

# Identification of synaptonemal complexes in postnatal oocytes from one-day-old puppies of domestic dog (*Canis familiaris*)

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**Abstract.** The present paper describes a synaptonemal complexes analysis carried out on oocytes collected from the ovaries of one-day-old puppies of domestic dog (*Canis familiaris*). Ovaries have been collected from 20 individuals altogether. Synaptonemal complexes were identified in oocytes originating from two puppies. It is concluded that the onset of canine female meiosis may occur earlier than previously reported.

**Key words:** domestic dog, oogenesis, synaptonemal complexes.

## Introduction

The process of meiosis and spermiogenesis in the dog is quite well documented (ELIASSON et al. 1968, GHOSAL et al. 1983). On the other hand, female meiosis in this species is not described in details. It was shown that the pachytene substage of the first prophase appears in dog oocytes between days 10 and 30 after birth (FREIXA et al. 1987). It is exceptional since in most mammalian species, female germ cells entrance into meiotic division in the fetal life (AUSTIN 1995). However, oocytes at pachytene stage have been found in wild rodents neonatal ovaries (FREIXA et al. 1985, PAL SINGH et al. 1993). Moreover, in the domestic dog and the blue fox, eggs are ovulated as primary oocytes (FARSTAD et al. 1989, RENTON et al. 1991).

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The aim of the current study was to examine ovaries collected from one-day-old puppies for the presence of oocytes at the pachytene substage.

## Material and methods

Pairs of ovaries have been collected from 20 one-day-old female puppies. The animals (breed - mongrel) were born at the local animal shelter and put down after birth. The ovaries were processed following the whole-mount technique (COUNCE, MEYER 1973) with some modifications described by ŚWI-TOŃSKI (1991) in order to visualize the synaptonemal complexes under a light microscope.

## Results and discussion

Germ cells displaying the presence of synaptonemal complexes have been found in ovaries collected from two individuals (2/20; 10%) (Fig. 1). Only a few cells at pachytene stage (4-5 cells) have been observed in each puppy. This shows that oocytes at the pachytene substage of the first prophase may be found in dog ovaries one day after birth. The results published by FREIXA et al. (1987) showed that such cells appeared in dog ovaries between days 10 and 30 after birth. In that study ovaries collected from 15 puppies have been studied, however, there is no data concerning the number of individuals investigated in each age group. The advantage of our study is a quite high number of analysed female puppies which were the same age. It should also be mentioned that in an earlier study by KIRK (1970, cited by FREIXA et al. 1987) it was reported that the transformation of oogonia into primary oocytes in the dog is completed prenatally.

Oocytes of some wild rodent species enter into meiotic division in neonatal period. PAL SINGH et al. (1993) reported that almost all substages of prophase I were present in day 0 ovaries of different wild rodent species. Whereas FREIXA et al. (1985) showed that synaptonemal complexes can be observed in the Syrian hamster for up to 7 days from birth and in the mouse during the first day post partum.

It can be concluded that the timing of early stages of canine female meiosis requires further studies. Specially, it is not clear when oogonia start their transformation into primary oocytes and when this process is completed.

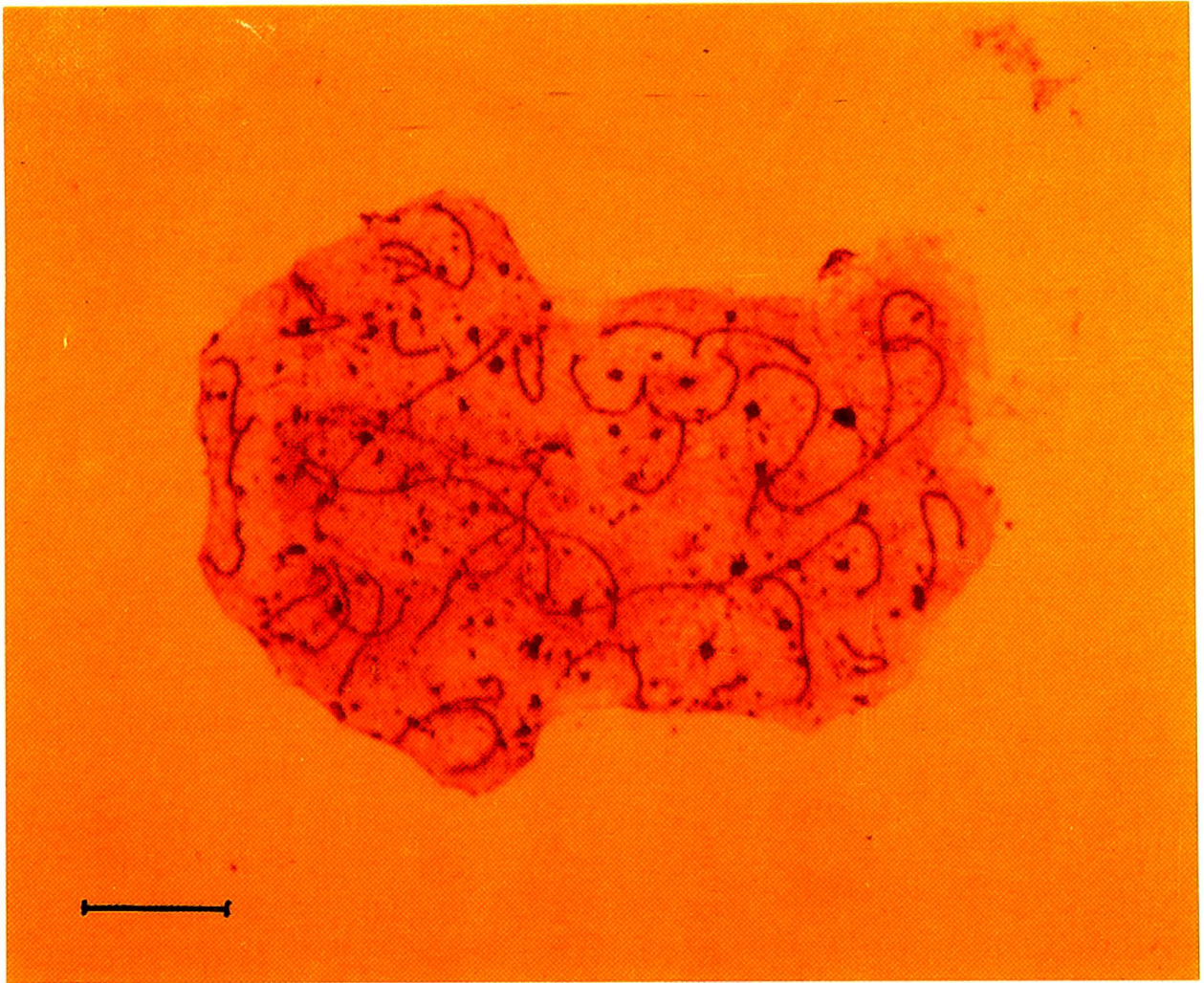


Fig 1. A dog oocyte at pachytene stage derived from one-day-old puppy (the bar represents 10  $\mu\text{m}$ )



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