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EVALUATION OF LEYDIG CELL DEVELOPMENT IN FAYOUMI AND RHODE ISLAND RED COCKERELS

(With 3 Tables, 2 Plates and 14 Figures)

By

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تقييم تطور خلايا ليدج في ديوك سلالتي الفيومي والرود ايلاند الإحمر

عزيزه سليم ، جمال كامل ، أحمد حسن ، منى علي

أستهدف هذا البحث دراسة التغييرات التي تطرأ على الخلايا البينية الصماء في سلالتي الفيومي والرود ايلاند الأحمر خلال الفترة مابين الفقس وسن البلوغ . بلغ وزن خصية سلالة الفيومي ثلاثة أضعاف مثيله في سلالة الرود ايلاند الأحمر خلال الفترة مابين الأسبوع السادس عشر الى الاسبوع الرابع والعشرين بعد الفقس . وجد أن حجم النسيج البيني وكذلك عدد وحجم خلايا ليدج في خصية سلالة الفيومي أعلى من مثيله في الرود ايلاند الأحمر خلال المراحل المختلفة للدراسة.

SUMMARY

The present investigation was carried out on cockerels of two poultry breeds; Fayoumi and Rhode Island Red at different ages, obtained from poultry breeding farm, Faculty of Agriculture, Assiut University. The increment in the mean testicular weight was three-time higher in Fayoumi than in Rhode Island Red.

The volume density of the intertubular tissue as well as the number and size of the Leydig cells were higher in the testis of Fayoumi than in Rhode Island Red cockerels. On the basis of the morphological evidences, it was concluded that the reproductivity expected to be higher in Fayoumi cockerels than in the Rhode Island Red.

INTRODUCTION

During the postnatal life in mammals, marked changes occur in the number, structure and function of Leydig cells (SHARPE, 1982). It seems certain that these changes of Leydig cells in fowl follow similar morphological pattern to that in mammals. It is perhaps expected that these morphological processes show quantitative variation between different species of fowl. Therefore, inspite of considering indetail the posthatching development of Leydig cells in the fowl, it seems appropriate to perform a comparable study by considering the morphological changes that occur in the Leydig cells of two fowl breeds chosen for low and high fertility (Fayoumi and Rhode Island Red, respectively). Accordingly, a quantitative histological study on the Leydig cells was undertaken from the testes of one day-old until the age of 24 weeks of both Fayoumi and Rhode Island Red cockerels.

MATERIAL and METHODS

The material used in the present work represented two male breeds from one-day old up to 24 weeks old (Table 1), the first is endogeneous (Fayoumi) and the second is exotic breed (Rhode Island Red). They were obtained from the experimental poultry farm production, Faculty of Agriculture, Assiut University. Body weight, testicular measurments and testicular volume recorded for each species. After routine histological processing, the specimens were embedded in paraffin and serial sections were cut at about 5-7 Um in thickness. The sections were stained with Haematoxylin and Eosin, Crossman's trichrome method, Weigert's elastica stain and PAS technique according to DRURY and WALLINGTON (1980).

Formol calcium fixed tissues were stained with Sudan black (LISON and DAGNELIE, 1935) for demonstration of neutral lipid. For the histometrical study semithin sections stained with toluidine blue were examined.

The number of Leydig cells per/mm² (Unit area) was counted by using the square grid (area/mm²) at magnification of 1000. Semithin sections for light microscope were subjected to quantitative analysis (LORDING and De KRETSER, 1972). A grid in the eye piece of the microscope outlined a field of 10.000 Um² at magnification 1000 and the number of the interstitial cells of Leyding were calculated in 100 fields (an area of 1.000.000 Um²=/mm²). The calculation was performed using five samples for each male fowl in both Fayoumi and Rhode Islands breeds.

The number of interstitial Leydig cells per single testis of each bird was determined by the FLODERUS (1944) equation.

Nv = Na (T+D-2h) where :

Na = The number of Leydig cell (nuclei per unit area (1 mm²).

D = The average nuclear diameter measured only in nuclei showing perfectly focused nucleoli.

T = The average thickness of section.

h = The thickness of the smallest recognizable cap section of the nucleus.

The total number of Leydig cells per testis was calculated by multiplying the number of Leydig cells per unite volume Nv (mm³) X testicular volume (mm³). The cell and nuclear volumes of the interstitial cells of Leydig were recorded.

Variations in shape and size of interstitial cells of Leydig were drawn semidiagramatically by the aid of camera Lucida at magnification of 1000.

The microscopic measurements were carried out by using an eye-piece micrometer which was calibrated with a stage micrometer to the nearest micrometer to the nearest micron. All these mesurements were carried out from five different areas in the testis as shown in (Plate I).

Data were statistically analysed by means of (NCR) computer in two ways of variance.

Table (1): Materials available in the present study

Age in weeks	Number of males	
	Fayoumi	Rhode Island Red
One-day-old	7	4
1 week	6	4
2 weeks	5	3
4 weeks	6	3
6 weeks	4	3
8 weeks	5	3
12 weeks	5	3
16 weeks	9	3
20 weeks	7	3
24 weeks	6	3

PLATE (1): Histometric methods used in five selected areas in the testis.

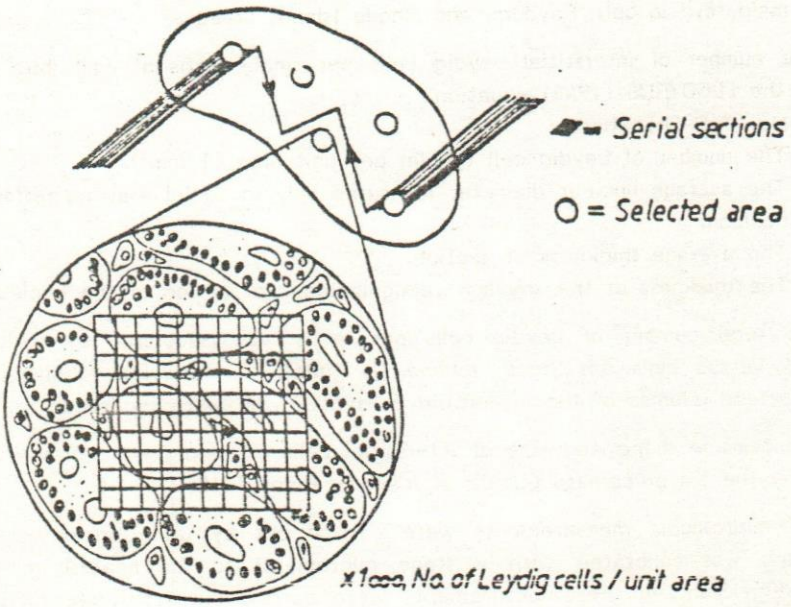


Plate [1]

RESULTS

In both Fayoumi and Rhode Island Red cockerels there was a period of relatively slow testis growth to 12 weeks of age. However, the next 4 weeks (12-16) were characterized by pronounced changes in the testis weight of Fayoumi cockerels. From 16-24 weeks age, the mean testis weight of the Fayoumi increased approximately three-fold and reached about 22.7 gm, while those of the Rhode Island cockerels increased approximately one-fold and reached an average of about 8.53 gm.

At one day-old, the intertubular tissue of the testes of both breeds was loosely arranged and demonstrated blood and lymph vessels of different sizes, elongated fibroblast and interstitial Leydig cells (Fig. 1). Few macrophages were also demonstrated in the intertubular tissue (Fig. 2). The interstitial cells of Leydig were scattered singly or arranged in small groups and most of which were located close, to the vascular elements (Fig. 1). They were of different sizes and shapes (Fig. 2 and Plates 2). They appeared oval, rounded, triangular, polyhedral, elongated or even pear-shaped. Their nuclei were large oval or rounded and contained one or two distinct nucleoli. Their cytoplasm appeared pale and were characterized by numerous clear vacuoles of different sizes and shapes (Figs. 1,2). Frozen sections stained with Sudan black revealed presence of abundant and large sized lipid droplets in their cytoplasm (Fig.3 a & b).

They Leydig cell number was relatively higher in the testis of Fayoumi than those of Rhode Island breed (Tables 2,3). their number per unit area was 25 and 14 in the testes of Fayoumi and Rhode Island breeds, respectively. Their absolute number per testis are presented in (Tables 2, 3). The Leydig cell volume was 704.78 Um^3 and 620.6 Um^3, while their nuclear volume was 78.13 and 64.24 Um^3 in both breeds, respectively.

The interstitial macrophage was much smaller than the Leydig cells and were relatively few in number. They appeared oval, rounded or irregular in shape with oval, deeply stained and eccentric nuclei. Their cytoplasm contained strong PAS-positive materials.

The relative as well as the absolute volume density of the intertubular tissue of the testes of Fayoumi was much abundant than those of the Rhode Island Red breed. The relative volume density was 49.1% and 39% for both breed. The absolute volume density was 2.1 mm^3 in the testes of Fayoumi and 1.08 mm^3 in Rhode Island (Tables 2, 3).

Small vessels of special structure were observed in the intertubular tissue of the testes. They possessed a relatively thin muscular media and a bolster of exclusively glomus cell structure, glomus bolster. The latter was located subendothelially with the absence of tunica elastica internal (Fig. 4).

At 1-4 weeks age, the volume density of the intertubular tissue was relatively abundant in the testis of Fayoumi than those in Rhode Island (Fig. 11). Their absolute volume density per testis was 20.5 mm^3 and 4.73 mm^3 for both breeds, respectively.

EVALUATION OF LEYDIG CELL

Leydig cell number per unit area was higher in the testes of Fayoumi chicken and less than those recorded in the previous age. Their number reached an average of 10 cells per unit area in the testes of Fayoumi and 7 cells in those of Rhode Island (Tables 2,3 and Fig. 12).

Their absolute number of Leydig cells per testis was much higher in both breeds than those recorded in the previous age (Fig. 13). Their cells and nuclear volume were recorded in (Tables 2, 3 and Fig. 14).

Variations in size and shape of Leydig cells from one day to 24 weeks of age in both breeds are represented in (Plate 2).

At 6-8 weeks of age, most of the Leydig cells appeared to be less active in the testes of Rhode Island than those in Fayoumi breed (Figs. 5,6). Their cell number per unit area was 6 in the testes of Fayoumi breed, while in the Rhode Island breed their number was 5 (Fig. 12). Their absolute number per testis were greatly higher in Fayoumi than in Rhode Island breed (Tables 2, 3). The total number of Leydig cells per testis, in both breeds were significantly increased than those recorded in the previous ages (Fig. 13).

The absolute volume density of the intertubular tissue was greatly higher in the testis of Fayoumi 57.7 mm^3 than those recorded for Rhode Island breed (12.7mm^3). Pigmented cells were occasionally demonstrated in the intertubular tissue in the testis of Fayoumi breed. Mitotic figures were demonstrated in the intertubular tissue (Fig. 7).

At 12 weeks of age the mean number of Leydig cells per unit area was decreased than those recorded in the previous ages. However, their absolute number per testis was greatly increased than those recorded in the previous ages (Table 2, 3 and Fig.13). Moreover, the cell and nuclear volumes presented about two times increased than those mentioned in the previous age, the Leydig cell volume of Fayoumi breed was 1021 Um^3, while the nuclear volume was 96.85 Um^3. These cells were either polyhedral, oval rounded or elongated in shape with large spherical nuclei containing peripherally concentrated chromatin. Their cytoplasm was faintly stained and contained several vacuoles of different sizes and shapes.

At 16 weeks of age the volume density of the intertubular tissue of the testis of Fayoumi breed was significantly decreased. It was about 5.90 percent of the total testicular parenchyma and occupied about 442 mm^3 of the total testicular volume. The interstitial cells of Leydig were arranged in groups which occupied the space between the seminiferous tubules. They were either polyhedral, oval or elongated in shape with large spherical or oval nuclei, containing peripherally concentrated chromatin and one or two distinct nucleoli. Their cytoplasm was faintly stained and contained small lipid droplets (Fig. 8). The Leydig cell number per unit area was 4 cells. Their absolute numbers per testis were greatly exceeded those recorded in the previous ages (Table 2 and Fig. 13). Their cell volume was 1530.20 Um^3 while the nuclear volume was 130.20 Um^3.

The relative volume density of the intertubular tissue in the testis of Rhode Island cockerels was higher than those described in Fayoumi breed. It occupied about 14.8 percent of the total testicular parenchyma. However, the absolute volume density of the intertubular tissue was greatly lower in the testis of Rhode Island cockerels than those recorded in Fayoumi breed. It occupied 34.77 mm^3 of the total testicular volume. The intertubular tissue of the testis of the Rhode Island cockerels demonstrated more sudanophilic material than that observed in the testis of Fayoumi breed.

The Leydig cells of the testis of the Rhode Island cockerels appeared less in number and less in activity than those described in Fayoumi breed (Table 3). The Leydig cell number per testis in Rhode Island cockerels was greatly lower than those observed in Fayoumi breed (Tables 2, 3 and Fig. 13). Their cell and nuclear volumes were 780.90 Um^3 and 95.38 Um^3, respectively.

At 20 weeks age, the relative volume density of the intertubular tissue of the testis of Fayoumi cockerels was close to those described in the previous age. However, the absolute volume density of the intertubular tissue was higher than those recorded in the previous age. They occupied 579.1 mm^3 of the total testicular volume.

The interstitial cells of Leydig were larger in size and highly active. They were large rounded, oval, polyhedral or elongated in shape, with large spherical or oval nuclei containing peripherally concentrated chromatin. There were one or two deeply stained nucleoli.

Their mean number per unit area appeared to be similar to those recorded in the pervious age. However, their total number per testis was significantly higher than those recorded in the previous ages (Table 2 and Fig. 13). Their cell volume was 1810.40 Um^3, while the nuclear volume was 150.01 Um^3 (Fig. 14).

The relative volume density of the intertubular tissue ofthe testis of Rhode Island cockerels was slightly decreased, reaching about 11.0% of the total testicular parenchyma. They occupied 375 mm^3 of the total testicular volume. The Leydig cells and nuclear volumes were slightly increased than those recorded in the previous age. Their cell volume was 970.45Um^3 while the nuclear volume was 109.30 Um^3.

At 24 weeks age, the relative volume density of the intertubular tissue was nearly similar to those recorded inthe previous age for Fayoumi breed. However, the absolute volume density was greatly increased in both breeds. They occupied 1046.6 mm^3 of the total testicular volume for Fayoumi and 574.6 for Rhode Island cockerels.

The number of the interstitial cells of Leydig per unit area was more significantly decreased than those recorded in the previous ages in both breeds (Tables 2, 3 and Fig. 12). However, their absolute number per testis was significantly increased in both breeds. Moreover, their number was higher in the testis of Fayoumi cockerels than those of the Rhode Island breed (Fig. 13). The Leydig cells were either rounded, oval, polyhedral or elongated in shape with large spherical nuclei containing peripherally concentrated chromatin. Their nuclei contained one or two distinct nucleoli. Their

cytoplasm contained few and small lipid droplets. Their cell volumes were 1830.40Um³ and 1120 Um³, while nuclear volume were 170.8 Um³ and 120.48 Um³ for both Fayoumi and Rhode Island cockerels, respectively. Lipid histochemical technique demonstrated gradual decrease of sudanophilic materials in the intertubular tissue in the testis of both Fayoumi and Rhode Island chicken from one day post-hatching to reach its minimal amount at 24 weeks of age (Fig. 9).

Glomus organs, occlusive or throttle artery as well as some blood vessels with inner circular and outer longitudinal tunica media were demonstrated in the intertubular tissue of the testis of both breeds from one day post-hatching to 24 weeks of ages (Fig. 10).

Table (2): Quantitative analysis of the interstitial cells of Laydig in the testis of Fayoumi chickens at different age groups.

Age weeks	Inter-tubular T.		Leydig cells			
	Relative vol.den. %	Absolute vol.den. $/mm^3$	Cell vol. Um^3	Nucl.vol. Um^3	No/unit area	Absolute No/ testis
One-day	49.1±	2.1±	704,5±	78.13±	25±	34933.3±
	0.55	0.69	157.7	2.1	5.8	11499.1
1	46.7±	5.9±.	650.3±	65.1	17±	31728±
	1.6	0.21	109.7	1.8	0.58	8724.5
2	41.6±	9.1	430.3±	38.2±	15±	39474±
	1.85	2.19	100.3	3.4	2.9	1446.1
4	32.4±	20.5±	401.3±	30.13±	10±	70400±
	1.74	2.8	95.7	1.3	I.16	10569.9
6	28.3±	43.0±	420.4±	34.04	6±	139200±
	2.4	4.1	112.5	2.7	0.58	20890.4
8	25.2±	57.7±	630.2±	40.2±	6±	240450±
	0.39	5.2	110.8	4.7	1.16	24465
12	20.3±	53.6±	1021.48±	96.9±	4±	314520±
	1.14	10.9	190.5	3.5	0.58	53742.9
16	5.9±	442.0±	1530.2±	130.2±	4±	19699073±
	0.49	143.9	222.3	7.6	0.58	6447044.8
20	5.1±	579.1±	1810.4±	150.01±	3±	14549394±
	0.94	105.8	160.7	5.8	1.16	117565.2
24	4.8±	1046.6±	1830.4±	170.8±	3±	26768840±
	0.46	74.85	379.8	8.6	1.3	3533632.4

Table (3): Quantitative analysis of interstitial cells of Leydig in the testis of Rhode Island chicken at different age groups.

Age in weeks	Inter-tubular T.		Leydig cells			
	Relative vol.den. %	Absolute vol.den. mm^3	Cell vol. Um^3	Nucl.vol. Um^3	No./unit area	Absolute No./ testis
One-day	39±	1.08±	620.5±	64.2±	14 ±	19278±
	2.14	0.32	63.6	2.4	2,02	4754.1
1	35.1±	2.78±	590.3±	55.3±	10±	20930±
	1.16	1.3	109.7	2.9	5.8	929.5
2	34.2±	4.25±	411.5±	30.4	7±	26950±
	1.04	0.17	59.5	5.8	1.16	11461.0
4	33.9±	4.73±	303.9±	25.4±	7±	21206±
	1.97	0.99	29.01	1.16	2.9	3609.7
6	32.3±	8.65±	380.4±	30.2±	5+	30840±
	3.5	2.6	69.3	1.3	1.16	5760
8	25.9±	12.7+	395.4±	30.5±	5+	69993±
	0.4	0.1	118.9	2.7	0.58	1482.8
12	15.3±	22.3±	630.9±	75.2±	4+	88140±
	0.29	3.8	63.6	3.5	1.16	61849.2
16	14.8±	34.3±	780.9±	95.4±	3+	116732±
	0.58	25.4	103.9	5.9	1.16	53407.8
20	11.0±	37.5±	970.5±	109.3±	2±	147055±
	1.2	19.8	115.3	7.6	0.58	27678.8
24	7.7±	574.6±	1120.4±	120.5±	2±	4820720±
	1.1	63.8	109.7	5.9	0.58	1,277,823.9

± = S.E.

LEGENDS

Fig. (1): One day old testis of Rhode Island chicken showing a group of interstitial Leydig cells around blood vessel (arrow). Semithin secton (toluiuine stain, 1000 X).

Fig. (2): One day old testis of Rhode Island chicken showing abundant intertubular tissue. Notice Leydig cell (L) and Macrophage (M). (H & E 1000 X).

PLATE (2): Semidiagramatic illustration showing variations in shapes and sizes of testicular interstitial Leydig cells in both Fayoumi and Rhode Island chickens at different ages.

EVALUATION OF LEYDIG CELL

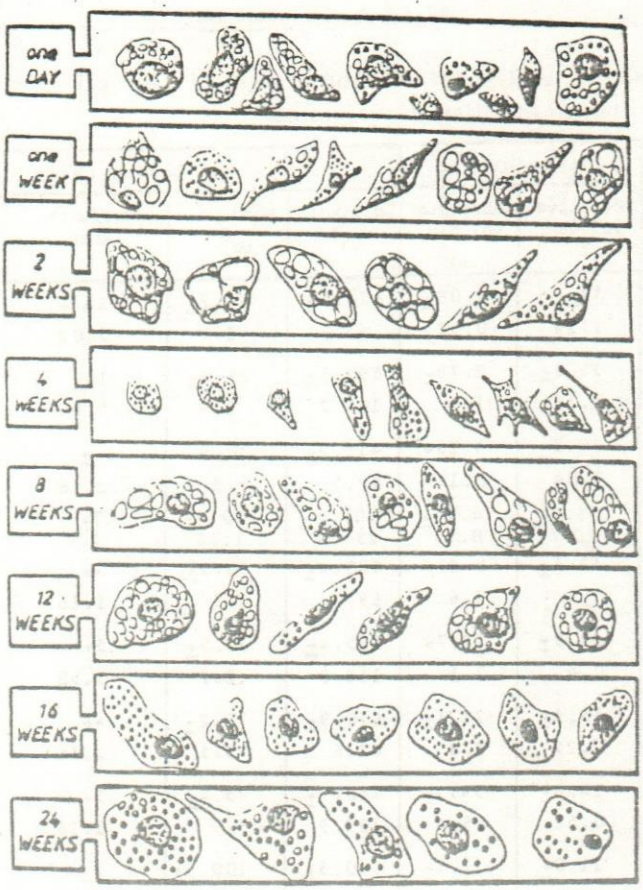
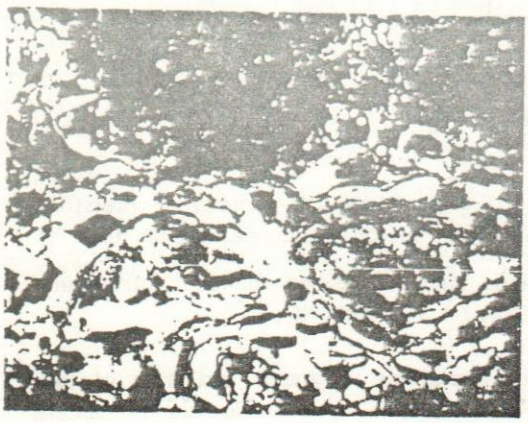
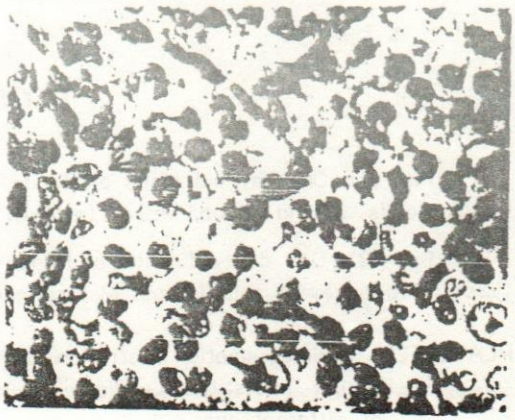


Plate [2]



Fig(1)



Fig(2)

Fig. (3): One day old testis of Fayoumi chicken domestrating abundant sudanophilic materials in the intertubular tissue. Frozen section (Sudan black stain, a 63 X and b 160 X).

Fig. (4): One day testis of Fayoumi chicken showing glomus vessel in the intertubular tissue (arrow). Semithin section (Toluidine blue stain, 100 X).

Fig. (5): Six-weeks old testis of Rhode Island chicken showing peritubular cells (P), Leydig cells (L). Semithin section (Toluidine blue stain 1000 X).

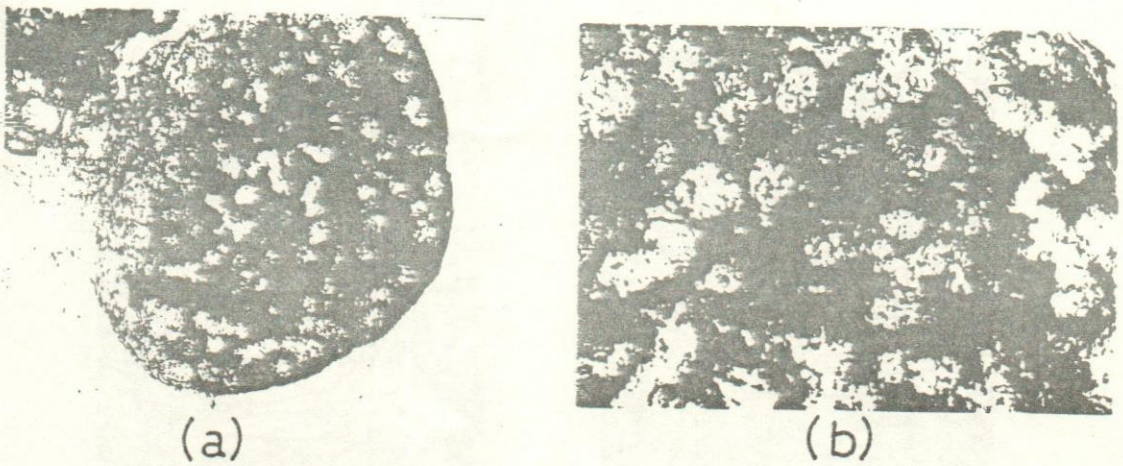
Fig. (6): Six weeks old testis of Fayoumi chicken showing Leydig cells (L7. Semithin section (Toluidine stain, 1000 X).

Fig. (7): Eight weeks old testis of Fayoumi chicken showing mitotic figure in the intertubular tissue (arrow) (PAS-haematoxylin stain 1000 X).

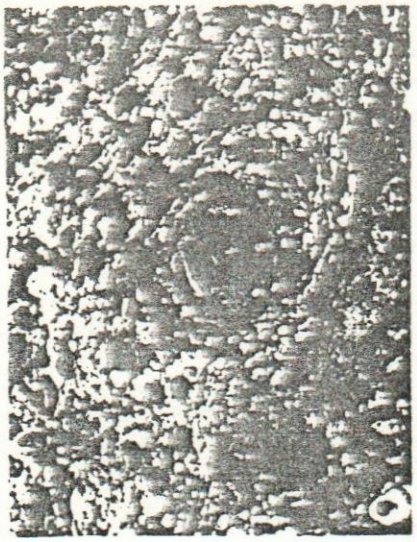
Fig. (8): Sixteen weeks old testis of Fayoumi cookerels showing few sudanophilic droplets in the cytoplasm of the interstitial Leydig cells (arrow). Frozen section (Sudan black stain, 1000 X).

Fig. (9): Twenty-four weeks old testis of Rhode Island cockerels demonstrating small sudanophilic droplets in the cytoplasm of Leydig cells (arrow). Frozen section (Sudan black stain, 1000 X).

Fig. (10): Twenty four weeks old testis of Rhode Island cockerels demonstrating blood vessel posses two definite muscular media, an inner circular and outer longitudinal smooth muscle fibers (H & E stain 400 X).



Fig(3)



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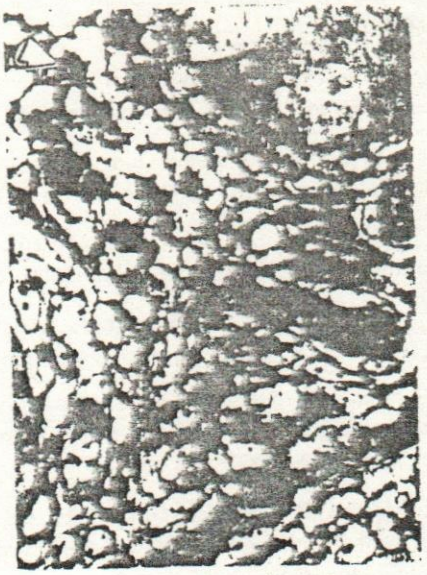

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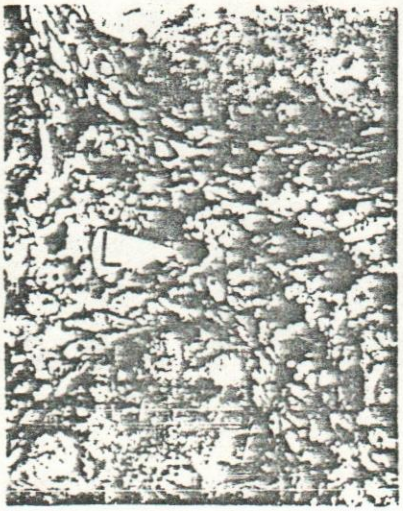

Fig(6)

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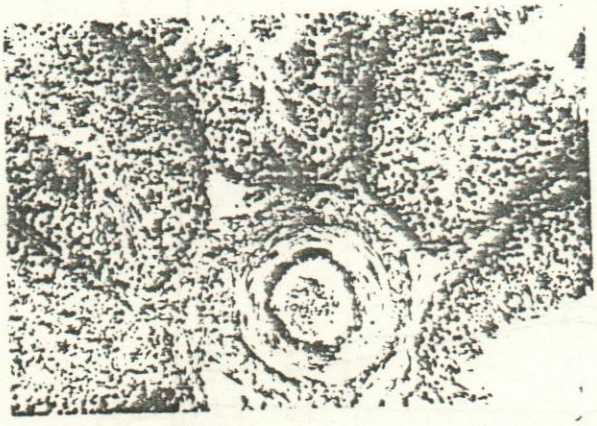


Fig(10)

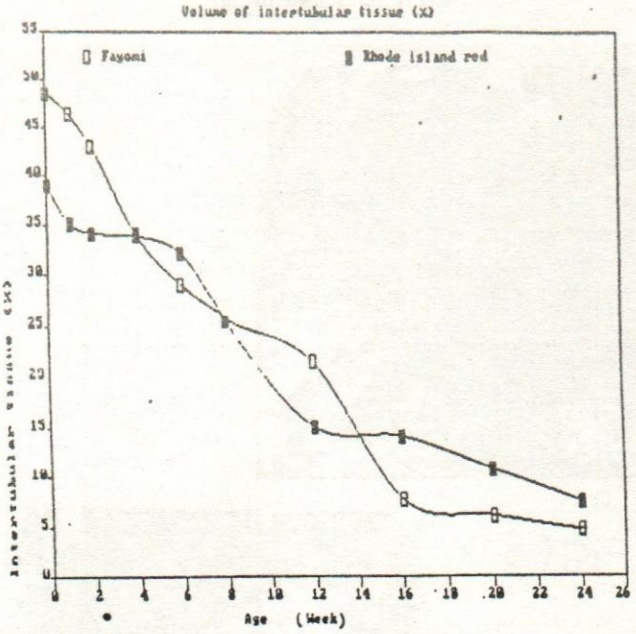


Fig. (11)

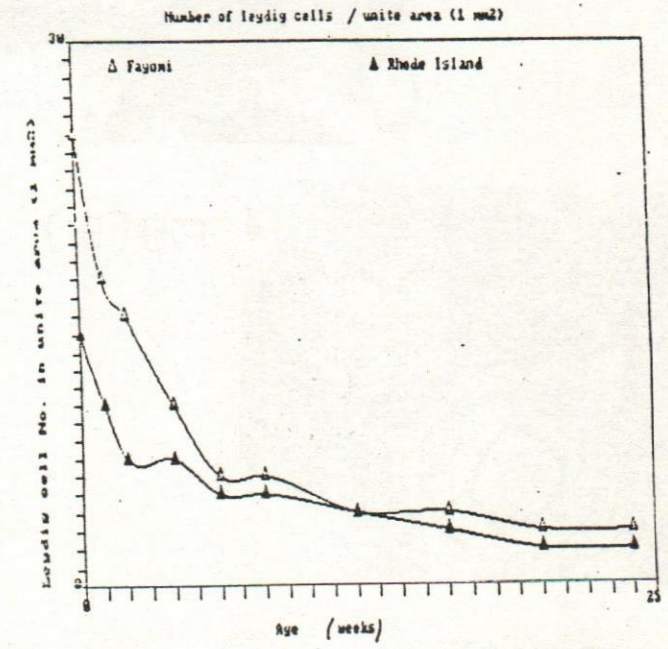
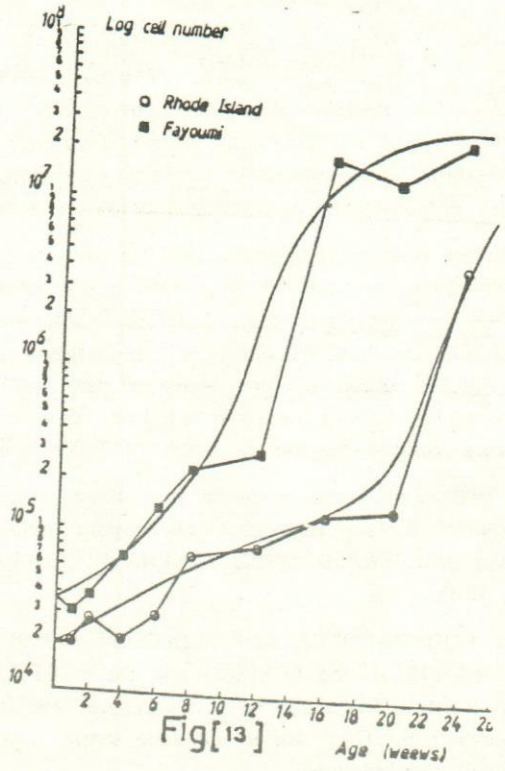


Fig. (12)

Fig. (11): Relative volume density of the intertubular tissue in the testis of Fayoumi and Rhode Island chickens at different age groups.

Fig. (12): Number of Leydig cells per unite area in Fayoumi and Rhode Island chickens at different age groups.



Fig[13]

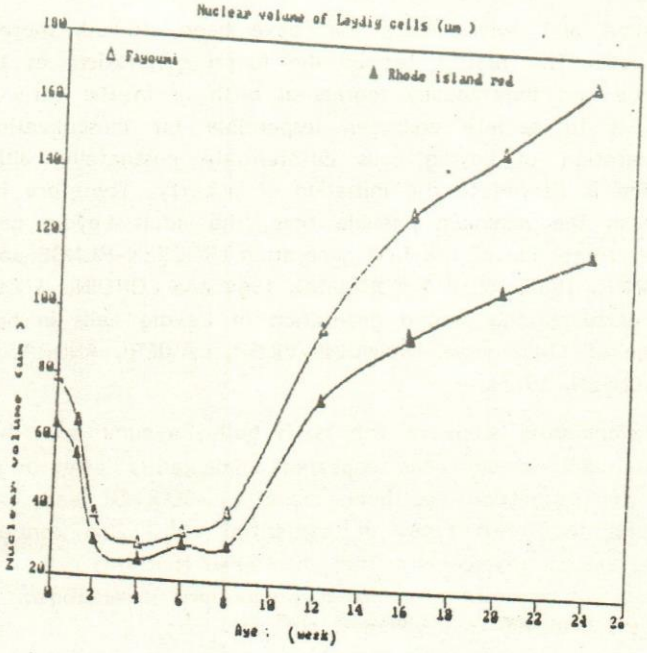


Fig. [14]

Fig. (13): The number of Leydig cells per testis in Fayoumi and Rhode Island chickens at different age groups.

Fig. (14): Nuclear volume of Leydig cells in Fayoumi and Rhode Island chickens at different age groups.

DISCUSSION

The present investigation revealed that the intertubular tissue of the testes of both Fayoumi and Rhode Island chickens was loosely arranged and contained blood and lymph vessels of different sizes, elongated fibroblast and interstitial Leydig cells. Few macrophages were also demonstrated in the intertubular tissue.

The interstitial macrophages were demonstated in the testes of both Fayoumi and Rhode Island chickens from one day to 24 weeks age. These macrophages were closely associated with Leydig cells and their functional state was related to that of the interstitial cells. CLEGG and MACMILLAN (1965) reported interstitial PAS positive macrophage in the intertubular tissue of the testis of the rat and suggested that these cells were precursors for Leydig cells. In addition, development and differentiation of Leydig cells were related to the presence of macrophages (TAKHA, 1986).

Furthermore, there are unequivocal evidence that these macrophages are steroidogenic and possess common surface antigen with Leydig cells (MILEWICH, CHEN, LYONS, TUCKER. UHR and MacDONALD, 1982; MOLENANR. ROMMERTS and Van der MOLEN, 1984 and BERGH, 1985).

In agreement with ROOSEN-RUNGE and ANDERSON (1959) NIEMI and IKONEN (1963); NIEMI and KORMANO (1964) and LORDING and De KRETSER (1972), the interstitial Leydig cells were present in the testis of both Fayoumi and Rhode Island chickens from one day to 24 weeks age. They varied in size, shape and number during the various sexual development of the chickens.

In most mammalian and avian testes that have been studied, there are two generations of Leydig cells. The first is termed the foetal generation, as this is the time of their appearance and they usually regress at birth or in the early post-natal period. Their function is to secrete androgen responsible for musculization of the foetus. The adult generation of Leydig cells differentiate postnatally, although the time of their appearance is geared to the initiation of puberty. Therefore in the rat, which reaches puberty in the minimum possible time, the adult Leydig cells appear almost immediately after regression of the first generation (ROOSEN-RUNGE and ANDERSON, 1959; NIEMI & IKONEN, 1963; NIEMI & KORMANO, 1964 and LORDING & DEKRETSER, 1972). At the other extreme, the second generation of Leydig cells in human does not appear until the age of 11-13 years (MANCINI, VILAR, LAVIERI, ANDRADA & HEINRICH, 1963 and CHRISTENSEN, 1975).

The present developmental study of the testis both Fayoumi and Rhode Island chickens indicated that adult Leydig cells appeared immediately after regression of the fetal generation. The suggestion has been made by SLUITER and Van OORDT (1947) that the cockerels had two types of interstitial cells. One contained many lipid globules, resembling classic Leydig cells. They mentioned that this cell was probably a cell for storage and not directly involved in production of androgen. The other epithelioid interstitial cells had no lipid golbules, but had many granular and filamentous mitochondria. They proposed that this was the secretory cells that elaborated

androgen. They also suggested that in old cockerels the glandular cells lose their secretory ability and become lipid containing cells. In agreement with the postulation of HOOKER (1970), CONNELL (1972) and CHRISTENSEN (1975), the interstitial Leydig cells appeared to arise from the interstitial mesenchymal cells which are fibroblastic in appearance and by process of differentiation they acquire the characteristic of adult Leydig cells, the peritubular cells in the testis of both Fayoumi and Rhode Island Chickens were more demonstrated at 1-4 weeks age and exhibited high potency for mitosis.

The present study revealed that the total number of Leydig cells per testis was greatly higher in Fayoumi cockerels than those of the Rhode Island one. In both breeds, their number were grandually increased with the advance of age. Their number per testis was about 34.400 and 19.278 cells at one day old and reached 26, 769, 240 and 4, 820, 700 cells at 24 weeks of age in both Fayoumi and Rhode Island cockerels, respectively.

The present study revealed that the total number of Leydig cells showed typical "S" biological curve in Fayoumi cockerels while those of the Rhode Island failed to give this sigmoid biological curve. This indicated that the Fayoumi chickens reached the sexual maturity earlier than those of the Rhode Island.

The present study showed a series of different structural mechanisms in the peripheral circulation of the testis in both Fayoumi and Rhode Island chickens from one day to 24 weeks of age. Glomus organs, occlusive or throttle artery were demonstrated in the intertubular tissue. These findings are in agree with that noted in genital organs of the buffalo (EL-ETREBY, 1968). The blood vessels of special structure are supposed to possess an important regulatory function for the peripheral circulation. They exert an active function for the peripheral circulation through their throttling or occlusion effect. This mechanism is attained either through the contraction of the smooth muscle fibers or by the presence of glomus cells which cause a reduction in the diameter of the lumen by their ability to swell (EL-ETREBY, 1968). Aslo, in agreement with him that the glomus organs may act as thermoregulatory element for temperature control of the testis which is functionally very sensitive to temperature.

In agreement with the findings obtained by CLEGG (1966) and LORDING and De KRETSER (1972), lipid histochemical technique demonstrated gradual decrease of sudanophilic materials in the intertubular tissue of the testis of both Fayoumi and Rhode Island chicken from one day to reach its minimal amount at 24 weeks of age. This findings indicated that there was an increase in the output of testicular androgen leading to the paucity of lipid materials in the interstitial Leydig cells.

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