ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(7): 1322-1325
www.allresearchjournal.com
Received: 26-05-2017
Accepted: 29-06-2017

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Effect on the morphological - histological changes of female gonads contemplated to analyse the effect of over changing biotic community in a selected swamp of Madhubani, Bihar

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Abstract
Most of the Indian birds are seasonal breeder. Oogonial proliferation occurs during embryogenesis. All the oogonia in the avian ovary enter the prophase of meiosis ovary enter pre-mordial follicles (oocyte) which constitute the stock of future grwoing follicle. Pre-moradial follicles are known to have a dual fate as some of them enter the normal growth process while other degenerate at various stages of their growth and differentiation.

Keywords: Morphological - histological, changes female gonads, Bihar

Introductions
The avian oogenesis has been subject of a good number of studies. Most of the birds of temperate region (Bihar) are seasonal in mating. Swamps are of great seasonal, ecological and biological significance in respect of adaptive seasonal in mating in particular habitat for their flora and fauna of north Bihar. Availability of abundant zooplanktons, insects, macro-invrtebrate are common biotic fauna present in changing pattern of swamp.
Unusual variations in the climates and production of food grains of Bihar have an effect on the gonadal cycles of avian fauna due to the changing pattern of swamp.
Study of the regulatory mechanism of gonadal cycle in temperate zone birds varies due the widely accepted geographical location in Bihar.
The size and weight of the gonads varies with the phases of breeding cycles and also regulated by swamp environmental factors.

Material and methods
For morphological, histological studies of the ovary and oviduct were weighed separately, cut into pieces and were fixed in aqueous Bowin's fluid, 10% Formaline, Carnoy's fixative fortnightly.
Parafin sections were cut and stained in heameotoxilin. Eosin and Mallory's triple, for routine histological observations, were as for histological observations as described in pear's (1983) were adapted.
Follicular diameter of different size's of follicles were measured with the occular-micrometer from histological slide of the ovary. Similarly percent frequency of ova diameter from March "11" to Feb. "12" were measured, calculated and recorded.
Accordingly monthly changes in the rate of oocyte, developing ova and average number of pre-ovulatory, post-ovulatory and oocyte per ovary were also calculated and recorded.
The average monthly record of per day rainfall and temperature of the year were compared statistically and a positive correlation obtained between environmental factors vs gonad. (Table-1).
Diurnal seasonal changes in physico-chemical condition of swamp and ovary weight, Ova diameter developing follicle resulted in four distinct phases are followed:-

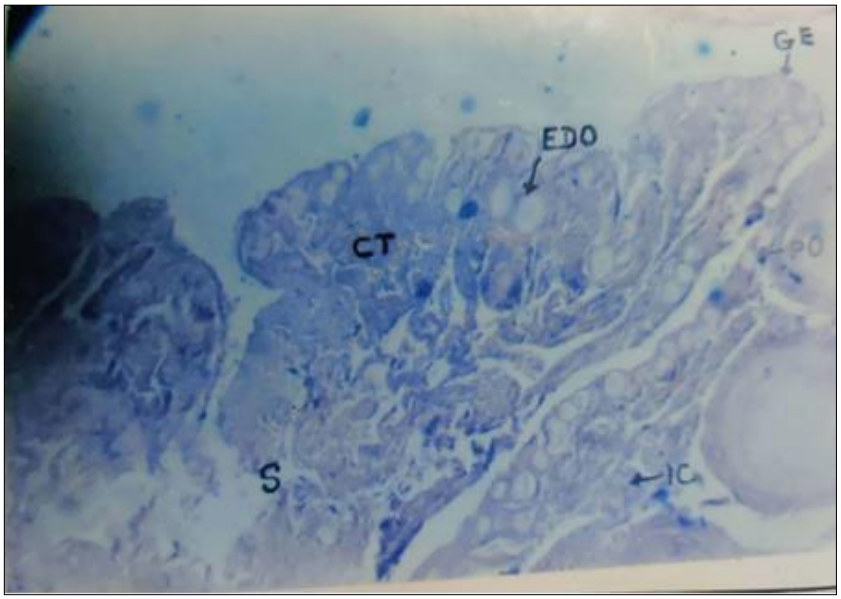
A) Acceleration phases (March - April)
B) (+) Logarithmic phase (May – July)
C) (-) Lag phase (August -October)
D) Dormant phase (November -Febrsuary) (Table 2) (Photo – 1, 2, 3, 4)

Table 1: Relationship sof variates with correlation & co-efficient equation

Parameters	$\Sigma dx.dy$ / $N.dx.dCy$	Correlation (ɤ)
Rainfall (x) VS Ova. Wt. (y)	154015.3367 / 326796.84	0.471287809 = 0.47
Ova. dia. (y)	13634.56 / 17673.2496	0.771480079 = 0.77
Oviduct (y)	694231.18 / 2112805.44	0.3285 =0.33
Temperature (x) Vs Ova. Wt. (y)	154015.3667 / 326796.84	0.471287809 = 0.47
Ova. dia. (y)	322415.7525 / 417962.196	0.771399316 = 0.77
Oviduct (y)	637436.375 / 89374.752	0.713214566 = 0.72
Water depth (x) Vs. Ova Wt. (y)	-16610.71 / 101731.896	-0.163214566 = - 0.16
Ova dia (y)	-12976.25 / 130111.6824	-0.099731628 = -0.10
Oviduct (y)	-129001.15 / 65783.088	-0.196055419 = -0.20
Ova. Wt. (x) Vs Ova. dia. (y)	717377.04 / 746881.008	0.960497097 = 0.96
Oviduct (y)	3592149.97 / 3777024.96	0.951052749 =0.95
Ova. dia (x) Vs. Oviduct +(y)	4672203.78 / 4830688.224	0.96719216 =0.97

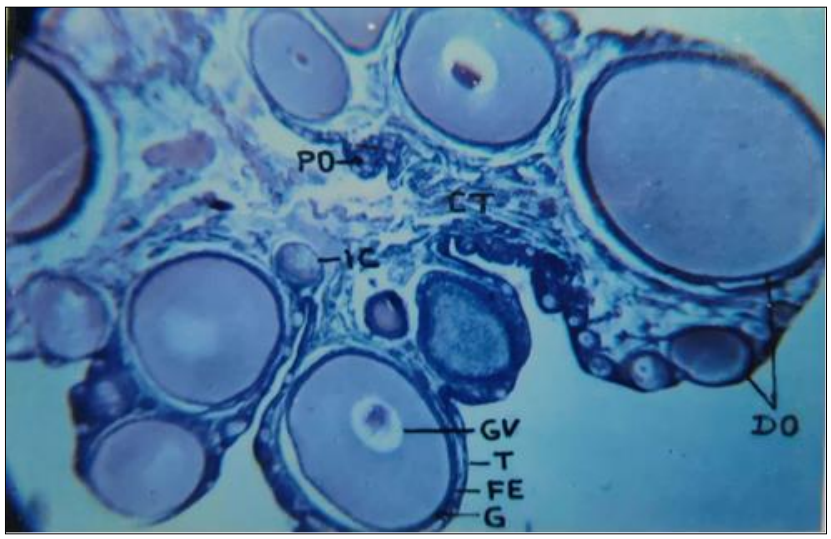
Table 2: Seasonal variations in swamp physical parameter relationship with anatomical changes in gonads.

Months	Diurnal temperature (0°)	Rainfall (mm)	Water depth (cm)	Water temperature (0°)	Ovary weight (mg)	Ovary diameter (µm)	Oviduct (mg)
Jan.	18	Dormant Phase	70	15	160	170	85
Feb.	20	18	70	20	Dormant	195	150
March	25	19.3	75	22	190	680	2505
April	27.2	35.25	90	23	400	693	2800
May	37.8	42	70	25.5	Acceleration	702	3000
June	43	45	80	34	510	725	3010
July	40	430.3	170	29	624	994	3500
August	35	225.25	150	27	Logrithmic	350	200
Sept.	28	150	152	20	690	244	90
Oct.	26	27.05	155	21	Phase	300	75
Nov.	23		140	18	750	190	50
Dec.	20	Dormant Phase	135	17	730 Lag 300 Phase 205 225 Dormant 110 Phase 100	100	60



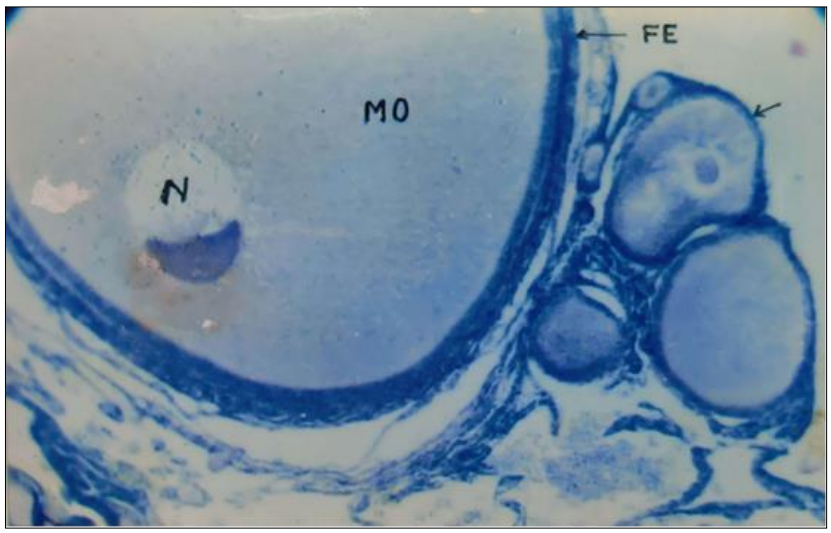
EDO:- Early Developing Oocytes, CT :- Connective Tissue, I.C.:- Interstitial Cells
GE:- Germinal Epithelium, S:- Stroma

Fig 1: T. S. of Ovary of Chirugus during October (Lag Phase) Showing Germinal epithelium (GE) and Early developing oocytes (EDO).



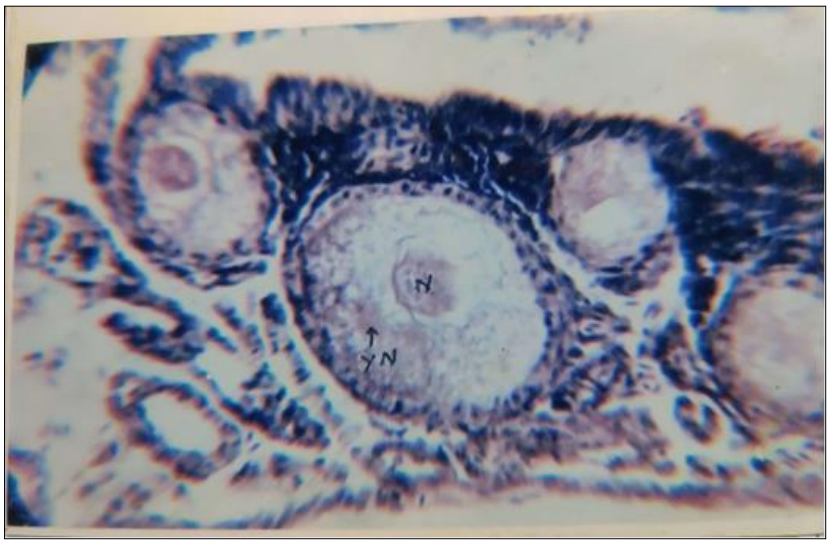
DO:- Developing ova, PO:- Primary oocytes, GV:- Germinal Vasicle, T:- Theca cells, Follicle epitbelium, G:- Granulosa

Fig 2: T.S. Of ovary during February (Dormat Phase) showing Developing ova (D.O)



MO:- Mature oocytes, FE:- Follicle epithelium, N:- Nucleus

Fig 3: T.S. Of ovary of chirugus during April (Acceleration phase) showing mature ova



MO:– Mature Oocytes, YN:- Yolk nucleus, N:- Nucleus

Fig 4: T.S. Of chirugus ovary during Logarithmic phase showing follicle cells & maturing stage with yolk nucleus.

Conclusion

Seasonal limnological factors of selected swamp play a significant role in the gonadal development of selected bird. It is clear that adaptation usually occurs due to the variation in the unusual environment leading to have a better basis for adaptation and consequently survival.

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