ISSN 2250-3153

Aquatic plant diversity of ponds in Nemmara panchayath, Palakkad district, Kerala, India

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Abstract- Palakkad is is a district in kerala which contain 10500 ponds (as per the Gazateer of Palakkad district). Ponds are not merely the water storage areas, they contain numerous plants also. Some are used as food and some are economically important also. Now a days the number of ponds are decreasing rapidly due to anthropological activities like uncontrolled construction works, filling of ponds by soil, converting the ponds into agricultural areas etc., thus by destroying the aquatic ecosystems. If the present situation continues it will lead to the end of the pond ecosystem. Most of the people are more conscious about the conservation of forests. Pond plants are more or less neglected. The present work is to give importance to pond plants and to their conservation.
Selected ponds are rich in plants,and are having economic importance also.Since the wetland ecosystem is playing a major role in the ecosystem it is the time to take steps in conserving ponds and pond plants.

Index Terms- Aquatic plants, Pond ecosystem, Kerala, Palakkad, nemmara

I. INTRODUCTION

A pond may look peaceful on the surface, but the complex ecology of a pond ecosystem is actually constantly in motion and teeming with life. In and around a pond, a delicate ecological balance exists that is all too easy to destroy. A pond ecosystem is a complex independent system of plants, animals and microorganisms along with physical environment in which they live. Pond ecology depends first and foremost on the freshwater environment for nutrients and survival. Ponds are usually shallow, which allow sunlight to reach organisms growing on the bottom. Every element of a pond ecosystem works in conjunction with others to maintain balance.

Most of the people are more conscious about the conservation of forests. Pond plants are more or less neglected. The present work is to give importance to pond plants and to their conservation. Area selected for the present study is Nemmara panchayath in Palakkad district in Kerala.
General description of the area

II. LOCATION AND EXTENT

Nemmara panchayath is situated in the southern part of palakkad district adjoining Nelliyampathy hills. The panchayath lies between$10^0$31'47"and$10^0$36'45" north latitude and $76^0$34'41"and$76^0$38'48" east longitude. The panchayath extents over an area of 3678.5 ha(according to panchayath vikasanarekha , area is384 ha)and consist of two villages *viz*.,Nemmara and Pothundy.

Nmmara panchayath is the valley of Nelliympathy mountains and the panchayath having so many small hills – (Athanadu , Allimala ,Cheriya allimala ,Vamala , Ayyappanpara , Karadikkunnu , Kottekkunnu , Mattayikkunnu etc.) and plains.
Physiographicalylly the panchyath area can be divided into the low lying lands along the riverbanks and in between the hills , and undulating to hilly uplands and highlands. The lowland forms the valleys. The upland and highland have undulating to hilly terrain and have normal to excessive relief. The hilly area of the panchayath come under erosion landscapes where as the low lands come under depositional plain.

III. WATER RESOURCES

Pothundy dam is the main water resource in Nemmara panchayath. Pothundi dam is an irrigation project to provide water to the hilly areas of Nemmara. The dam is unusual in being constructed without a conventional concrete core, which is employed in most earth dams to counteract the force exerted by high water pressure. The core is made up of a mixture of jaggery and quick lime and Surki and was constructed during 1800 AD. The dam is located about 8 km from Nemmara and 42 km from Palakkad; Nelliampathi, around 17 km away, is known for its Nemmara Vallengi Vela festival.

IV. CLIMATE

The climate of Nemmara panchayath in the south-eastern part of the Palakkad plains can be described as humid tropical. The mean annual temperature of the panchayath is 27.7^0c. March and April are the hottest months with mean temperature of 31^0c and July is the coldest with mean temperature of 25^0c. Rainfall is received mainly from southwest and northeast monsoons. The mean annual rainfall (2095.7mm) exhibits considerable variation over the years in the range of 1699mm to 3028mm.

V. METHODOLOGY

Collected the statistical datas from the panchayth office and from the krishibhavans. Frequent field visits are conducted to the ponds in Nemmara panchayath ,collected plants and conducted taxonomic studies and made it into herbarium.

VI. RESULTS

Nemmara panchayath has 125 ponds (private and public) Which extends up to269.12acre.(as per the Neerthada masterplan2010-2015). Selection of the ponds for the collection of plants has been done as per the richness of ponds. All the ponds are having water throughout the year. Some of the ponds are drought affecting ,yet there will be water at the centre of pond in the muddy form. Among the 125 ponds 25 ponds are selected for present study.

Table1: List of selected ponds

Name of ponds	Type of ponds
Chandallur kulam,Chattiyode	Private pond
Ananthalakulam,chattiyode	Private pond
Poongode valiya kulam	Private pond
Thottasserykkulam, Akampadam	Private pond
Vishnukshethrakkulam, Kombamkallu	Holy pond-Public pond
Pullakkulam, Kombamkallu	Public pond
Ayinikkode kulam,Chathamangalam	Public pond
Valiyakulam, Chathamangalam	Private pond
Kollayankadukulam,Chathamangalam	Private pond
Kuriyalloorukulam,Pezhumpara	Private pond
Thevarmanykulam, Thevarmany	Private pond
Kavarakulam, Thevarmany	Private pond
Puthankulam,Aluvassery	Public pond
Pachakkulam, Aluvassery	Public pond
Kothakulam,Aluvassery	Public pond
Thanniyappankulam, Vallanghy	Public pond
Vallanghy sivankovilkulam, Vallanghy	Holy pond-Public pond
Vakkode kulam, Vallanghy	Public pond
Choppankulam, Vithanassery	Public pond
Ayyappan kshethrakkulam, Viyhanassery	Holy pond-Public pond
Kannodukulam, Vithanassery	Public pond
Athanadukulam, Vallanghy	Public pond

Table 2: Species diversity of selected ponds

Name of plants	Common.	rare.
Azolla *pinnata* R.Brown .	✓	
Isoetes *coromandelina L.*		✓
Marsilea *quadrifolia* L.	✓	
Ceratopteris *thalictroides* (L.) Brongniart		✓
Salvinia *molesta* Mitchell	✓	
Centella *asiatica*(L.)Urban	✓	
Ceratophyllum demersum *L.*	✓	
Colocasia *esculenta(L.)Schott*	✓	
Commelina *benghalensis* L.	✓	
Cyanotis *axillaris* (L.) Sweet	✓	
Murdannia *nudiflora*(L.) Brenan	✓	
Ipomoea *aquatica* Forsskal	✓	
Ipomoea *fistulosa* Martius ex Choisy	✓	
Typha *angustifolia*		✓
Oldenlandia *brachypoda*	✓	
Hydrilla *verticillata*Royle	✓	
sacciolepis *indica*(L.)A.Chase	✓	

Coix *aquatica* Roxb.		✓
Juncus *bufonius* L.	✓	
Utricularia *aurea* Loureiro	✓	
Ludwigia *octovalvis*(Jascquin)	✓	
Acroceras *zizanioides*(kunth) Dandy	✓	
Brachiaria *mutica (*Forsskal) Stapf	✓	
Hvigroryza *aristata*(Retzius)		✓
Mnochoria *vaginalis(*N.L.Burman)Kunth	✓	
Lindernia *latifolia*(Blume) Koorders	✓	
Lindernia *parvifolia*(Roxburgh)	✓	
Lindernia *rotundifolia(L.)*	✓	
Nymphaea *pubescens willdenow*	✓	
Nymphaea *nouchali* N.L.Burman	✓	
Cyperus *pumilus* Nees	✓	
Kyllinga *melanosperma*(Nees)		✓

VII. CONCLUSION

All the selected ponds in Nemmarara panchayath have water throughout the year, and have a fair species richness in plants.The plants like Nymphaea are economically important.Since the flowers have a spiritual importants and the edible nature of the stem can make use by the people to cultivate it ina large scale.A pond may consist not only the plants but is maintaining a well balanced ecosystem also.More than that they are the good water storage areas, provide sufficient water for agricultural and irrigation purposes and also increases the ground water level. So the ponds and pond plants should be conserved.

ACKNOWLEDGMENT

We hereby thanks to management and staff of Karpagam University for providing all facilities for the present work. We also express our sincere thanks to Sri Babu Nemmara panchayath president and Sri Raghu for their kind help in the field work.

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