Polish Journal of Veterinary Sciences Vol. 13, No. 1 (2010), 69-73

Original article

Acrosin system of dog spermatozoa and reproductive tract secretions

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Abstract

The aim of this study was to determine the activity of proacrosin and acrosin in spermatozoa originating from the sperm-rich fractions (SRF) and whole ejaculates (WE) of dog semen. In addition, experiments were conducted to determine the activity of antitrypsin inhibitors in the fluids of different ejaculate fractions and whole seminal plasma. Ejaculates were collected from five dogs of mixed breed and one Beagle dog (aged from 2 to 9 years).

In the SRF, it was confirmed that the activity of the free acrosin form was predominant (acrosin / proacrosin; 2.38 ± 0.22 / 1.05 ± 0.08 mIU / 10^6 spermatozoa). On the other hand, spermatozoa originating from the WE exhibited significantly higher ($p<0.05$) proacrosin activity (proacrosin / acrosin; 2.19 ± 0.19 / 1.30 ± 0.11 mIU / 10^6 spermatozoa). Furthermore, acrosin inhibitor activity was lower in the fluids of the pre-sperm fraction (0.09 ± 0.006 IU / cm^3), whereas it was higher in the fluids of the post-sperm fraction (0.11 ± 0.007 IU / cm^3). Using PAGE analysis, the antitrypsin activity of the enzyme was represented by the presence of one electrophoretic band in the fluids of the pre-sperm and post-sperm fractions and whole seminal plasma. Furthermore, two electrophoretic bands were detected in the fluids of the SRF. The findings of this study indicate that specific proteinase inhibitors present in the individual ejaculate fractions of dog semen may act by stabilizing the sperm acrosin system.

Key words: canine, dog, semen, acrosin, proacrosin, antitrypsin inhibitors