A CLUTCH SIZE OF BLACK-WINGED KITE *ELANUSCAERULEUS* OF THE ARID ZONE OF RAJASTHAN

Madan Lal Meghwal¹, K. C. Soni² and V.C.Soni³

¹Research Scholar, Maharaja Ganga Singh University, Bikaner, Rajasthan, India.

²Department of Zoology, Lohia P. G. College, Churu (Rajasthan) 331001, India.

³Department of Biosciences, Saurashtra University, Rajkot – 360005, India

Corresponding Email: madankhardia99@gmail.com, kcsibis@yahoo.com,
vcsoni2009@gmail.com

ABSTRACT

The Black-winged kite (*Elanuscaeruleus*) is very common throughout India with wide distribution and a solitary breeder. It belongs to a family: Accipitridae. Surprisingly, no systematic studies have yet been carried out on any aspects of breeding biology of the species. Breeding of Black-winged kite poorly known [1][7].

Keyword: clutch, black-winged, kite, *elanuscaeruleus*, arid zone

INTRODUCTION

Among other species breeding chronology has been studied in birds such as Black eared kite (*Milvus migranslineatus*) by Bhuiyan and Khan [2], Brahminy kite (*Haliasturindus*) by Kumar [10] and Bald eagle (*Haliaeetusleucocephalus*) by Broley [3]. Clutch size in birds varies from species to species [8,11,14]. Some species lay single egg and others many more. Here, the clutch size of the Black-winged kite of arid zone of Rajasthan is given. The study was carried out during 2012 to 2014. The clutch size in the Black-winged kite varies from 2 to 3 eggs. Thirteen clutches of eggs of

the species were recorded. The clutch size varies from 2 to 3 eggs per nest and the mean clutch size for the three years was 2.6 eggs per clutch. The geographical variations in the species also have been recorded by some workers. An average clutch of three or four eggs laid at Bharatpur was 3 eggs laid at 48-hour intervals [15]. In Zambia clutch size ranged from 2 to 6 eggs [5]. In China, it ranged 3-4 eggs whereas in Malay Peninsula clutch size is 3 eggs [18].

The study was carried out during January 2012 to December 2014 in the rural areas of Churu city and Ratangarh

city(Churu district) of Rajasthan, India (Lat 29° N, Long 75° E and 286 Msl).

METHODOLOGY

For field observations Olympus binoculars 10X50 were used and for photography Nikon P510 camera with 40X zoom. Close observations of five nests were made using machan to record the clutch size. The diameter was measured using plastic vernier calipers.

RESULTS

A Black-winged kite lays an average 2.6(Table 1). The clutch size varies from 2 to 3 eggs per nest (Fig:1). Eggs of the Black-winged kite were short elliptical in shape, glossless creamy white, heavily splashed all over with shades of brown to chocolate spots (Fig:1). The average diameter of 13 eggs studied was 39.48 X 29.9 mm. The average weight of egg was 38.8 g (Table: 1). The incubation started after clutch completion. The average of hatching success was 2.2 (84.6%) and average of fledgling success was 1.8 (81.8%). Infertile eggs were also laid. 19, 20 and 16 nest respectively were observed at various nesting sites ranging from 2012 to 14 (Table: 2). Total annual rainfall in 2012 to 2014 were 430.2, 449.5 and 398.4 respectively (Table: 3).

DISCUSSION

Five nests and thirteen eggs of the Black-winged kite were recorded in rural areas of Ratangarh city (Churu district) of Rajasthan and it was observed that the clutch size comprised of two to three eggs. The mean clutch size for the three years 2012 to 2014 was 2.6 eggs per clutch. Geographical variations in clutch size have been reported in several Central American birds [16,17] and in equatorial and tropical birds of prey [4]. Nest success in the Black-winged kite affected by the clutch size like another raptor [12]. Infertile eggs are also laid by the Black-winged kite. Pesticides and biocides are being used in the surrounding agriculture fields. This species is a top consumer of food chain, so biomagnifications is also possible and may affect their reproduction. Broley[3] noticed that between 1939 and 1947 the number of productive nests of Bald eagles (*Haliaeetus leucocephalus*) declined significantly in Florida and that the few nests that produced chicks average fewer nestling. He found only one productive nest and it contained only single chick. DDT in female's body distributed the shell making process and causing to produce very weak shells or no shells at all. Reproductive

performance depended on food material has been reported in many species of Raptor [6,9,13]. Scarcity of food during drought may be the reason of reduced reproduction performance. Not a single nest seen on many nesting sites of black-winged kite in the year having low rainfall. Lowest rainfall in the year 2014 due to which the lowest 16 nest observed this year perhaps due to food scarcity.

Annual fluctuations in the average clutch size on account of scarcity of food. The factors affecting the number of chick, fledged were food availability and climatic factors like sand storms rainfall with ice crackers, predation by cats and human disturbance. (Figure: 2,3).

CONCLUSION

We found that the smallest clutch size of Black-winged kite was 2 eggs per clutch and largest was 3 eggs per clutch during our study. Maximum number of clutch was 3 eggs per clutch so the average clutch size was 2.6. Annual fluctuations in the clutch size depends on the uses of pesticides in agricultural fields, climatic factors and scarcity of food.

Figure: 1.A nest of Black-winged kite with two eggs and one nestling in the study area.

Figure: 2. Picture is showing damaged egg of Black-winged kite by ice cracker during the rain. Figure:3. Khejari(*Prosopis cineraria*) tree leaves and twigs are cut and used as fodder and firewood by human beings and there by destroying the nest of Black-winged kite.

Table 1: Clutch Size and breeding success of the Black-winged kite during 2012-2014 breeding season in rural area of Churu district (Rajasthan).

No. of nests	Clutch size	Egg length (m m)	Egg width (m m)	Egg weight (gm)	No. of infertile egg	Hatching successes	Fledgling successes
1	3	38.7	28.9	37.2	Nil	3	3
2	3	39.1	29.3	38.7	01	3	2
3	2	39.6	29.9	38.9	01	1	1
4	2	39.8	30.2	39.2	Nil	2	2
5	3	40.2	31.2	40.0	Nil	2	1
Average	2.6	39.48	29.9	38.8		2.2 (84.6 %)	1.8 (81.8 %)

Table: 2. Number of nests in breeding season from 2012-2014.

S.No.	Nesting site	Nesting tree	2012	2013	2014
1	Shri Ganesh Temple	Khejari	1	1	Nil
2	Govt. Sec. School	Khejari	1	1	1
3	Sukha Ram's Farm	Khejari	1	1	1
4	SurjanaJohara	Khejari	1	1	1
5	Lalani Johara (Railway Puliya)	Khejari	1	1	1
6	Joranath ji Temple	Khejari	Nil	1	1
7	RananaJohara	Khejari	1	1	1
8	Mohan Ram's Farm	Khejari	1	1	1
9	Kolath (Hanif's farm)	Khejari	1	1	Nil
10	NiraniJohara	Khejari	1	1	1
11	Sukra Nath Ji Ki Bari	Khejari	1	1	1
12	Govt. Primary School	Khejari	1	1	Nil
13	CJRM School	Khejari	1	1	1
14	Sohan Ram's farm	Khejari	1	1	1
15	Karni Mata Temple	Khejari	1	1	1
16	Muslim Graveyard	Khejari	Nil	1	1
17	Choudhary Farm	Khejari	1	1	1
18	Thakrana	Khejari	1	Nil	1
19	Primary School, Mata Mandir	Khejari	1	1	Nil
20	Jambhoji Gaushala	Khejari	1	Nil	Nil
21	Nath Ji Ki Jhopri	Khejari	1	1	1
22	Hanuman's Farm	Khejari	Nil	1	Nil
	Total Nest build up		19	20	16

Table.3. Monthly rainfall in mm in Churu from Jan.2012 to Dec.2014

Year Month	2012	2013	2014
January	0.00	35.70	17.70
February	0.00	39.10	30.10
March	0.00	0.80	26.30
April	20.60	4.70	12.20
May	29.70	2.20	87.50
June	0.20	21.50	40.60
July	107.00	183.10	45.70
August	223.50	84.60	72.60
September	38.90	56.30	65.60
October	1.10	6.50	0.10
November	0.00	15.00	0.00
December	9.20	0.00	0.00
Total	430.20	449.50	398.40

REFERENCES

1. Ali, S, &Ripley, S.D., 1978.*Handbook of the Birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka*, 2nd ed. Vol. 1 Oxford University Press, Delhi.
2. Bhuiyan, H.R. & Khan, M.A.R., 1981.Population and breeding activities of Pariah Kite *Milvus migrans* (Boddaert) in Greater Dacca, Bangladesh. Proc. Third National Zoological Conference, Dacca.; 266-281.
3. Broley, C.L., 1947.Migration and nesting of Florida Bald Eagles, *Haliaeetusleucocephalus*. *Wilson Bull.*59(1): 1-68.
4. Brown, L.H. &Amadon, D., 1968.*Eagles, Hawks and Falcons of the World*. Vol. I & II. Country Life Books, London.
5. Dowsett, R.J., Aspinwall, D.R. &Dowsett-Lemaire, F., 2008. The birds of Zambia. Tauraco Press and Aves, Liège, Belgium.
6. Hiraldo, F., Veiga, J.P. &Manez, M., 1990.Growth and nestling Black Kites *Milvus migrans*: effects of hatching order, weather and season. *J. Zool. Lond.*1990;222: 197-214.
7. Kennedy, R.S. &Gozales, P.C., Dickinson, E.C., Miranda, Jr. H.C. & Fisher, T.H., 2000.Black-winged or shouldered Kite (*Elanuscaeruleus*), *A guide to the birds of the Philippines; Oxford University Press, USA*, 2000; 08.
8. Klomp, H., 1970.The determination of clutch size in birds. A review. *Ardea*, 58: 1-124.
9. Koga, K., Siraishi, S. & Uchida, T.A., 1989 Breeding ecology of the Black Kites *Milvus migranslineatus* in the

- Nagasaki Peniinsula, Kyushu. *Jpn. J. Ornithol.* 57: 57-66.
10. **Kumar,A., 2001.**Clay lumps as nest building material in kites. Newsletter for Birdwatchers, 41(3): 42.
11. **Mayr, E. & Cottrell, G.W., 1979.**Checklist of the birds of the world. Volume 1. (Second edition). Camb, Mass, Mus. Comp. Zool.
12. **Naoroji, R., 1997.**A study on the breeding biology of resident raptors in Corbett National Park, Utter Pradesh. *Journal Bombay Natural History Society*, 94.
13. **Ogada, D.L. &Kibuthu, P.M., 2012.**Breeding ecology of the Mackinder's Eagle-Owls (*Bubo capensismackinderi*) in farmlands of Central Kenya. *J. Raptor Res.* 46: 327-335.
14. **Olmos,F., 2003.** Nest location, clutch size and nest success in the Scarlet Ibis *Eudocimus rubber*. *Ibis*. 145(online): E12-E18.
15. **Prakash, V., 1988.**The General Ecology of Raptors (Families Accipitridae&Strigidae, Class Aves) in Keoladeo National Park. Bharatpur. Unpublished thesis. Bombay Nat. Hist. Soc. Bombay University.
16. **Skutch, A.F., 1949.**Do tropical birds rear as many young as they can Nourish. *Ibis*.91: 430-458.
17. **Skutch, A.F., 1954.**Life histories of Central American Birds. Pacific Coast Avifauna.No-31.
18. **Wells, D.R., 1999.**The birds of the Thai-Malay Peinsula: Vol. 1 (Non-Passarines)", Academic press. Identification, distribution map, habits, habitat, migration, conservation. 130-132.