



Original article

Some aspects of the breeding biology of the African Thrush *Turdus pelios* Linnaeus 1884 in Lokoja, Kogi State, Nigeria

Adang, K. L.

Department of Biological Sciences, Faculty of Science, Federal University Lokoja, PMB 1154, Lokoja, Kogi State, Nigeria

Submitted: September, 2018; Accepted: November, 2018; Published: December, 2018

ABSTRACT

The African Thrush *Turdus pelios* is a typical Thrush in appearance and habits. It is a melodious song bird that is native to Africa and is easily recognized by its song. It has a conspicuously yellow bill and forages mostly in parks and gardens. The sexes are similar and are dull grey-brown in colour. A study was carried out in order to provide information on the nest, eggs and nestlings of the African Thrush *Turdus pelios* in Lokoja, Kogi State, Nigeria. The study was conducted between June and July, 2016. A nest of the African Thrush was discovered by visual observation on the 12th of June 2016. The nest was located on a *Terminalia superba* tree in a fork within two branches. The height above ground of the nest was 5.2 m, measured using a surveyor's tape. The nest and its content were accessed with the aid of a ladder. The nest was the "statant cupped" type and had one egg in it when discovered. The second and third eggs were laid subsequently on the 13th and 14th June, 2016 respectively. The clutch size was three and the eggs were bluish in colour, dotted with reddish spots. Incubation of the eggs started immediately the last egg was laid and lasted for a period of two weeks. One of the eggs was hatched on the 28th of June, 2016 and the other two remaining eggs were not hatched. The breeding success was calculated to be 33.3%. The newly hatched nestling was naked and blind. Photographs of the nestling were taken on the 4th day after hatching and at one week after hatching, using a Fujifilm digital camera Fine Pix A700. The nestling fledged at ten days after hatching and the nest was dismantled for the identification of the nest materials. The study is evidence of the breeding of the African Thrush in Lokoja and it is likely that the breeding season of the species in Lokoja falls between June and July. Further study is hereby recommended in order to provide detailed information on the breeding biology of the species in the area.

Keywords: Breeding record, *Turdus pelios*, Lokoja, Nigeria

Corresponding author: ladang20@yahoo.com

INTRODUCTION

The African Thrush *Turdus pelios*, is a typical Thrush in appearance and habit. The bird is brown above and pale brown below, with the chin whitish and streaked

dark brown. The under wing coverts and the flanks are orange-chestnut, the bird has a yellow conspicuous bill and the sexes are similar [1]. It is mainly a ground feeder, feeding on earthworms, insects

and seeds. According to [2] foraging is crepuscular and fruits, especially of the neem *Azadirachta indica*, as well as figs, papaya, berries and seeds make up most of the diet supplemented with invertebrates and occasionally small fish. The song is a loud melodious varied warbling and the call is a rich chirp [1] or hard chuck, often repeated in dry series ([3]; [4]). The African Thrush can be found in all sorts of wooded habitats including forest edge, riparian woodland, scrub cultivation, parks and gardens [5]. The species is widespread and abundant in West Africa in the savanna and forest and is partial to cultivated land and human habitation, it is sedentary and usually absent from true forests. It ranges from Senegal and Gambia to Chad, the Central African Republic, Gabon and Congo. Mountain races inhabit the Cameroon Mountains and wooded high lands of Fernando Po ([1]; [6]). The bird according to [7] is a local common resident, often suburban from the coast north to the limits of the Guinea zone. It is less common north to Kano and Nguru, and is a partial migrant at Zaria and Kano in the wet season and similarly at Ibadan in the dry season. It is one of the 18 species reported to be of palearctic origin [3].

The adult African Thrush measures about 23 cm from bill to tail. Although the breeding of the species has been documented in some parts of the world ([1]; [3]) and in some parts of Nigeria ([7]; [8]), to the best of my knowledge, it has not been documented in Lokoja and environs. Breeding in birds may vary from one geographical location to another and this may not be unconnected to the variation in climatic conditions, which determine the survival of the young and also the availability of food to raise the young ([9]; [10]). It is also unscientific to use data obtained elsewhere on the breeding

biology of a particular species as global. Even in areas where information have been documented on a species, there is need for repeated studies with time because anthropogenic activities might have led to the modification of that habitat, which may in turn affect the behavior of the species in question. The present study was therefore aimed at providing baseline information on some aspects of the breeding biology of the African Thrush *T. pelios* in Lokoja, Kogi State, Nigeria. This information will help in designing conservation measures for the species whenever it becomes a victim of the ever-changing and threatening environment, which may place the species in jeopardy of extinction or extirpation.

The African Thrush feeds on seeds, thus helps in controlling weeds on farmlands. It also feeds on insects, some of which may be harmful and incriminated as pests to man, his domestic animals and crops. By feeding on them, the African Thrush helps in regulating the population of such insects. According to [8], the African Thrush also feeds on earthworms which serve as intermediate hosts to some helminths. [2] reported the African Thrush to feed on fruits and berries. Its feeding on fruits and berries could play an important role in park and garden regeneration. The African Thrush is a melodious song bird that adds beauty to the environment through its singing.

Materials and methods

Study area

The study was carried out in Lokoja, Kogi State, Nigeria. Lokoja lies between latitudes $7^{\circ} 45' 27.56''$ N and $7^{\circ} 51' 04.34''$ N and longitudes $6^{\circ} 41' 55.64''$ E and $6^{\circ} 45' 36.58''$ E (Figure 1). It has an estimated land mass of 63.82 sq.km and is situated in the Guinea Savanna belt,

witnessing the Aw type of climate [11]. Annual rainfall is between 1016 mm and 1524 mm, with its mean annual temperature not falling below 27.7° C. Lokoja is generally hot throughout the year and is sandwiched in the west and east by the Patti ridge and River Niger respectively. Lokoja has two distinct seasons, the dry season which lasts from November to February and the rainy season that lasts from March to October. The vegetation consists of mixed guinea woodland to forest savanna [11].

The nest was discovered in a compound located on a rocky outcrop at the Government Residential Area, Lokoja, along Maryville Street. The vegetation of the compound comprises of some exotic trees such as *Terminalia superba*, *Terminalia catappa*, *Polyathia longifolia*, *Azadirachta indica* and some economic trees such as *Citrus reticulata*, *Citrus aurantifolia*, *Mangifera indica*, *Psidium guajava*, *Carica papaya*, *Cocos nucifera* and *Moringa oleifera*. The floor of the compound comprises of sparsely distributed shrubs, herbs, sedges, flowers, grasses and some fallen decomposed leaves. The compound has a good vegetation cover that could support avian community.

Nest observation

The nest was discovered by visual observation, with the naked eye and the date on which the nest was discovered was recorded. The tree species on which the

nest was built was identified using a name tag placed on a similar tree at the Federal University, Lokoja, Adankolo campus. With the aid of a ladder, the position of the nest on the tree, the nest type and the content of the nest were all determined by visual observation. The height above ground of the nest was measured using a surveyor's tape.

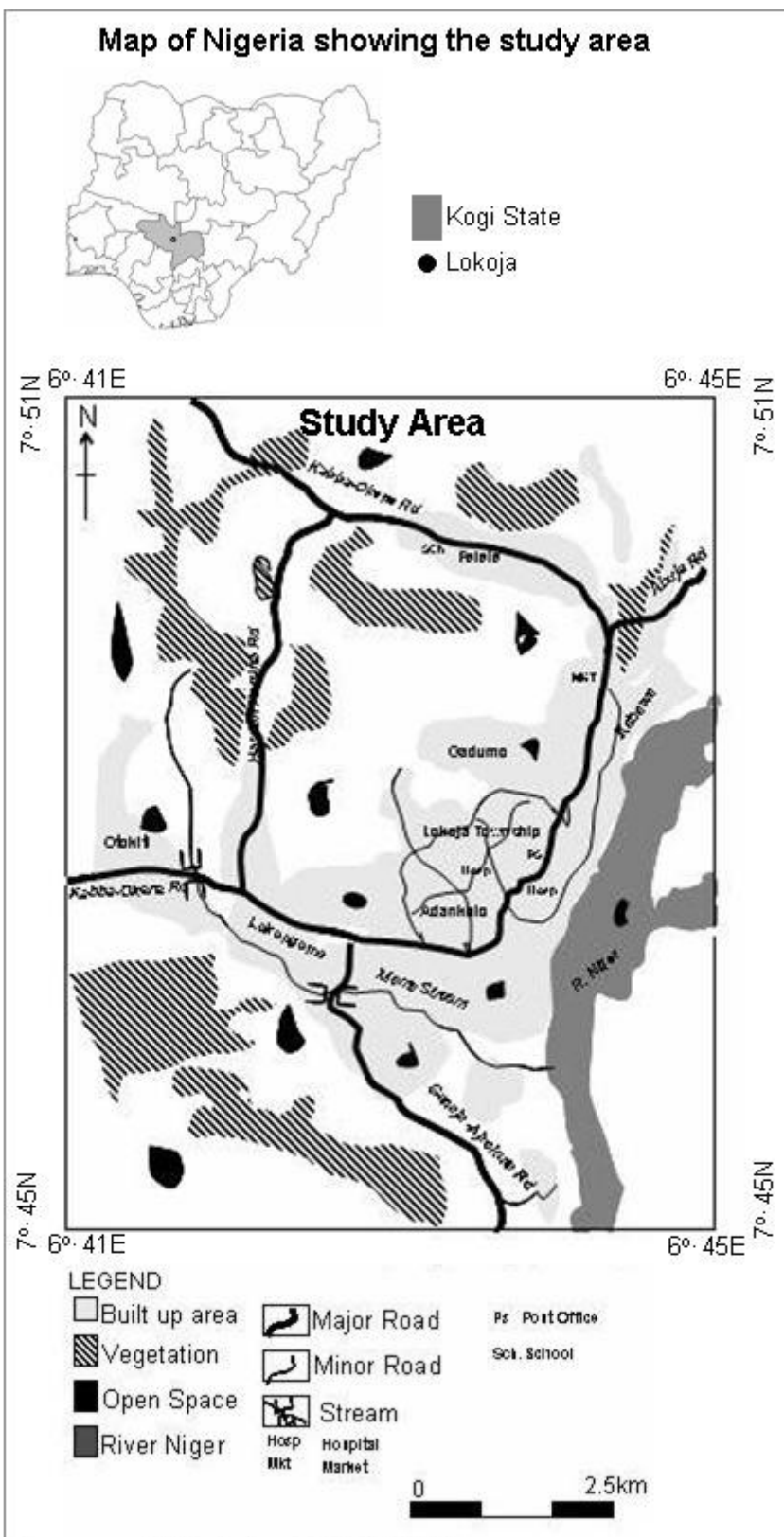
The nest owner was identified with the aid of an 8 x 30 pair of binoculars (Model number 6278) and using the Field Guide for Birds of Western Africa by [3] and Guide to Birds of Gombe State University by [12].

Eggs

The number of eggs (clutch size) was noted and the colour of the eggs was described. The dates of egg-laying and commencement of incubation, incubation period and date of hatching were recorded. The breeding success which is the number of eggs hatched divided by the number of eggs laid, multiplied by 100, was calculated.

Nestling

The description and behavior of the nestling at hatching were recorded. The developmental stages of the nestling were described sequentially. Brooding and feeding activities of the parents, nest reinforcement and sanitation and fledging date were recorded.



Source: GIS Lab, KSU 2007

Figure 1: Map Lokoja

Determination and identification of nest materials

After fledging, the nest was taken to the Biology Laboratory, Department of Biological Sciences, Federal University Lokoja. The nest was then dismantled to sort out and identify the nest materials.

A Fujifilm digital camera Fine Pix A700 was used to photograph the position of the nest on the tree, the nest type, the eggs in the nest and the nestling at four days after hatching, one week after hatching and at fledging and the nest materials.

RESULTS

Nest observation

The nest was discovered on the 12th of June, 2016 in a compound along Maryville Street at the Government Residential Area, Lokoja. The nest was located on a *Terminalia superba* (Satellite tree) in a fork within two branches, on the main trunk of the tree (Plate i). The nest was a simple, medium size, “statant-cupped” type (Plate i) and the height above ground of the nest was 5.2 m.

Eggs

The nest was discovered with one egg, probably the first egg laid. The second and third eggs were laid on the 13th and 14th of June, 2016 respectively.

The clutch size was three and the eggs were bluish in colour with dotted reddish spots (Plate ii). The incubation of the eggs started on the 15th of June, 2016, immediately after the third egg was laid and lasted for two weeks, from 15th to 27th June 2016.

The incubation period lasted 13 days during which one of the parents was always seen sitting on the eggs in the nest while the other parent stayed within the nest vicinity, guarding against any impending danger or intruder. It could

however not be monitored if both parents participated in incubating the eggs.

One of the eggs was hatched on the 28th June 2016 and the two other remaining eggs were never hatched (Plate iii). Breeding success was calculated as $1/3 \times 100 = 30.3\%$.

Nestlings

The newly hatched nestling was blind and naked (Psilopaedic altricial) and the skin was pinkish. The down feathers started shooting out on the spinal and wing pterilae on day four after hatching (Plate iii).

The nestling could be heard making a particular sound that could be described as a “food begging call”. While uttering this call, the mouth was wide opened and reddish in colour (Plate iii).

The nestling was again photographed at one week after hatching on 4th July 2016 (Plate ii). At this time, the nestling could be heard severally uttering the “food begging call”. The “food begging call” became more pronounced and clearer and less frequent. The eyes were now opened and the nestling was no longer blind as at hatching. The reddish colour of the inside of the mouth was gradually disappearing and the beak was thicker, longer, stronger and gradually becoming yellowish, which is characteristic of the species. The legs were thicker, stronger and more developed as well as the feathers.

On the 5th of July 2016, the nestling attempted to fledge and on the 8th of July 2016, it fledged.

Feeding activities

One of the parents was seen twice carrying an unidentified insect in its bill to the nest to feed the young with. Food items seen in the nest were pieces of the stem of a succulent grass species found within the nest vicinity, seeds of grasses, pieces of

worms and some insect parts. Food items from the bill of the parent were dropped/inserted directly into the wide opened mouth of the young, that is, mouth to mouth feeding. Although the feeding frequency/regime and the participation of

the male and female parents in feeding the young could not be monitored, it is likely that the nestling was fed several times a day by both parents based on the availability of food items.



Plate i: "Statant-cupped" nest type within two branches of *Terminalia superba* tree (Mag. X100)



Plate ii: Three eggs bluish in colour and dotted red (Mag. X100)



Plate iii: Two unhatched eggs and nestling at four days after hatching uttering a “food-begging”
Call (Mag. X100)



Plate iv: Nestling at one week after hatching with reinforcement of the nest (Mag. X100)

Nest Sanitation and reinforcement

The faecal sac from the nestling containing some fluid and undigested food materials and the shell of the hatched egg were swallowed and eaten up respectively by the parents. The faecal droppings (quano) of the nestling were removed from time to time by the parents to keep the nest clean or to avoid soiling the nest. After hatching, the nest was reinforced with some fresh branchlets of *Terminalia superba* (Plate iv).

Parental behaviour

On the day of photographing the newly hatched nestling, the researcher received threat/alarm calls and attacks from both parents. One of the parents attempted piercing the researcher with its beak, flying over the researcher several times. Both parents showed or manifested an aggressive behavior toward the researcher. The parents could be heard making calls different from their usual /normal calls, likely to be threat or alarm

calls. They responded to the “food-begging calls” of the young by way of these calls. The parents did not move far away from the nest vicinity and were always at closed range within the nest vicinity, especially after hatching. At night, both parents stayed closed within the nest vicinity on the roof of an uncompleted building to guard the young in the nest over- night. After hatching, the incubating parent could no longer share the nest with the nestling. The size of the nest could no longer accommodate the nestling and the incubating parent, thus, the parents only visited the nest to feed the young.

Determination and identification of nest materials

The nest was dismantled on the 12th of July, 2016, after the young had fledged on the 8th of July 2016. The nest comprised of the following materials (Table 1).

1. Branchlets of the nesting tree *T. superba*. Four branchlets were identified

comprising of two small and two big branchlets.

2. Sac fibres which were twenty-eight in number.

3. Rootlets which were thirty-seven in number.

4. Small pieces of plastics which were twelve in number.

5. Grasses which were two hundred and ten in number.

6. Unidentified materials which comprised of:

i. Loamy/sandy particles which were uncountable.

ii. Stone pebbles which were four in number.

iii. Leafy particles probably from the leaves of the nesting tree which were uncountable.

Table 1: Analysis of materials used for the construction of the nest of *Turdus pelios*

S/N	Material	Abundance
1.	Branchlets	4
2.	Sac fibres	28
3.	Rootlets	37
4.	Small pieces of plastics	12
5.	Grasses	210
6.	Unidentified	
	i. Loamy/sandy particles (mud)	Uncountable
	ii. Stone pebbles	4
	iii. Leafy particles	Uncountable

DISCUSSION

The observation of the nest in June concurs with the reports of [8] who observed three nests of the species in June 2005. The first nest observed in 2005 was reoccupied in July 2006 and May 2007. The study, thus, reveals June and July as the breeding season of the species in Lokoja, Kogi State, Nigeria. This is in support of the findings of [8] who reported the breeding season of the species in Zaria to be between May and July and [7] who reported the breeding season of the species from Lagos to Kano to be between April and September. [2] reported that breeding in this species is recorded in all months of the year but peaks in the wet season which is March to October in West Africa, April to July in Ethiopia and November to March in the rest of its range. The period of June to July, marks the

period of early rains in Lokoja and environs. It is therefore likely that rainfall plays an important role in the breeding of the species. The choice of the rainy season for breeding by the species might be due to food availability to raise the young. The food items used in feeding the young which are earth worms, insects, and seeds of grasses are readily available during the onset of the rains in Lokoja. [1] and [9] mentioned food availability as one of the factors that determine the choice of breeding season by birds.

The nest observed in this study was the "statant-cupped" type having been supported from below and possessed firmly standing upright rims as described by [13]. The same types of nests were observed by [1], [2] and [8].

The location of the nest in a fork on the main trunk of a *Terminalia superba* tree

within a garden seems to be a common feature in the African Thrush. [8] observed three nests of this species constructed in the forks of branches on *Cocos nucifera* and *Adansonia digitata* trees in a mini garden in the Department of Biological Sciences Ahmadu Bello University, Zaria, Nigeria. [2] observed the nest of this species placed on a horizontal branch, in a tree fork. [1] reported the nest of the African Thrush to be constructed in farm lands or gardens.

The height above ground of the nest which was 5.2 m appears lower when compared to the 8.4 m reported by [8] and 10 m reported by [2]. According to [14] the significance of nest height is difficult to assess as a multiplicity of environmental factors such as microclimate, storm damage, density of foliage, food availability, type of substrate and predator may affect the height at which a bird chooses to locate its nest.

The study confirmed the clutch size of the species to be 2-3 eggs as earlier reported by [1]; [3]; [8] and [2]. However, any slight differences in the clutch size might be attributed to factors such as age of the breeding parents, suitability of the nesting site, availability of food to raise the young and the physiological condition of breeding parents. The bluish colour of the eggs is supported by the report of [1]; [8] and [3].

In the present study, the nest was discovered on the 12th of June, 2016 with one egg, most probably the first egg laid. The second and third eggs were laid on the 13th and 14th June 2016 respectively. This sequential laying of eggs concurs with the findings of [8]. Incubation of the eggs commenced immediately after the laying of the last egg on 15th June 2016 and lasted for a period of 13 days. Incubation was done by one of the parents, probably the female parent as reported by [2], while the

other parent was always singing around the nest vicinity, making alarm calls anytime an intruder approached the nesting site. [8] also reported an incubation period of 13 days, with one of the parents incubating the eggs and the other guarding the nest against intruders. Of the three eggs laid, only one was hatched and the nestling survived to fledging stage. The 30.3% nest success reported in this study appears lower than that reported by [8] in 2005 and 2006 in Zaria, but higher than their report in 2007 where all three eggs could not survive to hatching. [15] and [16] reported that habitat disturbance affects the rate of habitat use and breeding success. The nest in the present study was located in a garden in a compound thus, exposed to frequent disturbances by the occupants of the compound. The frequent visits to the nest by the researcher could have also constituted a source of disturbance. Frequent disturbances could also account for the reason why two of the three eggs laid were not hatched.

The description of the newly hatched nestling given in the present study as being blind and naked (Psilopaedic altricial) and with a pinkish skin colour agrees with the description given by [8]. [8] however, did not mention the "food begging" calls uttered by the nestling to which the parents responded nor did they mention the reddish colour of the inside of the mouth of the nestling which gradually disappeared as the nestling progressed in age. The food begging calls became more pronounced, clearer and more frequent in the subsequent days because these were periods of intense feeding where the tending parents were always out on foraging trips and returning immediately to feed and care for the nestling. The beak and legs becoming thicker, stronger and more developed after one week of

hatching were indications of the nestling's advancement in age. The yellow colour of the bill which is characteristic of the species indicated full maturity of the nestling at fledging. The fledging of the nestling on the 8th July, 2016 showed that the entire breeding cycle took a total of 28 days. This confirms the earlier report of [8] of the breeding cycle of the species in Zaria.

In the present study, the food items used in feeding the nestling were insects, stems of succulent grasses, seeds of grasses and pieces of earthworms. [8] reported earthworms to form the major component of the nestling's diet, followed by unidentified food items, mole crickets and caterpillars. The present study identified food sources rich in protein and carbohydrates as food items for feeding the nestling. This agrees with [13] who reported that the choice of protein sources is in accordance with the energy requirements of the young. The removal and swallowing of the faecal sac by the parents, the consumption of the unhatched eggs and the shell of the hatched egg and the undigested part of the food offered to the nestling, formed a component of the parents diet. This reduces foraging time and energy expenditure on foraging trips by tending parents. Dropping of the food item directly into the wide opened mouth of the nestling by the parent was probably to avoid any spillage.

Though the feeding frequency, regime and the participation of both parents in the feeding of the nestling could not be established, it is likely that the nestling was fed several times a day by both parents based on the availability of food items.

On nest sanitation, the report of [8] on how the faecal sac from the nestling and the shell of the hatched eggs were swallowed

and eaten up respectively and how faecal droppings were removed from the nest from time to time by the parents, agrees with the observations made in the present study. Nest sanitation is probably to avoid soiling of the nest and to provide a conducive nest environment for the development and raising of the young. The tending parents were always seen within the nest vicinity especially after hatching. This could be indicative of their consciousness and concern for the young in the nest. Among the vertebrates, birds are next to mammals in terms of parental care. After hatching, the incubating and tending parent could no longer share the nest with nestling. It is likely that the nest was constructed only for the purpose of egg-laying, incubation, hatching and raising of the young. After fledging, the nest was abandoned and could only be re-occupied for another breeding season ([8]; [2]).

Of the nest materials identified in this study, [1] reported grasses, roots and earth, [2] reported grasses, leaves and mud while [8] reported rootlets and leaflets. Rootlets formed the major composition of the nesting materials in the present as also reported by [8]. However, [8] reported twiglets and the midribs of leaves while [2] reported plant fibres which were not identified in the present study. In the present study, branchlets, sac fibres, small pieces of plastics and stone pebbles were identified, which were not reported by these previous workers.

CONCLUSION

This study concludes that the African thrush breeds in Lokoja and that the weather conditions in Lokoja are conducive for its breeding.

The breeding period of the species in Lokoja is between June and July.

The incubation period of the species in Lokoja is 13 days while the entire breeding period is 26 days.

Rootlets form the major composition of nesting materials of the species.

RECOMMENDATIONS

The present study recommends that further studies should be carried out so that the detailed breeding biology of the species in Lokoja could be documented.

There is need for public enlightenment for the people to desist from disturbing or interfering with the breeding processes of birds, for this might affect nest success or breeding success.

For effective conservation actions, protection of the habitat of a species of interest is highly recommended.

Further studies should be conducted in other parts of the country where the onset of rains differ from what is obtainable in Lokoja and environs.

Acknowledgements

The author acknowledges the technical support of Dr. Tanko Dauda, Mr. Aina Victor for serving as research assistant and Pastor & Mrs. Aina for granting me free access into their compound during the research.

REFERENCES

1. Serle, W., Morel, G. J. and Hartwig, W. (1992). *A field guide to the Birds of West Africa*. Collins Grafton Street, London, pp. 351.
2. Clement, P., Hathway, R., Byers, C. and Wiczur, J. (2000). Thrushes. Christopher Helm. 326-329. ISBN 0713639407.
3. Borrow, N. and Demey, R. (2008). *Birds of Western Africa*. Christopher Helm, London. 511 pp.
4. Barlow, C., Wachter, T., and Disley, T. (1997). *A field guide to the birds of the Gambia and Senegal*. Pica Press. P. 297. ISBN 1-873403-32-1.
5. Anonymous (2016). African Thrush (*Turdus pelios*) Handbook of the birds of the world alive. Lynx Editions. Retrieved 2016-11-08.
6. Keith, S., Urban, E. K. and Fry, C. H. (1992). *The birds of Africa*. Vol. IV. Academic Press, London. 609pp.
7. Elgood, J. H., Heigham, J. B., Amberley, M. M., Anne, M. N., Sharland, R. E. and Skinner, N. J. (1994). *The Birds of Nigeria*. B.O.U. Check-list No. 9. B.O.U. London.
8. Tanko, D., Ezealor, A. U. and Gadzama, I. M. K. (2008). Some observations on the nests, eggs and nestlings of the African Thrush *Turdus pelios* in Zaria, Kaduna State, Nigeria. *Biological and Environmental Sciences Journal for the Tropics*, 5(3):5-8.
9. Dennis, B., Munholland, P. L. and Scott, J. M. (1991). Estimation of growth and extinction parameters for endangered species. *Ecological Monographs*, 6:115-143.
10. Leisler, B., Winkler, H. and Wink, M. (2002). Evolution of breeding systems in *Acrocephaline* Warblers. *AUK*, 119(2):379-390.
11. Ifatimehin, O. O., Ishaya, S. and Fanan, U. (2010). An analysis of temperature variations using remote sensing approach in Lokoja area, Nigeria. *Journal of Production*

- Agriculture and Technology*, 6 (2):35-44.
12. Nsor, C. A. and Adang, K. L. (2012). *Bird guide of Gombe State University, Gombe, Nigeria*. Pawo Graphics and Printing Press, Gombe, Nigeria, pp. 72.
13. Pettingill, O. S. Jr. (1985). *Ornithology in laboratory and field*. Academic Press.403 pp.
14. Welty, J. C. and Baptista, L. (1990). *The life of birds*. Sanders College Publishing.581 pp.
15. Maurer, B. A. and Whitmore, J. (1981). Foraging of five bird species in two forests with different vegetation structures. *Wilson Bulletin*, 93:478-490.
16. Jones, J. and Robertson, J. R. (2001). Territory and nest site selection of Cerulean Warblers in Eastern Ontario. *AUK*, 118(3):727-735.