ceæ have, as a rule, been more easily accomplished than the cross-inoculations between members of the Solanaceæ and members of the Cucurbitaceæ. Successful cross-infections between members of different families are more easily obtained with plants growing under very favorable conditions than with plants growing under unfavorable conditions.

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SPERMATOGENESIS OF THE GARTER SNAKE

UP to the present no work has been published on the spermatogenesis of the snakes. The only Reptilia which have been studied in any detail have been the lizards, and the recent work of Dalcq and Painter has definitely pointed out that an accessory element exists in this group. The work on the spermatogenesis of this species of snake (*Thamnophis butleri*) has progressed far enough to make it advisable to publish a few of the details, although the work has not yet been completed.

The species on which this study is being made was collected in the vicinity of Ann Arbor, Michigan, and was identified by Drs. A. G. Ruthven and F. N. Blanchard. It has one of the narrowest ranges of any of the garter snakes but is abundant in that locality.

The material has been fixed in Flemming's strong and Flemming's strong plus .5 per cent. urea at both room temperature and cold, and in Allen's modification of Bouin. The best results have been obtained with cold Flemming plus urea, fixed for twenty-four hours, sectioned at six micra and stained with Heidenhain's Iron Hæmx. by the short method of Lee.

The material shows thirty-seven chromosomes in the spermatogonial equatorial plates in the best counts and this is what would be expected from a study of the spermatocyte divisions. There is a border of large bent rod shaped chromosomes and an inner group of short rods and round chromosomes.

In the late prophase and side views of the equatorial plate of the first spermatocytes the accessory elements form a tripartite body. Polar views of the first spermatocyte show seventeen autosomes and either one or two accessory chromosomes depending on the way the plate is turned. At the first division, the tripartite body divides, two parts going to one pole and one to the other, the double part remaining more or less fused. A polar view of the first spermatocyte shows five quite large bivalents, two of which are slightly smaller than the other three, eleven medium sized and two microsomes, making eighteen as the haploid number. If the double accessory happens to be turned toward the observer, one of the three large ones gives the double appearance. There is little indication of an earlier division of the accessory elements though at times the double one may be seen lying closer to the centrosome, indicating that it has divided earlier. The first division is the differential division, the two daughter cells receiving the following: one, seventeen autosomes and the double accessory, and the other, seventeen autosomes and the single accessory.

The second spermatocyte division then becomes an equational one so far as the accessory chromosomes are concerned and give rise to two classes of spermatozoa.

Oogonial counts have not yet been made to determine whether the single or the double is the X chromosome, but it might be expected, in light of what has been found in the lizards by Painter, that the double one is the X and the single the Y and that oogonial counts should yield thirty-eight chromosomes. It would seem in this species of snake, at least, that the accessory chromosomes are found as three separate ones in the spermatogonia, which bears out what Painter has already described for the lizards.

Examination of some slides of snake testis of an unknown species has revealed a condition of the chromosomes more like the lizards as described by Painter. This material shows in the first spermatocyte division equatorial plates with approximately nine very large and eleven very small chromosomes as the haploid number. Before the complete results are published, a comparative study of other genera and families will be made in order to determine whether the behavior of the accessory chromosomes in snakes falls in line with what Painter has already described for lizards.

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