Discussion. The present experiments have unanimously proved that cigarette smoke inhalation induces characteristic lesions to spermatogenesis in rats. The primary spermatocytes appear to be the target of the noxa as cigarette smoke inhalation induces a swelling of the nuclei and an increase in the number of old spermatocytes prior to mitosis. But a mitotic inhibition of the spermatocytes can also be proved as an abnormal increase of RRG phase IV and a frequency of abnormal mitotic forms was found. Mitotic inhibition induces a decrease of spermatides with a reduced nuclear volume which is responsible for a low frequency of phase V.

Cigarette smoke inhalation damages the process of spermatogenesis by affecting mitosis in the spermatocytes. Noxae of spermatogenesis (e.g. ionising radiation[6]) generally exert their harmful effect mainly on primary spermatocytes. These cells seem to be the most susceptible to environmental noxae.

Several investigators have reported lesions to the testes induced by smoking or nicotine treatment[7-9], others have questioned such an effect[10-12]. Quantitative investigations into the process of spermatogenesis have, however, proved that cigarette smoke inhalation causes specific lesions in the development of spermia by inhibiting mitosis of the spermatocytes.

Zusammenfassung. Durch die Einatmung von Zigarettenrauch wurden bei Ratten Störungen der Spermiogenese beobachtet. Es kam zu einer Hemmung der Zellteilung von Spermatocyten.

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Salivary Chromosome-Like Structure of a Coccid Chromosome

Cytological researches in recent years have accumulated a wealth of information on the morphological and structural organizations of both animal and plant chromosomes[1,2]. In addition to those chromosomes which are usually seen in the mitotic and meiotic cells, there are also a few special types of chromosomes, the chief among them being (1) the lamp brush chromosomes of the amphibian oocytes, (2) the salivary gland chromosomes of the dipteran insects like *Drosophila, Chironomous, Camptomya, Sciara* and *Rhyncosciara* and (3) the accessory or supernumery or 'B' chromosomes, whose number vary from one to many.

While reports are available on the occurrence of supernumery chromosomes in Coccids[3,4], there is no reference for the occurrence of chromosomes which resemble those of the salivary gland in species such as coccids where the chromosome is holokinetic. The salivary chromosomes so far studied are all from the dipteran insects. These chromosomes are the largest ones and their importance in the field of cytogenetics has been stressed by many earlier workers[5-9]. Along with their giant size, the salivary

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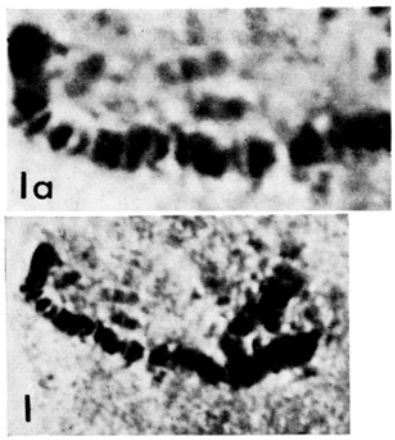

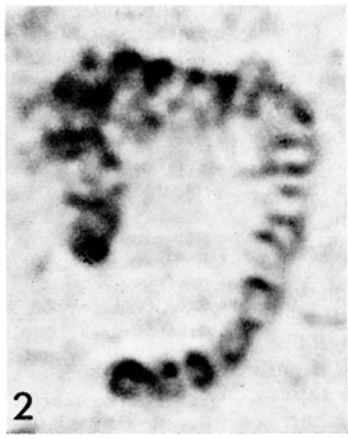

Fig. 1. The haploid compliment of 2 chromosomes from an embryo; 1 long and another short (bent) chromosome. Note the chromatic and achromatic banding pattern. Ca. × 2910.

Fig. 1a. Enlarged portion of a long chromosome. Ca. × 4365.

Fig. 2. Similar type of chromosome from a different embryo. Ca. × 4365. (All Figures are stained with Schiff's reagent.)

chromosomes exhibit a clear picture of synapsis, a feature so characteristic of meiotic chromosomes in pachytene, and carry multiple strands[10] whereby they have entered a permanent prophase[11]. It is in this context that it will be interesting and significant to know and compare the chromosomes of a local coccid, *Icerya aegyptica* Dougl. (Tribe: Iceryini, Monophlebinae) with that of the salivary chromosomes of a dipteran insect.

The embryos fixed in BRADLEY-CARNOY mixture were stained with SCHIFF's reagent as well as with the modified alcoholic carmine of SNOW[12]. *Icerya aegyptica* is a haplo-diploid Iceryine coccid and the males are found in very small numbers and live for a very brief period. The karyotype of this species, like other Iceryine coccids, is $2n = 4$ (♀), $n = 2$ (♂). The 2 pairs of chromosomes differ slightly in their length.

In Figures 1 and 2, the coccid chromosome presents the characteristic chromatic and achromatic banding normally noticed in the salivary gland chromosomes. These chromosomes of the coccid, however, are not giant in their size although they exhibit the band structure. As is usual with the salivary chromosomes, many chromatic bands form the bulb here also. Such differences in the individual bands due to the formation of the bulbs necessarily lead to the varied appearance and stainability of the chromosomes, which in itself is a reflection of the functional activities of the chromosomes in particular and of the metabolism and differentiation of the cell in general. Further, based on the staining reaction (with SCHIFF's reagent) it is possible to state that wherever such bulb formation on the chromosome has taken place, there is an equal increase in the DNA content of the bulb also[13].

Résumé. Démonstration d'une structure analogue à celle des chromosomes géants des Diptères chez un Coccide.

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Development of the Middle Lamella in Rib Meristem Cells

A rib meristem is characterized by a complexus of longitudinal rows or ribs of cells which divide at right angles to the growth axis. This growth pattern is clearly represented in the cortex of the root. The longitudinal walls of the rib are primary longitudinal walls, the transverse walls being formed, basically, by middle lamella. At each division cycle, 2 daughter cells are formed, and the cell plate forms the new middle lamella between them. The fine structure of the cell plate formation has been studied by several authors[1-10]. Moreover, FREY-WYSSLING et al.[2] showed that the middle lamella formed by the coalescence of small Golgi vesicles, grew thicker through the supply of new Golgi vesicles. The aim of this paper is to study the development of the middle lamella in relation to the cell division cycles.

Material and methods. Seeds of *Phalaris canariensis* were germinated at room temperature, using filter paper and tap water. The seedlings were grown for 2 or 3 days. At the end of this period the root tips (2–3 mm) were removed and immediately fixed by the following method: $KMnO_4$ 2% in distilled water for 2 h at 20–22 °C. The fixed material was dehydrated in an acetone series and embedded in Durcupan ACM (Fluka). During the dehydration, the material was stained overnight in lead uranyl acetate[11]. To obtain the ultrathin sections an Ultratom L.K.B. was employed. The observations were made with a Siemens Elmiskop I, and the pictures taken on Sciencia Gevaert plates.

Results and discussion. The study of longitudinal sections of ribs from the cortex gave clear evidence of the existence of a certain range of types among the middle lamellae, which could be characterized by their different thicknesses and differences of contrast on staining. The thinnest middle lamella showed a thickness of from 0.1–0.2 μ, with a markedly sinuous outline (Figure 1a) as well as a fair degree of electronic density. As the thickness of the middle lamellae increases, their contours become more uniform and their electronic density decreases. The thickest of them to be observed were 0.4–0.5 μ in diameter, and similar to the longitudinal walls of the rib of cells in electronic density.

The daughter cells observed in late telophase showed the peculiarity of being bounded by 3 transverse walls with clearly different characteristics. The middle lamella recently formed between the 2 daughter cells was seen to possess the characteristics of young walls, with a thickness of 0.1–0.2 μ, sinuous outline and relatively high electronic density, probably due to the high proportion of pectins. The 2 other transverse walls differed from it and from each other in thickness.

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