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Effect of Photoperiod on the Body Weight of Silver Pheasant (*Lophura-nycthemera*)

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ABSTRACT: Pheasants belong to a family 'Phasianidae' order Galliformes. There are forty eight differed species of pheasants. Rowan (1925, 1929) discovered that reproductive activity could be induced out of season by artificial increases in day length. Photoperiod I was introduced by Garner and Altard. All most all birds have been shows to respond to artificial illumination. Generally males are most susceptible to light stimulation while female is altogether effected by other subsidiary factors. So it was decided to provide artificial light to silver pheasant. Almost all birds have been shown to respond to artificial illumination. Experiments on the effect of photoperiod was studied for a period of 12 months (From 1st July 2014 to 30th June 2015). Experiment shows great variation in the body weight of male birds whereas little variation in the body weight of female birds. Experimental male had maximum body weight in the month of March where as controlled male had maximum weight in May and June. Experimental female bird had maximum weight in April. Controlled female bird had maximum weight in April and May. The weight of experimental birds were observed to the more than controlled birds.

KEYWORDS: Photoperiod, illumination, pheasant.

I. INTRODUCTION

Pheasants belong to a family 'Phasianidae', order 'Galliformes' that includes some of the most beautiful birds in the world such as the Golden pheasant, famous in Chinese art, have delighted and benefited man for centuries but sadly many of them are today under threat as a result of his activities. There are forty-eight different species of pheasants, according to the IUCN. Red list of Threatened spp. Behaviour of silver pheasant is largely directed towards self and racial-survival. It is an internally directed system of activities, which strives to maintain the physiological stability of the body in the face of many environmental hazards, such as heat & cold, sun and rain, lack of food, competition, predators and parasites. It is also a system that, through reproductive behaviour, tends to guarantee the continuation of the species. Behaviour is influenced by many factors such as harmones, nutritions, periodic physiological cycles, age and maturation and particularly the past experiences of the individual year.



Male Silver Pheasant
(*Lophura-nycthemera*)



Female Silver Pheasant
(*Lophura-nycthemera*)

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Pheasants have a different characteristic. Sometimes it is a shy bird that only comes forward to feed when the person had passed on to the next aviary or a greedy cheer pheasant that jumps up and attempts to take the feed from the hand or the silver pheasant which stands patiently at the corner of the cage each morning waiting to be fed. Pheasants should always be try to feed at the same time and start with the same pen and feed in the same order. The precision in the timing of reproduction in birds stimulated **Rowan 1926** to make a thorough analysis of the factors that might explain their astonishing regularity. After considering many seasonal factors, he concluded that only one was precise enough each year to play a role, i.e. the increasing day length. Since birds fly to northward to breed and since their reproductive organs are reactivated before the flight begins, Rowan reasoned that perhaps increasing day length induced development of the reproductive organs and their activity in turn stimulated the northward migration. **Rowan (1925, 1929)** discovered that reproductive activity could be induced out of season by artificial increases in day length. "Photoperiodism" was introduced by "Garner and Allard" Pioneer experiments in photoperiodism by **Rowan (1929, 1938)** demonstrated that Juncos, junconyematis, and other species could be stimulated in sexual activity in sub-zero winter weather by subjecting them to artificially lengthened days. In addition to reproductive readiness, photoperiodic stimulation commonly evokes such natural concomitants as molt into breeding plumage, courtship behaviour, body fat accumulation and migratory restlessness. "Photoperiod" is the most outstanding factor controlling the reproduction. Photoperiodic control of annual breeding has been well-established in temperate zone species of birds.

Generally males are most susceptible to light stimulation as spermatogenesis can induced only by light stimulation, while female is altogether effected by other subsidiary factors. So it was decided to provide artificial light to silver pheasant to observe its effect on annual gonadal and annual body weight cycle. "Photoperiosm" was introduced by "Garner and Allard". Several researches had been done on hormonal control by photoperiod in birds and mammals by different scientist **Stevenson et al. (2003), Watanabe et al. (2007), Ubuka (2009) and Stevenson et al. (2008, 2009) and Wang (2011).**

A lighting program is one of the important management practice that influences growth and reproductive performance of diff. spp of birds. Through manipulation of artificial light, researchers have been able to affect growth in turkeys (**Auckland, 1978**). Pheasants was influenced using different lighting regimen. Even though people in the game bird industry might be utilizing artificial lighting to control reproductive performance, management practice used normally result in the birds starting production at 1 year age. Photoperiodism is the physiological reaction of organism to length of day or night. A number of biological and behavioral changes are dependent on this. **Hahn et al. (2008), Nakao (2008), Nakane (2010) and Kumar (2010)**, had done several researches on photoperiod.

II. MATERIAL AND METHODS

Two experiments were designed to find an optimum lighting regimen, which improves body weight of pheasant. Aviaries were sited in a sheltered position where they got the benefit of the sun for at least part of the day. Heavy shade was avoided. A dry drought proof hut, or shelter was also necessary. A few attractively shaped dead branches lying, will improve the appearance a pen and pheasant like to perch on them, a pair of birds needs about 100 sq. feet area.

Experiment was started from the month of July 2014 and concluded on 30 June 2015. One pair of experimental birds (male and female) was kept under constant light (24 hr) and one pair of male and female birds as controlled bird were kept under normal light (12L/12D). During the course of study birds were provided with food containing ingredients like maize, wheat, soybean, grain, groundnut cake, rice polishing, meat meal, letluce, salt, mineral and vitamins. Grit 'or' limestone was available to the birds at all time.

III. RESULTS AND DISCUSSION

The body weight of experimental and controlled male bird shows great variation. Experiment bird shows maximum weight in the month of March, April whereas controlled male bird shows maximum weight in the month of May and June, see table-A.

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The body weight of experimental and controlled bird shows little variation. Experimental female birds shows maximum weight in the month of April and May where as controlled bird shows maximum weight in the month of March and April (see table-A).

July 2014 : In the may the body weight of the male pheasants was almost same in both experimental and controlled bird. The body weight of female pheasant was less than the body weight of controlled female bird.

August 2014 : The body weight of the male birds remained exactly the same as in the previous smooth. The body weight of the female bird increased in August and in increase was more than the initial body weight.

September 2014 : In this month the body weight of the experimental and controlled male bird increased. The increase was more than the initial body weight. The body weight of the experimental female bird increased in this month whereas the body weight of the controlled female bird remained same.

October 2014 : The body weight of experimental male bird increased and the increase is more than the initial weight recorded in September. The body weight of controlled male bird decreased in this month. The body weight of experimental and controlled increased female bird.

November 2014 : In this month the body weight of the experimental male bird decreased significantly and the body weight of the female bird remained exactly the same as in the previous month. The body weight of the controlled male bird increase and the body weight of controlled female bird decreased.

December 2014 : The body weight of the experimental male and female bird was almost the same in this month, when compared with the body weight in the previous month. The body weight of the controlled male and female bird increased in this month and the increase is more than the initial body weight.

January 2015 : The body weight of the experimental male and female bird increased. The body weight of the controlled male and female bird increased.

February 2015 : The body weight of the experimental male and the female bird increased more than previous month. The body weight of the controlled male and female bird was also increased than the previous month.

March 2015 : The body weight of the experimental male bird showed maximum weight in this month. The body weight of the female bird decreased. The body weight of the controlled male bird decreased and the body weight of the female bird increased.

April 2015 : The body weight of the experimental male bird remained the same as recorded in the previous month. The body weight of the female bird increased. The body weight of the controlled male and female bird remained the same as in the previous month.

May 2015 : The body weight of the experimental male and female decreased. The body weight of the controlled male bird increased slightly in this month. The body weight of the controlled female bird decreased in this month.

June 2015 : The body weight of the experimental male bird remained the same as in the previous month but the body weight of the female bird decreased little. The body weight of the controlled male and female bird was almost the same in this month. When compared with the body weight in the previous month.

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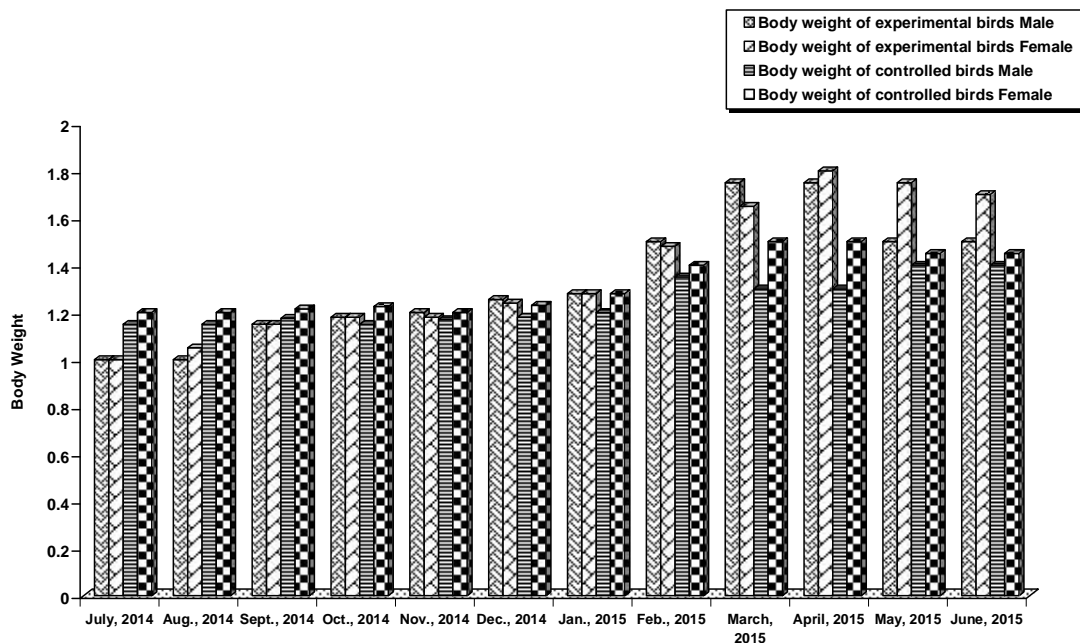
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Annual Body weight cycle of silver pheasant kept in constant photo period (24 L) and normal day light (12 L)

Table –A

Months	Body weight of experimental birds		Body weight of controlled birds	
	Male	Female	Male	Female
July, 2014	1.00 Kg.	1.00 Kg.	1.150 gm.	1.200 gm.
Aug., 2014	1.00 Kg.	1.050 gm.	1.150	1.200
Sept., 2014	1.150	1.150	1.175	1.215
Oct., 2014	1.180	1.180	1.150	1.225
Nov., 2014	1.200	1.180	1.170	1.200
Dec., 2014	1.255	1.240	1.180	1.230
Jan., 2015	1.280	1.280	1.200	1.280
Feb., 2015	1.500	1.480	1.350	1.400
March, 2015	1.750	1.650	1.300	1.500
April, 2015	1.750	1.800	1.300	1.500
May, 2015	1.500	1.750	1.400	1.450
June, 2015	1.500	1.700	1.400	1.450



Annual Body weight cycle of silver pheasant kept in constant photo period (24 L) and normal day light (12 L)

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Effect of photoperiod on body weight of pheasants were studied by different scientist. **Blake, Flegal, and Ringer (1987)** provide dark light cycle in Ring necked pheasant. **Okamoto and Nagata (1989)** observed the effect of photoperiod on growth and body weight of quail. Influence of experience and visual stimulation in Japanese quail by **Michel (1989)**, competitive behaviour in domestic chick by light exposure during incubation, **Rogers and Workman (1989)**.

We know a little about the mechanism of the neural system. We can infer that changes in the photoperiod alter its overall activity and also the ease with which this activity is modulated by the levels of steroid hormones in the blood. It is sometimes difficult to separate the two actions, though some authors would recognize a steroid dependent and steroid independent action of light on the system (**Turek., F.W. & GB. Ellis 1981**). The seasonal increase in body weight is fairly general in birds. In some species the body weight was maximum during winter, while in others no change occurs throughout. In Japanese Quail Coturnix (*Coturnix Japonica*) (**F1-Ibiary et al. 1966**) and spotted Munia *Lophura punctulata* (**Thapilyal 1969**) there is considerable difference in the body weight of two sexes. Variations in body weight of the English and Irish pheasants was noted by **Robertson, et al. (1997)**.

The body weight cycle of temperate zone birds is well studied. **Thapilyal 1968, Chandola et al. 1973 and Thapilyal 1978, 1981; 1982.**

Photoperiod has also been reported to influence the body weight cycle of photoperiodic or photosensitive birds **Kumar, 1981; Lal 1982; Tewary and Kumar, 1983; Dixit 1987; Tripathy 1987**. The weaver bird seems to be an exception long or continuous darkness has no effect on the annual body weight cycle. (**Thapilyal and Garg, 1969; Bageshwar et al.; Thapilyal and Bageshwar, 1970**). The body weight cycle of ring necked pheasant was studied by **Csanji (1987)**. Several work had been done by different workers like **Lewis (1974), Stokkan and Sharp (1984), Dixit (1987)**.

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