دراسة لتكاثر الجمال
التغيرات العينية فى شكل الخصيتان
وعلاقتها مع العمر وفصول السنة

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الملخص

درست التغيرات فى وزن ومقاييس وحجم الخصى مع علاقتها بالعمر وفصول السنة على ٦٣ زوج من خصى الجمال الصعيدى المصرى أحادية الصنم والتى تتراوح أعمارها من خمسة الى ثمانية عشر أعوام .

وقد وجد أن هذه الدلالات تزداد من عمر خمس سنوات الى عمر عشر سنوات ولكن تثبت بعد ذلك . وقد وجد أن الخصية الشمال أكبر وأثقل من الخصية اليمين ولكن هذا الفرق ليس له مغزى أحصائيا .

وقد لوحظت تغيرات فصلية على الحيوانات الناضجة التى تبلغ من العمر تسعة أعوام وكانت هذه التغيرات ذات معنى أحصائى .

وكانت الخصى أكبر وأثقل فى فصل الخريف وأصغر فى فصل الصيف . وكانت الزيادة أقل فى فصل الخريف عنها فى فصل الشتاء . وقد لوحظ أكبر حجم ووزن فى شهر مارس .

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STUDIES ON REPRODUCTION IN CAMELS
(Camelus dromedarius)
IV. GROSS CHANGES IN THE MORPHOLOGY OF THE TESTIS IN RELATION TO AGE AND SEASON

with 3 tables and 3 figures

By

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SUMMARY

The changes in testicular weight, dimensions and volume in relation to age and season had been studied in 63 pairs of testes of the one humped camel (Camelus dromedarius) of the native Egyptian breed (Saiidi breed), ageing 5-18 years. These criteria were found to increase between the age of 5 and 10 years and appeared to be stable thereafter. The left testis was found to be heavier and larger than the right one but the difference is not significant statistically. Seasonal and monthly changes were observed in adult animals ageing 9 years and the changes were found to be statistically significant. The testis is heavir and larger during the spring and decreased in the summer. The increase during the autumn is rather slower than that during the winter. The maximum weight and volume occured in March.

INTRODUCTION

Reproduction in the male camel have received rather meager attention. An adequate knowledge of the anatomy and physiology of the reproductive organs is essential for a through study of the pattern of reproduction in this animal. Although the morphology of the reproductive organs were studied by TAYEB (1945) EL-WISHY, MOBARAK and FOUAD (1972) and MOBARAK, EL-WISHY and FOUAD (1972), but these studies had not included any data on the changes in these organs in relation to either the age or the season. It is well known fact that the camel is a seasonal breeder with a rut season occuring in the late winter and spring (LEESE, 1972 ; ASHOUB, 1936 and NOVA, 1970) and clear seasonal changes have been observed in the testicular size during the rut season (VOLCANI, 1954 ; CHARNOT, 1964 and 1965).

The aim of this investigation is to study the gross morphological changes in the testis of the one humped camel in relation to age and season.

MATERIALS AND METHODS

The material included in this study consists of 63 pairs of normal testis obtained from one humped camels of the native Egyptian breed (Saiidi breed). The collected material represent a complete year and covered the ages from 5-18 years. In each case, the testis was obtained shortly after slaughter, stripped of its tunics and freed from the epididymis and other adhering structures. Each testis was weighed seperately to the nearest 0.5 gm. The length, breedth and thickness were measured to the nearest millimeter by a caliber, and the volume estimated to the nearest millilitre by water displacement.

The material collected from animals ageing 9 years and over were statistically analysed from the monthly and seasonal changes. The data for younger animals were not analysed seperately, since they were not represented in the different seasons with adquate numbers.

RESULTS

Changes in relation to age

The average testicular weights are presented in table (1) and fig. (1). The weight of both testes increased rapidly from 47.0 gm at the age of 5 years to 122.4 gm at the age of 6 years. The weight increased after the later age but on slower rate. From the age of 8 years to 18 years there is slight increase in the weight and the averages fluctauted between 125.64 and 173.25 gm. The weight of the left and right testis showed slight asymmetry. In all the material, the left testis was heavier and averaged 74.21 gm. where as the right one averaged 73.00 gm. The difference between the weight of the left and the right testis (1.21 gm) is not statistically significant (t=0.287,d;f;124).

Th measurements of the testis are presented in table (1). The different measurements increased progressively with age up to the age of 8 years and did not show great variations after that. In all the material the thickness is greater than the breadth.

The average testicular volumes are presented in table (2) and fig (1). The volume follows the same trend of growth as that of the weight. The volume of both testes averaged 37.0 ml at the age of 5 years. The increase in the volume is progressively and rapidly up to the age of 8 years. From the latter age on, the volume fluctuated around an average of 127 ml. The volume of the left testis averaged 63.13 ml and the right one averaged 60.67 ml. The difference (2.46 ml) is not statistically significant (t=0.591, d.f = 124).

TABLE 1 : Average Testicular weights and Measurements

Age years	No of animals	Both testes	Weights (gm) Range	Measurements (cm)				
				Left	Right	Length	Breadth	Thick
5	1	47.00 ±		22.00	25 00	5.3	2.5	2.7
6	5	122.40 ± 56.30	72.0 — 216 0	61.10	61.30	7.5	3.4	3.6
7	2	132.00 ± 25.46	114.0 — 190.0	69.00	63 00	7.6	3.7	4.0
8	7	157.36 ± 69.27	77.5 — 281.0	78.00	79.36	8.0	3.5	4.0
9	7	125.64 ± 34.70	87.5 — 178.5	56 00	59 64	7.5	3.4	3.8
10	7	168.79 ± 55.96	102.5 — 278.0	86.21	82.57	8.4	3.9	4.3
11	2	141.75 ± 68.19	126.5 — 157.0	71.50	70.25	8.6	3.4	4.2
12	19	157.00 ± 37.28	105.5 — 234.0	79.13	77.87	7.9	3.8	4.2
13	5	138.80 ± 45.96	91.5 — 172.0	72.10	66.70	7.6	3.4	3.6
15	5	148.20 ± 46.57	71.0 — 193.5	70.90	77.30	7.5	3.8	4.3
16	1	141.00		75.40	65.50	7.8	3.5	4.1
18	2	173.25 ± 74.91	156.5 — 190.0	80.50	92.75	7.8	4 1	4.8

± Standard deviation,

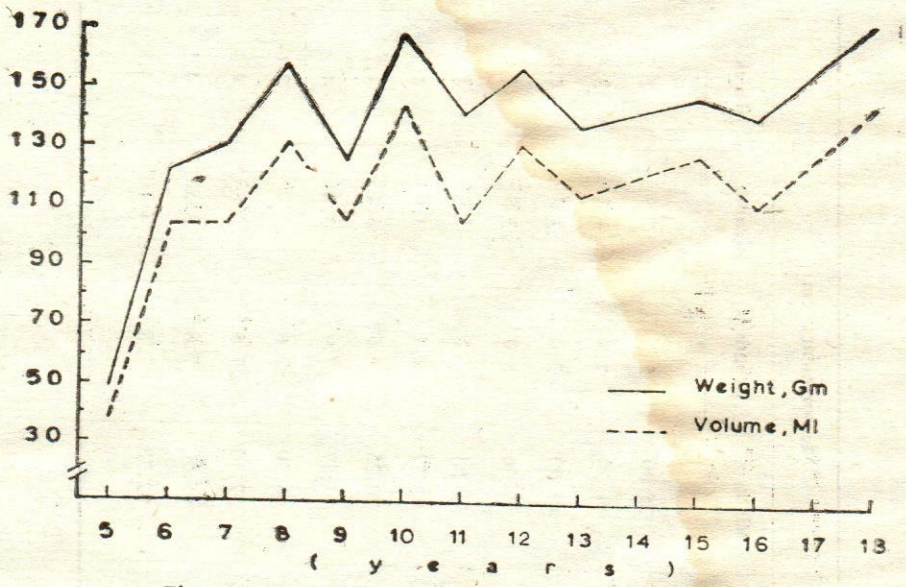

Fig. 1 Average testicular weights and volumes

TABLE 2 : Average Testicular Volumes

Age years	No of animals	Both testes (m)	Range	Left	Right
5	1	37.00 ±		17.00	20.00
6	5	104.20 ± 55.12	60 — 198	52.00	52.20
7	2	105.00 ± 21.21	90 — 120	55.00	50.00
8	7	132.29 ± 73.29	50 — 265	65.29	67.00
9	7	106.71 ± 31.69	75 — 160	57.14	49.57
10	7	145.14 ± 76.99	88 — 255	74.43	70.71
11	2	107.50 ± 24.74	90 — 125	53.00	54.50
12	19	131.58 ± 35.58	85 — 205	67.63	63.95
13	5	115.60 ± 37.68	75 — 153	62.20	53.40
15	5	129.40 ± 47.21	55 — 180	62.20	67.20
16	1	112.00		64.00	48.00
18	2	145.00 ± 21.21	130 — 160	67.50	77.50

± = Standard deviation.

Changes in relation to season

Analysis of variance showed that there is significant statistical changes in the weight of the testis (P. 0,05). The heaviest weight was reported in the spring (fig. 2 and table 3). The weight decreased during the summer and started to increase during the autumn and winter. On studying the monthly changes it was found that the testis reached its maximum weight in March and decreased rapidly thereafter (Fig. 3). The increase occuring during the autumn months is slower when compared with that occuring during winter months.

The volume of the testis showed, like the weight, statistically significant seasonal changes (P 0.05). Both the seasonal and monthly changes are parallel to those observed for the weight (Table 3, Fig. 2 and 3).

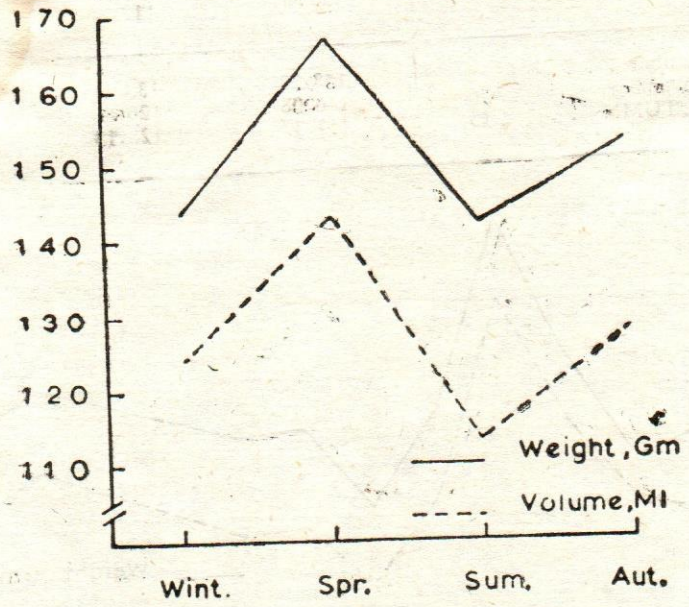

Fig. 2 Seasonal changes in testicular weights and volumes

TABLE 3 : Monthly and seasonal changes in testicular weight and volume in adult camels

Month and season	No of Animals	Weight Both testes (gm)	Volume Both testes (ml)
December	8	139.88	115.75
January	5	132.90	120.40
February	4	164.25	143.75
WINTER	17	143.56	123.71
March	4	206.75	182.00
April	3	148.33	122.66
May	2	119.0	96.00
SPRING	9	167.94	143.33
June	3	144.17	113.33
July	4	141.25	112.50
SUMMER	7	142.50	112.86
October	9	158.22	133.11
November	6	146.08	120.66
AUTUMN	15	153.37	128.13

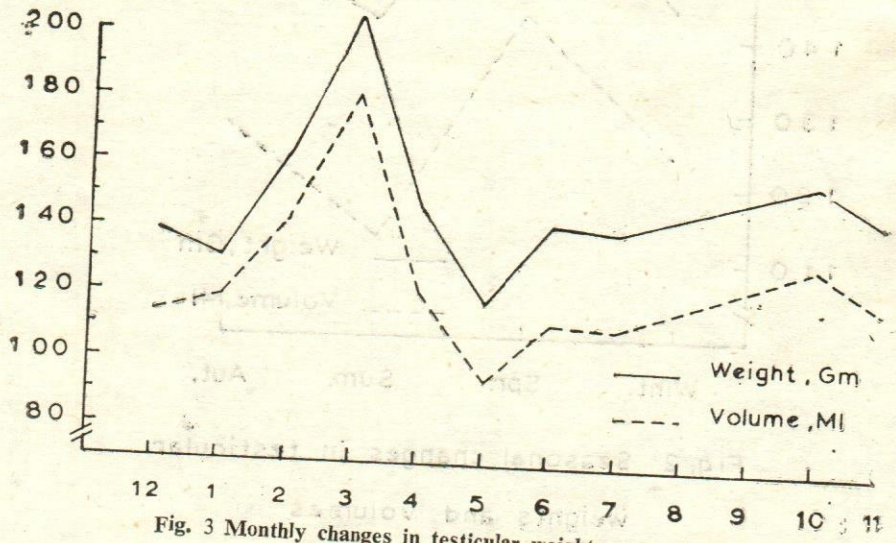

Fig. 3 Monthly changes in testicular weights and volumes

DISCUSSION

The present data shows that the weight of the testes increase from the age of 5 years up to 10 years and then appeared to be stable after that. No comparable data is found in the literature for the camel. TAYEB (1945), found that a range of 80-104 gm for the weight of the testis in camels ageing more than three years, which is almost equal to the tesicular weights of 6 years old camel included in the present study. The progressive increase in testicular weight up to the age of 8 years and the slight increase thereafter simulates the condition observed in growing anmials of other species as cattle (ABDEL-RAOUF, 1960) sheep (CARMON and GREEN, 1952), Goats YAO and EATON, 1954) and swine (PHILIPS and ANDREWS, 1936). The fluctuation observed between the age of 8 and 18 years may be due to seasonal changes, since the number of animals in each season within each age group is not equal which would likely give rise to such variations.

In this material, the difference in the weight between the left and the right testis was not statistically significant. In almost all animals the bilateral organs or glands are not equal in weight or size and growth varies by side, but the significance of such difference varies. In the bull, ABDEL-RAOUF (1960), found that the right testis as well as the right epididymis and seminal glands are significantly heavier than the left one. On the other hand ERIKSON, (1943) found that the difference between the right and left testis in the bull is not significant.

The different measuremens of the testis showed progressive increase up to the age of 8 years and slight changes thereafter, which denotes an increase in the growth of the different dimensions in relation to age. TAYEB (1945) gave only the length of the testis of adult camel more than 3 years. His figures are almost equal to those reported for 6 years old camels included in the present study. The rate of increase in the volume of the testis runs parallel to that observed for the weight. Similarly were the differences between the volume of the left and right testis. The available literature did not provide any data on the changes in the testicular volume to be compared with those occuring in the camel. However, EL-SAWAF (1966) noticed similar changes in young bulls.

Seasonal changes in the weight of the testis in the camel ageing 9 years or more showed statistical differences. The testis was much heavier during the spring season and decreased in weight during the summer and reincreased during the autumn and winter. Similar changes have been reported for the camel testis by VOLCANI (1964) and CHARNOT 1963 and 1964).

VOLCANI (1954) found that the camel testis averaged 96 gm in the winter and 66 gm in the summer. CHARNOT (1963 and 1964) found that the weight from mid Decembre to mid May was more than 165 gm and from May to November the weight was less than 140 gm. In other words, this means heavier testicular weight during the winter and spring than during the summer and autumn. In all seasonal breeding animals ; even the wild ones, the testis increase in weight during the rutting season (ASDELL, 1946).

The detailed monthly changes showed that the maximum weight is observed during March and that the increase observed during the autumn months is slower than that occuring during the winter months. The available literature used to culminate the data in seasons rather than months, and thus no comparable data are found for camels or other domestic animals.

The seasonal and monthly changes in the volume runs parallel to that of the weight of the testis. In the camel, CHARNOT (1965) found that during the rut season the size of the testis is greatly increased due to increased development of interstitial tissue. Also in the mink the testicular volume was highest at the end of February (rutting season) and lowest in October-November (KOSTRON and KUKLA, 1971).

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