



A REPORT ON THE ASIAN OPENBILL STORK (*ANASTOMUS OSCITANS*) AROUND MUSEUM LAKE AND ITS CURRENT STATUS IN THIRUVANANTHAPURAM, KERALA

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Abstract: This paper deals with the report of Asian Openbill Stork (*Anastomus oscitans*) from Thiruvananthapuram Museum Lake during the avifaunal diversity studies around the lake. During the early days of field study, the freshwater snail species *Bellamyia bengalensis* was not recorded except for the rare observation of African snails (*Achatina fulica*) during monsoon season. Openbills are a large wading migratory bird in the Stork family Ciconiidae. They usually prefer places with abundant water and snails to eat which is the preferred food of them. After this sighting of Openbills, the freshwater snail species was observed very common. This assumes that the snails must have come along with the storks. Thus they themselves made habitat for their survival. They are seen foraging near the lake, roosting on the tree trunks, but nesting and breeding was not observed. Though sighting of these local migrants was made earlier from the outskirts of Thiruvananthapuram city from Vellayani Lake, Veli- Akkulam Lake by the bird watching groups like “Warblers and Waders”, “Kerala Birder” and several other individual ornithologists this one from Museum Lake is for the first time. *Anastomus oscitans* like all the bird species is an ecosystem health indicator. This species can be considered as local migrants, as majority of them travel within the country.

Key words: Ciconiidae, Rain tree, Roosting, Freshwater Snail, Avifauna.

INTRODUCTION

Biodiversity encompasses variety of all life forms on earth that play a great role in human existence. Urbanization is a frequently cited as one of the cause of biodiversity loss (Czech and Krausman, 1997). The expansion of urban areas and the increasing demand for natural resources inevitably leads to habitat destruction. Urbanization is a pervasive and growing threat to avian populations globally, birds as indication of urban healthy condition (Pertti, 1989; Yuan & Liu, 1994), which also provided useful advice for urban design and programming (Chen *et al.*, 2000). Numerous studies have found that both the richness and abundance of native species including plants (Thompson and Jones, 1999), mammals (McKinney, 2008) insects (McIntyre *et al.*, 2000)

and amphibians (Ripley *et al.*, 2005) response to urbanization. Still, our understanding about urban ecology is severely limited (Marzluff *et al.*, 2001). Parks and gardens harbour many trees, occurring naturally or planted, which contribute to a number of environmental functions in urban environments, such as the survival of urban-dwelling species mainly bird species (Das *et al.*, 2014). Birds amongst other species provide a wide range of environmental and social functions to cities and urban dwellers (Orians and Lowenthal, 1986; Costanza *et al.*, 1997; Sanesi and Chiarello, 2006; Padoa-Schioppa *et al.*, 2007). Significant loss of natural habitats in urban areas has increased the emphasis upon the capacity of zoos and parks in contributing towards the conservation of

biodiversity of native fauna (Kuruville, 2014). Rich vegetation of native and exotic floral species can support a wide number of avifauna in non captive here. Ecologically, birds are of tremendous importance because of their key roles as pollinator and agents of seed dispersal (Bibi and Ali, 2013). Moreover birds are considered as an excellent ecological indicator of environmental health. The paper deals with the report of Asian Openbill Stork (*Anastomus oscitans*) from the Thiruvananthapuram Museum Lake during the avifaunal diversity studies around the lake. There are only scattered research works found on population abundance of Asian open bill stork in different places of South East Asia and especially in India (Johnson, 1992; Sharma 2007; Lim et al., 2011; Low et al., 2013; Das et al., 2014; Vishwakarma, 2015).

This paper also looks into the eBird report of openbills for the past ten years from the major areas in Thiruvananthapuram where they are recorded usually. And also major threats posed by these local migrants, their significant reason for the presence around Museum Lake.

Study Area

The Thiruvananthapuram museum and zoo is one of the oldest of its kind in India located at the heart of the city (08°30' N, 076°57'E) (Fig. 1).

Spread over 55 acres of land with Museum, Zoo and Garden, the zoo covers an area of 36 acres. This is a unique institution its construction where a Natural History Museum, Botanical Garden and a Zoological Garden exist in a single compound. The Zoo was started by Uthram Thirunal in 1857 and established as an annexe to the Museum in 1859 in order to attract more visitors. Thiruvananthapuram zoological garden is a unique institution in India for its remarkable landscapes and luxuriant vegetation. Royal look of lofty trees, towering bamboos, lush green landscapes give it a rare distinction of being one of the most beautiful zoos in South East Asia. The sprawling Museum Lake is an artificial water body constructed and designed by Mr. Hinglobe in 1859 purely for recreational purpose. The Museum and Zoo provides immense opportunity for the nature lovers as well as bird watchers. The expansive lake inside the zoo - complete with an island, lush vegetation and the consequent abundance of winged visitors has never failed to arrest the attention of visitors. The Thiruvananthapuram Museum Lake which is often named as 'the lungs of the city' is a haven of winged migratory birds too. Museum Lake which is a perennial and artificial lake is 156 year old one and right from its construction in 1859 has never lost its water level

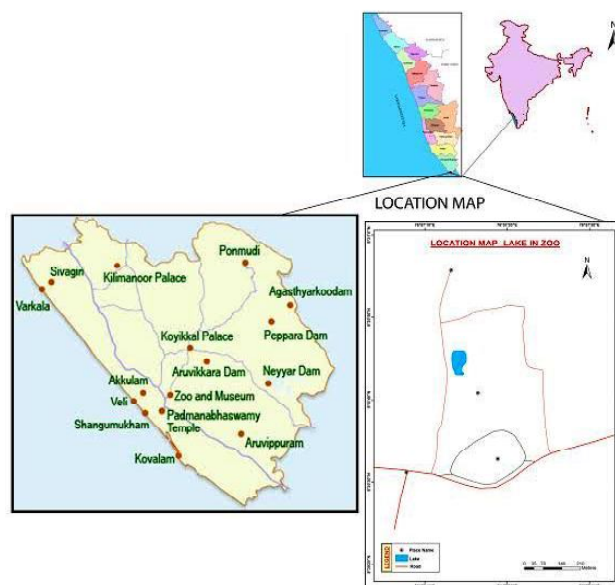


Fig. 1. Location Map showing Museum Lake Thiruvananthapuram

even in the scorching summers. This watery ecosystem and surrounding vegetation is an abode of diverse fauna which emancipates the global concept of conservation and ecological duty, even if it is being landscaped at the heart of the overcrowding city. Museum Lake is a notable habitat and a visiting ground for wide range of avifaunal species with different feeding habitat including local and distant migrants.

Asian Openbill Stork is a widespread bird in most of the wetlands in Kerala. It was a rare bird until the 1970's and since then has spread its distribution to many parts of the State. The Asian Openbill Storks (*Anastomus oscitans*) have been observed from Thiruvananthapuram

Museum Lake during the avifaunal diversity studies around the lake. This observation is of significant because it indicates the favourable conditions for these local migrants here. Identification of the bird was done using the field guide by Grimmet *et al.* (2014).

RESULTS AND DISCUSSION

Birds are often used as a biological model because they are good ecological indicators and they are easily observable (Clergeau *et al.*, 2001). In the past, ecologists paid little attention to urban ecosystems and focused mainly on pristine ones (Blair, 2004; Collins *et al.*, 2000; Jules, 1997; Marzluff *et al.*, 2001; Vandermeer, 1997). But ecological studies in urban areas now seem to be on the rise (Grimm *et al.*, 2001). Urban areas contain a large number of widely different habitats at small scales such as gardens, parks and wasteland. Each of these may provide very different habitats and so support a wide variety of species; urban gardens in particular are highly variable with no two containing quite the same combination of plants (Hardman, 2011). Asian Openbill stork are a large wading migratory bird in the Stork family Ciconiidae. They are greyish white stork that is readily distinguished from other large water birds in Asia by having a greyish bill with an open space between the mandibles (Robson, 2000). It is widely distributed across the Indian subcontinent and mainland of Southeast Asia (Robson, 2000). They usually prefer places with abundant water and feeds mainly on molluscs, and particularly freshwater snails. Openbill is predominantly greyish white with glossy black wings and tail that have a green or purple sheen (Ali, 1969). The name is derived from the distinctive gap formed between the re-curved lower and arched upper mandible of the beak in adult birds. Young birds do not have this gap. The cutting edges of the mandible have a fine brush like structure that is thought to give them better grip on the shells of snails (Gosner, 1993). They are colonial resident breeders. Ali and Ripley (1987) have documented a total of nineteen stork varieties globally. Among them Openbills are the smallest, the commonest and most successful storks. They usually prefer places with abundant water and snails to eat which is the preferred food of them. Members of the ciconiidae family are widely distributed in Asia (Hancock *et al.*, 1992); six resident species of storks have been reported from the Indian subcontinent (Ali and Ripley, 1987).

Openbills were observed around the Museum Lake during the avifaunal field study here. They were

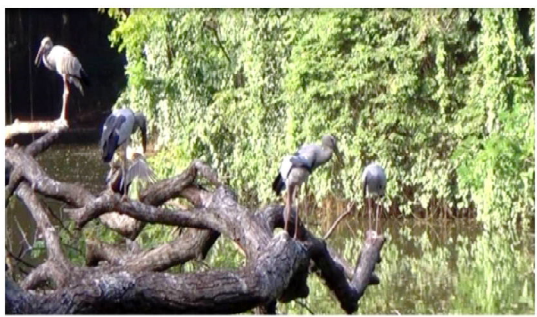


Fig. 2. Asian Openbill Stork around the Museum Lake

observed from a period of July 2015 to present (Fig. 2). During the early days of field study, the freshwater snail species *Bellamya bengalensis* were not recorded except for the rare observation of African snails (*Achatina fulica*) during monsoon and post monsoon seasons. After this sighting of openbills, the freshwater snail species was observed very common. This assumes that the snails must have come along with the storks. The plausible reason is that aquatic snails can survive gut passage for many hours over long distances by the water birds commonly known by the term 'endozoochory' (Leeuwen *et al.*, 2012). Thus they themselves made habitat for their survival here. They are seen foraging near the lake, roosting on the tree trunks, but nesting and breeding was not observed.

The sightings of these local migrants was made earlier from the outskirts of Thiruvananthapuram city from Vellayani Lake, Veli- Akkulam Lake, near Paddy fields of Kesavadasapuram, from Dewasom Board Junction and also near Poovar Estuary and Aruvikkara Dam Reservoir by the bird watching groups like "Warblers and Waders", "Kerala Birder" and several other individual ornithologists but this one from Museum Lake is for the first time. Fig 3 is the map showing the birding locations of openbills from Thiruvananthapuram.

In this study we focussed on the status of openbills from four major birding sights from Thiruvananthapuram city. The birding data for the last ten years from eBird database have been used for the enumeration of bird sightings. One of the world's largest citizen science projects is eBird, a database that has been used primarily to address questions of bird distributions and abundance over large spatial scales (Callaghan and Gawlik, 2015). The eBird data is shared with the conservationist and the scientific community working for the betterment of flora and fauna of the ecosystem and hence the inputs of data (observations) in eBird can help further in the habitat decline of birds.

Birding data from Vellayani Lake, Veli-Akkulam Lake and Paddy fields of Kesavadasapuram shows the pattern of total counts for openbills for the past ten years (Fig.4). Openbills were observed from Vellayani and Veli-Akkulam region and Paddy fields of Kesavadasapuram with good number of counts. A total of 115 observations have been made from the Vellayani region for the past ten years and 72 counts from the Paddy fields of Kesavadasapuram. The ebird data shows 'X' number (innumerable) count from Veli-Akkulam region during the year 2012. At the same time, the counts for the next years showed a decreasing

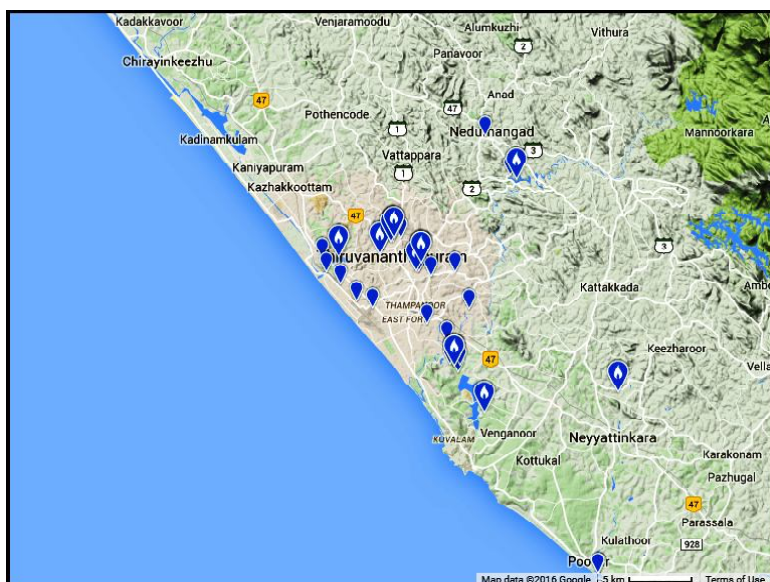


Fig. 3. Map showing the birding locations of openbills from Thiruvananthapuram. Image provided by eBird (www.ebird.org) (2016)

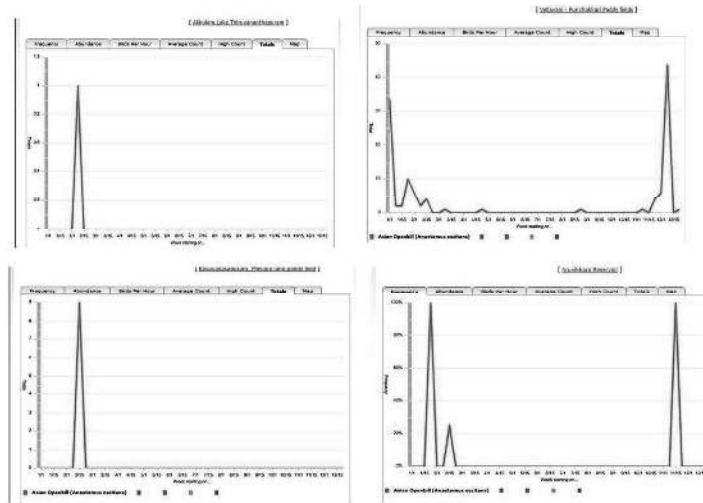


Fig. 4. Line graph showing the total count of Asian openbill storks for the past ten years (2006-2016) from different locations in Thiruvananthapuram city.

Image provided by eBird (www.ebird.org) (2016).

trend. The Openbills count for Aruvikkara reservoir region showed a minimum with 7 counts only for the study period.

It is clear from the data that there is a decline in the bird count for the last ten years. Vellayani and Veli-Akkulam observed high counts for the storks. But it showed a declining pattern the count for the years. Meanwhile various bird surveys like Asian Waterfowl Census (AWC), HSBC Kerala Bird Race for the years also reports that the bird count of these locations shows a declining pattern. The survey points that changes in the land use pattern and pollution are the major reasons for this decline. The decline near the paddy fields are due to loss of feeding grounds due to lack of agriculture. And also due to the use of pesticides and chemicals over the cultivation which subsequently enters into the body of the birds through their food.

A total of ten Openbills were observed from around the Museum Lake. Sighting of Openbill Storks from Museum Lake is significant, which shows the availability of necessary resources from the water body.

Anastomus oscitans like all the bird species is an ecosystem health indicator. They usually avoid human interaction and were found common be-

fore the zoo visit timings start. This species can be considered as local migrants, as majority of them travel within the country. However, a good number of flocks of Asian Openbill Stork are also coming from tropical South Asia. Asian Openbill is resident in tropical southern Asia, from India and Sri Lanka, east to south-eastern Asia.

The major threats posed by these local migrants are invasive weed species that clogs the wetlands which results in the reduced water flow and drying of the wetland. Pesticides used in the agricultural fields are also a major threat to them which causes increase in mortality rate of these bird species. Reduction in the mollusc species by extensive use of pesticides and chemical fertilizers in the fields are also a major threat to them. Urbanization is another major risk posed by these winged beauties. Depletion of freshwater resources and pollution, human interventions are also the chief causes.

The study suggests for a further scientific studies on the declining nature of these migrants as the birds are an excellent tool in monitoring the ecosystem health. Moreover the right use of citizen science projects like eBird in monitoring the bird community, their conservation and in their habitat management.

As urbanization is making depletion of the natural habitats, this ex situ conserved area well nourished with exotic and indigenous floras and perennial water body inside could provide shelter for the winged beauties. The study reveals better role of ex situ conservation sites in conserving biodiversity. Thiruvananthapuram zoo even though it was being in the middle of an overcrowding city is providing space for non captive birds too there by leading its meaningful service of conservation. Scientific studies on the feeding guilds, habitat and population of the openbill storks can reveal status of declining pattern.

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