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Research Article

MORPHOMETRIC CHARACTERISTICS OF EGGS OF THE RED WATTLED LAPWING (*VANELLUS INDICUS*) IN AGRICULTURAL LANDSCAPE OF PUNJAB

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ABSTRACT

In this study we analyzed morphometric intraspecific differences (length, width and weight) in the eggs of the Red Wattled Lapwing (*Vanellus indicus*). Egg length and width of 125 eggs from 33 clutches, while egg weight of 58 eggs from 15 clutches were measured in fields of Punjab Agricultural University, Ludhiana, Punjab, India. Statistically, significant differences were observed for length, width and weight among eggs of different clutches. Our results found that the mean length of Red Wattled Lapwing eggs was 41.44±0.29 mm in 2012 season and 41.410.33 mm in 2013 season. Similarly, average egg width was 29.89±0.15 mm in 2012 season and 30.39±0.14 mm in 2013 season. While average weight was 19.02±0.27 gm, recorded only in 2013 breeding season. It was also concluded that maximum egg length, breadth and weight observed in two breeding seasons was 44.41 mm, 31.72 mm and 21.40 gm, respectively, while minimum egg length, breadth and weight was 37.31mm, 28.15mm and 15.97gm, respectively.

INTRODUCTION

The Red Wattled Lapwing (*Vanellus indicu)s* is a plover that resides in the open countryside, ploughed fields, grazing patches, and margins and dry beds of water bodies, in parts of Asia (Ali, 1996). Lapwings are known to occupy areas that have dense human population (Piersma and Wiersma, 1996).

A monogamous bird, the Red Wattled Lapwing breeds from March to August, and the majority of eggs are laid in May or June. The nest is usually just a simple shallow scrape in the ground that can be encircled with small stones or hard clay. It is typically situated on open, slightly elevated ground in close proximity to water (Norman, 2007). The female Red Wattled Lapwing usually lays three or four eggs which can vary in color from pale olive-green to yellowish, and are profusely marked with blackish-brown or spots black (Norman, 2007).

Studies of the reproductive ecology of Red Wattled Lapwing are important for our understanding of its conservation biology and status. Morphometrics in general refers to measurements of the body parts like length, breadth and weight (Kabir *et al*., 2012). The knowledge and information on morphometric characteristics is therefore essential for understanding an animal and its reproductive biology in particular (Danilov, 2000). Several studies about the reproductive ecology of Red Wattled Lapwing are available and include information on nesting, incubation, hatching, etc (Gupta and Bajaj, 2000; Gupta and Kumar, 2009; Gupta *et al*., 2010), but little of this research has been devoted to morphometric characteristics of Red Wattled Lapwing. We herein record data on egg morphometric characteristics of the Red Wattled Lapwing in the fields of Punjab Agricultural University, Ludhiana from April 2012 to June 2013 and analyze these characteristics to investigate intraspecific differences in morphometery.

MATERIALS AND METHODS

The field work was carried out during the breeding seasons of April 2012 to June 2013 at the fields of PAU, Ludhiana, Punjab. The mean egg dimensions (length, width and weight) were observed for two breeding seasons with an objective to determine dimensions of eggs in a single clutch and others and also to determine intra-specific variation in the dimensions of eggs within and different clutches. Egg length and width of 125 eggs from 33 clutches were measured by using digital vernier calliper, while egg weight was measured using digital weight balance. Results were statistically analyzed by analysis of variance (ANOVA) using computer software CPCS1.

RESULTS AND DISCUSSION

The bird's egg is a glorious, wondrous feat of engineering. Eggs come in 5 basic shapes; round balls in owls and woodpeckers; pyriform or top-shaped eggs like plovers, these

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are round eggs with one end looking quite pointed, this end is normally aimed in towards the center of the nest; long are an adaptation to possessing a narrow pelvis, yet needing to lay a bigger egg. Long, thin eggs which are pointed at one end and thus ten to roll around in circles are a feature of cliff nesting species such as Guillemots.

Table 1 Morphological characteristics of the eggs of Red Wattled Lapwing

Morphometric characteristics	Maximum		Minimum		Mean	
	2012 (n=20)	2013 (n=17)	2012 (n=20)	2013 (n=17)	2012 (n=20)	2013 (n=17)
Length	44.47 mm	44.41 mm	37.31 mm	38.42 mm	41.44±0.29	41.41±0.33
Width	31.64 mm	31.72 mm	28.15 mm	28.68 mm	29.89±0.15	30.39±0.14
Weight	----------	21.40 gm	----------	15.97 gm	----------	19.02±0.27

Finally, there is the ordinary oval egg, characterized by the common chicken egg. This is by far the most common form of egg (Ramel, 2009). The egg weight is expressed in terms of size; there is an enormous range in egg size among different species and within the species between individuals. The size of the eggs laid by one individual may differ widely from those laid by another of the same species and breed. Egg size is influenced by climate, the amount of available food, parent's body size, evolutionary status and some other factors (Stadelman and Cotterill, 1995).

From Table 1, it is apparent that, average length of Red Wattled Lapwing eggs was 41.44±0.29 mm in 2012 season and 41.410.33 mm in 2013 season. Similarly, average egg width was 29.89±0.15 mm in 2012 season and 30.39±0.14 mm in 2013 season. While average weight was 19.02±0.27 gm, recorded only in 2013 breeding season. By using statistical method of Analysis of variance (One Way ANOVA), it was concluded that there were differences in variation among the morphological characteristics of the eggs laid by different females as compared to eggs laid by the same female(Table 2 and 3).

Table 2 Table provides Morphometerical characteristics in clutches recorded during 2012 breeding season

Clutch	Egg Length (mm)					Egg Width (mm)				
	Clutch Size				Mean±S.E	Clutch Size				Mean±S.E
	1	2	3	4		1	2	3	4	
1.	39.60	39.75	40.96	40.30	40.15 ± 0.26	30.22	29.75	29.55	29.79	29.82 ± 0.12
2.	42.27	42.40	41.40	42.53	42.15 ± 0.22	30.62	30.82	30.73	30.20	30.59 ± 0.11
3.	43.02	43.13	43.74	------	43.29 ± 0.18	28.41	28.83	28.15	------	28.46 ± 0.16
4.	41.44	41.11	40.93	41.20	41.17 ± 0.09	30.32	29.61	30.24	29.86	30.00 ± 0.14
5.	41.18	40.80	43.27	------	41.75 ± 0.62	29.44	28.82	29.08	------	29.11 ± 0.14
6.	40.42	38.89	40.16	39.69	39.79 ± 0.29	29.59	29.86	28.33	28.99	29.19 ± 0.29
7.	38.58	39.27	37.31	38.94	38.52 ± 0.37	30.57	30.78	30.07	30.37	30.44 ± 0.13
8.	39.11	43.15	40.13	39.21	40.40 ± 0.81	30.09	30.38	30.85	31.16	30.62 ± 0.20
9.	43.71	41.76	41.89	42.51	42.46 ± 0.38	29.12	29.45	29.40	29.04	29.25 ± 0.08
10.	41.38	41.34	39.75	------	40.82 ± 0.43	29.66	29.67	28.56	------	29.29 ± 0.30
11.	44.47	43.01	42.15	42.26	42.97 ± 0.46	30.75	29.85	29.73	29.35	29.92 ± 0.25
12.	41.24	42.70	42.07	41.61	41.90 ± 0.27	28.76	30.21	29.76	29.94	29.66 ± 0.27
13.	41.49	41.27	41.61	38.17	40.63 ± 0.71	30.23	29.51	30.07	28.62	29.60 ± 0.31
14.	41.51	42.26	41.55	------	41.77 ± 0.19	30.35	30.10	30.40	------	30.28 ± 0.07
15.	42.45	42.01	43.20	------	42.55 ± 0.28	31.64	30.90	31.22	------	31.25 ± 0.17
16.	43.79	42.94	43.28	43.92	43.48 ± 0.19	30.11	29.93	30.02	30.43	30.12 ± 0.09
17.	42.51	43.17	43.91	43.78	43.34 ± 0.27	30.24	30.20	30.81	31.15	30.60 ± 0.19
18.	39.74	39.13	40.38	40.66	39.97 ± 0.29	28.78	29.52	28.80	29.29	29.09 ± 0.15

(⟵) Egg length and width were Significantly different (P<0.05) among eggs in different clutches

Table 3 Table provides Morphometerical characteristics in 3-4 egg clutches recorded during 2013 breeding season

Clutch	Egg Length (mm)					Egg Width (mm)					Egg Weight (gm)				
	Clutch Size				Mean±S.E	Clutch Size				Mean±S.E	Clutch Size				Mean±S.E
	1	2	3	4		1	2	3	4		1	2	3	4	
1.	40.47	40.44	40.76	39.53	40.30 ± 0.23	29.36	29.61	29.65	29.01	29.40 ± 0.12	17.97	18.21	18.47	17.16	17.95 ± 0.24
2.	41.71	41.12	42.16	41.30	41.57 ± 0.20	30.78	30.64	30.62	30.61	30.66 ± 0.03	20.31	20.10	20.45	20.05	20.22 ± 0.08
3.	39.94	38.52	38.42	38.88	38.94 ± 0.30	31.09	30.66	30.91	30.04	30.67 ± 0.19	17.65	16.99	17.26	16.59	17.12 ± 0.19
4.	39.14	40.07	39.50	38.61	39.33 ± 0.26	29.65	29.91	29.68	29.27	29.62 ± 0.11	17.30	18.08	17.19	17.01	17.39 ± 0.20
5.	42.49	42.58	42.69	42.64	42.60 ± 0.03	29.52	29.32	28.68	28.87	29.09 ± 0.16	18.20	18.22	17.42	17.97	17.95 ± 0.16
6.	40.25	39.70	41.58	41.43	40.74 ± 0.39	30.98	29.90	30.16	30.75	30.44 ± 0.21	19.22	18.04	18.79	19.64	18.92 ± 0.29
7.	41.71	44.10	42.70	43.65	43.04 ± 0.45	30.26	30.86	31.12	30.80	30.76 ± 0.15	19.17	20.94	20.02	19.97	20.02 ± 0.31
8.	39.05	39.49	41.86	42.40	40.70 ± 0.72	30.13	29.41	29.71	31.16	30.10 ± 0.33	16.60	15.97	17.32	21.40	17.82 ± 1.05
9.	43.10	44.41	42.94	43.79	43.56 ± 0.29	31.43	30.80	30.11	30.59	30.73 ± 0.23	19.48	19.35	18.38	19.21	19.10 ± 0.21
10.	41.88	41.42	41.52	------	41.60 ± 0.11	31.72	31.36	30.92	------	31.33 ± 0.18	21.34	20.66	20.32	------	20.77 ± 0.24
11.	41.25	42.03	42.67	41.74	41.92 ± 0.25	31.12	31.54	30.80	31.31	31.19 ± 0.13	20.53	21.34	20.54	20.77	20.79 ± 0.16
12.	40.09	39.98	40.66	40.36	40.27 ± 0.13	30.34	29.41	30.30	30.24	30.07 ± 0.19	19.03	17.61	18.41	19.08	18.53 ± 0.29
13.	41.03	41.31	41.16	41.18	41.17 ± 0.04	30.62	29.91	30.54	30.33	30.35 ± 0.13	19.01	18.34	18.43	18.15	18.48 ± 0.16
14.	41.89	41.37	41.38	41.16	41.45 ± 0.13	30.34	30.64	30.76	30.29	30.50 ± 0.09	19.64	19.22	19.77	19.23	19.46 ± 0.12
15.	41.40	41.44	41.86	------	41.56 ± 0.12	30.55	30.21	30.06	------	30.24 ± 0.12	19.32	19.36	18.87	------	19.18 ± 0.12

(⟵) Egg length, width and weight were Significantly different (P<0.05) among eggs in different clutches.

Egg length, breadth and weight observed in present study were significantly lower (44.41 mm, 31.72 mm and 21.40 gm, respectively), as compared to egg length, breadth and weight (47 mm, 33 mm and 26 gm, respectively) observed by Linnaeus (1758) in *Vanellus vanellus*. Also egg weights observed in present study were lower than that observed by Hegyi and Sasvari, 1998 (24.33gm). Most variation in egg size was attributable to differences between females but was also

influenced by clutch number (eggs in replacement clutches on the rough grazing, but not the arable, site were smaller), clutch size (eggs were smaller in smaller clutches), maternal body condition (females in good condition produced larger eggs) and habitat (since females on the arable site fed more successfully, they were in better condition and laid larger eggs) (Foger and Pegoraro, 1996). The reason of this differentiation may be genetically or environmental conditions. Because, the egg size in birds is determined genetically with an efficiency factor to 70 %, while the effects of environmental conditions, such as feeding resources, altitude and ambient temperature at last 3-4 days before egg-laying, are relatively restrained (Foger and Pegoraro, 1996).

References

Ali, S. (1996): The book of Indian birds. Mumbai: Bombay Natural History Society and Oxford University Press, India, pp. 1-354.

Danilov, R.V. (2000): Effect of hens' age on quality of hatching eggs and embryonic development. Proc. 21st World's Poultry Congress. Montreal, Canada.

Foger, M. and Pegoraro, K. (1996): Uber den Einfluß der Nahrung auf die Eigröße der Kohlmeise. *J. Ornithologie*., 136: 329-35.

Gupta, R.C. and Bajaj, M. (2000): Preliminary observation on a rare lapwing species, white tailed (*Vanellus leucurus*). *J. Natcon*., 12 (2): 197-203.

Gupta, R.C. and Kumar, S. (2009): Determination of avian biodiversity in Morni hills in district Panchkula, *Haryana*. *J. Adv. Zool*., 30(1): 44-53.

Gupta, R.C., Parasher, M. and Kausik, T.K. (2010): Analysis of avifauna of Chilchilla Bird Sanctuary in Haryana, *India*. *J. Adv. Zool*,. 30(1): 35-44.

Hegyi, Z. and Sasvari, L. (1998): Components of fitness in Lapwings (*Vanellus vanellus*) and Black-tailed Godwits (*Limosa limosa*) during the breeding sea- son: do female body mass and egg size matter? Ardea., 86:43-50.

Kabir, M.A., Islam, M.S. and Dutta, R.K. (2012): Egg morphometric analyses in chickens and some selected birds. *J. zool. Rajshahi Univ.*, 31: 85-87.

Linnaeus,. (1758): Lapwing (*Vanellus vanellus*). www.blx1.bto.org.com

Norman, K.B. (2007): Popular Handbook of Indian Birds. Gurney and Jackson, London.

Piersma, T. and Wiersma, P. (1996): Order Charadriiformes. Family Charadriidae (Plovers). Handbook of the Birds of the World. *Lynx Edicions, Barcelona, Spain*, Vol 3, pp. 384-43.

Ramel, G. (2009): Bird's Eggs. www.earthlife.com

Stadelman, W.J. and Cotterill, O.J. (1995): Egg Science and Technology. An Imprint of the Haworth Press Inc, New York, London, pp. 1-590.

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