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DIFFERENCES IN SIZE AMONG WATERBIRD EGGS IN PULAU RAMBUT : SOME PRELIMINARY OBSERVATIONS

(Perbedaan Ukuran pada Telur Burung-Burung Merandai di Pulau Rambut : Hasil Pengamatan Sementara)

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ABSTRAK

Tujuan penelitian ini adalah untuk mengetahui ukuran (berat, lebar dan panjang) telur 7 jenis burung merandai di Pulau Rambut sebagai salah satu upaya untuk mengenali sarang mereka. Telur ketujuh jenis burung ini memiliki ukuran, warna dan bentuk yang hampir sama. Meskipun demikian dengan pengukuran yang seksama, telur masing-masing jenis dapat dikenal dan dibedakan satu sama lain.

INTRODUCTION

Eggs of waterbirds (herons, egrets, ibises, and cormorants) are very similar in shape, dimension and appearance. All have an oval shape, about 5 cm long and 3 cm wide or slightly smaller. Although most author agree about the description of the texture (i.e., fine texture, smooth), the color description vary widely, depend on the authority. The egg color of these species have been described as pale blue-green, greenish, bluish-white, greenish-white, and so forth.

In Pulau Rambut, colonies of grey heron (*Ardea cinerea*), purple heron (*A. cinerea*), black-crowned night heron (*Nycticorax nycticorax*), great egret (*Egretta alba*), little egret (*E. garzetta*), cattle egret (*Bubulcus ibis*), cormorant (*Phalacrocorax* sp.) and glossy ibis (*Plegadis falcinellus*) nest in the same mangrove forest during January 1990. Very often nests of different species are mixed in the same tree and makes it difficult to identify the egg unless the parents are present.

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The objective of this study is to examine the size (weight, length, and width) and general appearance of 7 species of waterbirds nesting in Pulau Rambut during January 1990. This knowledge is especially important when encountering an unidentified waterbird in the field. Moreover, if an egg is present in a nest, it can be used to identify the owner of the eggs and/or nest as well. This study is a part of a dissertation project on the characteristics of waterbirds' nests.

DESCRIPTION OF STUDY SITE

Pulau Rambut Nature Reserve (106°31'30"E, 5°57'S, elev. 1.5m) is a small (45 ha) island, located about 2.5 km off the north coast of Tanjung Pasir, Tangerang, West Java. Vegetation of the island can be categorized into 3 formations: coastal/beach forest, mixed secondary forest, and mangrove forest. Almost all herons, egrets, cormorants, and ibises use only mangrove forest as their nesting site during this study.

Rhizophora mucronata and *R. stylosa* are dominant trees in mangrove forest. Other species of mangroves are *Sonneratia alba*, *Bruguiera gymnorrhiza*, *Avicennia officinallis*, and *Excoecaria agallocha*. The mangrove forest covers most of the outer part of the east, north, and west side. The vegetation is mostly a dense growth of mature trees (3 to 10 m), except in some locations where die-back of mangrove occur.

METHODS AND MATERIALS

Eggs were sampled during the third and forth week of January 1990. THe nest was identified first by the general appearance of the nest, the presence of the parents on the nest, and/or the presence of lining material especially feathers.

After a tree is chosen as a sampling unit, all eggs inside the nest were taken out by climbing the tree and then transported down for measurement and further observation. The length and width of the eggs were measured using a caliper. Its weight was measured by a Pesola scale (50 g capacity). All measurements were in metric units. Other external characteristics (color, texture, any deformities, etc.) were also recorded. Shape and color were captured by a 35-mm camera equipped with a macro-lens. The eggs were placed back to the nest after observation completed.

Means and standard deviations of each species' eggs were calculated. No specific test performed at this time due to the limitation of data.

Classification of egg shape (Fig. 1) followed Hoogerwerf (1949):[1]

A. Asymmetrical (crosswise):
   - o Type I : normal-oval
   - o Type II : long-oval
   - o Type III : wide-oval

B. Symmetrical (crosswise):
   - o Type IV : wide-oval,almost round
   - o Type V : long-oval, elliptical
   - o Type VI : normal-oval

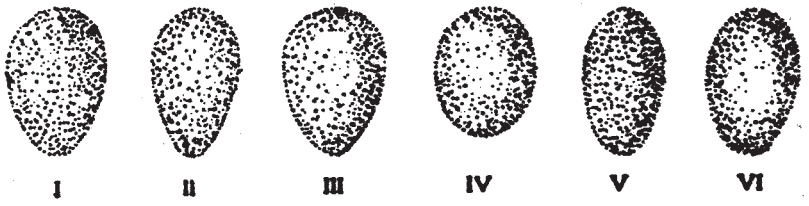

Fig. 1. Classification of egg shape (Hoogerwerf 1949)

RESULTS AND DISCUSSION

Total of 114 eggs from 45 nests were observed. The number of eggs examined for a certain species depends on the availability of the egg at that time and the easiness of egg collection. The nests of grey heron, for example, were placed on small branches. Therefore, only 3 samples can be obtained for this species.

[1] Hoogerwerf,A. 1989. Een bijdrage tot de oologie van het eiland Java. Plantentuin van Indonesie. Buitenzorg, Java. pp.1-4.

Egg Size

With the exception of glossy ibis, the size of each species is relatively consistent and shows only a small variance. The heaviest and biggest egg among these 7 species is grey heron egg, follow by purple heron and great egret eggs. The average size of the eggs are presented on Table 1.

Table 1. Average weight, length, and width of waterbird eggs in Pulau Rambut Nature Reserve, January 1990 (number in parentheses are standard deviations)

Species	No. of sample	No. of egg/nest mean	mode	Weight (g)	Length (mm)	Width (mm)	Egg Type
Cormorant	32	2.9	2	28.86 (2.89)	50.61 (2.98)	33.01 (1.33)	V
Cattle egret	20	2.9	2	19.54 (4.11)	41.34 (3.94)	29.88 (2.66)	VI
Great egret	12	2.4	2	33.67 (3.20)	51.23 (3.73)	35.28 (1.88)	VI
Black-crowned night heron	26	2.9	3	27.25 (3.75)	45.95 (2.95)	33.49 (1.44)	VI
Grey heron	3	3.0	3	47.50 (3.49)	57.60 (0.90)	42.07 (0.45)	VI
Purple heron	9	1.8	1&2	43.83 (3.60)	54.02 (2.63)	41.06 (2.85)	VI
Glossy ibis	12	2.4	3	27.71 (5.26)	47.43 (4.39)	32.81 (1.80)	VI

Cormorant egg is easy to differentiate from the others by its relatively small size but quite long, elliptical shape (50.61 X 33.01 mm). For further comparison in this paper, cormorant egg is chosen as a 'standard' size because of its easiness to identify.

Cattle egret has the smallest egg. However, the egg of this species might be difficult to distinguish from the little egret, which often nest in the same colony. Unfortunately, sample of the little egret egg is difficult to find at the time of observation.

The egg of great egret has a slightly deeper pale-blue color. The length and width of the egg is similar to that of cormorant's, but the weight of these two species differ due to shape differences.

Black-crowned night heron has a medium size egg. The weight and width of this species' egg is similar to cormorant's, but it has a shorter length. Both grey and purple heron has big eggs. However, no firm discussion can be done at this time due to data limitation.

Glossy ibis' egg is difficult to identify and distinguish from the others. Even though most eggs have deep-blue color, a few even have a turquoise color, or a pale green color. It seems that color cannot be a reliable indicator for this species due to its inconsistency. Unfortunately, size is not a reliable indicator either. Its weight (27.71 $\pm$ 5.26 g) and length (47.43 $\pm$ 4.39 mm) vary highly (notice the high standard deviation), although the width of this species' eggs are relatively uniform. Extra caution is needed to identity the glossy ibis' egg.

Number of Egg per Nest

Number of egg in a nest varies between 1 to 4. Nests of cormorant, cattle egret, and great egret usually contain 2 eggs, while most nests of black-crowned night heron and glossy ibis have 3 eggs inside them. Lack of sample of grey and purple heron makes it difficult to draw conclusion.

Means of number of egg per nest for cormorant, cattle egret, and great egret are higher than modes. This indicates that their distributions are skewed to the right (i.e., the probability to find higher number of egg per nest is greater than the probability to find lower number of egg per nest). The mean number of glossy ibis' nest, in contrast, is lower than its mode. Number of egg for this species has a skewed to left distribution.

General Appearance and Shape

Eggs of these 7 species have very similar appearance: (i) solid blue-green color, spotless, (ii) fine texture, smooth, and (iii) dull, not glossy. All but cormorant have the same shape, the symmetrical (crosswise) normal oval (type

VI). However, measurements reveal that the shape of each species is slightly differ than the other (see Table 1). Cormorant egg, on the other hand, is relatively longer compare to the other six species (type V).

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