

Changes of Environmental factors and its impact on pineal gland and gonads of male grey quails *Coturnix corturnix*

**Dr. Pratibha Mishra, Dr. Rekha Shukla,
Dr. Rashmi Srivastava, Dr. Shikha Tripathi and
Dr. Bacchu Singh Azad
D.A-V.P.G. College, Kanpur U.P. India**

Abstract :- Male Grey quail is very small compact bird with secretive behaviour. They have black throat to identified as male or may have black throat band. This bird is known for small ground vesting game bird. In present study 80 males were taken to analysis the effect of temperature and other seasonal effects on their gonads and pineal gland. The result indicate that the summer season did not have any effect on gonad in comparison to spring season. The volume of gonads increases significantly during the autumn season study was carried out for one year.

Key words: Seasons, Summer, Gonads, Pineal gland.

Introduction:

The birds originated from a wild environment similar as any other domesticated animal and was first domesticated in Japan in 1595. 45 species of quails are found all over the world. In India only two species of quails are found these are brown- coloured Japanese quail found (*Coturnix coturnix*) which is bred for meat and used for commercial purposes and the black-breasted jungle or rain quail (*Coturnix cormandelica*) found in the jungles. In India quail keeping started in 1974 at Ijat Nagar, when Central Avian Research Institute, introduced improved germplasm of domesticated quail varieties from Japan (1) and then in 1983 at Tamil Nadu. Therefore Agricultural Universities of Andhra

Pradesh, West Bengal and Mizoram in North-east India (2) veterinary Colleges as well as husbandry department played of vital role in the promotion of rain quail breeding as a farm enterprise. Quails are closely related to harlequin quails *Coturnix delogorguei* [3-6]. Their primary habitat is on grazelands, fields with grass land shrubs. Most of them migrate into the southern regions during the winters [7].

Quail start laying eggs at the age of six (6) weeks and continue laying eggs up to 24 weeks of age [8].

Fertility and hatchability were directly proportional to the egg weight [9]. The cool and dry place is used for storage, the egg trays with the storing temperature between [10-15] degree Celsius and the relative humidity around 70-80 per cent. For the healthy chicks, the breeder should be provided with optimum minerals and vitamins in their feed [11]. Chiefly terrestrial birds, they are easily trapped and provide gainful employment [12].

It is reported that in some states of India poultry industries are developed to breed this bird, on commercial basis as agricultural species for egg and meat production [16].

Quails are cheap providers of protein. Enteropathogenic bacteria are prevalent among quails [17]. According to a report on quail production and management in Georgia [18], no medications are approved for quail and there are no disease preventive vaccines. Animals come into breeding condition at different times of year depending on the stimuli they receive and react to, both from external and internal environment.

Environmental factors that influence gonad cycle, such as temperature and photoperiod presumably do so through influence on the secretion of gonadotropin, which is affected by pineal gland.

Material & Method

Bird : Grey quails

Gender : Male

To study the effect of the climatic conditions:-

1. Temperature
2. Humidity
3. Photo period

On pineal gland, weights and gonad volume.

The male grey quails *Coturnix coturnix* locally procured and housed. we have taken forty eight male grey quails and divided in to twelve groups of four quails each to study the effect of the environmental factors. Each month to record the pineal weight and the gonad volume. In each month physical parameters data were also recorded.

Table 1: Showing variation in winter on pineal weight and gonad volume in basis of environmental factors.

Month	Body weight	Humidity %	Temp. C ⁰	Photo period (in hrs)	Pineal weight (Mg per 100) gm B.W.	Testis volume mm ²
Sept.	90.5 ±0.3	75.2	28.4	12.51	0.7	222.0±3.2
Oct.	86.5±5.2	65.0	27.2	11.25	1.9	79.9±2.9
Nov.	89.9±1.2	62.2	18.6	11.51	2.4	31.9±1.0
Dec.	99.1±2.7	70.5	15.2	10.58	2.6	18.5±2.3
Jan.	94.5±5.0	67.9	18.5	10.6	2.7	57.6±3.0
Feb.	99.1±2.7	71.3	14.2	10.3	2.5	18.5±2.3

Values expressed as mean ± SE

No. of Birds -4

Table 2: Showing variation in summer on pineal weight and gonad(testis) volume in basis of environmental factors.

Month	Body weight	Humidity %	Temp. C ⁰	Photo period (in hrs)	Pineal weight (Mg per 100) gm B.W.	Testis volume mm ²
March	88.8±3.4	30.1	28.6	12.23	1.1	160.9±2.9
April	84.3±12.5	47.5	24.5	11.44	2.0	96.9±2.5
May	87.3±3.4	36.5	36.1	12.99	1.3	147.6±3.5
June	92.1±6.2	37.3	32.1	13.21	0.5	210.0±3.1
July	90.3±2.3	67.5	32.0	12.99	1.8	131.9±2.5
August	91.3±1.4	62.5	30.5	11.35	1.2	187.8±3.9

Values expressed as mean ± SE

No. of Birds -4

Observations and Discussion:-

Data were recorded according to winter and summer condition. In month of September to February the mean weight of the pineal gland and the mean of the gonad volume were recorded (Table-1). In month of March to August data were recorded the mean weight of the pineal gland and the mean of the gonad volume in (Table-2).

Table 1 and Table 2 clearly shown that the rise in temperature and longer day length during the summer and the rising autumn showed low pineal weight (P<0.001) as compared to that in.

The humidity did not affect the pineal weight during the winter and summer (Table 1 and Table 2) further, gonad volume showed significant

increase during the summer. The spring on the rising autumn (Table-2). Physiological factor temperature, photoperiod and humidity are affected reproduction by way of the pineal gland. Testicular weight peaked in March, April, May and June (Table 2) when the longest days and the highest temperatures prevailed and humidity was moderately low.

Seasonal and acute changes in adrenocortical responsiveness in an arctic breeding bird. [19]

In this study the grey quail showed that longer day length and high temperature are gonado-stimulatory which inhibits the pineal gland weight, effect of photo period alterations an adrenocortical, pineal and gonadal activity in nocturnal bird, *Athena brama* and diurnal bird *perdicula asiatica* [20]

Rate of testicular maturation, in relation to gonadotrophin and testosterone levels, in quail exposed to various artificial photoperiods and to natural day lengths. [21]

In the Indian weaver bird common myna and the rain quail, long days are gonado-stimulatory and short days in gonda-inhibitory [22-23]

References

1. Premavalli K, A Ashok, A V Omprakash, and M Babu. Broiler Japanese quail rearing- a boon for both urban and rural poultry farmers.2015; J VeterinarSci Technol.
2. Buragohain R. Prospects of quail farming in Northeast India. North-East Veterinarian. 2008;8(1):4-6.
3. Alderton D. The Atlas of quails. Neptune City, NJ: T.F.H. Publications.1992.
4. Finn F. The game birds of India and Asia. Thacker, Spink & Company; 1911.

5. Hopkinson E. Records of birds bred in captivity. HF & G. Witherby; 1926.
6. Johnsgard PA, Jones H. The quails, partridges, and francolins of the world. Oxford: Oxford University Press; 1988 Jul.
7. Bertin A, Houdelier C, Richard-Yris MA, Guyomarc'h C, Lumineau S. Stable individual profiles of daily timing of migratory restlessness in European quail. *Chronobiology international*. 2007 Jan 1;24(2):253-67.
8. Priti M, Satish S. Quail farming: An introduction. *Int. J. Life Sci*. 2014;2(2):190-3.
9. Narahari D, Abdul Mujeer K, Thangavel A, Ramamurthy N, Viswanathan S, Mohan B, Muruganandan B, Sundararasu V. Traits influencing the hatching performance of Japanese quail eggs. *British Poultry Science*. 1988 Mar 1;29(1):101-12.
10. Wechsler B, Schmid I. Aggressive pecking by males in breeding groups of Japanese quail (*Coturnix japonica*). *British poultry science*. 1998 Jul 1;39(3):333-9.
11. Khan SH, Atif M, Mukhtar N, Rehman A, Fareed G. Effects of supplementation of multi-enzyme and multi-species probiotic on production performance, egg quality, cholesterol level and immune system in laying hens. *Journal of Applied Animal Research*. 2011 Dec 1;39(4):386-98.
12. Long JL. Introduced birds of the world: The worldwide history, distribution and influence of birds introduced to new environments.
13. Nasar A, Rahman A, Hoque N, Talukder AK, Das ZC. A survey of Japanese quail (*Coturnix coturnix japonica*) farming in selected areas of Bangladesh. *Veterinary world*. 2016 Sep;9(9):940.
14. Bednarczyk M, Paolone A, Ricciuto G, Baumgartner J, Benkova J, Elminowska-Wenda G, Končekova Z, Rutkowski A, Maiorano G. Nutritional and sensorial meat quality of different selected Japanese

- quails (*Coturnix coturnix japonica*). Italian Journal of Animal Science. 2007 Jan 1;6(sup1):725-.
15. Troutman. What are the Benefits of Quails Eggs? Retrieved 18th January 2014. from http://www.ehow.com/list_6671158_benefits-quail-eggs_.html
 16. Vali N. The Japanese quail: A review. Int. J. Poult. Sci. 2008;7(9):925-31.
 17. Dipineto L, Russo TP, Gargiulo A, Borrelli L, De Luca Bossa LM, Santaniello A, Buonocore P, Menna LF, Fioretti A. Prevalence of enteropathogenic bacteria in common quail (*Coturnix coturnix*). Avian pathology. 2014 Nov 2;43(6):498-500.
 18. Dozier WA, Bramwell K, Hatkin J, Dunkley C. Bobwhite quail production and management guide.
 19. Astheimer and Othara, Seasonal and acute changes in adrenocortical responsiveness in an arctic breeding bird 1995 Horm. Bohar.29:442-457.
 20. Sudha Kumari, Cr. and Halder C. Effect of photoperiod alterations on adrenocortical, pineal and gonadal activity in nocturnal bird, *Athena brama* and diurnal bird *Perdicida asiatica* 2001 zoop.Sci 18:71-79.
 21. Follett, B.K. and Maung, S.L. Rate of testicular Maturation in quail exposed to various artificial photoperiods and to natural day lengths 1978, J Endoenonal 78:267-280.
 22. Saxena, V.L. and Saxena, A.K. 1977 Pavo.15;14-17.
 23. Saxena V.L. and Sexena, A.K. 1984 Annale's D. Endocrinologic Vol. 45.