

Study of ecological behaviour and morphometry of eggs in Red-wattled Lapwing (*Vanellus indicus*)

Anshu

Assist. Prof. - Zoology

Govt. Women PG College

Kandhla, Shamli (U.P.)

Abstract

They are ground birds that are incapable of perching. Their characteristic loud alarm calls are indicators of human or animal movements. The red wattled lapwing is a monogamous bird. It breeds from March to August and majority of eggs are laid in April to June. Female lays 3-4 eggs. Nests are difficult to find as eggs usually match the ground pattern. The eggs hatch in 28-30 days. Cryptically, plumaged chick lies still when alarmed. The red wattled lapwing is noisy bird and has loud 'did-he-do-it-call'. It has slow flight with deliberate flaps. They constantly make alarm noises at a higher pitch and a soft sound for guiding the hatchlings. The observation on ecological behaviour and morphometry of eggs of Red Wattled Lapwing was observed during March to May 2017 in agriculture land of Bisauli, Badaun, U.P. Two clutch size in which 08 eggs were recorded in the ground nest. Average length and breadth or width of eggs are (L × W) 4.20 X 3.10cm. and average weight of an egg was 18.12 gm. and average egg shape index (ESI) was 75.80. Behaviour of both the parents were observed during protecting and imprinting hatchlings.

Keywords: Ecological behaviour, morphometry of egg, red Wattled lapwing and egg shape index.

Introduction

The Red-wattled Lapwing (*Vanellus indicus*) is a common and widespread wading bird of the Indian Subcontinent. The species, in common with other Charadriidae, lays 3–4 eggs on the ground, in a small natural depression or scrape. The red-wattled lapwing is a terrestrial bird of open fields. The red-wattled lapwing (*Vanellus indicus*) is an Asian lapwing or large plover. *Vanellus indicus* belongs to the family Charadriidae of the order Charadriiformes. They prefer to live in outskirts of towns and villages in open fields near wetlands and are often found in pairs or trios. It shows a preference for sites in close proximity to freshwater. It is a monogamous bird and breeds from March to August. the average size of 100 eggs was 4.21 X 3.03cm (Patel and Dhandhukia, 2015). Typical nesting habitat includes open country, grazing land, fallow fields, dry beds of village tanks, and islets in rivers (Ali & Ripley 1998). Selection of nesting site is considered to be one of the most important factors in reproductive success in many species of birds (Li and martin, 1991). Red-wattled lapwing mostly picks their food from ground. Its diet

includes insects, snails and other invertebrates, vegetable matter. It also feeds on some grains. The incubation period ranges from 28 to 30 days and both sexes perform incubation duties (Desai & Malhotra 1976, Ali & Ripley 1998). Eggs are lost to an array of predators (e.g. mongooses, crows, kites, dogs), to human activities (e.g. ploughing) and to trampling by grazing animals (Naik et al. 1961). Desai & Malhotra (1976) studied the nesting success of ground-nesting Red-wattled Lapwing and observed that out of 74 eggs laid 39 (52.70%) hatched successfully, and ultimately 30 young fledged, leading to an overall nesting success of 40.54%. Additionally, this species has occasionally been observed to nest on flat pebbled roofs in urban environments (Mundkur 1985, Grimmett et al. 1998). The courtship involves the male puffing its feathers and pointing its beak upwards. The male then shuffles around the female. Several males may display to females and they may be close together (Vyas, Rakesh 1997). The eggs are laid in a ground scrape or depression sometimes fringed with pebbles, goat or hare droppings (Sharma 1992). About 3–4 black-blotched buff eggs shaped a bit like a peg-top (pyriform), 42x30 mm on average. Nests are difficult to find since the eggs are cryptically coloured and usually matches the ground pattern (Ali, S & S D Ripley 1980). Roof-nesting has been also observed (Dwyer et al. 1996, Crawford & Dyer 2000). Use of flat roofs for nesting has been suggested as an adaptive response of ground-nesting birds to the loss of traditional nest sites and habitats subjected to rapid urbanisation (Baumann 2006). Additionally, roofs have been suggested to be more protected from humans, most mammalian predators and grazing animals when compared to open ground (Douglass et al. 2001). Loss of natural habitat has been suggested as a possible reason for roof-nesting by Red-wattled Lapwing (Mundkur 1985). However, no studies have so far been conducted to ascertain the reasons causing such a shift in the species's nesting habitat. This paper aims to study of ecological behaviour and morphometry of eggs in Red-wattled Lapwing (*Vanellus indicus*).

Classification

Kingdom – Animalia

Phylum – Chordata

Class – Aves

Order – Charadriiformes

Family – Charadriidae

Genus – *Vanellus*

Species – *indicus*

Binomial name – *Vanellus indicus*

Materials and Methods

The breeding biology of *Vanellus indicus* was studied in agricultural fields of village Bisauli, Badaun, U.P. India under natural condition. The study was carried out from March -May 2017. Which latitude is 28.2978°N and longitude is 78.9345°E and 164 meters above the sea level. The red-wattled lapwing (*Vanellus indicus*) were visually observed by binoculars (GOR

Standard 10×50). Number of eggs damaged and hatching success was also observed. Eggs weights were measured with the help of electric weighing scale. Data of egg length and width were calculated by the help of Vernier caliper. Eggs volume and egg shape index were recorded with the help of mathematical equation as per given by Bored (1999).

Formula of egg volume $(V) = 0.52 \times L \times B^2$

Where V = Volume of egg, L = Maximum length, B = Maximum breadth and 0.52 is a constant for external ellipsoidal volume.

Formula of egg shape index $(ESI) = B/L \times 100$

Where ESI = Egg shape index, L = Maximum length, B = Maximum breadth.

The observations were recorded in the early morning and evening hours. In this study, the nesting sites, nests, eggs, chicks, juvenile of the bird, and adult birds were not harmed in any way.

Result and discussion

In early breeding season, both male and female red-wattled lapwing bird were responsible for the selection of nesting site. Birds take 11 to 27 days in the selection of nesting site (Lamba, 1963g). Distance between breeding and feeding sites (abiotic and biotic components) also played an important role in the selection of breeding sites, along with safety from predators and inter-specific competition (Dhandhukia and Patel, 2012). Selection of nesting site is considered to be one of the most important factors in reproductive success in many species of birds (Li and martin, 1991) and it has been recorded that in some species, reproductive success has been reduced due to poor nest site selection (Frederick, 1986). Any physical measurement of nests (size or nesting materials used) should be done after the nestlings have fledged from the nest. Artificial wooden nest boxes, a hole in a tree trunk or in a wall is the usual nesting site for the brahminy myna. Male brahminy myna bird appears to select a possible nesting site but the final selection is done by the female brahminy myna bird. Both male and female bird completes its nest with in 12-25 days (Lamba, 1963f).

It was observed that maximum nest material act as insulator that is help in decreasing heat exchange result play an important role in eggs incubation (Panicker 1980). The red-wattled lapwings prefer nesting sites close to water. The nest is a shallow scrape which may be bare or lined with small stones. Both of the pair take part in nest building, incubation and care of chicks. When the nest construction activity completed then egg laying process start. The female red-

wattled lapwing lays eggs on alternate days and the typical clutch contains four eggs. The eggs are pyriform (pear shaped), colour pale olive green or buff with blackish brown spots and markings. Also this type of research done by others (Lamba, 1963c, Dhandhukia and Patel, 2016). Nests are difficult to find since the eggs are cryptically coloured and usually matches the ground pattern (Ali, S and S D Ripley 1980).

Average length and breadth or width of eggs are (L × W) 4.10 X 3.06cm and average weight of egg was 18.12g and average range of weight of eggs was 15.82-19.60 g. Average egg volume of an egg was 19.98 cm³. Average egg volume range was 18.78-20.75cm³. and average egg shape index (ESI) was 75.80 (Table 1) and range of egg shape index (ESI) was 70.10 to 79.51.

Table 1. Morphometric Parameter of eggs of red-wattled lapwing, during study-

S.N.	Length (cm)	Breadth (cm)	Egg Volume (cm ³)	Egg shape index (ESI)	Weight (gm)
1.	4.28	3.00	20.03	70.10	18.94
2.	3.96	3.02	18.78	79.51	16.82
3.	4.00	3.08	19.73	76.26	17.52
4.	4.10	3.12	20.75	76.10	19.60
5.	4.06	2.98	20.75	73.40	15.82
6.	3.98	3.10	19.88	75.60	19.56
7.	3.88	3.08	19.13	79.38	18.86
8.	4.10	3.12	20.75	76.10	17.88
Range	3.88-4.28	2.98-3.12	18.78-20.75	70.10-79.51	15.82-19.60
Average	4.10	3.06	19.98	75.80	18.12

Female Brahminy myna starts incubation process by sitting on the eggs in the day time after the laying of the second egg. The incubation period of brahminy myna (*Sturnus pagodarum*) was found to 11 – 12 days and 13 – 14 days incubation period was found in common myna (*Acridotheres tristis*) (Lamba and Tyagi, 1975). In this study it was observed that the total number of eggs laid were eight (08) in breeding month from mid March to May 2017. In which 07 young ones hatched so hatching success was 87.5% and the mortality rate was observed to be 12.5% till hatching stage. After hatching 06 chicks were modified in to fledge of birds from out of 08 eggs. So fledge of birds success was 75% and the mortality rate was observed to be 25% till fledge of birds in Red-wattled Lapwing birds. Chudasama and Dodia (2017) observed that fledging success in common myna and bank myna was observed 67.30% and 50.09%. The mortality rate was observed to be 38.9%. Nestling mortality was due to

shortage of food especially during first week and predation were the main factors of nestling mortality in Brahminy myna (Tyagi and Lamba, 1984).

References

1. Chudasama, P. and Dodia, P. (2017). Comparative study on clutch size and morphometry of eggs in common myna (*Acridotheres tristis*) and bank myna (*Acridotheres ginginianus*) in Bhavnagar city, Gujarat, India. Vol. 6(1) 28-33.
2. Dhandhukia S. N. and Patel K. B. (2016). Morphometric study of three species of myna at Junagadh, Gujarat, India, Indian Journal of Research, Volume: 05, Issue:04, 401-403.
3. Patel, K.B. and Dhandhukia, S.N. (2015). Egg Dimension and Egg Weight loss During Incubation of red- Wattled Lapwing (*Vanellus Indicus*) at Junagadh city, Gujarat. Indian j. of Applied Research. 5 (5):19-20.
4. Dhandhukia S. N. and Patel K. B. (2012). Selection of nesting sites and nesting material in common myna (*Acridotheres tristis*), in an arban area. International Journal of pharmacy & life science. Volume: 03, Issue 8, 1897-1904.
5. Baumann, N. (2006) Ground-nesting birds on green roofs in Switzerland: preliminary observations. Urban Habitats 4: 37–50.
6. Douglass, N. J., Gore, J. A. & Paul, R. T. (2001) American oystercatchers nest on gravel-covered roofs in Florida. Florida Field Naturalist 29: 75–80.
7. Crawford, R. J. M. & Dyer, B. M. (2000) Swift terns *Sterna bergii* breeding on roofs and at other new localities in southern Africa. Marine Orn. 28: 123– 124.
8. Ali, S. & Ripley, D. (1998) Handbook of the birds of India and Pakistan. Delhi: Oxford University Press.
9. Grimmett, R., Inskipp, C. & Inskipp, T. (1998) Birds of the Indian Subcontinent. Delhi: Oxford University Press.
10. Vyas, Rakesh (1997). "Flocking and courtship display in Redwattled Lapwing (*Vanellus indicus*)". Journal of the Bombay Natural History Society. 94: 406–407.
11. Dwyer, C. P., Belant, J. L. & Dolbeer, R. A. (1996) Distribution and abundance of roof-nesting gulls in the Great Lakes region of the United States. Ohio J. Sci. 96: 9–12.
12. Li, P. and Martin, T. E. (1991). Nest site selection and nesting success of cavity nesting birds in high elevation forest drainage. Auk 108: 405-418.
13. Frederick, P. C. (1986). Conspecific nest takeovers and egg destruction by White Ibises. Wilson Bull 98: 156-157.
14. Mundkur, T. (1985) Observations on the roof-nesting habit of the Red-wattled Lapwing (*Vanllus indicus*) in Poona, Maharashtra. J. Bombay Nat. Hist. Soc. 82: 194–196.

15. Tyagi, A. K. and Lamba, B. S. (1984). A contribution to the breeding biology of two Indian myna. Zoological Survey of India, June, Calcutta.
16. Ali, S & S D Ripley (1980). Handbook of the birds of India and Pakistan. Vol. 2 (2nd ed.). Oxford University Press. pp. 212–215.
17. Panicker, K. N. (1980). Ecology of hole nesting bird. J. Bombay Nat. Hist. Soc 75: 1227-1237.
18. Lamba, B. S. and Tyagi, A. K. (1977). Period of Incubation in Brahminy myna *Sturnus pagodarum* (Gmelin). J. Bombay Nat. Hist. Soc. 74 (1): 173-174.
19. Desai, J. H. & Malhotra, A. K. (1976) A note on incubation period and reproductive success of the Red-wattled Lapwing *Vanellus indicus* at Delhi Zoological Park. J. Bombay Nat. Hist. Soc. 73: 392–394.
20. Lamba, B. S. and Tyagi, A. K. (1975). Incubation period in common myna *Acridotheres tristis* Newsl. Zool. Surv. India 1 (3): 47-48.
21. Naik, R. M., George, P. V. & Dixit, D. B. (1961) Some observations on the behaviour of the incubating Red-wattled Lapwing, *Vanellus indicus indicus* (Bodd.). J. Bombay Nat. Hist. Soc. 58: 223–230.
22. Lamba, B. S. (1963c). Nidification of some common Indian birds No. 4. The common myna Res. Bull. Punjab Univ., 14 (I-II): 11-20.
23. Lamba, B. S. (1963f). Nidification of some common Indian birds No. 7. The Spotted billed or grey Pelican, *Pelecanus philippensis* Gmelin, Payo The Indian Journal of Ornithology, 1 (2): 110-119.
24. Lamba, B. S. (1963g). Nesting habits of common birds. Everyday Science. VIII, (3-4): 47-55.