Development of the stomach in the domestic goose (*Anser anser f. domestica*) from 9th to 25th day of incubation

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The stomach in birds consists of two parts: proventriculus (glandular stomach) and ventriculus (muscular stomach). The aim of the study was to follow the developmental rate of both chamber of stomach of goose and characterize histogenesis of the their wall.

The study is proceed on the domestic goose embryos from 9th to 25th day of incubation by using LM and SEM methods. The studies were conducted with approval of Ethical committee.

During the incubation the intensive growth of stomach was observed. The weight of the stomach increase about 173 times and the length increase 11 times. It change also the proportion of size the two-chambered stomach. Until the 13th day proventriculus it is longer chamber of stomach, but before hatching the decrease of the length to the half part of the ventriculus was observed. The development of the wall of the stomach occurs in two periods. The first – embryonic period lasts between 9th to 15th day and the second – differentiation period lasts from 16th to 25th day. In the first period the embryonic tissues transform into mucosa layer with primordia of proper glands, muscular and serosa layer. During the differentiation period glandular primordia in the proventriculus and ventriculus develop. Proper glands of the proventriculus transform from simple tubes into compound glands from 19th day of incubation. Between 19th and 23rd day they produce neutral glycoproteins and from 24th day acid glycoproteins. Simple ventriculus glands start to produce neutral glycoproteins from 16th to 18th day and on 24th – 25th day elongate and reach the muscular layer.

At the end of incubation the both chamber of geese's stomach is ready to fulfill the function as in the adult birds. The development of the of superficial glands in proventriculus and glands of ventriculus will continue after hatching under the influence of the collected food.

SEM observations on embryonic development of the tongue in *Lacerta agilis* (Reptilia)

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The tongues in adult sand lizard have characteristic morphology with divided apex of the tongue covered by keratinized epithelium and numerous mucosal fold on dorsal and lateral surfaces of tongue, called lingual papillae. The aim of the SEM studies was to analyze the morphogenesis of the tongue in sand lizard embryos from 10–30 day of incubation.

The mandibles with tongues were fixed in Karnovsky solution, dehydrated and critical point dried. Finally the samples were covered with gold and observed in scanning electron microscope ZEISS 435 VP.

The tongues of very early embryo on 10–12 day of incubation have triangular shape with slightly furrow on the apex as primordium of future anterior processes. The mucosa on dorsal surface of tongue is flat with embryonic epithelium. Between 14–19 day of incubation the apical furrow get deeper. In posterior part of the tongue at laryngeal entrance the mucosa is slightly folded. Between 21 and 23 day of incubation the anterior processes elongate and are covered partly by keratinized epithelium. The dorsal and lateral mucosa on body and root of the tongue shows delicate pattern of parallel ridges running transversely to the main axis of tongue. On 26 –30 day of incubation these mucosal ridges are observed only on lateral borders of the tongue. In the middle surface of tongue mucosal ridges divided into smaller squamae, directed to posterior part of tongue. The measurement of tongues during incubation showed in 2.5× increase in length and also in width.

The SEM observation showed that the development of microstructures of the tongue in sand lizard are continued after hatching.

All specimens used in experiment were captured according to Polish legal regulations concerned with wild species protection (Dz.U. nr 2 poz. 11 z 1984 r., Dz.U. nr 114 poz. 492 z 1991 r.). Department of Histology and Embryology obtained approval of Polish Ministry of Environment Protection and Forestry for performing studies on protected species (DOPog-4201-02-94/05/aj). The sand lizard *Lacerta agilis* L. is not included in Washington Convention of 1973, ratified by Poland in 1991(Dz.U. nr 27 poz.112).