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Micromorphological spectrum of the ovary of *Gaddi* sheep during different phases of reproduction and senility

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Abstract

The germinal epithelium of ovary of *Gaddi* sheep was simple squamous to cuboidal type in cyclic animals but was denuded in senile animals. Follicles in different stages of development and corpora lutea occurred in ovarian cortex of cyclic animals. In senile animals follicles were atretic and most of the stroma was replaced by fibrous tissue with many corpora albicantia. Polyovular primary follicles were also frequent in cyclic animals. Hilar cells were also recorded in the medulla of ovary.

Key words: *Gaddi*, sheep, ovary, micromorphology.

Introduction

Gaddi (Kashmere) sheep is reared by the nomadic tribes known as '*Gaddi*' of the temperate zone of Himachal Pradesh and Jammu and Kashmir. According to a popular belief, the very word '*Gaddi*' is as such derived from a Sanskrit word 'Gadi', which means sheep. Livestock as a whole and sheep in particular are integral part of tribal society and economy. It is the main source of milk, meat and wool for them and therefore, plays a key role in their socio economic life. The poor reproductive performance of the sheep culminates into heavy losses to the marginal farmers and in turn affects the state and national economy adversely. The extreme paucity of information on the anatomical and physiological aspects of this animal (Rajput and Sharma 1996, 1997 a, b and c) prompted the exploration of detailed histology of the ovary of the Gaddi sheep in different stages of the development and growth.

Materials and Methods

Ovaries were collected bilaterally from fourteen apparently normal adult (five in follicular, five in luteal and four in senile phase) sheep of Gaddi breed from different slaughter houses in and around Palampur town. After proper fixation in 10% neutral buffered formalin tissues from all the ovaries collected were processed through alcohol-benzene schedule for paraffin sectioning. Sections of 6 µm thickness were stained with Haematoxylin & Eosin for routine histology and Verhoff's - Van Gieson stain and Gridley's reticulum stain for fibro-cellular elements of the ovary of Gaddi sheep.

Results and Discussion

The germinal epithelium of ovary was simple squamous or cuboidal type as reported earlier (Rajput and Sharma, 1997b). The epithelium rested on a distinct basement membrane as in goats (Harrison, 1962). In senile animals epithelium was denuded. Tunica albuginea comprised of outer dense and inner loose layers.

In cyclic animals follicles and corpora lutea occurred in cortex in different stages of development interrupting the tunica albuginea as reported earlier (Rajput and Sharma, 1996). In senile animals there were no normal developing follicles. Almost all of them were atretic. The stroma was replaced by fibrous tissue with many corpora albicantia (Rajput and Sharma, 1997b) which comprised of a mass of fibroblasts and fibrocytes along with lot of macrophages. Primordial and primary follicles occurred as egg nests as also reported by Joshi (1974) in goats. Polyovular primary follicles were also frequent (Rajput and Sharma, 1996). The secondary follicles had 2-8 layers of follicular cells with the poorly defined theca. The Graafian follicles (diameter 1700-2000 µm) had fibrous theca externa and cellular theca interna.

Luteinised and haemorrhagic follicles were also seen in the cortical stroma of the ovaries. The atresia was a regular and continuous process but was more evident in senile phase. Certain unusual atretic follicles with acidophilic mass in centre surrounded by 6-8 layers of cuboidal cells were also observed. Their capsule comprised of smooth muscle cells. The corpus

luteum derived its capsule and trabeculae from the theca externa. Theca interna gave rise to small luteal cells while granulosa cells gave rise to large luteal cells as reported by Botha and Niekerk (1980). Spindle shaped cells were observed representing intermediate stage between large and small luteal cells.

The cortical stroma also contained fibroblasts, scattered and intrathecal interstitial cells, leukocytes specially eosinophils and mast cells (Rajput and Sharma 1996, 1997b).

The centrally located medulla contained thick walled and coiled blood vessels, fibroblasts, reticular fibers and bundles of smooth muscle (Harrison, 1962). Among the cellular contents many macrophages, fibroblasts, large and small lymphocytes and hilar cells were observed as recorded earlier (Rajput and Sharma, 1997b).

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