

# Cattle Egrets and dry fish business in coastal areas

<sup>1</sup>Seedikkoya K and <sup>2</sup>PA Azeez

<sup>1</sup>Department of Zoology, MES College, Mampad, Malappuram, Kerala. Email: seedikkoya@yahoo.com

<sup>2</sup>EIA Division, SACON, Anaikatty, Coimbatore. Email: azeezpa@yahoo.co.uk

Cattle Egret is one of the common wetland birds in India. Its efficiency to make use of human interfered habitats according to Subramanya (1996) and ability to act as a scavenger (Javed 1983, Seedikkoya, 2007) will explain its commonness. Reynolds (1965) reported that these birds feed on flies attracted to light. Yadav (1999) and Middlemiss (1955) documented the importance of these birds in insect pest management. Blaker (1969) studied its importance in controlling the dipteran pests of cattle. Green blow fly in the food items of these birds is also reported (Ali 2002, Siegfried 1972). Fish forms a major dietary component in the menu of many people, especially in the developing countries of Africa, Asia and the Pacific, hence dipteran infestation of fish during sun drying is a menace in such countries (Wall *et al* 2001). In such a context, the investigation of the role of this bird in coastal areas where fishes and fish parts are laid for sun-drying has much significance.

## Study Site

The study was conducted at a fish landing and drying site in Puthiyappa beach (N 34<sup>0</sup> 00' 00.0" E 068<sup>0</sup> 54' 22.5"), approximately 5km north of Calicut in Kerala state on the south-west coast of India, and the study area extends about 25ha (Plate-1). Here, sun drying of fishes and fish parts is a widespread traditional practice and may be the only practicable means of preserving fish in a form that can be stored and transported far and wide to consumers especially to Tamil Nadu. The fishes that are selected for sun-drying are cut open and are laid in the sun for about two to three weeks until they are properly dried and ready for transport and marketing elsewhere.



**Plate-1 Study Site**

### **Methodology**

Data on maggots of houseflies and calliphorids and percentage composition of the sun drying fishes were collected by laying quadrats of 1x1m randomly twice a month (2004-2006) on various fishes and fish parts (Table 1) that were laid for drying on the sea beach. Quadrates were laid for counting the maggots of houseflies and calliphorids. Counts of houseflies and maggots were made in a few nearby houses and tea stalls in the vicinity of the drying pans using quadrat method. Apart from this the numbers of maggots developing in 250g of drying fish and fish parts were also determined. Maggots and adults were identified following Nayar et al. (1996). Birds were counted regularly within two hours after sunrise by the spot counting method formulated by the International Bird Census Committee (1970), Dickson(1979), Cody (1968), and Subramanya *et al.* (1998) using binoculars of 10x50 magnifications.

### **Results and Discussion**

More than 25 tonnes of fishes and chopped fish-heads from fish processing sheds are laid on the beach for sun-drying. This includes fishes such as mackerels, sardines and

anchovies. Cattle Egrets being insectivorous (Seedikkoya *et al.* 2007), capture a variety of insects from all available habitats. Under warm and humid conditions, fish kept for sun-drying can rapidly become infested with dipteran maggots (Wall *et al.* 2001). These dipterans apparently are the chief attraction for Cattle Egrets to the fish-drying pans in the sea beach. The Dipterans in drying fish belong mostly to the families Muscidae and Calliphoridae (Seedikkoya *et al.* 2007). Few members of the family Sarcophagidae were also seen. The maggots of muscids (Plate-2) are smaller than that of the calliphorids (Plate-3). The relative percentages the maggots belonging to the three families vary according to the composition of the fish components (Table-2).

From 250g each of the infested Indian Mackerel and Sardine 4g and 3g respectively, of calliphorid maggots were found. Since these larvae are negatively photo tactic, they prefer damp condition, and feed within the partly dried and damaged fish. They move within a depth range of 5-10 cm from the surface depending on the size and thickness of the dehydrating fish. From the half-dried and chopped fish-parts, thousands of calliphorids and muscids emerge daily in the morning and swarm around. Thus, this fish-drying beach forms an important source of insect vectors. It also forms a rich source of food for Cattle Egrets, since they exploit the situation effectively. They feed on them with low exertion and expenditure of energy. The survey conducted in the vicinity in randomly selected houses and hotel premises in the area for one year showed large number of flies frequenting these locations (Figure-1). The number of flies was highest during monsoon because of the prevailing dampness in the environment favorable for their breeding, persisting wetness in the fish spread in the sun for drying, and perhaps the absence of any effective predator of their larvae. During this season Cattle Egrets migrates to their breeding sites elsewhere, out of Kerala (Seedikkoya *et al.* 2007).

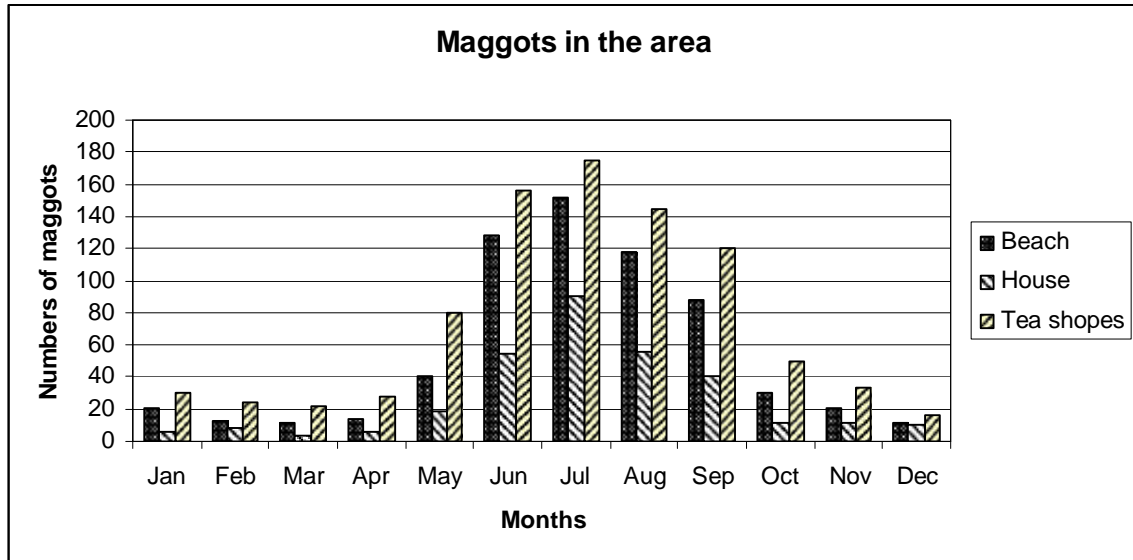


Figure 1. Seasonality in maggots in the fish in the sun-drying pans



Plate-2 Maggots of Muscidae



**Plate-2 Maggots of Calliphoridae**

Table- 1 Composition of fish-items Puthiyappa fish-drying pan during 2004-2005

Fishes or fish-wastes	Local name	Percentage
<i>Sardinella longiceps</i>	<i>Mathi or Chaala</i>	25
<i>Rastrelliger kangurta</i>	<i>Ayila</i>	20
<i>Stolephorus commersonii</i>	<i>Vatal or Nathal</i>	15
<i>Thryssa malabarica</i>	<i>Manungu</i>	06
<i>Auxis thazard</i>	<i>Elli Chooru</i>	10
<i>Trichiurus lepturus</i>	<i>Thalayan</i>	10
<i>Sphyraena jello</i>	<i>Thinda</i>	01
<i>Balistes erythrodon</i>	<i>Klathy</i>	03
<i>Lagocephalus lunaris</i>	<i>Peya</i>	04
Miscellaneous	<i>Pala vaka</i> or mixed	06

Table- 2 Maggots in sun-drying fishes at Puthiyappa beach during 2004-2005

Fish	Relative Percentage of Maggots		
	<i>Musca domestica</i>	<i>Calliphora sp.</i>	Sarcophagidae
<i>Sardinella longiceps</i>	33	67	0
<i>Sphyraena jello</i>	29	71	0

<i>Rastrelliger kangurta</i>	43	57	0
<i>Stolephorus commersonii</i>	71	29	0
<i>Lagocephalus lunaris</i>	56	44	0
<i>Thryssa malabarica</i>	44	56	0
<i>Auxis thazard</i>	22	78	0
<i>Trichiurus lepturus</i>	33	67	0
<i>Balistes erythron</i>	75	25	0
Miscellaneous	26	70.5	3.5

The study site had a population of Cattle Egrets ranging from 392-1539 and 260-960 during 2004-2005 and 2005-2006, respectively. Maximum number of the birds was seen from January 2005 to April 2005 and from January 2006 to March 2006 (Table-3). Areas having partly dried fish with dampish fleshy parts had larger number of Cattle Egrets than those areas with fully dried and hard fish, since the earlier location had more maggots than the latter. The number of maggots apparently is the factor that determines the abundance of egrets. In a random observation and estimation, it was found that a Cattle Egret made 5000-6000 pecks a day, suggesting that the bird removed about 175-200g maggots/day. It indicated the valuable service rendered by the egrets in controlling the flies in and around the coastal area.

Cattle Egrets were totally absent from June to September except for a few non-breeding individuals. Application of chemicals containing Monocrotophos, marketed in various trade names, to repel house flies from the drying fishes are known in the study area. Bleaching powder was also applied at various locations of the study sites in 2005, to reduce the maggot population. However, this practice of applying chemicals such as monocrotophos on drying fishes is an insidious health hazard to the consumers of dried fish and is to be strictly prohibited. It is reported that some steps in this direction, to curtail use of such chemicals, have been taken by the authorities. Areas that are applied with hazardous chemicals to control flies are normally avoided by the egrets. An instance of egret-death in the study area was reported in 2004 by consuming maggots contaminated with Monocrotophos. Human consumers from distant areas, however are unaware of this, and are at great risk. The fish drying farms should encourage egrets to do the job of controlling the maggots, a very ecofriendly practice, rather than resorting to unhealthy and hazardous practice of using pesticides.

Month	2004- 2005		Monthly Average	2005- 2006		Monthly Average
	I Week	IV Week		I Week	IV Week	
October	268	516	392	180	340	260
November	652	884	768	484	540	512
December	1136	1160	1148	648	872	760
January	1188	1236	1212	720	896	808
February	1296	1344	1320	808	952	880
March	1424	1456	1440	904	1016	960
April	1528	1550	1539	732	468	600
May	708	388	548	496	224	360
June	0	0	0	0	0	0
July	0	0	0	0	0	0
August	0	0	0	0	0	0
September	0	0	0	0	0	0

No vegetation grows on the study site, it being open sandy sea beach. However, such a location where natural prey is almost absent is preferred by Cattle Egrets because of the plenteous prey species in the location due to a particular human activity. The maggots are apparently relished by Cattle Egrets, which are more terrestrial and insectivorous. Studies have shown that 87% of the dietary items in the food of Cattle Egrets are insects (Seedikkoya *et al.* 2007). An examination of the habitat preference of the species reveals that of the several potential habitats the bird prefers the fish-drying site as in the case of solid waste disposal sites, which also provides abundant dipteran maggots at low energy cost (Frederick and McGehee 1994) and Seedikkoya 2003).

Residents, especially fishermen, living in the coastal areas face the problems of tackling the enormous swarm of the adult muscids and calliphorids frequenting the vicinity of their houses, especially during southwest monsoon, when the birds migrate to their breeding sites. The house flies and blue bottles act as vectors carrying pathogens, causing diseases such as dysentery, typhoid, and cholera and even some viral diseases. The egrets

for most part of the year prey up on them and help as friend of fishermen and other residents in the coastal areas.

## References

- Ali, S. (2002).** *The Book of Indian Birds*. 13<sup>th</sup> Edition (Revised). Published by BNHS, Oxford university Press.
- Aravindakshan, M.C. (1999).** Studies on the ecology, biology and comparative abundance of two dipteran insects- *Musca domestica* and *Calliphora vicina*. M.Sc. Dissertation submitted to University of Calicut.
- Blaker, B.R. (1969).** Behaviour of the Cattle Egret *Ardeola ibis*. *Ostrich* 40(3): 75-129.
- Cody, M.L. (1968).** On the methods of resource division in grassland bird communities. *American Naturalist* 102: 107-147.
- Dickson, J.G. (1979).** "Seasonal populations of insectivorous birds in a mature bottomland hardwood forest South Louisiana". In Dickson, J.C., Connor, R.N., Fleet, R.R., Jackson, J.A. and Kross, J.C. *The Role of Insectivorous Birds in forest Ecosystems*, Academic Press, New York.
- Frederick, P.C. and McGehee, S.M (1994).** Wading bird use of wastewater treatment wetlands in Central Florida, USA. *Colonial Waterbirds* 17: 50-59.
- International Bird Census Committee. (1970).** An International standard for mapping method in bird census work recommended by International Bird Census Committee. *Audubon Field Notes* 24: 722-726.
- Jackson, S. (1984)** Predation by Pied Kingfishers and whitebreasted Cormorants on fish in the Kosi Estuary System. *Ostrich* 55: 113-132.
- Javed, S. (1983).** Scavenging by Cattle Egret. *News Letter for Bird Watchers* 33(2): 38.
- Middlemiss, E.H.J.(1955).** Food of egrets. *Ostrich* 26: 159
- Nayar, K.K., T.N. AnanthaKrishnan and B.V David (1996).** *General and applied Entomology*. Tata Mc Graw Hill, New Delhi.
- Reynolds, J. (1965).** Association between Little Egret and African Spoonbill, *Breeding Birds* 58: 468.
- Seedikkoya, K. (2003).** Comparative Ecology of Certain Paddy Field Birds with Emphasis on the Habitat Quality. *PhD Thesis, University Of Calicut*.66-103



**Seedikkoya, K., Azeez,P.A. and Shukkur, E.A.A. (2007).** Cattle Egret as a biocontrol agent. *Zoos' Print Journal* 22 (10): 2864-2866.

**Siegfried, W.R. (1972).** Aspects of feeding Ecology of Cattle Egret (*Ardeola ibis*) in South Africa. *Journal Animal Ecology* 41:71-78.

**Subramanya, S. (1996).** Distribution, status and conservation of Indian heronries. *Journal of Bombay Natural History Society* 93: 459-486.

**Subramanya, S. and G.K. Veeresh (1988)** “Avifaunal patterns in the rice fields of Bangalore”. In, Dhindsa, M.S., Rao, P.S. and Parasharya, B.M. *Birds in Agricultural Ecosystem*. Published by Society for applied Ornithology (India) and sponsored by Indian council of Agricultural Research: 30-53.

**Wall, R., J.J.Howard and J.Bindu (2001).** The seasonal abundance of blowflies infesting drying fish in South-west India. *Journal of Applied Ecology* 38: 339-348.

**Yadav, D.N. (2000).** All India Network Project on Agricultural Ornithology, *Annual Report*. Published by Gujarat Agricultural University, Anand. 1-14.