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THE EVALUATION OF POLAR VIXEN VAGINA MICROFLORA DURING MATING SEASON

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ABSTRACT

The aim of the study was to define micro-organisms in polar vixen vagina and changes in vagina microfloral content during sexual cycle.
Before mating, all females were given Enrobioflex antibiotic, usually used against infections caused by Pseudomonas aeruginosa. The analyses on 38 females from base herd, took place three times: 18th and 26th March and 8th April 1998. The females were divided into three groups. The division criterion was phase of sexual cycle showed by the females. Vaginal swabs were collected and sent to microbiological analyses.
No Pseudomona aeruginosa micro-organism was cultured, what might indicate its sensitivity to Enrobioflex.

Increased amount of isolated micro-organisms was detected during oestrus phase. Increased amount of micro-organisms in mixed cultures was detected during oestrus phase and after mating.
No yeast-like cells were detected.

Key words: Polar fox, vagina microflora, Staphylococcus intermedius, Esherichia coli, Proteus sp., Streptococcus sp. Beta-hemolytical, Enterobacter sp.

INTRODUCTION

Beside supply and demand factors, profitability of fur animal breeding is created by production effects: reproduction and connected with it herd fertility and fecundity. They are conditioned by genetic information and environmental conditions (Jarosz, 1993). Due to low heredity of fertility and fecundity, environmental factors seem to be the most important factors affecting reproduction effects in polar foxes (Cholewa, 1977, Gedymin et al., 1978, Maciejowski et al., 1993).

It is supposed, that 20-30% of failures within females fertility (infertility, miscarriage and born dead puppies) is caused by bacterial factors (Kopczewski et al., 1987). Different micro-organisms: Pseudomonas aeruginosa, Escherichia coli, Campylobacter sp., Proteus sp., Staphylococcus intermedius, Streptococcus sp. (Kopczewski et al., 1988, Birgere et al., 1996) were isolated from genital tract swabs, collected, in case of infertility, miscarriage, born dead or weak sucklings, from carnivorous animals females.

In foxes, Pseudomonas and Campylobacter rods, streptococci and staphylococci have especially negative effect on animals reproduction (Kopczewski eta1., 1988, Mizak et al., 1996).

Microorganisms get into newborn organism during parturition from female genital tract, from mammal glands or from infected environment and they are important reason for puppies mortality in first days of their life (Śmielewska-Łoś et al., 1996).

According to Sager and Remmers (1990), bacteria much often attack puppies during prenatal period.

Sieensenop et al., (1996) and Watts et al., (1996) noticed, that during late post oestrus phase and sexual peace period, only small amount of bacteria is isolated. The biggest number of microorganisms is detected in pre-oestrus and oestrus phase. Also type of isolated microorganisms is variable.

According to Bjurstom et al., (1992), Pasteurella multocida rod is typical for pre-oestrus and oestrus phases and pregnancy. Beta-hemolytical streptococci are common in pre-oestrus phase. The studies were conducted to determine the most often micro-organisms existing in polar vixen vagina, which cause females illnesses and lost of youngsters. We also analysed eventual changes in vagina microfloral content during sexual cycle.

MATERIALS AND METHODS

The studies were performed on Ferma Zarodowa Hodowli Lisów "Batorówka" in Moszczenica. The farm is located 12 km from Piotrków Trybunalski. It is built on sand soil and surrounded by mixed forests.

Base flock consists of 140 polar fox females. Foxes are kept in free standing cages and in pavillions. Thirty eight vixen were taken into studies. The appropriate mating term was determine using omometric method. Analysed females were divided into three groups. The

division criterion was phase of sexual cycle showed by the females. Analyses were repeated three times:

18th March 1998

Group I - females in pre-oestrus phase, not examined with omometer;
Group II - females start oestrus phase, examined with omometer and not mated
Group III - females in oestrus phase, omometricaly examined and mated

26th March 1998

Group I - not specificated
Group II - females in oestrus phase, examined with omometer
Group III - all females examined with omometer and mated

8th April 1998

Group III - all females mated

Before mating, all females were preventively given Enrobioflex antibiotic: 0.3ml per animal for 10 days, with 2 weeks break after first 5 days. Antibiotic was first given at the end of January 1998, then in the middle of February 1998. Enrobioflex is an antibiotic used against Pseudomonas aeruginosa caused infections.

The material were vagina swabs, collected with swab glass rods, carried on transport medium to laboratory. Vulva region was not disinfected before swab collection for to maintain natural conditions of mating. Then, cellected material was inoculated into medium:

- Blood agar (medium enriched with blood) - to indicate eventual hemolysis,
- McConkey medium (differentiating medium) - to differentiate separate bacteria species, basing on their specific biochemical features. The medium contains lactose, whose degradation is manifesting by changing base colour,
- Sabouraud medium - to isolate fungi.

After inoculating, the blood and McConkey mediums were incubated in 37°C for 24 hours, whilst Sabouraud mediums were incubated in 30°C for 4 days.

After incubation, preparations were made and stained with Gram method. Gram-positive bacteria are stained violet, Gram-negative - red.

RESULTS

The results are in Table 1.

Table 1. Species of micro-organisms isolated from vagina swabs of polar fox females.

N°	Female identif. number	Terms of analysis					
		18th March 1998	Group	26th March 1998	Group	8th April 1998	Group
1.	791b	Lack	**I**	Lack	**II**		**III**

2.	792b	Staphylococcus intermedius		Staphylococcus intermedius			
3.	793b	Lack		Enterobacter sp.			
4.	801	Staphylococcus intermedius		Staphylococcus intermedius			
5.	801b	Lack		Escherichia coli		Proteus sp.	
6.	803	Escherichia coli		Escherichia coli			
7.	805	Lack		Lack			
8.	812	Lack		Lack			
9.	832b	Lack		Lack			
10.	841	Staphylococcus intermedius		Escherichia coli		Escherichia coli; Streptococcus beta-hemolytic	
11.	581	Escherichia coli: Proteus sp.	**II**	Escherichia coli; Streptococcus beta-hemolytic			
12.	606	Escherichia coli: Proteus sp.		Escherichia coli: Proteus sp.; Streptococcus beta-hemolytic			
13.	610	Escherichia coli		Escherichia coli: Proteus sp.			
14.	802b	Escherichia coli: Proteus sp.		Escherichia coli: Proteus sp.			
15.	804	Escherichia coli: Proteus sp.		Escherichia coli: Proteus sp.			
16.	815b	Escherichia coli: Proteus sp.		Escherichia coli			
17.	842	Escherichia coli: Proteus sp.		Escherichia coli: Proteus sp.			
18.	844	Escherichia coli		Escherichia coli			
19.	845b	Escherichia coli: Proteus sp.		Escherichia coli: Proteus sp.; Streptococcus beta-hemolytic			
20.	574			Lack			
21.	584			Lack			
22.	588			Lack			
23.	589			Escherichia coli			

24.	593			Escherichia coli		Escherichia coli; Streptococcus beta-hemolytic	
25.	594			Lack			
26.	599			Escherichia coli			
27.	808	Escherichia coli: Proteus sp.		Escherichia coli			
28.	812b	Escherichia coli		Escherichia coli			
29.	813	Proteus sp.		Proteus sp.			
30.	822b	Escherichia coli		Escherichia coli			
31.	823b	Escherichia coli		Escherichia coli: Proteus sp.			
32.	824b	Proteus sp.		Proteus sp.			
33.	825	Proteus sp.	**III**	Lack	**III**		
34.	834	Proteus sp.		Enterococcus sp.			
35.	841b	Escherichia coli: Proteus sp.		Escherichia coli			
36.	805b					Escherichia coli; Streptococcus beta-hemolytic	
37.	611					Escherichia coli: Proteus sp.	
38.	813b					Streptococcus beta-hemolytic	

For samples collected on 18th March, Staphylococcus intermedius was the most frequently isolated micro-organism from samples of group I. In group II, the most common were Escherichia coli + Proteus sp. For group III, the most frequent were Escherichia coli + Proteus sp. and Proteus sp. It should be noticed, that among 10 analysed females from group I, in 6 of them no aerobic bacteria were found.

In vagina swabs collected on 26th March, we noticed decreasing frequency of Staphylococcus intermedius. Quite frequent were Escherichia coli + Proteus sp., lower was number of Escherichia coli and Escherichia coli + Streptococcus beta - hemolytical + Proteus sp.

In this group of 26 females were 6 from which no aerobic bacteria were isolated. Four of them are females from which no bacteria were isolated in the previous analysis. In group III, the most common was Escherichia coli while a little less frequent was Proteus sp.

In the last step of studies, on 8th April, swabs were collected from 6 females. In 3 of them two types of Escherichia coli+Streptococcus beta-hemolytic were isolated. In two other females we found single micro-organisms: Proteus sp. and Streptococcus beta-hemolytic. In one female Escherichia coli + Proteus sp. were isolated.

Twice, on 18th and 26th March, samples were collected from 28 females. In 12 females the same micro-organisms were isolated in both analyses. In 5 females, except bacteria cultured after first collection, were additionally isolated:
Enterobacter sp. - in 1 female,
Proteus sp. - in 1 female,
Streptococcus sp. beta-hemolytic - in 2 females,
Enterococcus sp. - in 1 female.

In 5 females, the number of bacteria species decreased. No Proteus sp. was isolated during the second analysis.

The change of microbial genus from Proteus sp. to Streptococcus beta-hemolytic and from Staphylococcus intermedius to Escherichia coli + Proteus sp. took place.

SUMMARY

1. During analyses no Pseudomonas aeruginosa was detected, what suggests that this species is sensitive to applicated antibiotic.
2. The studies showed that in pre-oestrus phase, the number of isolated micro-organisms is smaller than in later phases.
3. During oestrus and after mating bigger amount of micro-organisms was isolated in mixed cultures.
4. No yeast-like cells were detected during studies.

REFERENCES

1. Birger M., Staroniewicz Z., 1996; Rola bakterii w zespole endometritis pyometria u suk. Medycyna Weterynaryjna 52.
2. Bjurtsrom L., Linde-Forsberg C., 1992; Long – term study of aerobic bacteria of the genital tract in breeding bitches. American Journal of Veterinary Research 53.
3. Cholewa R., 1977; Czynniki wpływające na wyniki rozrodu lisów. HDI, 10, 8-9.
4. Gedymin J., Cholewa R., 1978; Odziedziczalność i powtarzalność niektórych cech rozrodczych u samic lisów polarnych. Prace Komisji Nauk Rolniczych i Leśnych. Tom XLV, 61-65.
5. Jarosz S., 1993; Hodowla zwierząt futerkowych. PWN
6. Kopczewski A., Zdunkiewicz T., Wróblewska M., 1988; Zaburzenia w rozrodzie lisów w świetle badań bakteriologicznych wymazów z pochwy i worka napletkowego w latach 1985-1987. Medycyna Weterynaryjna 11.
7. Maciejowski J., Jeżewska G., 1993; Genetyczne uwarunkowania cech rozrodu zwierząt futerkowych. Zeszyty Naukowe Towarzystwa Zootechnicznego. 12, 5-12.
8. Mizak B., Górski J., 1996; Występowanie przeciwciał parwowirusowych u lisów hodowlanych i norek w Polsce. Medycyna Weterynaryjna 52.
9. Sager M., Remmers C., 1990; Ein Beitrag zur perinatalem Welpensterblichkeit beim Hund Klinische, bacteriologische und pathologische Untersuchungen. Tierarzthiche – Praxis 18.
10. Siensenop U., Gruzel-Apel A., Hackbarth H., Spitz G., Bohm K., 1996; Die mikrobielle Vaginalflora bei Hundinnen einer Beaglegruppe, vor und im Verlauf des ersten Sexualzyklus. Kleintierpraxis 41.
11. Śmielewska-Łoś E., Klimentowski St., 1996; Śmiertelność osesków lisów hodowlanych w świetle badań bakteriologicznych. Medycyna Weterynaryjna 51.
12. Watts J., Wright P., Whitehear K., 1996; Uterine, cervical anfd vaginal microflore of the normal bitch throughou the reproductive cycle. Journal of small Animal Practice 37.

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