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Comparative histomorphological and histochemical studies on infundibulum of oviduct of jharsim & dahlem red hen

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Abstract

The present investigation was aimed to reduce the histomorphological and histochemical changes in infundibulum of oviduct of jharsim and Dashlem Red hens. The lamina epithelium of infundibulum in both jharsim and Dahlem red hens were lined by simple columnar cells along with few goblet cells. The mucosal folds of funnel part were branched up to secondary only, whereas in tubular part the mucosal folds were long which had tertiary branches also. The mucosal folds were better developed and larger in Dahlem Red birds. The tubular glands were not visible in funnel part of infundibulum in both jharsim and Dahlem Red hens. The lamina propria and submucosa were intermingled in both jharsim and Dahlem Red hens. The tunica muscularis in Dahlem Red hens showed a slight decrease in thickness and consistency of the muscle fibres as compared to the jharsim birds. In Jhareem birds the epithelium of infundibulum showed strong positive reaction for alcian blue, moderate for PAS and weak reaction for bromophenol blue as well as alizarin red. However, in Dahlem Red hen's lamina epithelialis of infundibulum showed strong positive reaction for PAS and alcian blue, moderate for bromophenol blue and weak for alizarin red. The number of tubular glands per mm square area per cross section were comparatively more in jharsim hens (545.33 ± 2.45) than that of Dahlem Red hens (532.33 ± 1.81). Significantly highest number of mucosal folds were recorded in tubular part of infundibulum and lower number of mucosal folds were seen in funnel part of infundibulum in both jharsim and Dahlem red birds. 't' test of significance was done to see the difference in number of mucosal folds per cross section in the same segment of jharsim and Dahlem Red hens. Significantly higher number of mucosal folds in jharsim hens in comparison to Dahlem Red hens.

Keywords: Histomorphological, histochemical, infundibulum, jharsim hen, dahlem red hen

Introduction

Jharsim is recently developed variety at Ranchi veterinary College, Birsa Agricultural University. It is dual purpose variety which is used for both egg and meat production. It gain body weight about 1-1.5 kg in three month of age. It lays egg about 120-140 egg per annum. It is produced by the cross of Dahlem Red, Desi and Punjab Bro. Dahlem Red is laying breed which is mainly used for egg purpose. It lays egg about 240-250 egg/annum. The production and reproduction traits in birds are directly related to the fertility, which in turn is related to the structural and functional status of the reproductive system. There is no literature available on the oviduct of adult jharsim hen. A clear conception and detail histomorphological and histochemical studies of oviduct of jharsim and Dahlem Red hens might be helpful in exploration of physiological action of oviduct of dual purpose and laying hen leading to completion of an avian egg. Keeping all the above facts in view the present study had been

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conducted to explore the Histomorphological and histochemical study of m agnum of oviduct of jharsim and Dahlem Red hens.

Material and Methods

The present study was conducted on six jharsim and six Dahlem Red healthy hens. The oviduct was collected immediately after their slaughter in dissection hall of the Anatomy department of Ranchi Veterinary College. The small piece of tissue from Infundibulum were collected. The standard fixation procedure for histological and histochemical staining was carried out (Drury & wallington, 1967) [2]. The tissue was preserved in 10% neutral buffered formalin solution. A few tissue was preserved in chilled acetone and 70% cold alcohol for histochemical studies. After proper preservation of tissue, small piece of tissue of about 5mm in length was trimmed and hand driven Reichert rotatory microtome was used to cut the tissue block in to fine sections, usually 4 micrometre to 7 micrometre. The section so obtained was stained for Histological procedure (Luna, 1968) [5]. Cryostat section at 8-10 micrometre was obtained from fresh tissue for various histochemical procedure (Humanson, 1967) [4].

Results and Discussion

Lamina epithelialis of the Infundibulum of oviduct of jharsim and Dahlem Red hens were lined by pseudostratified ciliated columnar cells. The above observation was in agreement with the statements of Gilbert (1979) and Shyam (2012) [9] in hens. The mucosal folds were long varied in shape and comparatively more branched up to secondary and tertiary folds in jharsim hens (Fig. 1). However, it was finger like in Dahlem red hens (Fig. 2). This statement was in agreement with the statements of Rao (1994) [8] and Deka *et al.* (2014) [1] in duck. The folds possessed scattered branched tubular glands in both the jharsim and Dahlem Red hens. The number of tubular glands per mm square area per cross section were comparatively more in jharsim hens (545.33 ± 2.45) than that of Dahlem Red hens (532.33 ± 1.81). Mehta (2001) [6] stated that the tubular glands were densely packed in tubular part of infundibulum in both Developing (47.23 ± 0.23) and laying hens (847.99 ± 2.14). Significantly highest number of mucosal folds were recorded in tubular part of infundibulum and lower number of mucosal folds were seen in funnel part of infundibulum in both jharsim and Dahlem red hens. The 't' test of significance was done to see the difference in number of mucosal folds per cross section in the same segment of jharsim and Dahlem Red hens. Significantly higher number of mucosal folds in jharsim hens in comparison to Dahlem Red hens. In accordance with above finding significantly maximum number of tubular glands were seen in tubular part of infundibulum in laying hen Mehta (2001) [6]. Mehta and Singh (2004) [7] stated that laying birds significantly highest number of mucosal fold was observed in tubular part of infundibulum, however, lowest number was observed in funnel part of infundibulum.

In Jhareem birds the epithelium of infundibulum showed strong positive reaction for alcian blue, (Fig. 7), moderate for PAS (Fig. 3) and weak reaction for bromophenol blue (Fig. 5). Whereas, the tubular glands of infundibulum showed weak positive reaction for PAS (Fig. 3), bromophenol blue (Fig. 5), and very weak for alcian blue. Regarding, Dahlem red the lamina epithelialis of infundibulum showed strong positive

reaction for PAS and alcian blue (Fig. 4 & 8), moderate for bromophenol blue (Fig. 6). However, tubular glands showed strong positive reaction for PAS (Fig. 4), bromophenol blue (Fig. 6) and weak for alcian blue (Fig. 8). Mehta and Singh (2003) described that the epithelium of tubular part showed strong affinity for PAS and bromophenol blue but very strong affinity for alcian blue in developing birds. However, in laying hens lamina epithelialis showed a weak affinity for PAS and strong to very strong affinity with alcian blue and bromophenol blue.

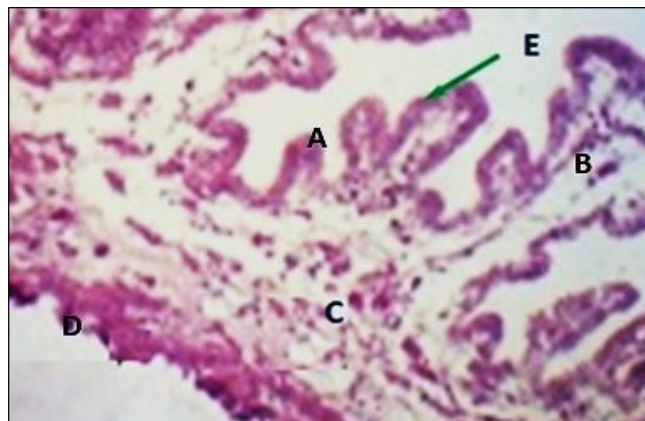


Fig 1: Cross section of tubular part of infundibulum of jharsim hen showing A-Epithelium, B-Core of the mucosal folds, C-Tunica muscularis, D-Tunica serosa, E-Secondary branch of mucosal folds (H & E X 100)

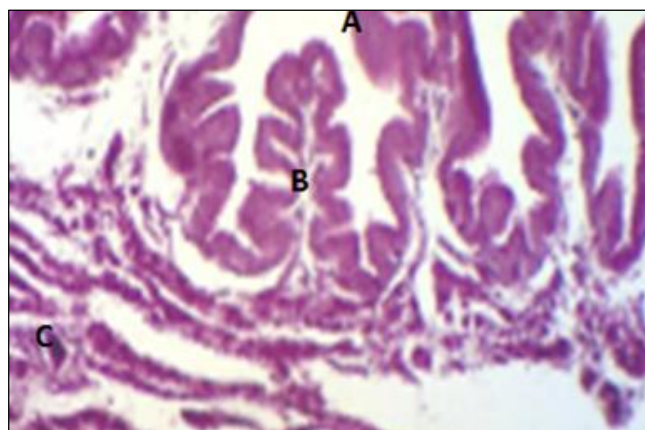


Fig 2: Cross section of infundibulum of Dahlem Red hen showing A-Epithelium, B-Core of mucosal folds, C-Tunica muscularis (H & E X 100)

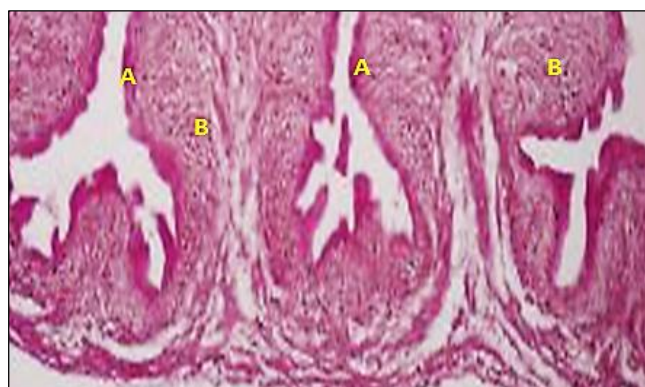


Fig 3: Cross section of infundibulum of jharsim hen showing A-Epithelium B-Tubular glands (PAS X 100)

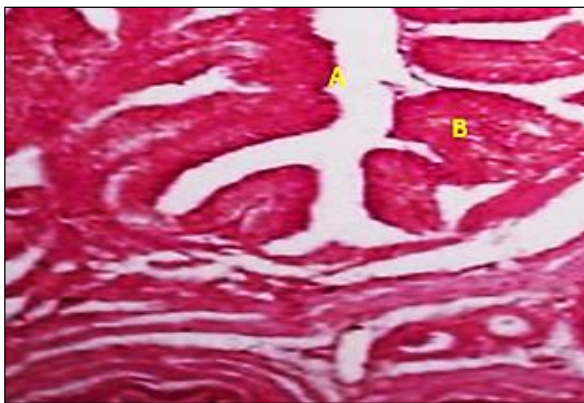


Fig 4: Cross section of infundibulum of Dahlem Red hen showing A- Epithelium B-Tubular glands (PAS X 100)

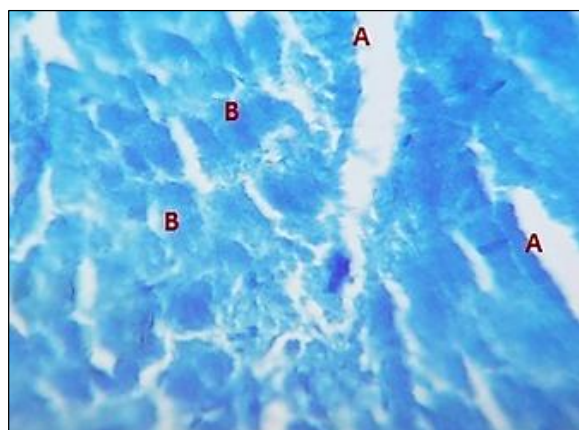


Fig 5: Cross section of infundibulum of jharsim hen showing A- Epithelium B-Tubular glands (Bromophenol blue X 100)

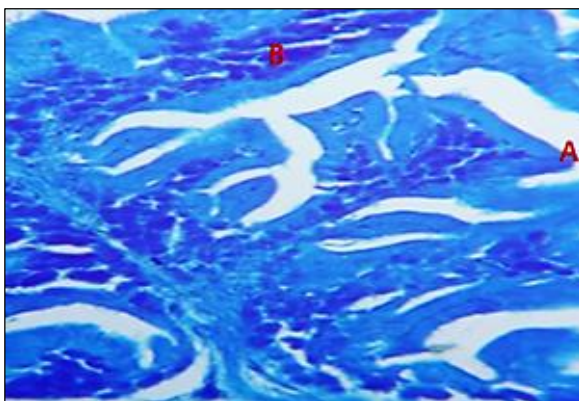


Fig 6: Cross section of infundibulum of Dahlem Red hen showing A-Epithelium, B-Tubular glands (Bromophenol blue X 100)

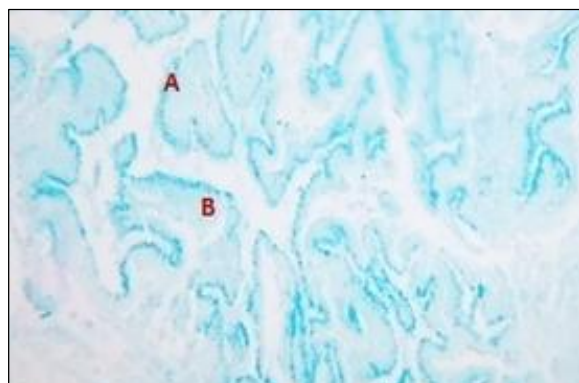


Fig 7: Cross section of infundibulum of jharsim hen showing A- Epithelium, B-Tubular glands (Alcian blue X 100)

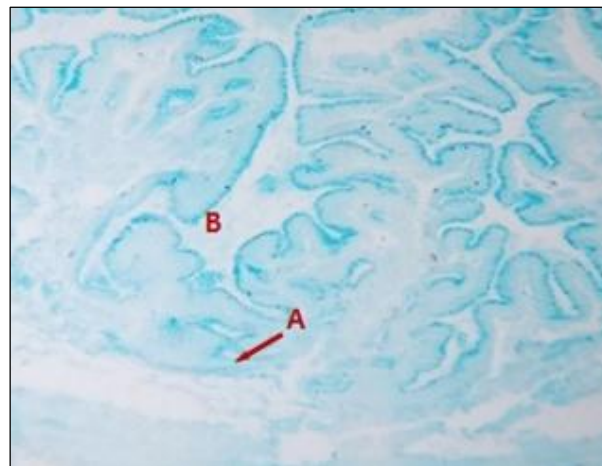


Fig 8: Cross section of infundibulum of Dahlem Red hen showing A-Epithelium, B-Tubular glands (Alcian blue X 100)

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