IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 8, Issue 1 Ver. II (Jan. 2015), PP 27-29
www.iosrjournals.org

A Study on Gross Structure of Thyroid Gland in Pati Ducks (Anas Platyrhynchos Domesticus) Of Assam at Various Age Groups

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Abstract: *In the present investigation, a total of 42 Pati ducks were utilized. The ducks were randomly divided into seven (7) groups consisting of six (6) birds in each group. The seven groups of birds were sacrificed at 7 different age viz. day old, 2 weeks, 4weeks, 8weeks, 20weeks, 30weeks and 40 weeks. The location and relative topographic in-situ position of the thyroid gland was recorded. Both the thyroid glands were taken out and the weight of each of them were recorded. The paired thyroid glands in the Pati ducks were located on either side of the trachea close to the vascular angle formed by the subclavian artery and common carotid artery. The average lengths of the thyroid gland were 0.2716± 0.0054 cm and 0.2750 ± 0.0050 cm for left and right respectively in day old ducks. Weight of the thyroid gland also showed an increasing trend with age.*

Keywords: *Thyroid gland, Pati ducks, Age groups.*

I. Introduction

Duck rearing plays an important role in the upliftment of the socio-economic condition of the rural population of Assam. The thyroid gland is a unique endocrine gland which plays an important role in carbohydrate, protein, lipo-regulatory mechanisms etc.relevant to growth. It is a critical organ for maintaining general metabolic rate and controlling pre and post natal growth and differentiation of many organ systems. Thyroid hormones in birds regulate body weight, plumage growth, fertility, secondary sex characteristics and lipid metabolism. Literature on the gross structure of thyroid gland in duck is scanty and therefore, this work was undertaken to study the age related developmental changes of thyroid gland in Pati ducks and to form the basis for correlating the possible functions of thyroid gland in relation to the growth and production of layer ducks, deficiency syndrome and detection in any abnormality of the thyroid gland.

II. Materials And Methods

The experimental birds were sacrificed according to the method of Gracy (1986). After slaughter, the birds were placed on a clean dissecting table, mid-ventral incision was put ;clavicle along with breast muscles were cut and were reflected carefully without disturbing the organs of the region. The thoracic cavity of each bird was exposed by making a ventro-median incision and then the thoracic muscular layers and air sac of the clavicle were reflected. The location and relative topographic in-situ position of the thyroid gland was recorded. Both the thyroid glands were taken out and the weight of each of them were recorded with the help of electronic pan balance. The gross anatomical characteristics of each gland were studied and the different biometrical measurements viz, length, breadth and thickness of the right and left thyroid glands were recorded by Vernier callipers (Mc Cance, 1974). The data were analysed using the Statistical Analyses System version 9.3 (SAS 2012) for Microsoft Windows.

III. Results And Discussion

The paired thyroid glands in the Pati ducks were located on either side of the trachea close to the vascular angle formed by the subclavian artery and common carotid artery (Fig 1). Similar observations were made by Raether (1964) in ducks. The thyroid glands were round, oval or elliptical and were reddish brown in colour (Fig 2). Similar findings were observed by Hodges (1974) in poultry. The average length of the thyroid gland were 0.2716± 0.0054 cm and 0.2750 ± 0.0050 cm for left and right respectively in day old ducks and 0.9833± 0.0021 cm and 0.9866 ± 0.0021 cm for left and right respectively in case of 40 weeks old birds. The average breadth of thyroid in day old ducklings were 0.2016 ± 0.0030 cm for left and 0.2016 ± 0.0040 cm for right , while in the case of 40 weeks old ducks the corresponding values were 0.7783 ± 0.0040 cm and 0.7783 ± 0.0040 cm for left and right thyroid gland respectively. The average thickness in day old ducklings were 0.1750 ± 0.0022 cm for left and 0.1750 ± 0.0022 cm for right , while in 40 week old ducks the values were 0.8283 ± 0.0047 cm and 0.8216 ± 0.0030 cm for left and right side thyroid gland respectively. Similar increasing trend was observed in all the length, breadth and thickness morphometric parameters during postnatal growth were

observed by Firdous et al. (2012). Weight of the thyroid gland also showed an increasing trend with increase in age. The average weight of the thyroid gland in day-old duckling was 0.0216 ± 0.0047 g and 0.0216 ± 0.0047 g for left and right respectively, while in case of 40 weeks old ducks the corresponding values were 0.9816 ± 0.0047 g and 0.9816 ± 0.0047 g for left and right thyroid respectively. Increase in weight with age was in accordance to Nichols et al. (1949) who reported that the weight of the thyroid gland was almost directly proportional to body weight, length and age. The left thyroid gland in Assam Pati ducks was almost similar in size as that of the right one. Similar finding was reported by Radek and Piasecki (2005) in Accipitridae. Morphometrical parameters are shown in table 1.

IV. Conclusion

In this study, all the morphometrical parameters of the thyroid glands in Pati ducks showed an increasing trend with increase in age.

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Table 1: Morphometry Of The Thyroid Glands In Assam Pati Ducks At Different Age Groups

Experimental groups	Age		Organ Weight (g)	Length (cm)	Breadth (cm)	Thickness (cm)
I	Day Old	Left	0.021 ± 0.004^{g}	0.271 ± 0.005^{g}	0.201 ± 0.004^{g}	0.175 ± 0.002^{g}
		Right	0.021 ± 0.004^{g}	0.275 ± 0.005^{g}	0.2016 ± 0.004^{g}	0.175 ± 0.002^{g}
II	2 Weeks	Left	0.053 ± 0.004^{f}	0.420 ± 0.002^{f}	0.260 ± 0.002^{f}	0.213 ± 0.002^{f}
		Right	0.056 ± 0.004^{f}	0.426 ± 0.003^{f}	0.265 ± 0.003^{f}	0.216 ± 0.002^{f}
III	4 Weeks	Left	0.120 ± 0.003^{e}	0.476 ± 0.014^{e}	0.388 ± 0.005^{e}	0.258 ± 0.003^{e}
		Right	0.120 ± 0.003^{e}	0.473 ± 0.004^{e}	0.380 ± 0.005^{e}	0.258 ± 0.003^{e}
IV	8 Weeks	Left	0.338 ± 0.004^{d}	0.568 ± 0.003^{d}	0.438 ± 0.004^{d}	0.316 ± 0.003^{d}
		Right	0.331 ± 0.004^{d}	0.566 ± 0.003^{d}	0.438 ± 0.004^{d}	0.310 ± 0.002^{d}
V	20 Weeks	Left	0.738 ± 0.003^{c}	0.653 ± 0.003^{c}	0.576 ± 0.004^{c}	0.558 ± 0.003^{c}
		Right	0.733 ± 0.002^{c}	0.651 ± 0.003^{c}	0.576 ± 0.004^{c}	0.550 ± 0.003^{c}
VI	30 Weeks	Left	0.853 ± 0.003^{b}	0.776 ± 0.003^{b}	0.636 ± 0.004^{b}	0.700 ± 0.005^{b}
		Right	0.853 ± 0.003^{b}	0.776 ± 0.003^{b}	0.636 ± 0.004^{b}	0.700 ± 0.005^{b}
VII	40 Weeks	Left	0.981 ± 0.004^{a}	0.983 ± 0.002^{a}	0.778 ± 0.004^{a}	0.820 ± 0.004^{a}
		Right	0.981 ± 0.004^{a}	0.986 ± 0.002^{a}	0.778 ± 0.004^{a}	0.821 ± 0.003^{a}

Means with different superscripts are significantly different from each other.

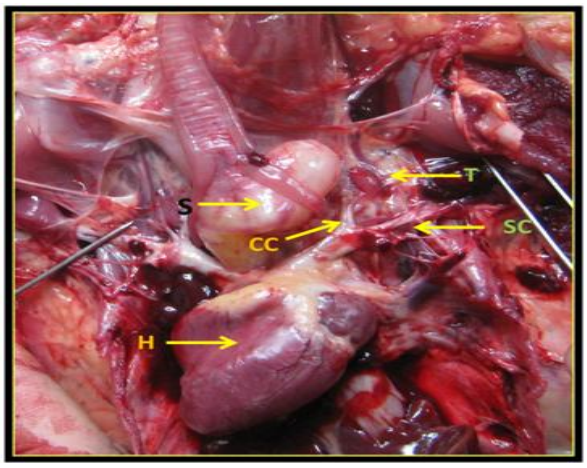

FIG. 1: Photograph showing in situ position of thyroid gland(T) with heart (H), syrinx (S), common carotid artery (CC) and subclavian artery (SC) in 20 weeks old duck.

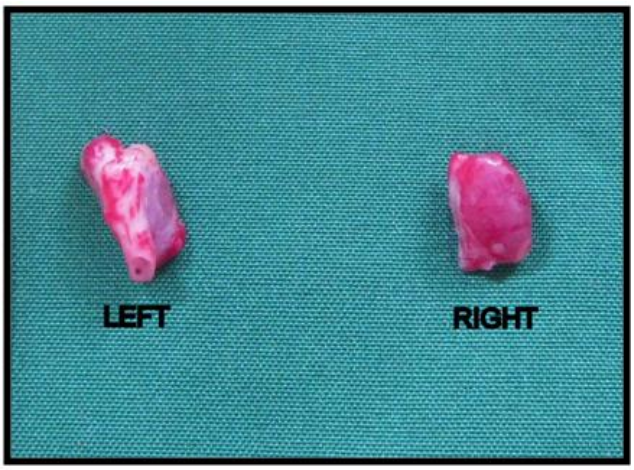

Fig. 2: Photograph showing the reddish colour oval shaped left and right thyroid gland in 40 weeks old ducks.