

Bird Diversity in Fruit Gardens in Bang Nang Li Sub-district, Amphawa District, Samut Songkram Province

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Abstract: This research is quantitative and qualitative explorative research. The purposes of this research was 1) to study bird species, feeding behavior, abundance and status in study area 2) to study activities in utilization of birds in the study site. The data was obtained by interviewing the owners of fruit gardens and field surveys of bird species, activities of birds in habitat utilization in three kinds of organic fruit gardens namely; lychee garden, coconut garden, and pomelo garden in Bang Nang Li Sub-district, Amphawa District, Samut Songkram Province from October 2012 – September 2013. The result of bird survey in 3 gardens found 31 families and 61 species of birds. 52 bird species were found the most in organic pomelo gardens. In feeding habitats, insectivorous, piscivorous, granivorous, nectivorous birds and aquatic invertebrate feeding birds were found. Abundance level of birds in organic fruit gardens was at level 5. 23 bird species were frequently found. 43 bird species were found in November because migratory birds came to utilize the study site. According to the status of bird species, 48 resident bird species, 6 resident and 7 migrant bird species were found in organic fruit gardens. The birds' activities in fruit gardens were feeding and nesting.

Keywords: Samut Songkram Province, Fruit gardens, Bird diversity.

Introduction

Thailand is located in the tropical area of ecological biodiversity. Amphawa District is a district of Samut Songkram Province with Mae Klong River as the main river and several branch canals of the Mae Klong River. The area has fresh water, brackish water and salt water. It is called "City of Three Streams." With the fertile ecological system and with 3 water conditions, it is the source of diversity in bird species. Thepkorn (2006) said that around the canal, you may find the birds *i.e.* *Egretta garzetta* (Little Egret), *Orthotomus sutorius* (Common Tailor-bird), *Haliastur indus* (Brahminy Kite), *Pycnonotus blanfordi* (Streak-eared Bulbul). The prominent riverine flora is *Sonneratia caseolaris* which is the habitat of many fireflies. Amphawa District has the advantage of the natural tourism. However, as a result from tourism with the ever increasing tourists, the materials and civilization from outside are brought into affecting the area. It is another cause of the changing lifestyle of the population in the community and it may negatively affect the

domicile of bird species, which are less in number than in the past. Moreover, the database system of natural resources does not cover the study area. Bang Nang Li in Amphawa District in Samut Songkram Province has several canals with organic agriculture with fruit gardens. It aims to develop the area into a sustainable development area. Therefore, it must study the bird diversity in the fruit gardens of Bang Nang Li Sub-district, Samut Songkram Province to obtain a database of the bird species domiciled in organic fruit gardens for ecotourism. It is consistent with the National Economic and Social Development Plan Vol. 10 (B.E. 2550 – 2554) (2007-2011) in the strategy No. 4 focusing on the development on the basis of the variety of biological species; the stability of the resource base and environment by emphasis on the resource base; and good balance of the ecological system in order to maintain the good balance between the conservation, utilization and participation of resource management. Ecotourism is a type of tourism which supports awareness of environment reservation. Ecotourism should be considered about education

and good awareness in ecosystem reservation together (Tourism authority of Thailand, 2002). Ecotourism activities are the tools in reservation of natural resources and biodiversity for sustainable development.

The aim of this study was to study bird species, feeding behavior, abundance, status and activities in utilization of birds in study area.



Figure 1. *Rhipidura javanica* and its nest.

Materials and Methods

A. Study area

The study area consisted of three kinds of 3 organic fruit gardens, namely: lychee gardens, coconut gardens, and pomelo gardens in Bang Nang Li Sub-district, Amphawa District, Samut Songkram Province from October 2012 – September 2013.

B. Research equipment

- 1.) Environment record forms for fruit gardens.
- 2.) Survey forms for bird species and activities in the utilization of fruit gardens.

C. Methodology

A research survey was conducted in Samut Songkram Province as follows:

- 1) The bird species survey was done with binoculars, camera and bird were identified according to Lekagul and Round (1991); Round and Kongthong (2009). The survey was conducted by spending time in the morning from the sunrise until 11:00 h and in the afternoon from 15:00h until the sunset for 5 months from October 2012 – September 2013, 2 days per month.

- 2) Analysis was made of the relative abundance by the mean of Pettingill (1969)

- 3) Classification was made of the feeding behavior, status and activities in the utilization of birds in study area.

Results and Discussion

A. Bird species, feeding behavior, abundance and status

From the study, it found that there were 31 families and 61 species of birds, with 52 species in pomelo gardens, 50 species in lychee gardens and 42 species in coconut groves.

According to feeding behavior, some bird species using the area for living stand still to catch aquatic animals for food, *i.e.* *Todirhamphus Chloris* (Collared Kingfisher), *Ardeola speciosa* (Javan Pond Heron), *Egretta garzetta* (Little Egret), *Alcedo atthis* (Common Kingfisher). Some species catch insects as food, *i.e.* *Cacomantis merulinus* (Plaintive Cuckoo), *Rhipidura javanica* (Pied Fantail), *Dicrurus macrocercus* (Black Drongo). Some species wait to snatch or catch insects for food, *i.e.* *Merops philippinus* (Blue-tailed Bee-eater), *Hirundo rustica* (Barn Swallow). Some species eat pollen or nectar as food, *i.e.* *Cinnyris jugularis* (Olive-backed Sunbird), *Anthreptes malacensis* (Brown-throated Sunbird). Some species eat plant seeds as food, *i.e.* *Streptopelia tranquebarica* (Red Collared Dove), *Geopelia striata* (Zebra Dove). Some species eat fruit and insects, *i.e.* *Pycnonotus blanfordi* (Streak-eared Bulbul), *Crypsirina temia* (Racket-tailed Treepie).

From the study of abundance, it was found that 23 species are most abundant, 15 species are less abundant, *i.e.* *Hypothymis azurea* (Black-napped Monarch, *Aviceda leuphotes* (Black Baza,) *Lanius cristatus* (Brown Shrike), *etc.*



Figure 2. *Hypothymis azurea*.

According to bird species status, 48 species of resident birds, 7 species of migrant birds and 6 species of birds that are resident and migratory were found. The survey results are shown in Table 1 as follows:

Table 1. Bird species and bird status in Bang Nang Li Sub-district, Amphawa District, Samut Songkram Province from October 2012-September 2013.

Bird Status	Bird Species		
	pomelo garden	lychee garden	coconut groves
Resident	42	39	35
Migrant	4	5	2
Resident and Migrant	6	6	5
Total	52	50	42

From Table 1, it can be seen that in pomelo garden, 52 species are most often found. 42 species are resident, 4 species are migratory and 6 species are resident and migrant. The resident species are found in all three habitats, *i.e.* *Todirhamphus Chloris* (Collared Kingfisher), *Amaurornis phoenicurus* (White-breasted Waterhen), *Ardeola speciosa* (Javan Pond Heron), *Egretta garzetta* (Little Egret), *Rhipidura javanica* (Pied Fantail). The migrant species are *Halcyon pileata* (Black-capped Kingfisher), *Coracina melaschistos* (Black-winged Cuckooshrike), *Alcedo atthis* (Common Kingfisher).

B. Activities of birds utilizing the study area

Bird activities in fruit gardens were feeding and nesting *i.e.* *Cinnyris jugularis* (Olive-backed Sunbird), *Todirhamphus chloris* (Collared Kingfisher), *Lonchura striata* (White-rumped Munia), Brown-throated Sunbird *Anthreptes malacensis* (Brown-throated Sunbird), *Amaurornis phoenix-curus* (White-breasted Waterhen), *Rhipidura javanica* (Pied Fantail), *Cinnyris jugularis* (Olive-backed Sunbird). The survey results are shown in Figs 1-3.

Table 2: Bird similarity index of bird diversity in fruit gardens in Bang Nang Li Sub-district, Amphawa District, Samut Songkarm Province.

Fruit gardens	Bird Similarity Index
pomelo garden and lychee garden	0.843
lychee garden and coconut garden	0.848
pomelo garden and coconut garden	0.851



Figure 3. *Cinnyris jugularis* and its nest.

From Table 2, It is seen that the bird similarity index of 3 gardens are 0.843, 0.848 and 0.851, showing that the number of bird species utilized in 3 areas are very similar because three garden 3 are kept in the same way without using chemical in getting rid of insects and weeds but using Biological fermentation. The water used in three gardens was from the sane canal. Similar bird species use these areas for feeding; insectivores *i.e.* Common Tailorbird *Orthotomus sutorius* (Common Tailorbird) *Cacomantis merulinus* (Plaintive Cuckoo), *Rhipiduru javanica* (Pied Fantail), *Dicrurus paradiseus* (Greater Racket-tailed Drongo); granivores *i.e.* *Lonchura punctulata* (Scaly-breasted Munia), *Lonchura striata* (White-rumped Munia); nectarivores *i.e.* *Cinnyris jugularis* (Olive-backed sunbird), *Anthreptes malacensis* (Brown-throated Sunbird); piscivores, *i.e.* *Egretta garzetta* (Little Egret), *Ardeola speciosa* (Javan Pond Heron), *Todirhamphus Chloris* (Collared Kingfisher), *Halcyon smyrnensis* (White-throated Kingfisher). Migratory birds utilizing the study area for feeding were *Alcedo atthis* (Common Kingfisher), *Halcyon pileata* (Black-capped Kingfisher), *Ficedula albicilla* (Taiga Flycatcher). The bird species affecting the garden was *Daaeum cruentatum* (Scarlet-backed Flowerpecker) which was the cause of parasites on the trees of the garden.

Conclusions

Organic gardening is suitable for bird diversity in their utilization of those habitats in feeding and nesting. Other benefits are that birds are valuable for agriculture in pollination, plant seed dispersion and preying on insects that are harmful to crops. Organic gardening should be supported in the communities to preserve local biodiversity. Birds could indicate the fertility and safety of each residential area (Phattara-

phittaya, 1996). In addition, the causes of bird detection in each interval are different because the season is the influential factor for the appearance of the bird. In the rainy season, if it rains heavily, the rain becomes an obstacle to the bird's ability to fly and other activities (Pettingill, 1969). In addition, bird appearance is relative to the species and local quantity of food (Sukwong, *et al.*, 1975).

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