American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)

ISSN (Print) 2313-4410, ISSN (Online) 2313-4402

http://asrjetsjournal.org/

Ecological Study of *Vanellus indicus* in District Narowal, Pakistan

Waqar Ahmad[a], Asif Mehmood Qureshi[b], Anam Javed[c*]

[a]*M.Phil Researcher, School of Zoology, Minhaj University Lahore, Pakistan*

[b]*Professor, School of Zoology, Minhaj University Lahore, Pakistan*

[c]*Assistant Professor, School of Zoology, Minhaj University Lahore, Pakistan*

[a]*Email: waqarahmad34501@gmail.com*

[b]*Email: chairman.zoology@gmail.com*

[*c]*Email: anam.zoology@mul.edu.pk*

Abstract

Red wattled lapwing is commonly found and endemic species of Asian agricultural lands. Its preferred habitat is airy lands, rural and even urban areas. The main aims of current investigatory effort were the observation of different parameters of breeding ecology of *Vanellus indicus* including breeding sites, incubation period, the clutch size, survival rate of chicks and possible reasons of their mortality which are localized in Narowal district. Red wattled lapwings forage on several types of insects, snails, seeds, and of invertebrates. Experimental observations highlight that the annual breeding season is of average 26-30 days of *V. Indicus* begins from the March and till the end of August. Moreover, the weight of their eggs falls between 22.0 to 28.0g. These findings about local species may serve for next experimental designs based of on *V. indicus* and further focus should be on those factors which may improve its breeding. Similarly, the estimation of feeding preferences of this species can directly help in low cost biological control management for crops.

Key words: *Vanellus indicus;* endemic; Asian agricultural lands; breeding ecology; breeding season; biological control management.

---

* Corresponding author.

1. Introduction

Red wattled lapwing (also known as ″Did-he-do it″) is a prominent bird of Asian agricultural lands. It is endemic to this region and also a representative of family Charadriidae. It is inhabitant of mainly open areas, villages and towns. A deceit of *V. indicus* usually consists of 8-10 birds. Morphologically, they are slim textured with conspicuous black collar, long yellow legs and brownish grey wings [1]. But males are with more prominent crest, facemask wattles or spot annex limbs [5]. Its characteristic feature is loud irritating alarm calls. This species of lapwing is carnivorous and feeds on small insects and different invertebrates. As for feeding purpose, *V. indicus* roam around agricultural lands and indirectly play an important role in biological control and insects and pest management [1]. Total seven species are included in genus *Vanellus* which have been reported from Indian subcontinent, three of them have been declared as endemic to this region, which are River lapwing (*Vanellus duvaucelii),* Yellow wattled lapwing (*Vanellus malabaricus)* and Red wattled lapwing (*Vanellus indicus).* Among them, the River lapwing mostly lives at the rivers' banks whereas Red wattled lapwing is a ground bird, so it prefers to live in open rural areas and near water bodies. Similarly, Yellow wattled lapwing is mostly found in dry stubbles and vast fallow fields and along the periphery of wetlands [2]. Generally, they move together in groups. *V. indicus* breeding season extends from April to September and mostly lays 2-4 eggs per brood in open and stony ground [3] and the nests are usually encircled with small pebbles which are helpful in camouflaging with background. Sometimes, these birds built their nests on the top of roof of buildings [6]. Though this bird mostly prefers open areas, pastures, fallow fields but also sometimes urban areas and dry beds of village tanks for nesting. Both male and female lapwings perform parental duties during incubation which ranges from 26-30 days. Effective defense strategies are also adopted by parent lapwings during incubation period for their eggs protection and to avoid diverse predators which mainly include mongoose, crows, snakes etc. As reported data indicates that more than half number of their eggs remain at verge of loss due to various farming activities and also due to flying predators [4]. Red wattled lapwing is mostly present in all irrigated lands of Punjab, Pakistan. It frequently forages on green fodder, beetles, ants, worms and plant remains [5]. The major objectives of this investigatory effort were the estimation of breeding ecology, breeding sites, incubation period, the clutch size, survival rate of chicks and possible reasons of their mortality.

Scientific Classification of Red wattled lapwing

Table 2

Kingdom	Animalia
Phylum	Chordata
Class	Aves
Order	Charadriiformes
Family	Charadriidae
Genus	*Vanellus*
Species	*V. indicus*

2. Materials and methods

2.1. Selection of Study Area

The study was conducted during March to August 2019 which is also breeding season of *V. indicus* in district Narowal. The total area of the district Narowal is approximately 2337 square kilometers. Narowal Tehsil occupies 1065 square kilometers while the remaining area falls in Shakargarh Tehsil. It lies from 31° 55' to 32° 30' north latitudes and 74° 35' to 75° 21' east longitudes. The district is bound on the northwest by Sialkot district, on the north by Jammu State, on the east by Gurdaspur district (India) and on the south by Amritsar district (India) and Sheikhupura district.

2.2. Climatic conditions

The general aspect of this district is a plain slopping down from the uplands at the base of Himalayas to the level country to the south west, and the general altitude is 266 meters above the sea level. Bounded on south - east by the river Ravi, the district is fringed on either side by a line of fresh alluvial soil, about which rise the low banks that form the limits of the riverbeds. At about a distance of 24 kilometers from Ravi river, and another stream, the Dake Nala which rises from the Jammu hills flow through this district. The district has extremes of climate. The summer season starts from April and continues till October. The hottest months are May, June and July. The mean maximum and minimum temperature during these months are 40 and 24 degrees respectively.

2.3. Feeding behavior estimation

The observations related to feeding behavior were collected from different sides of field with the help of digital camera from 4m distance, thrice per day, in the morning, noon and evening time, respectively.

2.4. Incubation period determination

Different nests were selected randomly to note incubation period of *V. indicus.*

2.5. Measurement of weight of eggs

The weight of eggs of *V. indicus* was measured by using electronic balance.

3. Result and discussion

3.1. Feeding Behavior

Red wattled lapwing feeds on small insects, snails, seeds, and other kinds of invertebrates (Table.1). The Red wattled lapwings prefer to select moist soil and wet lands for feeding especially during breeding season.

Table1: List of frequently consumed food items of Red-wattled Lapwing

Sr. No.	List of Probable Food Items
1.	*Anisops*
2.	Weevil
3.	Larvae of Damsel
4.	Larvae of Dragon fly
5.	*Chironomus pentaneura*
6.	Small Mollusks
7.	Beetles
8.	Earthworms
9.	*Sternolophus rufipes*

3.2. Breeding and Incubation period observations

Collected data indicates that there is a single annual breeding season of average 26-30 days of *V. Indicus* which starts from the March and terminates at the end of August. It was observed that incubation starts after completion of clutch. Daily incubation of 2 to 5 hours and synchronous hatching were observed. Recorded data indicates that time interval taken for pipping and emergence of the chick ranges from 12 to 24 hours (Figure.1). The phenomena of belly-soaking and egg wetting have been reported in the red wattled lapwing.

Figure 1: Image taken from Kanjroor Village (District Narowal) showing camouflage with the background of *V. indicus* chicks

3.3. Weight of eggs

Readings showed that the egg weight of *V. indicus* falls in range of 22.0 to 28.0g.

3.4. Discussion

The study of selected three parameters provided some important ecological information related to *V. indicus* that which type of habitat is selected by red wattled lapwings, what are their feeding preferences and it was clearly observed that as our selected time duration was also breeding season of this species. So, during this, they prefer to feed on nutrients' rich diet which indirectly might help in egg laying with better weightage. Similarly, cooling effect for the eggs by belly-soaking might be done to keep eggs cool, when the ambient temperature rose beyond 40°C.

4. Conclusion

This investigatory effort is quite helpful for the researchers of either Pakistan or at international level because in next experimental designs based of on *V. indicus*, people should focus on such factors which may improve its breeding. Similarly, the estimation of foraging behavior of this endemic species can directly help in low cost biological insects and pests control of crops.

Acknowledgement

No financial assistance was received by any authority or organization. This collaborative scientific effort was performed only by Mr. Waqar Ahmad, Dr. Asif Mehmood Qureshi & Dr. Anam Javed.

References

[1]. M. Kaur and K. S. Khera (2017). ″ On the fundamentals of breeding biology and present threats to red wattled lapwing (Vanellus indicus) in agricultural landscape of Punjab″. Journal of entomology and zoology studies. 5(4), p.1501-1506.

[2]. C. Kumar (2015). ″First record of a regularly occupied nesting ground of Yellow-wattled Lapwing, Vanellus malabaricus (Boddaert) in agricultural environs of Punjab with notes on its biology″. Journal of Entomology and Zoology studies. 3(1), p.129-134.

[3]. G. Ariyasiri, A. Menike, and K. Ranawana (2009). ″Breeding Ecology of Red-Wattled Lapwing (Vanellus Indicus) in Peradeniya University Premises″. Peradeniya University Research Session PURSE -2009, Proceeding and Abstracts, Vol.14,3rd December, 2009, University of Peradeniya, p. 307.

[4]. V. K. Sethi, D. Bhatt, A. Kumar and A. B. Naithani (2011). ″The hatching success of ground-and roof-nesting Red-wattled Lapwing Vanellus indicus in Haridwar. ″ India Forktail. 27, p. 7-10.

[5]. S. Khalil, T. Hussain, M. Anwar, M. Rafay, M. Abdullah, M. Khalid, and I. Ashraf (2019). ″Breeding biology of red wattled lapwing (Vanellus indicus) from Southern Punjab, Pakistan″. International Journal of Biodiversity and Conservation. 11(2), p. 78-84.

[6]. S. N. Dhandhukia and K. B. Patel (2015). ″ Growth of various morphometric parameters of red-wattled lapwing (Vanellus Indicus) at Junagadh City, Gujarat″. Ind J Appl Res, 4, p. 131-132.