

Short Communication

**ECOLOGICAL STATUS OF WATER LAKE (KANMAI) IN AND AROUND
KADAICHANENTHAL AT MADURAI DISTRICT, TAMIL NADU, INDIA: A
PRELIMINARY STUDY**

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ABSTRACT

In present study carried out the butterflies' 34 species and 5 families, Birds 24 species, 5 order and 13 families and Dragonfly 13 species and 3 families is recorded. The present study location is also facing tremendous conservation challenges by the impact of anthropogenic alteration of the habitats in and around the lake. In this paper showing a baseline data of butterfly, birds and Odonatas.

Keywords: Lepidoptera, Odonata, Avifauna, Diversity, Lake Ecology, Wetlands.

INTRODUCTION

Aquatic ecosystems are important one which provide livelihoods for the millions of people who live around them. Man depends ponds for most of his needs like fishing, agriculture, irrigation, and other domestic purposes. Ponds are playing a very good role in rain harvesting, storage of water and regulation of ground water level. So in order to maintain the ground water level we must conserve ponds and pond habitat [1]. The order Lepidoptera is divided into two suborders viz., *Heterocera* (Moths) and *Rhopalocera* (Butterflies). So far, about 1,57,424 species of Lepidoptera have been described globally [2]. There are about 18,000 species of butterflies in the world and India has 1,501 species of butterflies [3]. The Western Ghats harbours around 330 species of butterflies. The main causes for the decline of butterfly populations are deforestation, habitat destruction for urbanization, industrialization and agriculture causes changes in temperature, humidity and rainfall. Prevalence of unfavorable weather conditions often affect habitat suitability leading to local extinction of butterflies. Unfortunately developmental activities and resulting habitat fragmentation create threats to the survival of butterflies worldwide.

India is a home of many species of birds including local as well as migrant birds. Water birds are ecologically dependent on wetlands. They play an important role in human life on culturally, socially, scientifically and as a food resource. The Indian subcontinent supports diverse avifauna (1370 species i.e. 13% of the world's birds) and which includes 141 endemic species [4]. Tamil Nadu is known for its rich diversity of avifauna with more than 450 species including several endemic and conservation prioritized species [5]. Wetlands and water birds are inseparable elements; wetlands are serve as a reservoir

for sustaining native flora and fauna [6]. The aquatic birds are important bio-indicators of lake ecosystems which should be protected to conserve the biodiversity and environment [7].

Wetlands in India face tremendous anthropogenic pressure mainly due to the release of domestic sewage, industrial effluents, dumping of solid waste, over-exploitation of the natural resources and conversion of wetlands into barren lands. This resulted in biodiversity loss and disturbance of the wetland services [8]. This loss of wetlands has dangerously reduced the availability stopover sites for migrating birds and has increased the importance of remaining wetlands to migrants as well as nesting species.

Odonates are playing an important role in climate change mainly due to evolutionary history and its adaptations. Odonata (dragonflies and damselflies) are gorgeous aquatic insects distributed throughout the world. Globally, 5952 species of Odonates under 652 genera have been reported. In India, 474 species and 50 subspecies which belongs to 142 genera and 18 families were recorded [9].

The aim of current study is to find out the current status of butterflies, birds and Odonatas in kadaichanenthal lake and The study was also intended to generate baseline reference data to evolve a suitable for Healthy ecosystem.

Study area

Kadachanendhal (9.9248537, 78.1450406) is a Locality in Madurai West City in Tamil Nadu State, India (Figure 1). Showing the lake of kadaichanenthal (Figure 2). Showing the growing of weeds and lotus. Butterflies and Birds were primarily identified directly in the field by observation and use of the field guide. The difficult cases followed capture or photography of

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Figure 1. Study area-kadaichanenthal lake(kanmai).



Figure 2. A view of growing weeds and lotus in kadaichanenthal lake.

the species. This wetland provides water for fishing activities or aquacultural practice as well as irrigation to surrounding agricultural lands.

Results and discussion

A total of butterflies 34 species and 5 families were recorded from the study area (Table 1). The family is are Hesperidae (5 species), Lycaenidae (6 species), Nymphalidae (14 species), Papilionidae(4 species), Pieridae (5 species) (Figure 3). In many ecologically stable communities, plants have a strong role in the determination of the structure of the community and the eventual faunal survival in it [10]. The growth rate of Lepidopteran individuals depend on the host plants with constitute the nutritional composition of the insects. For butterflies, it is important to have sufficient food sources for caterpillars and adults. We need to focus on species diversity and representation of flowering plants in the habitat. Localities should have a minimum size (which is different for each species) and should not be too far apart from each other to prevent populations from isolation. Only like that they will be able to function properly and maintain the necessary number of individuals and genetic

diversity, which is necessary for their sustainable development [11].

The most important threat to butterfly diversity is urbanization. Complete eradication of greenery in an area drives the butterfly population away since there is a lack of food and reduced chances to increase the progeny. Human activities have an undeniably strong influence on the biodiversity of all existing species. Due to the availability of varied sources of feed as well as foraging, the rich diversity of the birds were documented during the present study. The wetlands provides heterogeneous feeding habits to avifauna [12].Wetland habitat by supporting different food sources like planktons, fishes and invertebrates, further adding to the diversity of the wetlands [13]. The present study area of kadaichanenthal lake recorded of birds 24 species, 5 order and 13 families (Table 2). The family wise distribution stutes recorded families are Ardeidae (4 species), Charadriidae(3 species) Ciconiidae(1 species), Columbidae(2 Species), Muscicapidae (4species), Motacillidae (2 species), Dicuridae (2species), by following families are only one species recorded Laridae, Passeridae (1species), Phasianidae, Phoenicopteridae, Rallidae, Threskiornithidae (Figure 4).

Table 1. Butterfly diversity of water lake (kanmai) kadaichanenthal at Madurai district, Tamil Nadu.

S.No	Scientific name	Common name	Family
1	<i>Aeromachus pygmaeus Fabricius</i>	Pygmy Scrub Hopper	Hesperiidae
2	<i>Amittia dioscorides Fabricius</i>	Bush Hopper	Hesperiidae
3	<i>Badamia exclamationis Fabricius</i>	Brown Awl	Hesperiidae
4	<i>Baoris farri Moore</i>	Paintbrush swift	Hesperiidae
5	<i>Borbo cinnara Wallace</i>	Rice Swift	Hesperiidae
6	<i>Lampides boeticus Linnaeus</i>	Pea Blue	Lycanidae
7	<i>Talicauda nyseus Guerin-Meneville</i>	Red Pierrot	Lycanidae
8	<i>Zizina otis Fabricius</i>	Lesser Grass Blue	Lycanidae
9	<i>Castalius rosimon Fabricius</i>	Common Pierrot	Lycanidae
10	<i>Chilades lajus Stoll</i>	Lime Blue	Lycanidae
11	<i>Discolampa ethion Westwood Banded</i>	Blue Pierrot	Lycanidae
12	<i>Euploea core Cramer</i>	Common Crow	Nymphalidae
13	<i>J. atlites Linnaeus</i>	Grey Pansy	Nymphalidae
14	<i>Danaus chrysippus Linnaeus</i>	Plain Tiger	Nymphalidae
15	<i>J. iphita Cramer</i>	Chocolate Pansy	Nymphalidae
16	<i>J. hierta Fabricius</i>	Yellow Pansy	Nymphalidae
17	<i>J. orithiya Linnaeus</i>	Blue Pansy	Nymphalidae
18	<i>Lethe drypetis Hewitson</i>	Tamil Tree Brown	Nymphalidae
19	<i>L. rohria Fabricius</i>	Common Tree Brown	Nymphalidae
20	<i>Melanitis leda Linnaeus</i>	Common Evening Brown	Nymphalidae
21	<i>M. zitenius Herbst</i>	Great Evening Brown	Nymphalidae
22	<i>Moduza procris Cramer</i>	Commander	Nymphalidae
23	<i>Mycalesis patina Moore Gladeye</i>	Bush Brown	Nymphalidae
24	<i>Phalanta phalantha Drury</i>	Common Leopard	Nymphalidae
25	<i>Neptis hylas Linnaeus</i>	Common Sailer	Nymphalidae
26	<i>Belenois autrota Fabricius</i>	Pioneer	Pieridae
27	<i>Catopsilia pyranthe Linnaeus</i>	Mottled Emigrant	Pieridae
28	<i>Delias eucharis Drury</i>	Common jezebel	Pieridae
29	<i>Hebomoia glaucippe Linnaeus</i>	Great Orange Tip	Pieridae
30	<i>Leptosia nina Fabricius</i>	Psych	Pieridae
31	<i>G. doson C.&R. Felder</i>	Common Jay	Papilionidae
32	<i>P. memnon Linnaeus</i>	Blue Mormon	Papilionidae
33	<i>Papilio demoleus Linnaeus</i>	Lime Butterfly	Papilionidae
34	<i>Atrophaneura aristolochiae Fabricius</i>	Common Rose	Papilionidae

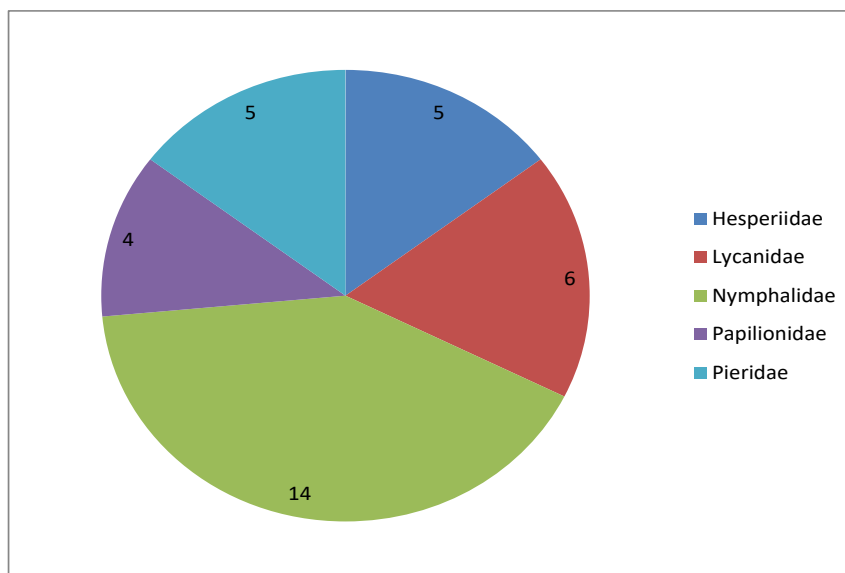
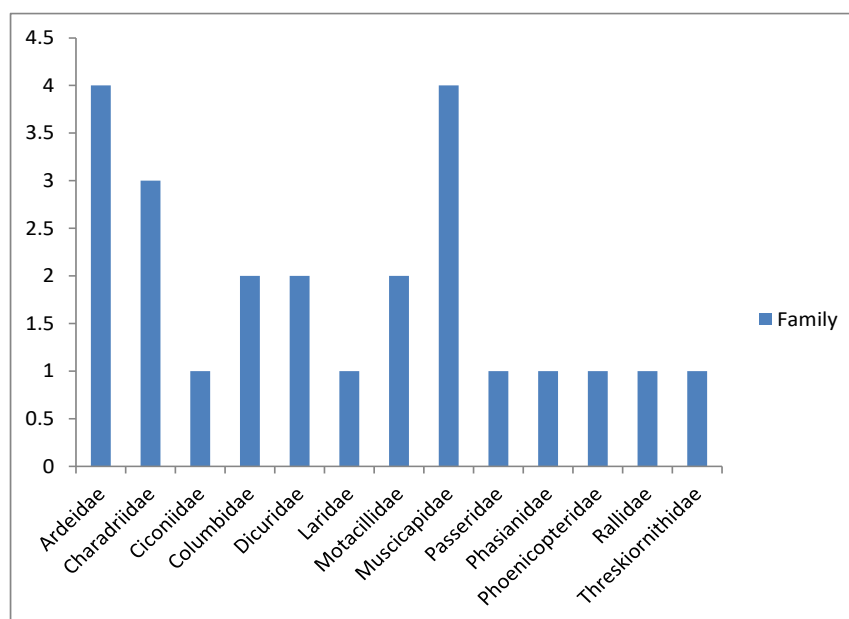


Figure 3. Distribution of families of Butterflies in kadaichanenthal lake (kanmai).

Table 2. Avifauna of water lake (kanmai) kadaichanenthal at Madurai district, Tamil Nadu.

S.No	Common Name	Scientific name	Order	Family
1	Indian Peafowl	<i>Pavo cristatus</i>	Galliformes	Phasianidae
2	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	Gruiformes	Rallidae
3	Blue Rock Pigeon	<i>Columba livia</i>	Columbiformes	Columbidae
4	Little Brown Dove	<i>Little Brown Dove</i>	Columbiformes	Columbidae
5	Black Drongo	<i>Dicrurus macrocercus</i>	Passeriformes	Dicuridae
6	Ashy Drongo	<i>Dicrurus leucophaeus</i>	Passeriformes	Dicuridae
7	Red-breasted Flycatcher	<i>Ficedula parva</i>	Passeriformes	Muscicapidae
8	Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	Passeriformes	Muscicapidae
9	Oriental Magpie Robin	<i>Copsychus saularis</i>	Passeriformes	Muscicapidae
10	Indian Robin	<i>Copsychus fulicatus</i>	Passeriformes	Muscicapidae
11	House Sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae
12	Yellow Wagtail	<i>Motacilla flava</i>	Passeriformes	Motacillidae
13	White Wagtail	<i>Motacilla alba</i>	Passeriformes	Motacillidae
14	Grey Heron	<i>Ardea cinerea</i>	Ciconiiformes	Ardeidae
15	Pond Heron	<i>Ardeola grayii</i>	Ciconiiformes	Ardeidae
16	Cattle Egret	<i>Bubulcus ibis</i>	Ciconiiformes	Ardeidae
17	Large Egret	<i>Ardea alba</i>	Ciconiiformes	Ardeidae
18	Painted Stork	<i>Mycteria leucocephala</i>	Ciconiiformes	Ciconiidae
19	Black Ibis	<i>Pseudibis papillosa</i>	Ciconiiformes	Threskiornithidae
20	Flamingo	<i>Phoenicopterus roseus</i>	Ciconiiformes	Phoenicopteridae
21	Redwattled Lapwing	<i>Vanellus indicus</i>	Gruiformes	Charadriidae
22	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	Gruiformes	Charadriidae
23	Little Ringed Plover	<i>Charadrius dubius</i>	Gruiformes	Charadriidae
24	Indian River Tern	<i>Sterna aurantia</i>	Gruiformes	Laridae

**Figure 4.** Distribution of families of Birds in kadaichanenthal lake (kanmai).

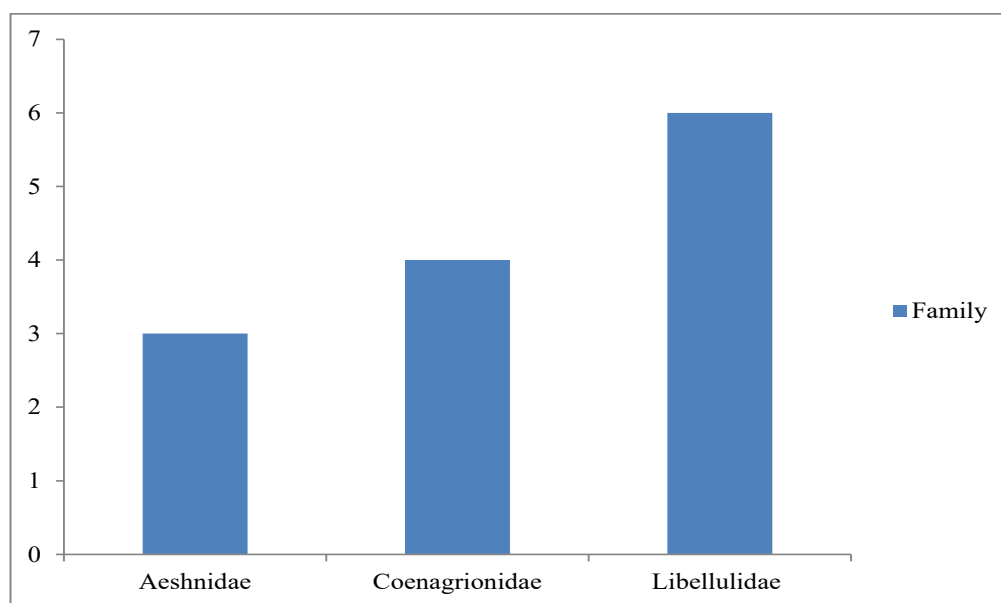
Many researchers done related work such as recorded Ardeidae to be the most dominant family in Bharathpuzha river basin in Kerala, and Surana recorded Anatidae to be the most dominant family in Chimdi lake Nepal [14]. Also the avifaunal diversity was studied by different authors from Maharashtra state such as recorded 78 species from Pohara- Malkhed forest reservoir of Amravati district, recorded 74 species from two freshwater lakes of Washim district, recorded 68 species from Chhatri lake of Amravati district, reported 72 species from Nagpur city, recorded 126 species from Navegaon national park from Gondia district, recorded 52 species from Shrungarbandh lake in Gondia

district, recorded 131 species from Bhayander and Naigaon wetlands in Thane district, reported 27 species from Zaliya lake in Gondia district [15-20]. Durairaj reported 117 species from Thiruthalaiyur Lake Tiruchirapalli Forest Division, Tamil Nadu [21]. reported 51 species from Komaranahalli Lake, Davanagere District, Karnataka [22].

In present study reported in kadaichanenthal Lake Odanates are 13 species (Table 3). The family wise status are Aeshnidae (3 species), Coenagrionidae (4 species), Libellulidae (6 species), (Figure 5). Followed by 419 individuals under 4 families, 9 genera and 10 species of Odonata were recorded in Palni Hills

Table 3. Odonata of water lake (kanmai) kadaichanenthal at Madurai district, Tamil Nadu.

S.No	Scientific name	Common name	Family
1	<i>Brachythemis contaminata</i>	Ditch jewel	Libellulidae
2	<i>Crocothemis servilia</i>	Ruddy Marsh Hawk	Libellulidae
3	<i>Diplocodes trivialis</i>	Ground Skimmer	Libellulidae
4	<i>Pantala flavescens</i>	Wandering Glider	Libellulidae
5	<i>Urothemis signata</i>	Greater Crimson Glider	Libellulidae
6	<i>Rhyothemis variegata</i>	Common picture wing	Libellulidae
7	<i>Pseudagrion microcephalum</i>	Blue river damsel	Coenagrionidae
8	<i>Ischnura aurora</i>	Golden darlet	Coenagrionidae
9	<i>andering midget</i>	Wandering midget	Coenagrionidae
10	<i>Ischnura senegalensis</i>	Marsh blue tail	Coenagrionidae
11	<i>Anax guttatus</i>	pale-spotted emperor	Aeshnidae
12	<i>Gynacantha bayadera</i>	parakeet darner	Aeshnidae
13	<i>Anax immaculifrons</i>	blue darner	Aeshnidae

**Figure 5.** Distribution of families of Odonates in kadaichanenthal lake (kanmai).

of Western Ghats in Tamil Nadu. Among the Odonata families, Libellulidae was speciose (5 species) followed by Euphaeidae (2 species), Chlorocyphidae (1 species), Coenagrionidae (1 species) and Aeshnidae (1 species).

Environmental factors like water quality, altitude and nutrient supplements influenced the diversity of aquatic fauna and also showed great impact on species richness [23]. Several investigators have reported that dragonflies and damselflies are very common in rice agroecosystem. Kandibane have recorded 12 species of Odonata under three families in rice fields of Madurai, Tamil Nadu. More than 70 per cent species belonging to these families that occur in India are endemic to Western Ghats [24]. Libellulidae and Gomphidae are well-distributed Anisopteran members across Indian subcontinent, with few species restricted to Western Ghats and/or northeast India [25-27]. It is opined that in place wherever deforestation, canalization of water bodies, urbanization, industrial development and disturbance of the natural cropping systems with agrochemicals was seen, dominance of Libellulidae was observed [28,29].

CONCLUSION

The study documents the rich avifauna shows that the area still

provides some potential habitats for declining population of the species. Study area is situated near the city. So it has high human interference. Anthropogenic activities may be the reason for depressed species diversity. Unfortunately, these regions are getting invalid by commercial activity due to urbanization. There is a need to monitor this area systematically with focused study and a conservation plan should be under taken by the government to save the urban species and their sustainable production.

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