

Female No. 38 remaining in the metaestrus phase without hormonal stimulation (29 July 1975) received 7.5 microgrammes of  $F_2$  alfa. On the third day after the injection a typical proestrus picture was obtained ending by the appearance of a mass of leucocytes with a considerable number of vacuoles in the cytoplasm, what was succeeded by an incomplete oestrus on the 5th day.

The experiments made it possible to state, that one can prompt the oestrus and copulation in the beaver outside the mating season by way of gonadotropic hormones. The small material used for experiments on prostoglandine  $F_2$  alfa made it impossible to draw conclusions.

#### REFERENCES

- Doboszyńska T. & Żurowski W., 1975: Changes observed in the reproductive tract of a beaver female after high dosages of gonadotropic hormones. Acta theriol. 20, 8: 105—112. Downey B. R., 1974: Control of the estrous cycle with prostaglandins. Vet. Med.-Small Animal Clinician, 69, 7: 880—888. Żurowski W. & Doboszyńska T., 1975: Superfetation in European beaver. Acta theriol. 20, 7: 977—104.

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### Vaginal Smears during a Sexual Cycle of the Beaver

Rozmazy pochwowe w cyklu płciowym bobra

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Doboszyńska T. & Żurowski W., 1977: Vaginal smears during a sexual cycle of the beaver. Acta theriol., 22, 8: 153—155 [With Plate V].

On 19 females of the European beaver was examined the possibility of applying vaginal smears for diagnosis the generative stages. Ascertained was a complete adequacy of this method. Stained smears made it possible to determine explicitly the occurrence of proestrus, oestrus and metaestrus. Moreover, the occurrence of irregular cycles outside the mating season was stated. A prognosis of cyesis on the basis of smears seems possible in the second half of the pregnancy, but does not give a complete certainty.

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Observation on the reproduction of the European beaver (*Castor fiber* Linnaeus, 1758) are, because of their mode of life, very difficult. A knowledge of their reproductive occurrences became necessary when a farm breeding of this species was undertaken. Investigation were started on the utilization of vaginal smears for the diagnosis of generative stages. Because of the specific build of the end part of the generative tract (Gieniec & Doboszyńska, 1972) the smears were taken from the central part of the vagina by a special glass rod protected by a glass



tube. The material obtained was preserved and stained by the method by Doboszyńska (1976). This method rendered it possible to differentiate the cells depending on the phase of the cycle through their affinity to stain. It proved that the vaginal smears from a beaver make it possible to differentiate clearly the phases of the vagina cycle. The investigations were conducted on 19 females of various ages and at different seasons of the year.

On one, 2 year old female, *i.e.*, before reaching maturity, the smears taken in May and June did not demonstrate clear phases of the vaginal cycle. In all the smears existed parabasal, intermedial and superficial cells as well as leucocytes. A majority of the epithelium cells stained green, and the mucus in various shades of blue. A sporadic appearance of superficial, non-nuclear cells with an eozynophile cytoplasm suggest an incomplete ovulation.

Adult females, in the mating season (9 animals), demonstrated in the vaginal smears taken in January and February the occurrence of clear phases of the vaginal cycle. The proestrus, lasting two days, was characterised by the appearance of parabasal and intermedial cells as well as leucocytes and a fibrous mucus (Fig. 1). The cytoplasm of parabasal cells stained to an intensive green, and the nucleus—dark blue. The parabasal cells were definitely in the majority. The intermedial cells, slightly larger, stained similarly. The cytoplasm of leucocytes stained to a light green, and their segmented nucleus—dark blue. Elements of the epithelium were distributed loosely and in places appeared a fibrous mucus staining to a very dark blue. The oestrus lasted 1—2 days. In the smears, the parabasal and intermedial cells, as well as the leucocytes and mucus disappeared. Visible were only superficial cells with a notably eozynophile cytoplasm. Some of them had a small pycnotic nucleus. A majority consisted of large, firm cells without a nucleus, distributed loosely, stained orange (Fig. 2). In this stage occurred the oestrus and fertilisation testified by the appearance of spermatozoons on the smear (Fig. 3). Metaestrus lasted for about 3 days. In the smears appeared intermedial and parabasal cells, leucocytes and a non-structural mucus. A majority of the superficial cells which still existed in the smear was subjected to dissolving and phagocytosis. Leucocytes and the superficial cells agglomerated (Fig. 4). In this stage a part of the intermedial cells demonstrated a eozynophile cytoplasm. Only the parabasal cells had a cyanidophile cytoplasm. Anoestrus lasted 1—2 days. It was characterised by an appearance of delicate, short-fibre mucus, a decrease in the number of leucocytes and by the existence of cell giants—thin, »spoty«, without a nucleus. When the vaginal smears were taken for a longer period, and a successful fertilisation did not take place, the vaginal cycles appeared periodically in the mating season. The oestrus appeared every 7—9 days.

Smears taken from pregnant females (4 animals) did not present explicit interpretation. In certain females during pregnancy there can appear an ovulation (Żurowski & Doboszyńska, 1975). The smears from three females taken in the second half of their pregnancy were similar. They were characterised by a notable cyanidophilicity of both epithelium cells and the leucocytes and mucus. Among the epithelium cells

there existed a considerable number of scaphoid cells and Döderlein's bacillus, which probably caused the cytolysis of the epithelium.

During the generative inactivity of 5 females examined there occurred irregular vaginal cycles. Here the anoestral stage lasted sometimes for over a dozen days and was often characterised by a complete disintegration of the epithelium cells, so that the picture presented a cell aggregate. Beside that, a great number of fresh leucocytes appeared. The cycles observed outside the mating season indicate, in certain cases, a lack of a completed ovulation.

#### REFERENCES

Doboszyńska T., 1976: A method for collecting and staining vaginal smears from the beaver. *Acta theriol.*, 21, 22: 299—306. Gienc J. & Doboszyńska T., 1972: Macromorphological description of the genital organs of the female beaver. *Ib.*, 17, 30: 399—406. Żurowski W. & Doboszyńska T., 1975: Superfoetation in European beaver. *Ib.*, 20, 7: 97—104.

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#### ERRATA

to »*Arvicola richardsoni*: Ecology and biochemical polymorphism in the front ranges of southern Alberta« by P.K. Anderson, P. H. Whitney & J.-P. Huang, *Acta theriol.* 21, 31, 1976. p. 449 par. 1, should read:

Monthly mean temperatures are above 1°C only from June through September (4.2, 9.8, 7.1 and 4.2°C for these months respectively in 1968) and ground frost occurs frequently even in the warmer months (38% of nights in August 1971) according to Trottier (1972).

p. 431 — Fig. 2A shows habitat at Wilkinson Creek, while Fig. 2B shows Pocaterra Creek habitat.

#### ERRATA

to »Bioenergetics of British shrews in grassland« by J. C. Pernet, *Acta theriol.* 21, 33, 1976.

p. 484, line 16 should read:

of the other workers. Borowski & Dehnel (1953) present mean

p. 485, Table 2 should read:

<i>T. molitor</i> last instar larvae	6.2	4.5—8.4	2.7	5.8	4.0—7.2	2.5
<i>Musca</i> sp. pre-pupal larvae	11.9	8.5—14.7	2.5	11.5	8.0—14.0	2.4

p. 494 second line from the bottom should read:

of *S. araneus* and 67 in the case of *S. minutus*, ...