MICROSTRUCTURE OF THYROID GLAND IN QUAIL

(*Cortunix cortunix japonica*)

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ABSTRACT

Thyroid glands from 15 Japanese quails, ranging from 1 week to 9 weeks, were collected. The thyroid follicles were separated from each other by collagen fibers. The small and medium were abundant as compared to large follicles. These follicles were categorized as active and inactive on the basis of the type of epithelium and nature of colloid substance. Inactive follicles were more in adult quails. Large parafollicular cells were observed in intra-follicular space.

KEYWORDS : Histology, Thyroid gland, Japanese quail

INTRODUCTION

Thyroid gland is a unique endocrine gland in which hormone is stored extra-cellularly in the gland. The role and importance of hormone secreted by this gland in avians is well known. Hence, in many toxic and carcinogenic studies, histological examination is included (Hardisty and Broorman, 1990). This study forms functional norms in relation to growth and production of Japanese quail. Research on thyroid gland of quail is scanty which prompted us to undertake this study.

MATERIALS AND METHODS

Thyroid glands were collected from 15 Japanese quails, ranging from 1 week to 9 weeks old, at the intervals of 2 weeks. Quail were sacrificed by giving Chloroform anesthesia and thyroid glands were collected. Tissue pieces were fixed in 10 % Neutral buffered formalin. Paraffin blocks were prepared and sectioned at 5-6 µm thickness and stained by Haries Haematoxylin and Eosin method (Druy and Wallington, 1967).

RESULTS AND DISCUSSION

Thyroid gland had 2 similar lobulated structures observed on dorsolateral surface of cranial part of trachea connected by connective tissue capsule. It was made up of collagen, reticular and few elastic fibers and in full agreement with Hodges (1974) and Ashok *et al.* (1993) in fowl and cattle respectively . The follicles were separated from each other by more collagen fibers and few reticular fibers **(Fig. 1)**. Small and medium sized follicles were observed throughout the gland while large follicles were restricted to periphery and increased in number as the age of quail advances **(Fig. 2)**. These observations concur with the earlier reports of Balsundaram (1995) in white leghorn chicken and Sathyamoorthy and Vijayaragavan (1997). Distinct basement membrane was not observed in all the groups as reported by Bradley and Grahame (1960) and Fitzgeraled (1969) in quail on the contrary Balsundaram (1995) stated the presence of distinct basement membrane in the follicles of thyroid gland in white leghorn chicken.

Follicles could be categorized as active and inactive on the basis of type of epithelium and nature of colloid **(Fig. 3)**. Active follicles were lined by simple cuboidal epithelium with basophilic stained colloid, while inactive follicles were lined by simple squamous epithelium with acidophilic colloid. These observations are in collaboration with findings of Wight and Shannon (1985), Sathyamoorthy and Vijayaragavan (1997) in quail and Balsundaram and Mokkappan (2004) in domestic fowls. Granular and vacuolated colloid was observed in active follicles indicating the regular production and utilization in the follicles. Cytoplasmic granules observed in supranuclear position of follicular cells may be precursors of colloid in the follicular cells.

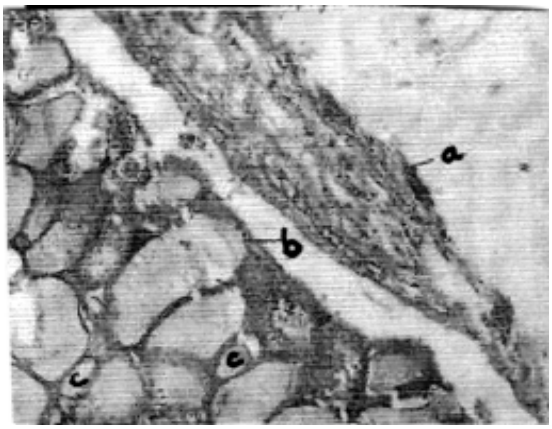

Fig. 1
Microphotograph of thyroid gland of quail showing -

(a) Capsule **(b)** Large follicle

(c) Small follicle H & E, 200X

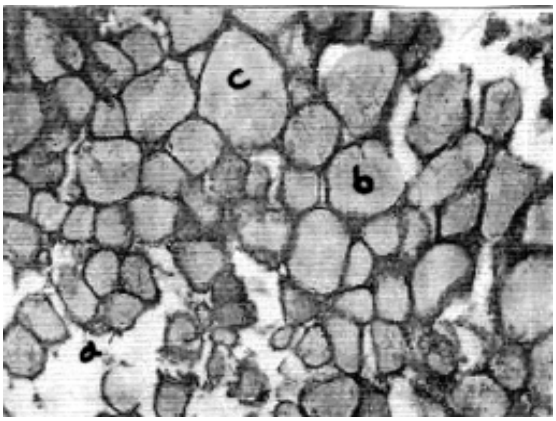

Fig. 2
Microphotograph of thyroid gland of quail showing -

(a) Small follicle **(b)** Medium sized follicle

(c) Large follicle H & E, 200X

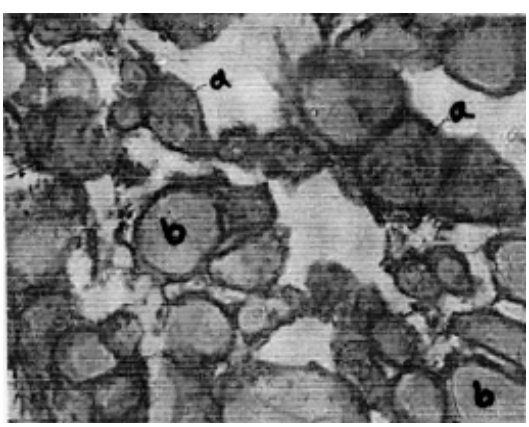

Fig. 3
Microphotograph of thyroid gland of quail showing -

(a) Active follicles **(b)** Inactive follicles

H & E, 200X

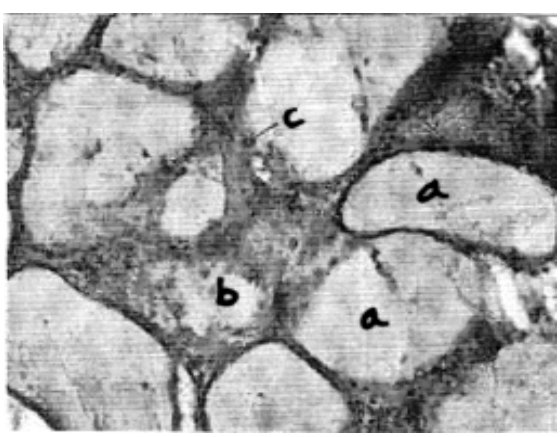

Fig. 4
Microphotograph of thyroid gland of quail showing -

(a) Inactive follicles with acidophilic colloid

(b) Active follicle with basophilic colloid

(c) Parafollicular cells

H & E, 200X

In 9 weeks old quails, more numbers of inactive follicles full of colloid were prominent than young quails **(Fig. 4)**. These findings concur with earlier findings of Singh and Bhardwaj (1982) in white leghorn chicken. The colloid contents of active follicles were basophilic, whereas the colloid contents of inactive follicles were acidophilic **(Fig. 4)**. These findings are in full agreement with the reports of Dellmann (1993) that colloid was accumulated in dense form due to less utilization for production. Colloid cells of Langendorff observed in follicles were believed to be the aged cells of the follicles replaced by the new developing cells in the follicles which is in agreement with Sathyamoorthy and Vijayaragavan (1997). In interfollicular space, groups

of large polyhedral cells resembling follicular cells were observed and may act as progenitors of new thyroid follicles. Large parafollicular cells with spherical nuclei and faintly stained cytoplasm observed in inter-follicular space, which are in accordance with the findings of Singh and Bhardwaj (1982) in white leghorn chicken and Sathyamoorthy and Vijayaragavan (1997) in quail.

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