

Study and identification of primordial germ cells in the gonad of female pheasant embryo (*Phasianus colchicus*) using various histological techniques

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Abstract

The goal of this study was to detect and evaluate the presence of primordial germ cells in pheasant ovarian tissue at various embryonic ages. These are the only growing cells in the embryo capable of transmitting genetic information to the following generation via gametogenesis. Birds are quite useful for research in this area because of their growth features. On the other hand, the pheasant is one of the birds with very beneficial features, but this rare species is at risk of extinction. In this study, 28 fertilized pheasant eggs were used, and the gonads of female embryos were differentiated based on their asymmetry and retrieved between embryonic days 9 and 24. Tissue sections were prepared as serial sections and the identification of primordial germ cells was examined using hematoxylin-eosin and PAS staining, as well as semithin slice preparation and toluidine blue staining. The number of primordial germ cells, cell volume, and nucleus volume of primordial germ cells were then estimated using stereological techniques. Early germ cells were recognized in paraffin and resin sections from embryonic days 9 to 14 because of their unique properties, which comprised a big nucleus and little cytoplasm. Furthermore, the response of these cells to PAS staining was negative at all ages. According to the stereological results, the number of primordial germ cells was decreased at more advanced ages of development, so that it was not seen at 18 day embryo. Whereas, the volume of the primordial germ cells and nucleus of these cells have been increased with the increasing of the age. The findings of this study revealed that primordial germ cells in the ovarian tissue of pheasant embryos at all examined ages responded negatively to the PAS staining, whereas routine hematoxylin and eosin staining and the use of semithin sections are suitable for microscopic detection of these cells. Morphologically, this cell in pheasant was similar to other birds, whereas in terms of histochemistry, the reaction of these cells was negative to PAS staining which differs from some species of birds.

Key words: Primordial germ cells, Pheasant embryo, Female gonad, Semithin section, Stereology

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