

## Study of Histopathological changes in Thyroid Gland in Buffaloes

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### Abstract

Present Study is observation of Histopathological changes of Thyroid Gland In Buffaloes. Tissue samples i.e.thyroid glands were collected from the 300 buffaloes slaughtered at Municipal Slaughter House, Balapur Akola. Thyroid glands were cut in to small pieces for further histopathological processing. They were dehydrated in ascending (50%, 70, 95, 100%) order of alcohol, cleared in xylene and embedded in paraffin and sections of 4-6 micro diameter were obtained and stained with haematoxylin and eosin stain. The animals slaughtered were certified as non-productive. During present study mean, standard deviation and standard error were calculated as per the standard procedure. Microscopically 76.96% glands were normal, incidence of colloid goitre was recorded in 11.72% thyroid, parenchymatous goitre in 1.89% thyroid, increased interfollicular spaces and fibrotic condition in 9.66% glands. Haemorrhages and congestion was observed in 2.75% thyroid glands. Conclusion of this study is colloid goitre due to distention and enlargement of number of follicles, congestion in the thyroid gland occurs as the part of more general syndrome and Interfollicular hemorrhages occurs due to distribution of RBCs, escaped from blood vessels.

**Keywords:** Thyroid gland, Goiter, Histopathology

### Introduction

Buffalo (*Bubalis bubalis*) is an important dairy animal species found in most of the Asian countries and are the main stay of milk supply in India, contributing 55 per cent of total milk production, though they constitute only 30 per cent of bovine population (FAO, 2002). Buffalo farming is an important agrobased industry for rural farmer, as rapidly increasing human population has caused an ever increasing demand of milk and other byproducts. Maharashtra State contributes 32,08172 buffaloes, out of which 5,69,417 buffaloes are in Nagpur and Amravati region.

Thyroid gland releases thyroxine as per demand by altering histological structure depending upon breed, age, sex and season etc. Hypothyroidism is one of the most important condition observed in bovines which is manifested by silent heat, still birth, retained placenta, purulent endometritis (Sastry,1983). Hypothyroidisms not only suppress development of immature ovaries but also normal physiological functioning of developed ovaries (Nasseri *et al.*, 1987). Thyroid gland has been indirectly involved in hypomagnesaemia as observed with thyrotoxicosis.

### Materials and Methods

Present study was carried out in the Department of Pathology, PGIVAS, Akola, Maharashtra Agriculture and Fishery Science University, Nagpur. In this study, the tissue samples of thyroid glands were collected from the 300 buffaloes slaughtered at Municipal Slaughter House, Balapur is situated at about 30 km away from Akola and Municipal slaughter house at Akola city in between April 2004 to August 2004. Thyroids were collected in normal saline at the time of slaughter and small pieces of thyroid glands in pair (right and left) were preserved in 10 per cent formal saline. Thyroid glands were cut in to small pieces for further histopathological processing. They were dehydrated in ascending (50%, 70%, 95%, 100%) order of alcohol, cleared in xylene and embedded in paraffin and sections of 4-6 micro diameter were obtained and stained with haematoxylin and eosin stain (Luna, 1968). The animals slaughtered were certified as non-productive during present study. Mean, standard deviation and standard error were calculated as per the standard procedure (Snedecor and Cochran, 1989).

## Results and Discussion

Microscopic examination of thyroid gland showed uniformly distributed variable sized viz., small, medium or large thyroid follicles lined by single layer of cuboidal or flat epithelium. The follicles were filled with uniformly distributed colloid. In some follicles colloid was reabsorbing type either with peripheral vacuolation or shred type or mobbing type leaving clear areas in the follicles. Empty follicles were also observed in some sections. In some sections very large sized follicles were also observed.

Majority of thyroid glands examined were normal, pathological lesions observed in thyroid glands were as follows.

Histopathologically colloid goitre was observed in 68 (11.72%) glands. Colloid goitre was characterized by distention and enlargement of number of follicles with single layered flattened epithelium filled with abundant colloid. Amidst these follicles medium small and microfollicles were seen which were lined by cuboidal epithelium microfollicles did not have any conspicuous lumen. In some cases colloid material was also observed to be distributed in the interfollicular spaces. These microscopic changes in colloid goitre were in agreement with findings of Verlekar (1999) and Ingole (2002) in buffaloes. Sastry (1983) reported that colloid goitre may occurs due to low levels of iodine in soil and water, increased demand during pregnancy, diseased conditions and ingestion of goitrogenous substances like thiouracil, soybean, cabbage etc.

During microscopic examination parenchymatus goitre was encountered in 11 (1.89%) glands. Parenchymatus goitre was characterized by combination of small and large sized follicles with hypertrophy or hyperplasia of follicular epithelium partially or completely occluding the follicular lumen. The some follicles contained scanty basophilic colloid or degenerated or desquamated lining cells. There was proliferation of interfollicular cells and increased vascularity, microfollicles were also observed in some such glands. Similar changes in parenchymatus goitre were also reported by Vashistha and Dwivedi (1975), Verlekar (1999) in buffaloes. Jubb *et al.* (1985) reported the inadequate amount of iodine available for organic

synthesis of thyroid gland were major cause /etiology of such condition, due to this output of thyroid hormone is reduced and compensatory increase in amount of TSH released from pituitary gland which leads to hypertrophy followed by hyperplasia of thyroid epithelium. In addition to this increase in amount of tissue capable of thyroxine synthesis, the thyrotropic hormone increase the efficiency of thyroid in trapping iodine and in the absence of inhibitory influence of synthesizing thyroxine leads to parenchymatus goitre occurs.

Such condition was observed in 56 (9.66%) of the thyroid. In these glands were showed variable sized follicles with increased interfollicular spaces and these spaces were filled with proliferated fibrous connective tissue / smooth tissue. The follicles of such glands were lined by flat or low cuboidal epithelium and in some follicles lumen were empty. Similar lesions were recorded by Purushottam *et al.* (1985). Such lesions were also described under the head myxedema by Jubb *et al.* (1985) opined that in thyroid atrophy follicular epithelium is replaced by adipose tissue along with mild increase of connective tissue in interfollicular spaces as observed in present study. Sastry (1983) revealed, fibrosis results due to chronic inflammation i.e. when irritant persist for long period and the body responds by producing excessive amount of connective tissue in the area. In the present study the trauma or injury could not be proved. It might be due to result of chronic irritation as in general the buffaloes are tied with chain and their movement might be causing some mild chronic injury to thyroid which may lead to fibrotic condition.

Congestion / haemorrhages was observed in 16 (2.75%) of thyroids. In congestion capillaries were engorged and packed with red cells. In haemorrhages there was escape of blood from capillaries. Similar observations were also recorded by Verlekar (1999) and Ingole (2002).

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Table-1. Incidence of microscopic lesions in thyroid gland of buffaloes

Sr. No.	Microscopic lesion	Right thyroid gland	Left thyroid gland	Total
1.	Colloid goitre	31 (5.34%)	37(6.37%)	68(11.72%)
2.	Parenchymatus goitre	6 (1.03%)	5(0.86%)	11(1.89%)
3.	Fibrotic condition	27(4.66%)	29(5.00%)	56(9.66%)
4.	Haemorrhages and congestion	7(1.21%)	9(1.55%)	16(2.75%)
5.	Normal	219(37.75%)	210(36.21%)	429(73.96%)
	Total	290	290	580

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