

**HISTOLOGICAL EXAMINATION OF SNAIL MEAT SPECIALITIES****Bohuslava Tremlová, Iva Steinhauserová**

Department of Meat Hygiene and Technology  
University of Veterinary and Pharmaceutical Sciences Brno  
Palackého 1 – 3, Brno  
CZ – 612 42

**Background**

Snail meat has been for many years an excellent culinary product of many nations. The edible snails represent *Helix pomatia*, *Helix lucorum*, and *Helix aspersa maxima*.

Nowadays, the indoor husbandry of the snail is being put into practice. Products from snail meat belong to foodstuffs with high nutritional value. (Souci 1989, Gomot 1998). The results of several investigations of fresh snail meat and its products have especially been described from the point of their microbiological and toxicological risks to human health. (Caklovica 1991, Štegnertova 1998).

Histological methods serve differentiation and identification of individual parts of foodstuffs of animal and herbal origin; for which snail products have not been used yet.

**Objectives**

Histological examination of the two commercial snail products manufactured in the Czech Republic (Snail meat pie and Snail liver in curing solution) was carried out to judge the structure and composition of tissues. Identification of tissues in the snail products facilitates comparison with histological preparation from raw material of snail meat.

**Methods**

The common histological technique involved formalin-fixed (5%) and paraffin-embedded treatment of the freshly killed specimen and commercial products. The fresh snail meat without shell and head was divided into several parts and individually processed. The commercial products were sampled from original counter packages (Snail meat pie and Snail liver in curing solution).

Paraffin-embedded sections were stained with haematoxylin-eosin. Microscopic examination showed various changes of stained tissues from a variety of pink (muscle and gland tissue) to violet colours (fibrous tissue, epithel).

**Results and discussion**

The microscopic structure of tissues followed the literature by Pavlásek (1950). The main part of the snail body represents the muscular foot, which is also the important raw material. The lower part of foot serves moving; another muscle attaches the body to the shell. The anterior part of the foot is provided with foot gland, other glands underlying the skin on both left and right lateral parts of the body including the back. The section in the proximal part of the foot revealed the gullet and salivary gland, other sections in the enlarged part of the intestine represented the stomach, intestine, genital system, excretory system, lungs and heart. Fine structures of these tissues contained in the product "Snail meat pie" (Fig. 1); but their correct identification is very often impossible. Herbal ingredients have also been found because of herbal butter.

Hepatopancreas extends to the posterior part of the gut and was manufactured individually in the products, eg. „Snail liver in curing solution“. After thermal heating and treatment in salt solution the cells changed colour and swelled. (Fig. 2). The appearance of the lobules of hepatopancreas remained the same.

In spite of many recommendations involving high quality snail meat for various diets, these products represent only an expensive delicacy for a few consumers rather than being a common part of a menu. Food safety and quality with regard to falsification should especially be maintained too. For identification of snail meat in products various methods have been used, eg. PCR-RFLP (Borgo et al., 1996) or immunoelectrophoresis (Renčová et al., 1998).

Production of snail meat specialities is under regular veterinary control that covers basic chemical and microbiological examination. These results should be confirmed by microscopic analysis. Microscopic analysis of body tissues of the garden snail follows the basic knowledge of animal tissue structure and morphology. Microscopic examination of snail products enables the differentiation of the strange materials and judge their composition as regards falsification.

### Conclusions

Histological examination of the snail body (*Helix aspersa maxima*) as a material for production of snail specialties of two commercial products (Snail meat pie and Snail liver in curing solution) has been carried out. The gained results of two commercial products confirmed tissues of the garden snail, the Snail meat pie contained also tissue of herbal origin.

Histological sections and photographic documentation of microscopic structure of snail meat and its product represent not only an interesting supplement of sample preparation in histology, but they are also motivation and groundwork for control of snail specialties regarding falsification of food.

### Pertinent literature

BORGIO, R., SOUTY-GROSSET, C., BOUCHON, D., GOMOT, L. (1996) : PCR-RFLP analysis of mitochondrial DNA for identification of snail meat species. *of Food Science*, 61, 1, 1 - 4

CAKLOVICA, F. (1991) : Composition and characteristics of snail meat and its contamination with potentially toxic substances from the environment. *Veterinaria, Yugoslavia*, 40, 1/2, 151 - 163

GOMOT, A. (1998) : Biochemical composition of *Helix* snails : Influence of genetic and physiological factors. *J. of Molluscan Studies*, 94, 2, 173 - 181

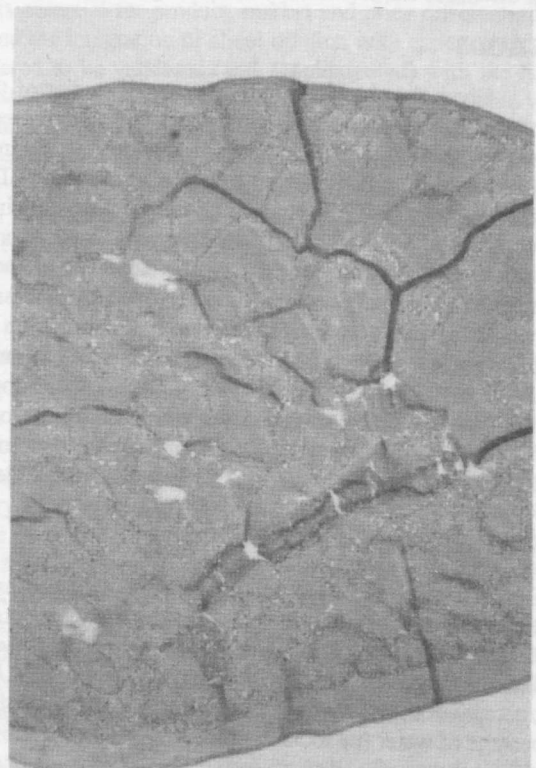
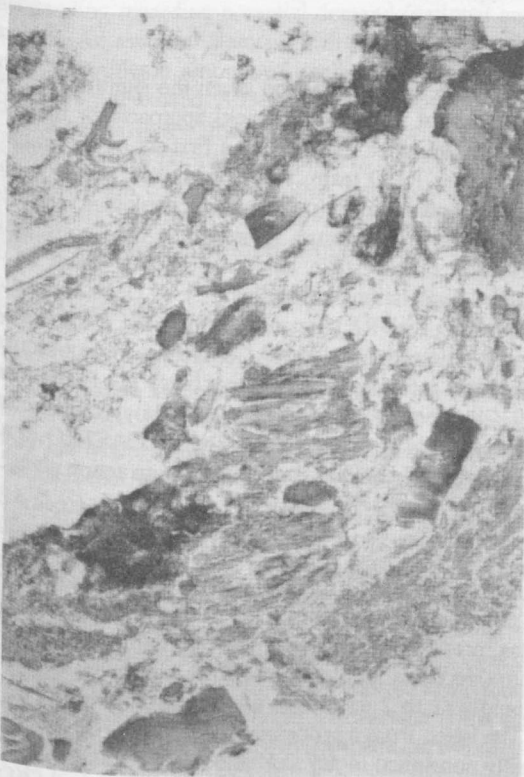
PAVLÁSEK, J. (1950) *Morfologie a biologie hlemýždě zahradního (Helix pomatia L.) vzhledem k potravinářství*. Disertační práce, VŠV Brno, 120 s.

RENČOVÁ, E., NECIDOVÁ, L. (1998) : ELISA – test pro průkaz hlemýžďího masa v delikatesních masových výrobcích. In : *Sborník referátů a posterů, XXVIII. Lenfeldovy a Höklovy dny, 11. a 12. listopadu 1998, Brno, s. 42*

SOUCI, S. W., FACHMANN, W., KRAUT, H. (1989) : *Food composition nutrition tables*. Wissenschaftliche Verlagsgesellschaft mbH Stuttgart, p. 407

ŠTEGNEROVÁ, H., LUKESOVÁ, D., POLÁK, P., HÄRYNGOVÁ, L. (1998) : Hodnocení jakosti suroviny a výrobků z hlemýždě *Helix aspersa*. *Evaluation of the quality of live *Helix aspersa* snails and the ready-to-eat product*. *Veterinářství*, 48, 2, 55 - 57

Research No - 162700005



**Fig. 1** Snail meat pie  
haematoxylin- eozin  
magnification 40 x

**Fig. 2** Snail liver in curing solution  
haematoxylin- eozin  
magnification 40 x