STRATEGY TO MANAGE BIO-ECO-HEALTH SYSTEM
FOR STABILIZING ANIMAL HEALTH &
PRODUCTIVITY TO SUPPORT PUBLIC HEALTH

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ABSTRACT

Immunocytochemical studies were performed to describe the characteristics of cell types and their distribution in the pars distalis of pituitary ostrich, Struthio camelus. The growth hormone (GH)-immunoreactive (ir) cells were round or oval orangeophilic cells distributed in the caudal region of the pars distalis with prominent aggregation in the posterolateral region. The prolactin (PRL) cells were pleomorphic carminophilic cells that occurred in the anterior, central and dorsocaudal regions of the pars distalis. The adrenocorticotropic (ACTH) cells were large round or polygonal amphiphilic cells in the all region of the pars distalis, except in the dorsal areas. The follicle-stimulating hormone (FSH) cells were identified immunohistochemically with antisera against the specific subunits of chicken FSH in the all regions of pars distalis of pituitary gland of the ostrich. No luteinizing hormone (LH) cells was found using anti-chicken LH rabbit serum.

Keywords: immunohistochemical, adenohypophysial cells, pituitary pars distalis, ostrich

INTRODUCTION

There is much variation in the pituitary morphology of adult domestic animals and fowls (Mikami, 1958). The avian adenohypophysis has a characteristic morphology, consisting of the pars distalis, which is divided into two cytologically distinct areas (the cephalic and caudal lobes), and the pars tuberalis, which bridges between the median eminence and anterior pituitary; the median eminence and anterior pituitary are not connected directly, but by the pituitary portal vessels, there being no pars intermedia (Mikami, 1958). Although several immunohistochemical studies about the distribution of adenohypophysial cells in the pituitary gland of chicken and turkey (Proudman et al., 1999; 2003), but there are no reports on the distribution of adenohypophysial cells in the pituitary gland of ostrich (Sruthio camelus). To clarify this, we studied the distribution of adenohypophysial cells in the pituitary gland of ostrich using immunohistochemistry (IHC) method.

MATERIALS AND METHODS

The ostrich used in this research, were obtained from Hyogo Ostrich Farm, Japan. The pituitary gland was rapidly removed and fixed in Zamboni’s solution for 2 days. Following fixation, the pituitary glands were dehydrated through a series ethanol solution, placed in xylene, and embedded with Tissue Prep (Pathoprep® 580, Wako, Japan). Pituitaries were serially sectioned at 5 μm sagittal in vivo. Sections were dewaxed in xylene and then dehydrated by passing through ethanol solution. Some of the sections were stained with hematoxylin and eosin (HE) and other stainings. For IHC, dewaxed sections of the pituitary glands were incubated in 1% skim milk and sections were treated with anti-human ACTH rabbit serum (NIDDK, 1:4,000), anti-chicken FSH rabbit serum (1:1,000), anti-human
rabbit GH serum (NIDDK, 1:1,000), anti-chicken PRL rabbit serum (1:3,000), anti-chicken LH rabbit serum (1:25,000). These sections were then washed in Phosphate Buffer Saline (PBS), incubated with 3% hydrogen peroxide (H₂O₂) in PBS and avidin-biotinylated enzyme complex (Wako, Japan), respectively, and washed in PBS. Hereafter, they were incubated in 0.02% 3,3'-diaminobenzidine tetrahydrochloride solution containing 0.005% H₂O₂ for 5 min, counter-stained with hematoxylin and observed under light microscopy.

RESULTS AND DISCUSSION

The GH-ir cells were round or oval orangeophilic cells distributed in the caudal region of the pars distalis with prominent aggregation in the posterolateral region. The PRL cells were pleomorphic carminophilic cells that occurred in the anterior, central and dorsocaudal regions of the pars distalis. The ACTH cells were large round or polygonal amphophilic cells in the all region of the pars distalis, except in the dorsal areas. The FSH cells were identified immunocytochemically with antisera against the specific subunits of chicken FSH in all regions of pars distalis of pituitary gland of the ostrich (Figure 1.). No LH cells were found using anti-chicken LH rabbit serum. In summary, the present study would seem to indicate that the distribution of adenohypophysial cells in the pars distalis of the ostrich mainly in the all areas except the GH cells.

Figure 1. Distribution of ir-adenohypophysial cells in the pituitary pars distalis of the ostrich (Struthio camelus)

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