SPONGY TISSUES

Ottelia alismoides

- **Aquatic herb**
- **Eaten in South-East Asia**

Hygrophylla diformis

- **Dimporphic leaves**
- **Aquarium plant**

Hydrocharis dubia

- **Himalayan regions**

Lagenandra toxicaria

- **Endemic to Western Ghats**
- **Renal troubles and cardiac ailments**

Pistia stratiotes L.

- **Antiseptic, anti dysenteric and cure for asthma**
- **Fed to ducks and pigs in Bengal**

Ipomoea aquatica

- **Shoots are edible**

Utricularia aurea

- **Carnivorous plant**

Rotala malampuzhensis

- **Only in Kerala rice fields**

Rotala malabarica

- **Endemic to South-West India**

Nuphar lutea

- European aquatic plant
- Recently distributed in India as a garden plant

NUPHAR LUTEA

Pimpinella heyneana

- A rare plant restricted to India, Myanmar and Srilanka
- Wet forest ground

PIMPINELLA

Myriophyllum indicum

- **Endemic to South East Asia and Srilanka**
- **In ponds and low land marshes**

Lemna minor

- **Foul waters**
- **Cleans the organic impurities**

Equisetum ramosisimum

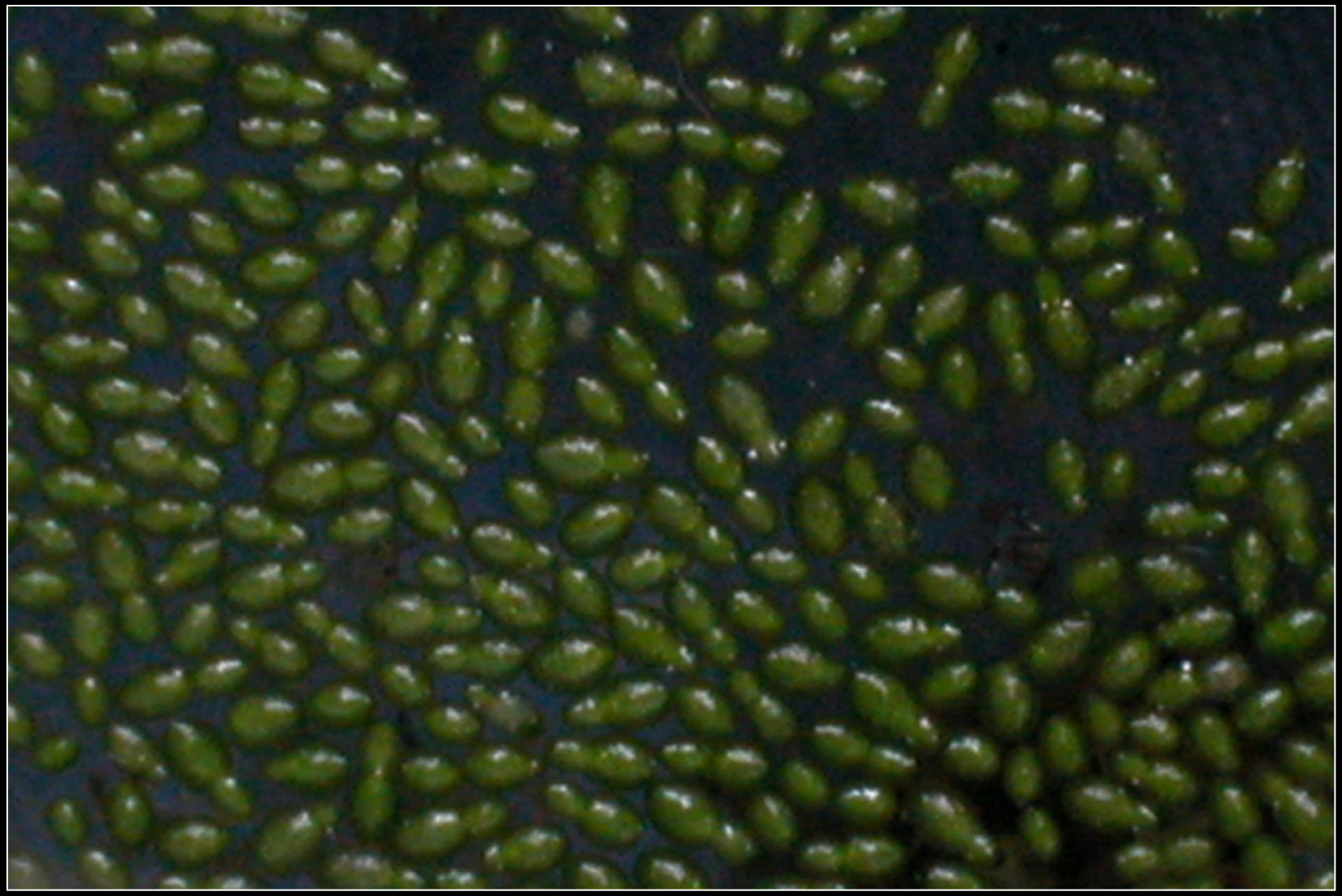
- **Aquatic fern**
- **Rare in Kerala**

EQUISETUM CONE

Hydrocera triflora

- **Annual and perennial herb found in shallow water**

Wolffia globosa



- **Smallest angiosperm**
- **Flowers are microscopic**

Limnopoa meeboldii

- It grows bottom rooted and floating in coastal lagoons
- Endemic to coastal south-west India

Eriocaulon heterolepis

- **Endemic to Western Peninsular India**

Euryale ferox

- **Annual or short lived perennial**
- **The seeds fruits and rhizomes are eaten locally by humans**