

Nest building behaviour and breeding success in Red-wattled Lapwing (*Vanellus indicus*)

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Abstract

This study documented some aspects of nest building behaviour and breeding success in Red-wattled Lapwing birds such as structure of nest, nesting building material, clutch size, hatching of eggs and fledging of birds in agricultural fields of Kandhla, Shamli, U.P. India. At the time of breeding season the male bird selected the territory. Both birds build their nest. The nest was a circular depression encircled by stones or pieces of some wood sticks, hard clay or pebbles. The average width and depth of nest was 24.15×3.25 cm. It breeds from March to August and majority of eggs are laid in April to June. Female lays 3-4 eggs. Four clutch size in which 15 eggs were recorded in the ground nest. After clutch the eggs, incubation period completed with in 26 to 29 days. The rate of hatching success was 86.6%. After hatching 10 chicks were modified in to fledge of birds from out of 15 young ones, so fledge of birds success was 66.6%. The hatchling were able to fly with in 23 to 30 days after hatching process.

Keywords: Nesting behaviour, breeding success, Red Wattled lapwing and incubation.

Introduction

The red-wattled lapwing (*Vanellus indicus*) is an Asian lapwing or large plover. *Vanellus indicus* belongs to the family Charadriidae of the order Charadriiformes. The red-wattled lapwing 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. 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 4.21×3.03 cm (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, vegetables 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 research paper aims to study of nest building behaviour and breeding success in Red-wattled Lapwing birds.

Materials and Methods

Study area and data collection

This study of *Vanellus indicus* was studied in agricultural fields of Kandhla, Shamli, U.P. India under natural condition. The study was carried out from March - July 2020. Which latitude is 29.3841°N and longitude is 77.2017°E and 241 meters above the sea level. The survey sites included 0.5 km. radius of Kandhla, Shamli, U.P. The red-wattled lapwing were visually observed by directly or some time by binoculars. Nest width, depth, building materials, number of eggs, hatching success and fledging of birds were also observed. Data of nest width and depth were calculated by the help of Vernier caliper. 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

A territory zone near the nest was developed by both birds. The site selection has been studied in birds (Clark and Shulter, 1999). They protect their nest by alarming calls by the both birds and also attacked the intruder. 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. 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 within 12-25 days (Lamba, 1963f). Female Brahminy myna starts incubation process by sitting on the eggs in the day time after the laying of the second egg. 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 parents participated equally in nest construction. Initially they gathered nesting material like pebbles, wood sticks of their surrounding areas (Balkhande and Shaikh, 2017). 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. The broken shells of eggs were cleared away from the nest by both parents (Jhahria, 2020) 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 and range of egg shape index (ESI) was 70.10 to 79.51 (Anshu, 2019). 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 Lamba and Tyagi (1975).

In this study it was observed that the average width and depth of nest was 24.15 × 3.25 cm., the total number of eggs laid were eight (15) in breeding month from March to July 2020. In which 13 young ones hatched so hatching success was 86.6% and the mortality rate was observed to be 13.4% till hatching stage. After hatching 10 chicks were modified in to fledge of birds from out of 15 eggs. So fledge of birds success was 66.6% and the mortality rate was observed to be 33.4% till fledge of birds in Red-wattled Lapwing birds (Table 1). 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). Damage to eggs in ground nests by grazing animals has been reported (Hart et al. 2002). The hatchling were able to fly within 23 to 30 days after hatching process.

Table 1. Clutch size, hatching of eggs and fledging of bird in common myna during study-

S.No.	Width and depth of nest	Clutch size	Hatching of eggs		Fledging of birds	
			Success	Mortality	Success	Mortality
Nest 01	24.2 × 3.2 cm	04	04	----	03	01
Nest 02	24.6 × 3.6 cm	03	03	----	02	01
Nest 03	23.8 × 3.0 cm	04	03	01	03	01
Nest 04	24.0 × 3.2 cm	04	03	01	02	02
Range	24.15 × 3.25 cm	03-04	03-04	00-01	02-03	01-02
Total	----	15	13	02	10	05
Percentage	----	100%	86.6%	13.4%	66.6%	33.4

References

1. Ali, S & S D Ripley (1980). Handbook of the birds of India and Pakistan. Vol. 2 (2nd ed.). Oxford University Press. pp. 212–215.
2. Ali, S. & Ripley, D. (1998) Handbook of the birds of India and Pakistan. Delhi: Oxford University Press.
3. Anshu, (2019). Study of ecological behaviour and morphometry of eggs in red wattled lapwing (*Vanellus Indicus*) IJESM Vol. 8, Issue 8, August 2019, 128-133.
4. Balkhande J. V. and Shaikh A., (2017). Study of nesting pattern and breeding biology of Red Wattled Lapwing *Vanellus Indicus* in agricultural field near to Asna river bridge, Nanded (Maharashtra). Research magma an international multidisciplinary journal. Vol.- 1, Issue VI.
5. Baumann, N. (2006) Ground-nesting birds on green roofs in Switzerland: preliminary observations. Urban Habitats 4: 37–50.
6. 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.
7. Clark R. G. and Shulter, D. (1999). Avian habitat selection pattern from process in nest site use by ducks. Ecology. 80, 272-287.
8. 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.
9. 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.

10. Dhandhukia S. N. and Patel K. B. (2012). Selection of nesting sites and nesting material in common myna (*Acridotheres tristis*), in an urban area. International Journal of pharmacy & life science. Volume: 03, Issue 8, 1897-1904.
11. 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.
12. 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.
13. 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.
14. Frederick, P. C. (1986). Conspecific nest takeovers and egg destruction by White Ibises. Wilson Bull 98: 156-157.
15. Grimmett, R., Inskipp, C. & Inskipp, T. (1998) Birds of the Indian Subcontinent. Delhi: Oxford University Press.
16. Hart J. D., Milsom, T. P., Baxter, A., Kelly, P. F. and Parkin, W. K. (2002). The impact of livestock on lapwing (*Vanellus vanellus*) breeding densities and performance on coastal grazing marsh, *Brd Study* 49: 67-78.
17. Jhahhria, A. (2020). Rare sightings of red wattled lapwing parental care in a arid town of Rajasthan. IJAR 2021; 7(5): 91-93.
18. Lamba, B. S. (1963c). Nidification of some common Indian birds No. 4. The common myna Res. Bull. Punjab Univ., 14 (I-II): 11-20.
19. 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.
20. Lamba, B. S. (1963g). Nesting habits of common birds. Everyday Science. VIII, (3-4): 47-55.
21. Lamba, B. S. and Tyagi, A. K. (1975). Incubation period in common myna *Acridotheres tristis* Newsl. Zool. Surv. India 1 (3): 47-48.
22. 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.
23. 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.
24. 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.
25. 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.
26. Panicker, K. N. (1980). Ecology of hole nesting bird. J. Bombay Nat. Hist. Soc 75: 1227-1237.
27. 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.

28. Tyagi, A. K. and Lamba, B. S. (1984). A contribution to the breeding biology of two Indian myna. Zoological Survey of India, June, Calcutta.
29. Vyas, Rakesh (1997). "Flocking and courtship display in Redwattled Lapwing (*Vanellus indicus*)". Journal of the Bombay Natural History Society. 94: 406–407.