



Morphological study of laying and non-laying female genital system in peacock (*Pavo cristatus*)

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Abstract

Although the avian female genital system has been studied in several birds, it's yet not been done regarding peacocks. Thus, this study approved recognizing its morphological architecture of it during laying and non-Laying periods with blood supply. The left ovary during active season showed three types of follicles: small, medium, and large; the same in non-laying with less measurement. The left oviduct was more convoluted in laying than in non-laying; its length is double that of non-laying. Both included six regions. The infundibulum had two parts; funnel and neck. The funnel internally showed a translucent rough surface, with not very well noTable folds changed into obviously distinguished folds towards the neck. Neck: very low longitudinal mucosal folds started to increase in depth towards the magnum, which was the longest and the most highly coiled part, compared to other regions with huge mucosal folds of wavy borders separated by indentations. Isthmus appeared shorter, thinner, and less coiled, with longitudinally mucosal folds straighter and lower than magnum; however, they were more prominent in laying than in non-laying. The uterus was the thickest and the widest region, its mucosal folds arranged longitudinally, intersected by 4-5 transverse furrows, in non-laying it was less thickness and size with the same arrangement. The (UVJ) in both laying and non-laying peahens is a very short region connecting the uterus into the vagina and protruding above lumens, characterized by numerous short mucosal folds. The vaginal mucosal folds were continuation to those of the junction region and appeared whitish and longitudinally oriented.

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Introduction

Domestic and wild birds share similar anatomical and histological features of the reproductive system. However, their reproductive organs are adapted to their reproduction pattern, a strange characteristic important to these animals' survival and reproduction, especially for wild birds (1). The avian female Sexual maturity is reached when the hen lays the first egg in her life. Generally, depending on the fowl genotype, it's 2-3 years in peahen. The peafowl mating season begins in the spring (from March - October). Peahens make their nests in scrub vegetation after mating, where they lay the eggs followed by a 28-30 days incubation period

without the participation of the male (2). In most avian species, including chickens, only the left ovary and oviduct are functional. Although the right one is present embryologically, it regresses during development and is vestigial in the adult bird (3). In mature birds, the left oviduct was subdivided anatomically, histologically, and functionally into five major pieces: The infundibulum, magnum, isthmus, uterus or shell gland, and vagina (4). Peafowl is a common name for three species of resplendent birds of the pheasant family. The male is a peacock, and the female is a peahen. The most-recognizable species of peafowl are the blue or Indian peacock (*Pavo cristatus*) of India and Sri Lanka and the green or Javanese peacock from

Myanmar (Burma) to Java. The Congo peacock (*Afropavo congensis*) lives in the forested interior of the Democratic Republic of Congo (5). The Indian peafowl is the largest among all the pheasants and is known as the national bird of India (6). This study aims to recognize the morphological architecture of the female genital system in peahen during the Laying and Non-Laying periods due to the lack of information about this system in this bird.

Materials and methods

Animals

The current study was achieved on sixteen healthy Peahens (4 years ago, 3.8-4 kg. Weight for Laying) and (2.5-3 years ago, 3100-3400 gr. for non-laying) divided as the following: (anatomical study included five birds for laying + 5 birds for the non-laying period) + 3 Birds for blood supply (laying and non-laying) + 3 Birds for cast making (laying and non-laying). All birds were euthanized by the using of ketamine (10mg/kg) and xylazine (1mg/kg) intramuscular injection (7,8); the celomic cavity was then dissected to expose the viscera which were subsequently removed to view and study the female genital system during Laying and Non-laying periods. The ovary and the related genital tract parts have been examined grossly and photographed by a digital camera to explain the general morphology and morphometric measurements, such as color, weight, length, and diameter, as well as topographical relationships. The study of the blood supply of each part of the female genital system using latex mixed with carmine stain injected by syringes attached to a catheter (gauge 20) inserted into a pinhole opened in the left ventricle of the heart.

Cast making of the genital tract

To demonstrate the shape of each part and view their fluctuation, folds, and torsions inside the celomic cavity using resin. The cast was prepared by mixing resin (powder with liquid at a rate of 1:4). Resin material consisted of 20% monomethyl- methacrylate powder and 80% polymethyl- methacrylate liquid and may add the suitable dyes.

Ethical approve

The research ethical approval was obtained from the (Research Ethics Committee) at University of Baghdad, College of Veterinary Medicine, number (837 / PG).

Results

Ovary

The results of the current study revealed that the reproductive system of the laying and non-laying female peacock (peahen) showed the presence of only functional left ovary and oviduct (Figures 1 and 2). The left ovary in laying and non-laying peahens showed enlarged variable-shaped organs with an irregular surface giving the appearance of a

bunch of grapes due to numerous sizes, yellowish, rounded objects called follicles which project from the surface of the ovary (Figures 1-4). The left ovary was bounded cranially by the caudal base of the lung and heart and attached to the medial surface of the anterior lobe of the kidney, obscuring the adrenal glands (Figures 1-3). The ovary of the laying peahens during the sexually active season contained three types of surface follicles: small 2-5 mm, medium 5-10 mm, both white and large-sized follicles or mature follicles which were yellow yolk-filled follicles; their measures were varied from 10-40 mm in diameter, the number of large follicles varied between 3-5 in number were suspended and attached to the ovary by their stalks or pedicles and were ready for ovulation (Figure 5). While the ovary of the non-laying peahen was also composed of small, medium, and large follicles, they were smaller. They had fewer measurements than the laying birds ranging between 2-7 mm in diameter (Figures 3-5). The left ovary measurements in laying peahen were 6.3760 ± 0.3640 cm length, 2.72 ± 0.05 cm width, and 52.38 ± 3.74 g weight, while in non-laying peahen, the measurements were 4.4404 ± 0.11135 cm length, 1.4496 ± 0.01863 cm width and 9.5358 ± 0.01611 g weight (Table 1).

Oviduct

The gross findings showed that the left oviduct in the peahen was highly convoluted in the laying peahen rather than the non-laying one, extended from the ovary to the cloaca, and filled most of the dorsal and caudal part of the left side of the celomic cavity, it related to the left kidney, spleen, lung, and intestine and suspended from the left side of the roof of the celome by thin peritoneal folds that were divided by the oviduct itself into dorsal and ventral ligaments of the oviduct (Figure 3-6). The present study revealed that the left oviduct in laying and non-laying peahen included six regions: infundibulum, magnum, isthmus, uterus, uterovaginal junction, and vagina. Each region anatomically and functionally differed from the others (Figures 7-9). In the non-laying period, although it has the same regions and it is possible to identify the regions of the oviduct, it seemed not well distinguished, thin straight-like tube compared with the laying period (Figures 7-9). The mean length and weight of the left oviduct in laying peahen were 53.52 ± 1.268 cm, 48.01 ± 4.36 gr respectively. They were statistically higher in comparison to non-laying birds 25.518000 ± 0.7753799 cm and 23.716 ± 0.0724083 gr, respectively (Table 2).

Infundibulum

The first part of the oviduct involved two parts. Funnel part: showed a translucent surface, with not very well noTable folds, which changed into obviously distinguished folds towards the neck part (Figure 10). Neck part: The internal mucosal surface of the neck region in both laying and non-laying peahen had a thicker wall than the funnel part with a narrow lumen, whitish in non-laying to pinkish color in laying peahen, and contained very low mucosal folds that

were longitudinally directed with the axis of the oviduct parts which started to increase in depth towards the magnum (Figure 10). In laying peahen, the length, diameter, and weight of the funnel were 5.8420 ± 0.30857 cm, 2.940 ± 0.16947 cm, and 0.5060 ± 0.01631 gr respectively, while in non-laying peahen, the measurements were 1.84 ± 0.10770 cm; 1.88 ± 0.13565 cm; 0.208 ± 0.00331 gr respectively. While the length, diameter, and weight of the neck region in laying peahen were 2.9840 ± 0.33425 cm, 0.6580 ± 0.05652 cm, 0.8460 ± 0.02581 gr respectively, and in non-laying peahen, the measurements were 1.46 ± 0.09274 cm; 0.35 ± 0.02302 cm; 0.43 ± 0.00524 gr respectively (Table 3).

Magnum

The longest and the highly coiled part compared to other regions of peahen's oviduct. The wall of the magnum was relatively thick so that it could be distinguished from the neck and isthmus; in non-laying peahen, it was slightly taller and larger than the isthmus and infundibulum, and the mucosal surface appeared whitish with small folds. While laying peahen, the magnum was pinkish red and contained huge mucosal folds, and the free borders of these folds were wavy (Figure 10). The inner surface of the magnum in laying peahen showed about 13-16 well-developed primary oblique longitudinally oriented folds that possess wavy free borders separated by 10-13 indentations or smaller folds in between them (Figure 10). In laying peahen, the magnum's length, diameter, and weight were 24.3580 ± 0.53208 cm, 1.5020 ± 0.05580 cm, and 22.1200 ± 0.08301 g respectively. While in non-laying peahen, they were 10.45 ± 0.13038 cm, 1.08 ± 0.03280 cm, and 11.81 ± 0.0135 g respectively (Table 3).

Isthmus

The third part of the oviduct is the isthmus which appeared shorter, thinner, and less coiled than the magnum. Its mucosal folds in laying peahen were pinkish-white in color, thinner, straighter, lower, and less prominent than that of the magnum, longitudinally oriented, and alternative (Figure 11). The junction between the magnum and isthmus was demarcated externally by constricted diameter while internally characterized by a thin, bright, and narrow constricted translucent zone (Figure 12); in non-laying peahen, the isthmus was thin, straight, and approximately the same width as the last part of the magnum and it isn't easy to recognize between them externally. While internally, it appears whitish with longitudinal mucosal folds, which were less protruding than in laying, and the translucent zone is unclear. In laying birds, the length, diameter, and weight of the isthmus were 8.0200 ± 0.09476 cm, 0.6460 ± 0.22912 cm, and 4.1480 ± 0.01934 g respectively. While in non-laying birds, the length, diameter, and weight of the isthmus were 4.59 ± 0.10677 cm, 0.27 ± 0.00694 cm, and 2.41 ± 0.009 g respectively (Table 3).

Uterus

The fourth region of the oviduct was large in both laying and non-laying peahens, forming the thickest and widest of the other parts. Its shape was sac-like and occupied the caudal quarter of the left body cavity. It was a thick, muscular and distended organ with a darkly pigmented wall, terminated in a posterior expanded pouch-like part where the egg remains for approximately 18-20 hours and an anterior very short tubular part. In the laying birds, its internal surface showed mucosal folds arranged longitudinally and intersected by 4-5 transverse furrows that formed leaf-like lamellae (Figure 11), While in non-laying peahen, the uterus was less thickness and size than the laying bird with the same arrangement and orientation of the mucosal folds and paler in color (Figure 12). In the laying peahen, the length, diameter, and weight of the uterus were 6.278 ± 0.282 cm, 4.3000 ± 0.17762 cm, and 13.242 ± 0.127 g respectively. While in non-laying peahen were 3.81 ± 0.17776 cm, 2.256 ± 0.01720 cm, and 5.09 ± 0.015 g respectively (Table 3).

Utero-vaginal Junction region (UVJ)

The uterovaginal junction in both laying and non-laying peahens was a very short region that connected the uterus to the vagina and is characterized by its numerous short mucosal folds. This area was slightly protruding above the two lumens of the uterus and vagina; it appeared paler in color than the uterus (Figures 11 and 12). In laying peahen, the length, diameter, and weight of the uterovaginal junction were 1.9280 ± 0.0666 cm, 2.1520 ± 0.11469 cm, and 1.8200 ± 0.02627 g respectively. During non-laying peahen, they were 1.262 ± 0.07479 cm, 1.628 ± 0.01409 cm, and 1.1 ± 0.009 g respectively (Table 3).

Vagina

The present study revealed that the vagina in laying and non-laying peahens was the terminal part of the oviduct that interconnected cranially with the uterus at the uterovaginal junction and opened caudally in the cloaca. It appeared as a short and straight tube with a thickened muscular wall and was pinkish-white in color, and the muscular sphincter was found in the vagina (Figures 11 and 12). The vaginal mucosal folds were continuation to those of the junction region and appeared longitudinally oriented (Figures 11 and 12). In laying peahen, the length, diameter, and weight of the vagina were 4.3780 ± 0.29633 cm, 2.2200 ± 0.12037 cm, and 4.9420 ± 0.03121 g, respectively. While in non-laying peahen, the length, diameter, and weight of the vagina were 2.116 ± 0.09274 cm, 1.762 ± 0.01772 cm, and 2.668 ± 0.0208 g, respectively (Table 3).

Blood supply

The present study revealed that several branches of descending aorta supply the female genital system in laying and non-laying peahens, as follows: The left ovary: which is supplied by the ovarian artery that originated as the first

branch of the left cranial renal artery as well as an ovarian branch that originated from the left cranial renal artery (Figure 13). The oviduct: has supplied by the following arteries: Cranial oviductal artery: It branches of the left cranial renal artery and supplies the infundibulum as well as the anterior and middle thirds of the magnum region by its branches (Dorsal & Ventral marginal oviduct arteries), in addition to giving branches that anastomosis with those of accessory cranial oviductal artery. Accessory cranial oviductal artery rose from the left external iliac artery. It supplied the posterior third of the magnum and the isthmus. Middle oviduct artery: It arises from the left ischiatic artery and supplies the magnum and uterus throughout the uterine artery and the vagina by the vaginal artery. 4-Caudal oviductal artery: they arose from the left internal iliac artery and supplied the uterus and the vagina.

Cast making

To demonstrate the shape of each part during laying and non-laying periods and view their fluctuation inside the coelomic cavity as well as folds and torsions (Figure 14).

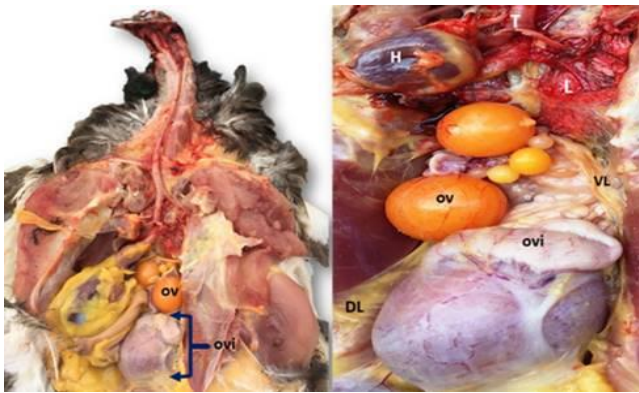


Figure 1: The reproductive system in the laying peahen showed the presence of only a functional left ovary (ov) and oviduct (ovi); Lung (L), Heart (H), Ventral oviductal ligament (VL), Dorsal oviductal ligament (DL).

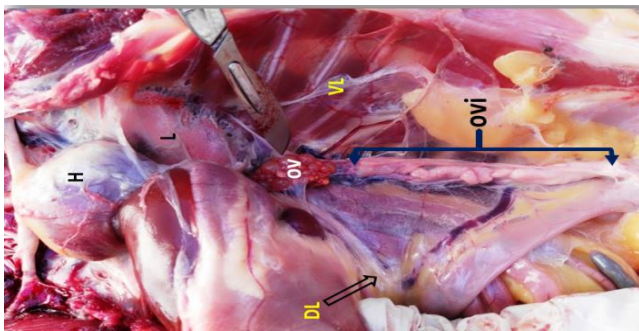


Figure 2: The reproductive system in the non-laying peahen showed left ovary (ov), oviduct (ovi), Ventral oviductal ligament (VL), Dorsal oviductal ligament (DL).



Figure 3: A: ovary of the laying peahens during sexually active season B: ovary of non-laying, both contained three types of follicles: small (S), medium (M), and large-sized (L).



Figure 4: Macrograph (A) in laying and (B) in non-laying peahens showed the oviduct and oviductal ligaments: Ventral oviductal ligament (VL), Dorsal oviductal ligament (DL).

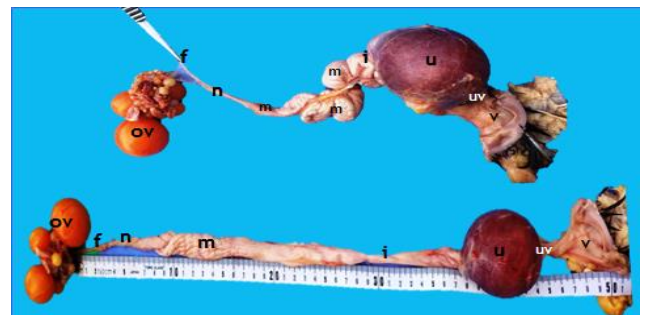


Figure 5: left oviduct of laying peahen included six regions: infundibulum: f- funnel part, n- neck part, m- magnum, i- isthmus, u- uterus, UV- uterovaginal junction, v- vagina.

Table 1: Shows the mean length, width, and weight of the ovary in laying and non-laying peahen

Parameters	Ovary in laying peahen	Ovary in non-laying peahen
Length/cm	6.27600 ± 0.36400	4.4404 ± 0.11135
Width /cm	2.9060 ± 0.13941	1.4496 ± 0.01863
Weight /gr	52.3840 ± 3.74303	9.5358 ± 0.01611**

** represent significant difference at level (P≤0.01).

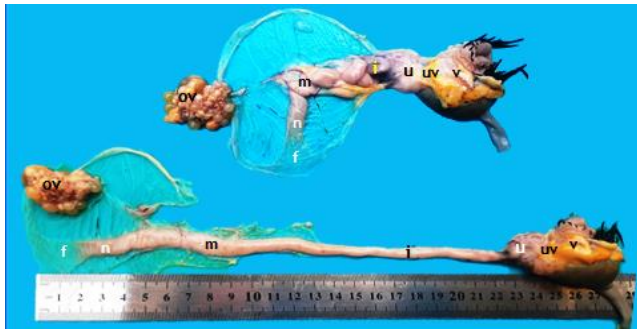


Figure 6: left oviduct of non-laying peahen also included six regions infundibulum: f- funnel part, n- neck part, m- magnum, i- isthmus, u- uterus, UV- uterovaginal junction , v- vagina.

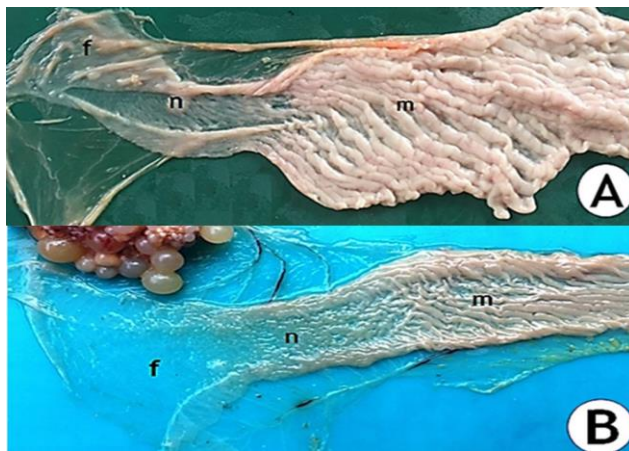


Figure 7: Infundibulum A- in laying B- in non-laying peahens showed: (F) Funnel part (N) Neck part, magnum (M).

Table 2: Shows the mean of total length and weight of oviduct in laying and non-laying peahen

Parameters	Oviduct in laying peahen.	Oviduct in non-laying peahen.
Length/cm	53.5240 ± 1.26899	25.518000 ± 0.7753799**
Weight /gr	48.0140 ± 4.3656	23.716 ± 0.0724083**

** represent significant difference at level (P≤0.01).

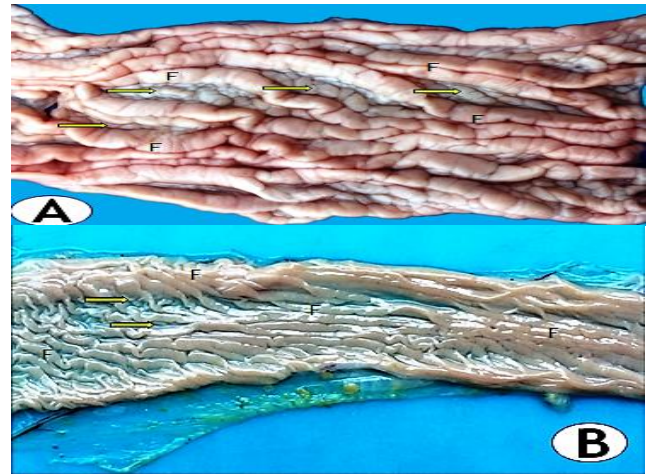


Figure 8: Magnum: A- in laying peahen: containing well-developed primary mucosal folds (F), indentations (yellow arrows). B- in non-laying peahen appeared whitish small folds.

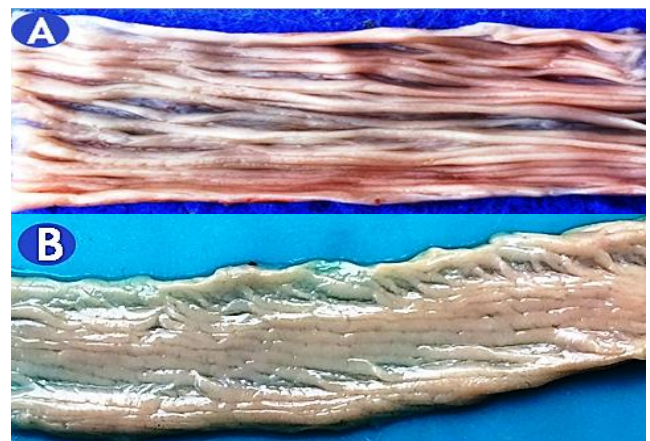


Figure 9: Isthmus: A- in laying peahen: The mucosal folds were less prominent. B- in Non-laying peahen: thin, straight, and whitish.

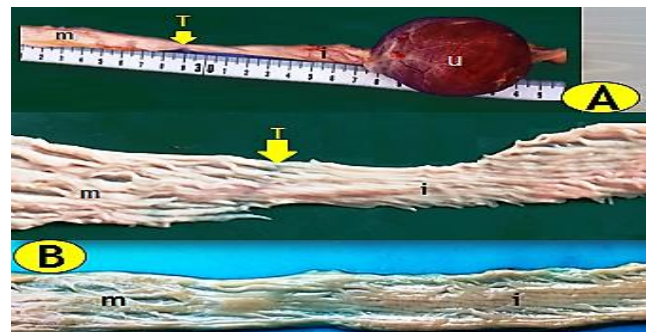


Figure 10: A- Translucent zone in laying peahen externally was constricted in diameter. B- in non-laying peahen wasn't clear well.

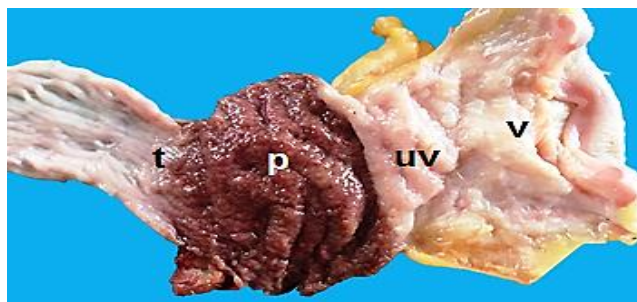


Figure 11: Uterus in Laying peahen contain pouch-like part (p) and tubular part (t), Utero-vaginal junction (uv), Vagina (v).

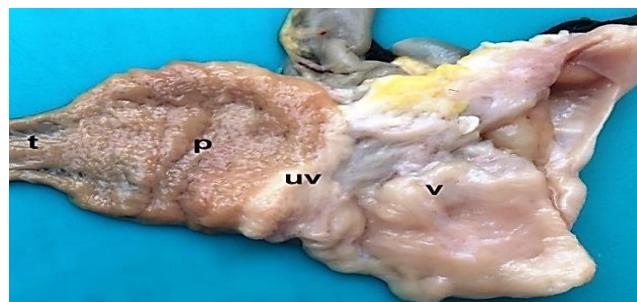


Figure 12: Uterus in non-Laying peahen contain pouch-like part (p) and tubular part (t), (uv)- Utero-vaginal junction, (v)- Vagina.

Table 3: mean length, diameter, and weight of oviduct regions in laying and non-laying peahens

Parameters	Length/cm		diameter/cm		Weight/gm	
	Laying peahen	Non-laying peahen	Laying peahen	Non-laying peahen	Laying peahen	Non-laying peahen
Funnel	5.84±0.30857*	1.84±0.10770	2.94±0.16947*	1.88±0.13565	0.506±0.0163*	0.208±0.00331
Neck	2.98±0.33425*	1.46±0.09274	0.658±0.05652*	0.35±0.02302	0.846±0.0258*	0.43±0.005
Magnum	24.358±0.53*	10.45±0.13038	1.502±0.0558*	1.08±0.03280	22.12±0.083*	11.81±0.0135
Isthmus	8.02±0.09476*	4.59±0.10677	0.646±0.229*	0.27±0.00694	4.148±0.019*	2.41±0.009
Uterus	6.278±0.282*	3.81±0.17776	4.3 ±0.1776*	2.256±0.01720	13.24±0.127*	5.09±0.015
UV junction	1.928 ±0.066*	1.262±0.07479	2.152±0.11469*	1.628±0.01409	1.82±0.02627*	1.1±0.009
Vagina	4.378±0.296*	2.116±0.09274	2.22 ±0.12037*	1.762±0.01772	4.94±0.0312*	2.668±0.0208

* Represent significant differences at level ($P \leq 0.05$ and $P \leq 0.01$) between means at the laying and non-laying periods.

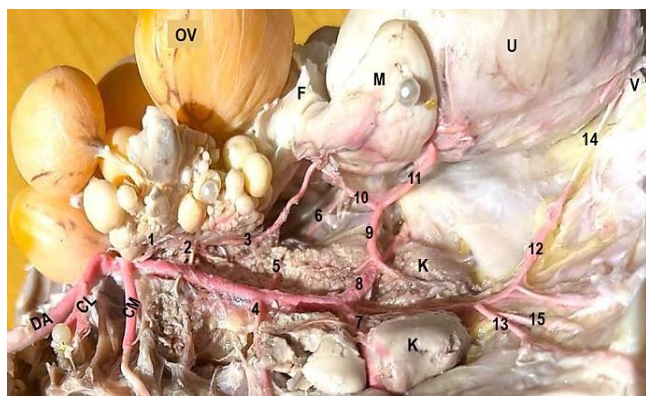


Figure 13: Blood supply of the genital system showed: ovary (ov), Infundibulum (F), Magnum (M), Uterus (U), Vagina (V), Descending aorta (DA), Celomic artery (CL), Cranial mesenteric ar. (CM), left & right kidney (K), ovarian artery (1), left cranial renal ar. (2), cranial oviductal ar. (3), right and left external iliac ar. (4,5), accessory cranial oviductal ar. (6), right and left ischiatic ar. (7,8), middle oviductal ar. (9), anastomosing branch (10), uterine ar. (11), right and left pudendal ar. (12,13), caudal oviductal ar. (14), median caudal ar. (15).

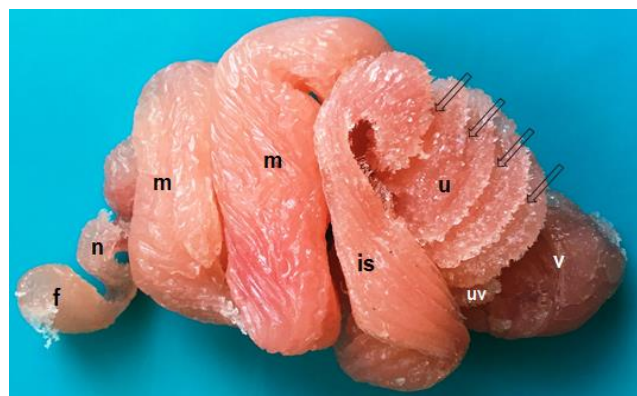


Figure 14: Cast of resin of the left oviduct in situ appeared to include six regions: (f)- funnel, (n)- neck part of infundibulum, (m)- magnum, (is)-isthmus, (u)- uterus with 4-5 transverse furrows (black arrows), (UV)- utero-vaginal junction, (v)-vagina.

Discussion

The present finding in laying and non-laying peahens indicated the presence of only functionally left ovary; these findings were matched with considerations of (9) in Ostrich; (10) in duck; (11) in pigeon, (12) in Chukar Partridge, while

in several species of birds such as long-eared owl, common buzzard, sparrow hawk and goshawk, both ovaries found functionally at mature periods as stated by (13), as well as Falconiformes and in brown kiwi (14). The findings on the shape and location of the ovary were similar to that previously reported by (14) in chicken, (15) in Japanese quail, and (16) in duck. The location and the relations of the left ovary were similar to those found in growing chicken (17,18) in geese. The ovary of laying peahens during the sexually active season contained three types of follicles similar to findings previously stated by (19) in turkey, (10) in duck, and (20) in Uttara fowl. While that of non-laying was similar arrangement but was smaller, so the present findings were matched with considerations of (21), who described the ovary of a non-laying hen become look like the shrunken gonads of the juvenile. The length value of the ovary in laying peahen was larger than in Uttara fowl as documented by (22) and also larger than adult chicken of Assam by (23).

The present morphological finding revealed the presence of only the left oviduct with its boundaries which is comparable to those recorded by (22) in ostrich; (19) in turkey hen; (23) in chickens; (24), in duck but this result disagrees with (25) who referred to the presence of paired oviducts noticed in eagles, falcons, and vultures and also disagree with the earlier reports of (25) in rhea bird, who divided the oviductal ligaments into three named ligaments according to the fixed regions of the oviduct. The division of oviduct parts was Parallel to that documented by (22) in ostrich, (26) in hens, and (1) in *Marreca pardinha*. Still, this finding has not corresponded with many authors who divided the oviduct either into five regions: such as (27,28) in duck and (29) in chicken, (11) in Pigeons, (12) in Chukar Partridge; or adding some parts as a dependent region to be six like red isthmus or tubular shell gland added in hen by (30) or white isthmus and red isthmus added in quail by (31). The findings of the left oviduct in non-laying are supported by the findings of (32) in Muscovy duck; also, these data strengthen by the findings of (33), who noticed a great increase of the oviduct of the mallard duck in laying period and observed an increase in the magnum region up to 280%. The results of oviductal length and weight in laying peahen were parallel to what mentioned previously by (24) in duck and emu but shorter than that in ostrich as mentioned by (34) in emu and ostrich; they were also lesser in comparison to turkey hens (35) but were higher in comparison with Japanese quail (36).

Funnel part findings were similar to the previous descriptions made by (37) in the emu, (38); in ostrich; (29) in chicken; (39) in white leghorn. Statistically, the funnel part was the shortest, and its diameter value was higher in comparison with other parts; this may explain the quickly engulfs the ovum with its thin funnel part and transfer it to the neck part for fertilization by the released sperms from its epithelial crypts as a secondary site for sperm storage.

Findings were Similar to that mentioned by (19) in turkey; and (24) in duck. The data on the inner surface of magnum in laying peahen was Parallel to those previously published by (17,23) in domestic hens, who mentioned that primary folds were 15–22, and they were 22 in adult chickens as stated by (21) while their number ranged from 35-44 in laying ostrich hens as documented by (22). This difference in folds number could be attributed to species differences. Results were in agreement with the previous description documented by (10) in duck (23); (12) in geese and guinea fowl, but in disagreement with (24) in Egyptian duck who said that the folds together with the mucosa of the isthmus were reddish.

Findings were similar to that reported by (28) in hens, (9,35,36) in Turkey, and (37) in ostrich in geese. The internal surface of the uterus in laying is similar to that reported by (38) in Japanese Quail; (23) in ducks; and (29) in Nigerian Chickens. The analysis showed that the uterus diameter was the widest compared to other parts. This wide diameter may come from staying in the egg for about 20 hrs in it to get an eggshell, so that this long time might cause dilated uterine muscle wall. Uterovaginal junction findings in laying and non-laying peahens were parallel to the previously mentioned by (10,39) in turkey and (40) in ducks. Location findings were similar to previous findings of (14) in domestic fowl. Vaginal shape description was similar to that documented by (41) in mature geese and (42) duck but was different from those (43) in ISA-brown chicken (44); in Turkey, and (45) in Egyptian duck, who showed spiral vagina forming S- shape. The vaginal mucosal folds were similar to those described by (46) in duck. Results were parallel to what was mentioned by authors, like (47) in turkey, (48) in geese, and (49,50) in geese and guinea fowl.

Conclusions

The present study revealed that left ovary in the peahen appeared large and functioning with numerous variable stages of developing follicles and the oviduct included six regions (infundibulum, magnum, isthmus, uterus, uterovaginal junction and vagina), the magnum was the longest region of oviduct while the utero vaginal junction was the shortest and the uterus represented the widest region of oviduct, While the neck was the narrowest region.

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Conflict of interest

There is no conflict of interest as declared by the authors.

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دراسة شكلية للجهاز التناسلي الأنثوي في الطاووس البياض وغير البياض

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الخلاصة

على الرغم من أن الجهاز التناسلي الأنثوي قد تمت دراسته في العديد من الطيور، لكن في أنثى الطاووس لم تتم بعد. لذلك، هدفت الدراسة للتعرف على البنية الشكلية خلال فترة وضع البيض وعدم الوضع مع دراسة التجهيز الدموي وعمل قلب من الرززين. أظهر المبيض الأيسر خلال الموسم النشط ثلاثة أنواع من الجريبات: صغيرة ومتوسطة وكبيرة ووجدت نفس الأنواع في الطاووس غير البياض لكن بقياس أقل. كانت قناة البيض اليسرى معقدة للغاية في البياض أكثر من غير البياض، وكان طولها في البياض ضعف طولها في غير البياض. تكونت كلتا القناتين من ستة مناطق: الأولى هي الجزء القمعي الذي تكون من جزأين. القمع والرقبة (الجزء الأنثوي). أظهر القمع داخلها سطحاً شفافاً، مع وجود طيات ليست بارزة جيداً تتغير لطيات مميزة بشكل واضح كلما اتجهنا نحو الرقبة التي كانت طيات غشاءها المخاطي الطولي منخفضة جداً تبدأ في زيادة عمقها كلما اتجهنا نحو المعظم الذي كان الجزء الأطول والأكثر التفافاً للغاية مقارنة بالمناطق الأخرى وكان ذو طيات مخاطية ضخمة ذات حدود متموجة. بدأ البرزخ أقصر وأرق وأقل التفافاً وكانت طيات غشاؤه المخاطي الطولية أكثر استقامة وأقصر مما كانت عليه في المعظم، ومع ذلك، فقد كانت أكثر بروزاً في البياض من غير البياض. كان الرحم هو المنطقة الأكثر سمكاً والأوسع، وكانت طياته المخاطية الطولية تقطعها 4-5 أخاديد عرضية، أما في غير البياض فقد كانت أقل سمكاً وحجماً وبنفس الترتيب. أما منطقة التقاطع الرحمي المهلي فكانت قصيرة جداً وتبرز فوق تجويفي كل منهما. كانت طيات الغشاء المخاطي المهلي استمراراً لمنطقة التقاطع.