as parallel sections. Some of the autoradiographic preparations were stained with PAS + azur; the others, after mounting, were studied unstained.

1 h following treatment, slight activity is present in some of the PAS positive cells of the thymus. After 3 h, PAS positive cells localized around the cortical vessels of the thymus showed high activity (Figure 1). A few PAS positive cells are present also in the lymph nodes, while the spleen is absolutely negative. After 6 h, very high activity can be seen in the mast cells of the lymph nodes. The mast cells are localized mainly in the sinuses in groups. Activity is localized exclusively to the mast cells and not perceivable in other cells. Although activity is well observable on the stained preparations, since the mast cell itself appears granular in stained preparations, a comparison of the unstained preparations with the parallel ones appears to be more promising (Figures 2, 3 and 4). It is easily observable that localized activity in the identifiable cells conforms with the stained mast cell groups.

Thus the experiment shows that the PAS positive cells – which in other experiments were observed as developing forms of the mast cells – and mast cells, electively take up ^3H corticosterone. No explanation can be given for the why and wherefore of this phenomenon. It is possible that, as heparin inhibits the reduction of corticosterone[9], the hormone is retained only in the mast cells. But this does not seem probable as activity in the mast cells increases just after 6 h. On the other hand, if corticosterone does disintegrate, isotope activity could be still present, which suggests an active uptake, or rather an active uptake taking place during transformation into mast cells. Should this indeed be the case, this would present the glucocorticoid-mast cell relation from an entirely different aspect.

Zusammenfassung. Die Aufnahme von Corticosteron-1,2-^3H in lymphatische Organe von Mäusen des Stammes BALB/C wurde untersucht. Autoradiographisch wurde gefunden, dass das markierte Corticosteron elektiv in den PAS-positiven Zellen bzw. später in den Mastzellen erscheint.

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Institute of Histology and Embryology, Medical University, Budapest (Hungary), 28th October 1966.

[9] R. C. Troop and J. T. Biggs jr., Metabolism *14*, 867 (1965).

Nucleic Acid Content of a Diploid and of a Triploid Strain of *Drosophila melanogaster*

The size of diploid individuals of *Drosophila melanogaster* is similar to that of triploid ones. These animals obviously possess a regulating system that adjusts the action of the 3 genomes of the triploids to almost the same action of the 2 genomes of the diploids. Since cytological experiments with giant chromosomes suggest that this adjustment takes place on the chromosomal level, the nucleic acid content of diploid and triploid *Drosophila* strains have been determined quantitatively. The results are presented in this paper.

The objects used in this experiment were larvae of the last stage of the diploid strain '*Berlin normal*' and of the triploid strain of the genetic constitution *FM4*, y^{31d} sc^8 *dm* B/y^2 *sc* w^a *ec.*=[1]. The animals were cultured under standard conditions[2]. In the triploid strain, at best half of the larvae are triploid, so that besides triploids always at least as many diploid larvae have been used for determination of nucleic acid content. The total amount of nucleic acids, extracted according to Schneider[3], has been measured by UV-absorption[4]. The DNA and RNA contents have been determined according to Burton[5] and Ceriotti[6] respectively.

The investigation has been carried out on 2 separate lines (29 single experiments); the results of both are almost in agreement. In this paper only the data of 1 of the 2 lines will be presented (Table).

The weight of 100 larvae of the triploid strain is about 10% lower than that of the diploids, and the portion of the lipid-free dry weight in respect of the wet weight is about 4% lower in the triploid strain than in the diploid one. It is striking that these differences are in contrast to the number of genomes.

The total nucleic acid content as well as the RNA content shows no significant differences in either strain. The DNA content of the triploid strain, however, is about 15% higher than that of the diploid one. Therefore the DNA/RNA ratio is changed too. The diploid strain shows a ratio of about 1:25, the triploid strain a ratio of 1:20. More detailed investigations of the diploid strain have shown that the ratio is constant even if the size and weight of the larvae are modified by environmental factors.

Provided that the portion of the triploid larvae of the triploid strain is 50%, one would expect about 25% more DNA in the triploid strain than in the diploid one. But, from the amount expected, only $^2/_3$ are measured. Since in the experiments the % of $3n$- and $2n$-larvae could not be examined, one has to suppose that the deficit of DNA is correlated to a lower amount of triploid larvae. But neither can one exclude the possibility that the amount of DNA of 3 genomes in the triploid individuals is less than one would expect.

Since, in spite of the high DNA content, the RNA content in the triploid strain is as high as in the diploid one, the 3 genomes of the triploids are as active as the 2 genomes of the diploid larvae – assuming equal stability of RNA in both strains.

The regulating mechanism which makes the size of these triploid organisms similar to that of the diploid

[1] We wish to thank Dr. I. Oster (Bowling Green, Ohio) for kindly providing the triploid strain.

[2] F. Mainx, *Das kleine Drosophila-Praktikum* (Springer, Wien 1949).

[3] W. C. Schneider, J. biol. Chem. *161*, 293 (1945).

[4] M. Ogur and G. Rosen, Archs Biochem. *25*, 262 (1950).

[5] K. Burton, Biochem. J. *62*, 315 (1956).

[6] G. Ceriotti, J. biol. Chem. *214*, 59 (1955).

	Diploid strain		Triploid strain		Mean deviation of the triploid strain from the diploid one in %	Probability of error in % (*t*-test)
	No. of experiments	Mean with standard error	No. of experiments	Mean with standard error		
Weight of 100 larvae in mg	7	180.7 ± 1.78	7	164.8 ± 1.01	− 9.6	> 0.1
Dry weight/100 g net weight	7	16.4 ± 0.118	7	15.8 ± 0.086	− 3.8	> 0.1
Nucleic acid content/100 g dry weight	7	5.81 ± 0.077	7	5.77 ± 0.064	− 0.69	ca. 50
RNA content/100 g dry weight	7	5.59 ± 0.055	7	5.53 ± 0.055	− 1.08	ca. 50
DNA content/100 g dry weight	7	$0.237 \pm 0.578 \cdot 10^{-2}$	7	$0.272 \pm 0.499 \cdot 10^{-2}$	+ 14.44	> 0.1

ones obviously starts at the level of nucleic acids. A more detailed publication is in the press[7].

Zusammenfassung. Beim triploiden *Drosophila*-Stamm *FM4, y^{31d} sc^{8} dm B/y^{2} sc w^{a} ec.* = ist der DNS-Anteil an der fettfreien Trockenmasse wesentlich höher als beim diploiden Stamm «*Berlin normal*». Der RNS-Anteil an der fettfreien Trockenmasse stimmt in beiden Stämmen überein. Es wird diskutiert, dass die 2 Genome der diploiden *Drosophila* offensichtlich etwa ebenso aktiv sind wie die 3 Genome der triploiden. *Drosophila* verfügt also offenbar über einen Regulationsmechanismus, der die RNS-Konzentration trotz unterschiedlichen DNS-Gehalts konstant hält.

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[7] F. ANDERS and R. FAHRIG, Biol. Zbl., in print.

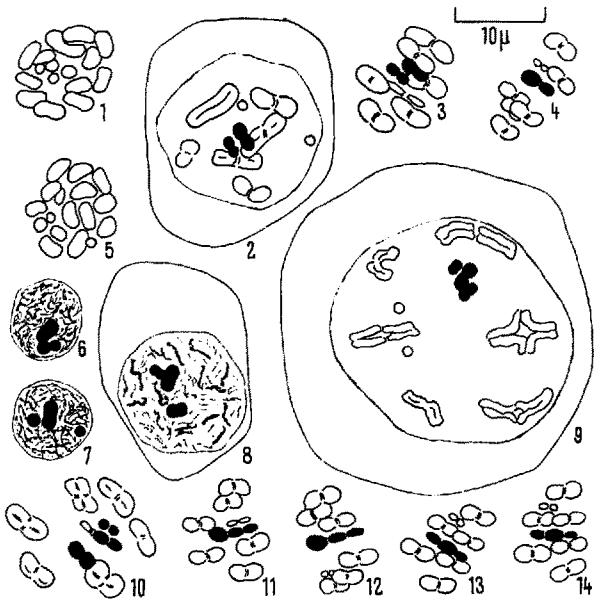
On the Multiple Sex-Chromosome Mechanism in *Trapezonotus arenarius* L. (*Heteroptera, Lygaeidae*)

Multiple sex-chromosome mechanisms have been described in numerous species of Heteroptera. However, only a few examples of such a mechanism have been reported, which occur besides a simple sex-determining mechanism of the *XX:XY* or *XX:XO* type[1]. The present communication, giving an account of meiosis in *Trapezonotus arenarius* L., is a continuation of the author's observations about chromosome cytology[2].

Testes of specimens collected in the environs of Olsztyn were dissected out in 0.6% saline and aceto-orceine squashes were made. The Figures have been drawn with a × 15 camera lucida eye-piece and × 100 oil immersion objective, giving a magnification of × 2400.

The chromosome complement in the spermatogonial metaphase plates of individuals with a simple sex-determining mechanism shows 16 chromosomes (Figure 1). They comprise 12 large and 4 small unequal size elements. The smallest 2 elements are a pair of *m*-chromosomes. The remaining 2 of the last-mentioned 4 elements represent the *X* and *Y* chromosomes. The *m*-chromosome pair and the *X* and *Y* ones are at this stage detectable from the autosomes only by their heteromorphic structure. The heteropycnotic character of the sex-chromosomes is just seen in the spermatocytes in which they are found, at first separated (Figures 2 and 3), then associated (Figure 4), together with the *m*-chromosome pair at the centre of the autosomal elements which form a ring around them.

During the studies the author happened to examine an individual which was found to differ markedly in its



Figs. 1–4. Meiosis of a single sex-determining mechanism of *X-Y* type (sex-chromosomes shown in black). Figs. 5–14. Meiosis of a multiple sex-chromosome mechanism. 1. Spermatogonial metaphase showing 16 chromosomes. 2. Late prophase I. 3. Metaphase I. 4. Metaphase II. 5. Spermatogonial metaphase showing 17 chromosomes. 6 and 7. 2 early prophase I nuclei with 3 sex-chromosomal elements each. 8. Prophase I. 10. Metaphase I. 11 and 12. Metaphase II showing the sex-pseudotrivalent set in order '*X* 1 supernumerary *Y*' or '*XY* 1 supernumerary'. 13 and 14. Metaphase II showing the sex-pseudotrivalent set in order '*XY* 1 supernumerary'.