

NEST, EGG AND BREEDING SUCCESS OF *Dendrocygna javanica* (LESSER WHISTLING DUCK) IN PALEIK IN (LAKE), SINKAING TOWNSHIP, MANDALAY DIVISION, MYANMAR

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Abstract:

Nest habitat characteristics, egg, clutch size and reproductive success of *Dendrocygnajavanica*(Lesser Whistling Duck) were recorded from 2004 to 2007 at Paleik In in SinKaing Township, Mandalay division. Nests of *D. javanicawere* observed among a variety of sites. All nests are nearly cup-shaped with a slight depression at the centre. During the study period (2004-2007) it was observed that 22 nests were constructed of twigs and broken dry leaves of Myet Mont Nyin grass (*Carexexpandanophylla*); six nests were found among the broken dry leaves of Myar grass (*Cyperusspp.*) and another two nests were observed on the bending branches of Kyee tree (*Barringtonia acutangular*) at Paleik In. During the breeding season a total of 30 nests, 155 eggs and 49 hatchlings were found at Paleik In. Clutch size ranged from 2 to 12 eggs. Incubation period were observed as 25-26 days. The eggs are pure-white when fresh, but soon became cream to buff color. Among these nests 20% were recorded as successful, 33.37% as lost due to predator, 26.66% were lost by flooding, 13.33% as abandoned and 6.66% as lost by unknown reason. Of the 155 eggs observed, 49 eggs survived until hatching.

Keywords — Breeding success, Wetland, Water bird.

I. INTRODUCTION

In Myanmar, six wetland regions can be divided based on four major river basins and two discrete coastal regions and it is included in the site of high conservation value and is considered as an important bird area by global conservation initiatives. Smythies (2001) listed 998 bird species of Myanmar, including species which have no recent records (Birds life international, 2001). Of the above listed Myanmar birds 122 species of water birds comprising 19 families were recorded in Myanmar between years 2000 and 2003. Under family Anatidae 32 species occur in Myanmar. Among the anatid species two species of whistling ducks occur in Myanmar, *Dendrocygnajavanica* is

the wide spread and abundant species throughout the country, with a total of 11, 038 from 23 sites and a total of 931 birds were recorded from Paleik In (Davies, Sebastian and Chan, 2004). Paleik In is a freshwater and natural wetland. It connects with agricultural rice fields and Myitnge River, a tributary of the Ayeyarwady River. In Paleik In, Kanabow (*Jussiaea spp.*), wall (*Bottiacordata*) and weeds (*Chana spp.*) were abundantly found during study period. Paleik In supports a large variety of different fauna and flora. Little grebe, great cormorant, grey heron, great egret, Ruddy shelduck and comb duck, lesser whistling duck were found as other waterbirds. Myet Mont Nyin (*Carexexpandanophylla*), Ye ThaGyi (*Sesbeniaseaban*), Myar grass (*Cyperus*

spp.) were found as other emergent vegetation. The Myet Mont Nyin and Myar grass are dominant nesting material at the Paleik In (MyintMyintPyone, 2007).

At least 404 species of water birds are recorded in the Asia-Pacific region. In Myanmar, total number of water birds were 144, 461 recorded in 44 sites according to 1997, 1998, 2000 and 2001 census. Among these Paleik In (2764), Yemyet In (211), and Kaung mu daw In (441) held respectively in 2001 (Wei and Taej, 2001).

Among the water birds, family Anatidae consists of 149 species in the world, 62 species in Aisa and 34 species in Myanmar. Two whistling ducks (*Dendrocygnabicolor* and *D.javanica*) are resident species in Myanmar (Symthies, 1940-1986).The lesser whistling duck, *D. javanica* was the most abundant and widespread anatid recorded throughout Myanmar, with a total of 11, 038 from 23 sites. Of the coast of Letkokkon, flocks of whistling duck were observed out at sea, resting on the surface. The largest flocks were recorded from Ngalaik Reservoir (889), Sa gar Kan (522), Inle Lake (525), BotalokeKan (1,280), Paleik In (931), Yekhar In (640), TaungKan (1,330), Kye In (515) and Indawgyi (3,757) (Davies, *et al.*, 2004).

Reproductive success for water birds depend on three main factors, food availability for adult birds to gain breeding condition for egg formation, provision of secure nesting sites and food availability for the young birds (Scott, 1997).

Dramatic changes in water level may significantly impact reproduction. For most species a large rise in water level following nesting will destroy many nests. Conversely, a large drop in level may result in connecting nesting islands to the mainland or draining breeding marshes and exposing the colonies to vastly increased predation (Feigley, 1997).Biota such as invertebrates and aquatic plants and these provide the food resources for the waterbirds. During winter, there is less food available and the chance of successful breeding event are considerably less (Scott,1997).The breeding of *D. javanica* has been of interest to study. Paleik In is a moderately large natural

wetland. Many different kinds of birds were found in this In water birds can get enough food supply. In Myanmar information on the breeding ecology of water birds at Paleik In is little known. With a little knowledge on the breeding ecology of water birds their conservation is not possible and problematic and thus to study the ecology of water birds is needed. Hence the present study was undertaken with the following objectives:-

- to investigate nest habitat characteristic,
- to examine the egg ,clutch size and breeding success

II.MATERIALS AND METHODS

A. Study Area and Study Period

Study area was carried out at Paleik In (21°50'N 96°03'E). This In is situated at Sinkaing Township, Mandalay Division. It lies near Mywe Pagoda. The water body of Paleik In is largest in the rainy season about 323.76 hectares while 40.47 hectares in hot season. The length of the Paleik In is 2.3 km and the width about 2.1 km (Fig 1). It is connected with Myintnge River, a tributary of Ayeyarwady River and other agricultural fields. There are rich habitats and microhabitats for water birds. Land birds are also observed at the vicinity. This In also supports a large variety of different flora and fauna. Myet Mont Nyin and Myar grass are the dominant emergent plants in this In. The study period is from January 2004 to August 2007.

B.Plant Density

Plant density was calculated by using Quadrat method (Subrahmanyam and Sambamurty, 2000). The formula of Quadrat method is: -

$$\text{Density} = \frac{\text{Total number of individuals of the species}}{\text{Total number of samplings studied}}$$

C. Identification of Species

For identification of the species, nets were used to capture and identify the species. Identification was conducted with reference to Smythies (1940-1996) and Blanford (1898).

C. Nest Site and Nest Characteristics

Nest search was conducted during breeding seasons (from Jan 2004 to Jan 2007) at Paleik In. Nest search was made by seven persons. Nest site characters were recorded including dominant vegetation species, vegetation height (cm), tree height (m) and surrounding water depth (cm) near the nest. Data collected at the nest included nest diameter, nest depth, nest materials and nest characteristics. As soon as the nest was observed it was recorded by taking photographs with a digital camera. Nests which were marked by using wooden sticks or bamboo poles were labelled with the nest number. Number of egg present and nest status were also labelled on the poles. Nest initiation dates were recorded.

D. Egg and Clutch Size Characteristics

Nest with eggs were recorded. The eggs were recorded as being incubated by the presence of adult at the nest. Eggs color were noted; shape and size were measured. Length and width of the egg were measured to the nearest mm with verniercaliper. In the study period, clutch size were also recorded.

E. Breeding Success

A nest was recorded as successful, if one or more eggs were observed to be hatched. For the nest that failed, they were recorded as either predated, lost due to flood, abandoned and for unknown reason. If egg shells and remains of hatching were observed they were considered as predated, and for nests with cold eggs for several days as abandoned.



Fig.1.Location Map of Paleik In, Sinkaing Township
From Google Earth

Source:

III. OBSERVATION AND RESULTS

A. Nest Site

Nests of *Dendrocygnajavanica* were observed among a variety of sites. It is observed that 22 nests were constructed with twigs and broken dry leaves of MyetmontNyin (*Carexexpandanophylla*), six nests were found among the broken dry leaves of Myar grass (*Cyperus* spp.) and another two nests were observed on the bending branches of Kyee tree (*Barringtonia acutangular*).

B. Vegetation Density

At Paleik In, vegetation density was recorded. Ten sampling units were determined in this study site. Each sampling unit area is one square foot (0.31 m). Vegetation density of Myet Mont Nyin grass was 43.5 and Myar grass was 24.1 during the study period.

C. Nest Building and Nest Characteristics

Nest building by both sexes begin in May 2004, 2005 and 2007 whereas in year 2006 it only in June. There were 22 nests were constructed with twigs and broken dry leaves of Myet Mont Nyin. The average vegetation (Myet Mont Nyin grass) height was 0.93 m. The surrounding water depth near the nests was 0.40 m. The nests were nearly cup-shaped,

six nests were found among the Myar grass with the average height of 1.74 m and water depth near the nests was 0.72 m. Two nests were found on the bending branches of Kyee tree. The average tree height was 6.55 m and water depth surrounding Kyee tree was 0.77 m during the breeding season. The initial construction of a nest is accomplished in five to seven days. By this time all nests are nearly cup-shaped, approximately 27.48 cm in diameter and 3.94 cm in width with a slight depression at the centre.

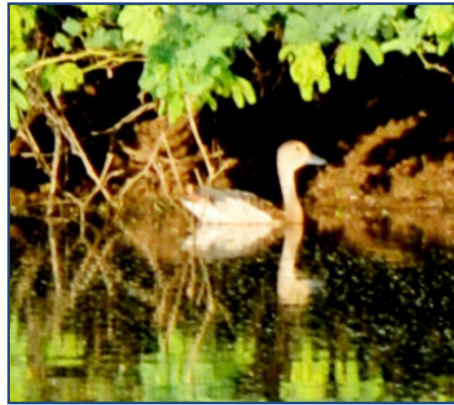


Fig.2. *Dendrocygnajavanica* (Lesser Whistling Duck)

D. Egg and Clutch Size Characteristics

A total of 30 nests with eggs were recorded from 2004 to 2007 during breeding season. The eggs are pure-white when fresh, but soon became cream to buff color. During the egg laying period, 155 eggs were found. Mean length and width of the eggs were $(65.47 \pm 2.61$ mm and 36.04 ± 2.81 mm). Number of nests, eggs and the percentage of total eggs were recorded during the year 2004-2007 (Table 1). In the study period, clutch size ranged from 2 to 12 eggs and mean clutch size during the year 2004 to 2007 were recorded (Fig 5).



Fig.3. Recorded nest with eggs and hatchlings

E. Incubation

During breeding season, the male lesser whistling duck larger than female were observed at Paleik In. Both male and female were also observed to remain together throughout the incubation period. When the female incubates the eggs, the male guards the female and their nest and kept watching from nearby emergent vegetation. Incubation period was observed to be 25 to 26 days during the year 2004 to 2007.

F. Nesting Effort

A total of 30 nests were observed during the study period from 2004 to 2007. Among these, six nests (20%) survived until hatching. Of these nests ten nests of failed, (33.37%) were lost to predator, eight nests (26.66%) were flooded, four nests (13.33%) were abandoned and two nests (6.66%) lost for unknown reason during breeding season (Table 2, Fig 4).

TABLE I

NUMBER OF NESTS, EGGS AND PERCENTAGE OF TOTAL EGGS OF *Dendrocygnajavanica* AT PALEIK IN DURING BREEDING SEASON

Number of eggs	Number of nests	Total eggs	% of total eggs
2	5	10	6.45
3	4	12	7.74
4	9	36	23.23
5	2	10	6.45
6	2	12	7.74
7	1	7	4.52
8	1	8	5.16
9	3	27	17.42
10	1	10	6.45
11	1	11	7.10
12	1	12	7.74
	30	155	100.00

TABLE II
NEST SUCCESS AND NEST LOST OF *Dendrocygnajavanica*
AT PALEIK IN (2004-2007)

Nest number	Nest outcome	Nest (2004-2007)
6	successful	20%
10	lost to predator	33.37%
8	lost by weather (flooded)	26.66%
4	Abandoned	13.33%
2	unknown reason	6.66%

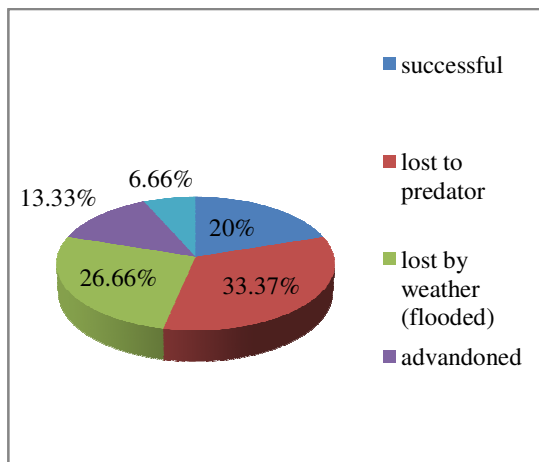


Fig 4. Nest Success and Nest Lost of *Dendrocygnajavanica* at Paleik In

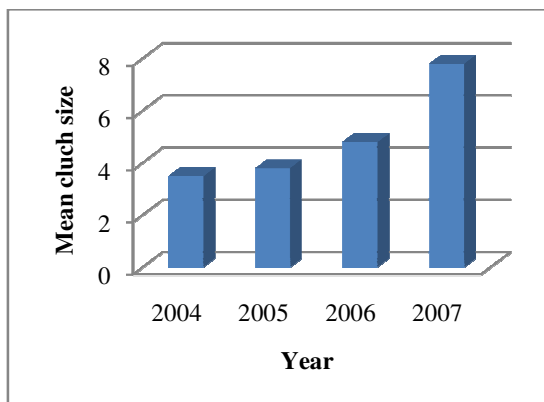


Fig.5. Mean clutch size of *Dendrocygnajavanica* at Paleik In

IV. DISCUSSION

In Myanmar, *Dendrocygnajavanica* is widely distributed (Smythies,1953). They are present the whole year round at Paleik In and the breeding season of starts from May to August. In Ceylon, the lesser whistling duck commences to breed at the end of June. Most eggs are laid in July and August (Blanford,1898). However at Paleik In, the lesser whistling duck starts to breed in May and most eggs were observed in June. Some of *Dendrocygna* spp. select large hollows in trees. Others make a comfortable grass nest on the ground in grass and vegetation near swamps or on the banks which divided the rice fields from one another (Blanford,1898). At the study site of Paleik In, nests of lesser whistling duck were observed among Myet Mont Nyin grass (*Carexexpandanophylla*) or Myar grass (*Cyperus* spp.) and on the bending branches of Kyee tree (*Barringtonia acutangular* (L.) during breeding season.

Breeding habitat of *Dendrocygnabicolor* (Greater Whistling Duck) in the United State includes freshwater wetlands (McCartney,1963, Hohman and Lee, 2001 cited by Pierluissi,2006). Nests were commonly found in flooded rice field (Hohman and Lee, 2001 cited by Pierluissi,2006). Paleik In is a freshwater wetland and is connected with agricultural rice fields. However *D. javanica* constructs nests among the emergent grasses and on trees in this wetland.

Dendrocygna spp. feed on aquatic vegetation obtained by swimming or diving under water (Bellrose, 1976 cited by Granholm, 2005). *Dendrocygna* spp. feed mostly nocturnally but also diurnally on rice, other grains, seeds and shoots of herbs (Granholm, 2005). At Paleik In, lesser whistling duck feeds mainly on rice grain and also feed on Kanabow (*Jussiaeaspp.*), Wall (*Bottiacordata*) and Weeds (*Chana* spp.).

The location of a nest site and construction of a nest is the first event of newly mated birds. In most bird species the nest site is selected by the female and the territory defended by male, but there are numerous exceptions (Wallace, 1963). To breed

successfully water birds require suitable places in which to build their nests. Nesting sites vary from species to species and include trees (both on branches and in hollows), reeds and bushes and islands in the middle of lakes (Scott, 1997).

Based on the observation of nesting habits of *D.javanica* these birds begin nest building in May. Nests were of moderate size, shallow cup-shaped with 27.48 cm diameter and 3.94 cm in depth. Eggs were observed in May during study period. No eggs were found during March and April. Hence it is suggested that whistling duck lay eggs starting from May during study period. Among 30 nests that were observed five nests with two eggs, four nests with three eggs, nine nests with four eggs, two nests with five eggs, other two nests with six eggs, one nest with seven or eight eggs, three nests with nine eggs, one nest with ten, eleven or twelve eggs were recorded during the year 2004-2007 at the breeding season.

The influence of weather and predators on nest success was variable. A nest was recorded as successful, if one or more eggs hatched. For nests that failed, they are recorded as either predated, flooded, abandoned and for unknown reason. Predated nests were those that were tipped with either eggshells or remains of hatchlings in the nest bowl. Abandoned nests were still intact, but eggs were cold for several days (Arnold, 2005). Nesting success of *D.javanica* at Paleik In has been estimated by observation data of nests from 2004 to 2007. Of all the nests (n = 30) 20% were successful nests, 33.37% destroyed by predators, 26.66% of destroyed by flooding, 13.33% abandoned and 6.66% lost by unknown reason were observed during breeding season at Paleik In.

V. CONCLUSION

This study has provided some information on the nest building eggs, clutch size and hatching success of lesser whistling duck. However, life history and ecology of water birds were poorly known at Paleik In which could be easily assessed for ecological

study. Thus from the result of present study it is suggested there is still a need to have more specific information on lesser whistling duck. Hence more behavioural study of water birds should be carried out at Paleik In. Until and unless the knowledge on the breeding behaviour and breeding ecology is adequate conserving these water birds will be difficult and problematic.

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