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## MORPHOMETRIC VARIATION IN THE JAVAN MUNIAS, *LONCHURA LEUCOGASTROIDES*.

By

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### ABSTRAK

VARIASI MORPHOMETRIK BURUNG PIPIT, *LONCHURA LEUCOGASTROIDES*. Variasi morfologi dari *Lonchura Leucogastroides* pada pengamatan ini merupakan uji pendahuluan dari dua lingkungan yang berbeda. Pengamatan dilakukan selama satu tahun pada empat tempat, yaitu : Cilember dan Batulayang (mewakili daerah dataran tinggi) serta Sindangbarang dan Kedung Halang (mewakili daerah dataran rendah). Jumlah burung yang diamati sebanyak 77 ekor. Hasil penelitian menunjukkan bahwa burung dari dataran tinggi mempunyai sayap dan ekor lebih panjang serta bobot badan yang lebih besar.



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## INTRODUCTION

The morphology of a species is a result of an adaptation of that species to the environments encountered by individuals, and to the specific form of life (Mayr, 1963). It has been predicted that animals have an optimal body size which maximizes the energy intake for particular resources (Pyke, 1978). However, there are pressures from other factors which can select the body size of a species. Those are, for example, prey densities (Schoener, 1965), competition for food (Van Valen, 1965; Lack, 1971; Diamond, 1973; Rothstein, 1973 a,b), nest-site (Dhondt *et al.*, 1979), and intraspecific social systems (Searcy, 1979 a,b). Because such different selective pressures may act in opposite directions, the overall morphology of a species tends to be a compromise, especially in variable environments (Mayr, 1963).

In this paper the variation in the morphology of Javan munias is preliminarily examined in order to interpret the significance of such selective pressures on them in two different communities.

## MATERIALS AND METHODS

The munias were caught during the dietary study in this species (August 1988 - June 1989) in two groups of localities which differ in altitude in West Jawa, Indonesia. Cilember and Batulayang, 750 m above sea level, are of similar environment consisting of paddy fields surrounded by settlement with very few vegetation. The birds caught from these localities are then considered as samples from high altitude. Sindangbarang and Kedung Halang, 150 m above sea level, are also of similar environment consisting of paddy fields surrounded by settlements and other farming practices with dense vegetation. The birds from these localities are considered as samples from low altitude.

A total of 77 adult Javan munias were measured for this study; 28 of which (16 males + 12 females) were from high altitude, and 49 (25 males + 24 females) were from low altitude. Five measurements were taken from each individual and measured solely by D in order to minimize biases resulted from observer's error. The measurements were made to the nearest mm with a ruler. The methods used in the study followed those mentioned in King *et al.* (1986).

The wing length was measured from the wrist bend to the tip of the longest primary, while the wing was flattened and straightened sideways. The tail length was measured from the tip of the longest feathers to the back, while it was bent at right - angles to the back, and the ruler was placed on the base of the tail which was gently pulled. The culmen length was measured from the tip to the skull, to the nearest 0.1 mm with a dial caliper, from the notch on the back of the inter-tarsal joint to the lower edge of the last complete scale before toe diverge. The body weight was measured to the nearest of 0.1 gr using a 50 gr Pesola spring balance.

## RESULTS AND DISCUSSION

None of the characters measured in this study of the Javan munias from either altitude was sexually dimorphic but the body weight of those from low altitude (Tables 1 and 2). Tiainen (1982), who found a great variability of morphological characters in three species of *Phylloscopus* warblers, has suggested that the intraspecific morphological variation was increased by sexual dimorphism. Since there is very little variability in all characters of the Javan munias, sexual dimorphism may not have any role in the intraspecific morphological variation in this species.

It has also been suggested that intraspecific competition is reduced by sexual dimorphism in all morphological characters (Van Valen, 1965; Selander, 1966; Rothstein, 1973a, b; Hogstad, 1978). The results in this study cannot come up with such a prediction since only one of the characters measured is sexually dimorphic. In granivorous species, such as this species, a great pressure of intraspecific competition for food can result in an increase in the variance of bill size which may lead to sexual dimorphism (Johnston & Klitz, 1977). The culmen length, which may indicate the bill size of this species, does not show any indication of sexual dimorphism in the birds from either altitude. This may suggest that intraspecific competition for food is met in other ways.

In contrast, three characters measured in this study were found to be significantly different between the birds from both altitudes (Table 3). The wing and tail in the birds from high altitude were longer than those from low altitude, and the body weight of those in high altitude was heavier than that of low altitude. It has been suggested that interspecific competition causes niche width reduction, and determines the partitioning of resources (Giller, 1984). Further, it can lead to the diversion of diet of species as found in ground finches (Smith *et al.*, 1978). Along with other selective pressures, interspecific competition may have determined the morphology of the Javan munias, at least in the study areas. Selective pressures may vary geographically, and this may result in geographical differences in the morphology of a species. This was found in the genus *Passer* whose morphology varies geographically (Johnston & Klitz, 1977). In the house sparrow, *Passer domesticus*, the size of most parts of its body as well as its body weight vary geographically (Johnston, 1973). The geographic variation of morphology in the Javan munias is, however, still scarcely known. Yet this species seems to be confined to the islands of Sumatra (Southern part), Jawa, Bali and Lombok (Kuroda, 1936; Mackinnon, 1988). The result of this study tends to show such variation.

Morphological characters of birds from both altitudes were different in that those of high altitude have longer wing and tail, and heavier body weight than those from low altitude. It has been found that such morphological characters as wing,

tail and tarsus relate to foraging behaviour (Partridge, 1976). Do the birds from both altitude differ in foraging behaviour? There are some other factors such as species density, competition and resource availability which may govern the morphological variation in this species. Further comprehensive studies seem to be called for.

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Table 1. Measurements of characters in the Javan munias from high altitude.

Characters	Males mean	(N = 16) sd	Females mean	(N = 12) sd	t	p
Wing length	47.97	1.36	48.17	2.20	0.30	ns
Tail length	39.14	3.64	41.88	4.14	1.86	ns
Culmen length	10.40	0.58	10.03	0.72	1.51	ns
Tarsus length	14.75	0.74	14.91	1.26	0.42	ns
Body weight	11.45	2.24	11.36	0.57	0.13	ns

ns = non significant.

Table 2. Measurements of characters in the Javan munias from low altitude.

Characters	Males mean	(N = 25) sd	Females mean	(N = 24) sd	t	p
Wing length	47.31	1.38	46.97	1.97	0.70	ns
Tail length	38.54	2.50	37.97	3.53	0.79	ns
Culmen length	10.16	0.72	10.24	0.64	0.41	ns
Tarsus length	15.13	1.07	15.21	1.05	0.26	ns
Body weight	10.59	0.71	11.06	0.68	2.36	<0.05

ns = non significant.

Table 3. Measurements of characters in the Javan munias from both and low altitudes.

Characters	High mean	(N = 28) sd	Low mean	(N = 49) sd	t	p
Wing length	48.06	1.74	47.13	1.66	2.32	<0,05
Tail length	40.31	4.03	38.26	3.03	2.53	<0,05
Culmen length	10.24	0.66	10.20	0.68	0.25	ns
Tarsus length	14.82	0.98	15.17	1.05	1.44	ns
Body weight	11.41	1.71	10.82	0.73	2.11	<0,05

ns = non significant.

A NEW RECORD OF *PLEUROGENOIDES HASHIMI* ROHDE, 1963  
(TREMATODA : LECITHODENDRIIDAE) FROM BOGOR, INDONESIA

by

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A trematode worm, *Pleurogenoides hashimi* Rohde, 1963 was first reported on *Rana cancrivora* in Malaysia (Rohde, K. 1963 Z.F. Parasitenkunde 22: 268 - 277). This species is a synonym of *Pleurogenoides taylori* Tubangui, 1928 found from Philippine frog, *Rana vittigera* (Fischthal, J.H. & Kuntz, E.R. 1967 Proc. Helm. Soc. Wash. 34(1) : 105 - 113).

A total of 159 frogs, *Rana cancrivora*, were collected from Bogor and its vicinity for observation of its endoparasites. The frogs were previously killed using chlorotone solution. Worms recovered were fixed in FAA solution, stained with semichon acetic carmine, dehydrated in alcohol series and finally cleared and mounted in glycerine.

Upon identification it was noticed that *Pleurogenoides hashimi* is an interesting species among the others. Morphological characteristics of the species as follows : body oval, posterior end more blunt than anterior. Length 1158,75 u by 810 u wide. Cuticle arms with dense spines in anterior half, which become rare in posterior half of body. Ventral sucker little larger (197,5 u) than oral sucker (185 u), located on postequatorial; median, oral sucker subterminal. Pharynx short, esophagus absent, ceca short, terminating at level of testes. Testes symmetrical, oval, measure 195 x 197,5, extracecal ; left testes located at posterior of cirrus pouch, near the end of ceca; the right testes near ovary; both testes preacetabular. Cirrus pouch large, club shaped, overlap with ceca, terminating at anterior of acetabulum, measured 396,25 x 213,75. Genital pore marginal, at level of oral sucker. Ovary pear shaped, measured 175 x 236, intercecal, sometimes overlap with right ceca, located at posterior ceca bifurcation and right testes. Seminal receptacle posterior to ovary. Uterus loop in a half posterior body, beginning from posterior of testes. Metraterm absent. Egg oval, measured 30 x 15. Vitelline glands follicular, 6 - 7 in number in the right, arranging between cirrus pouch, ceca bifurcation and oral sucker; 8 glands in the left arranging between ovary, ceca and right testes and oral sucker. Excretory vesicle V shaped. Measurement throughout the text are given as the mean in micrometers.

Measurements of *P. hashimi* of the present study, almost equal to the species described by Rohde, rather than the one reported by Tubangui. In Indonesia the case of infection by this worm in *Rana cancrivora* is a new record with high prevalence (68,5 %) in small intestines, compared with other parasites (Table 1.)

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Table 1. Prevalence of *Pleurogenoides hashimi* and the other worms in *Rana cancrivora* from Bogor, Indonesia.

Species of worm	no. of host examined	no. of positive (%)
1. <i>P. hashimi</i>	159	68,5
2. Unidentified nematode	159	12,2
3. Unidentified cestode larvae	159	38,4