pigment granules in adult eyes. In the only other previous ultrastructural report on the development of pigment granules, Shoup[2] has distinguished the early-forming pigment granules of brown, vermilion, white and varigated-eye mutants. We wish to report on fine structural differences between yellow, red and brown pigment granules as noted at 54, 72 and 90 hours post-pupation in wild type, sepia and clot. At 54 hours, the only pigment body present in all flies checked was ommochrome and it increased in size throughout the time periods tested. Ommochrome-containing granules were small (average diameter 0.22-0.24 μ), electron dense, globular masses, and possessed no definite enveloping membrane. At the 72-hour stage, the same type of pigment granules were larger in size (ave. 0.53 μ), and of uniform medium electron density. At this stage, pteridine pigment granules were present in both the wild type and the mutants studied.

Among the pterin-containing granules, sepiapterin pigment granules in sepia were larger and morphologically distinguishable from drosopterin pigment granules in wild type. Both drosopterin and sepiapterin were present at 72 and 90 hours--but morphologically became more difficult to distinguish in the older pupae. However, sepiapterin pigment granules remained larger in average size at both 72 and 90-hour time periods. The pigment granules found in wild type were ommochrome and drosopterin; in sepia ommochrome and sepiapterin were present; and in clot ommochrome, drosopterin and sepiapterin were present.

The distribution of the pigment granules may be characterized in clot, since all three basic types of bodies are found there. Fig. 1 (clot, 90-hour post-pupation) represents a transverse section at the level of the seventh retinular cell (distal from the cornea) with the rhabdome at the top of the figure, and the secondary pigment cells at the bottom. All three basic types of pigment bodies may be identified in the secondary pigment cells, and only small ommochrome-containing bodies are present in the retinular cells. Detail of the fine structure of an ommochrome pigment granule is shown in Fig. 2, drosopterin in Fig. 3, and sepiapterin in Fig. 4.

These observations account for the differences in morphology between sepiapterin and drosopterin not previously reported, and indicate an increase in the size of pteridine pigment granules from 72 hours to 90 hours post-pupation--a finding in opposition to that reported by Shoup in the other mutants. A more comprehensive investigation by means of electron microscopy of the pigment granules in these and other mutants has been initiated.

References: [1]Nolte, D.J. 1961, Heredity. 16:25-38. [2]Shoup, J.R. 1966, J. Cell Biol. 29:223-249.

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Doschek, E. Institut für Allgemeine Biologie, Vienna, Austria. Competition between the three types of sex-determination of Megaselia scalaris in artificial populations.

The male sex of the Phoride M.sc. is determined by an epistatically-operating sex-realizer which is exchanged between the three non-homologous chromosomes by a regular translocation process (1). Experiments of competition in artificial populations have shown that by using different strains a certain balance can be achieved between the three different chromosomes that are the carriers of the sex realizer (2). In this case, the problem has been examined against the genetic background of one particular wild-type strain. A female caught in nature was used to produce a strain "Las Palmas 6/7". Females of this strain were mated with single males carrying the sex-realizer on chromosomes I, II or III respectively. For the following 10 generations the males were mated with females of the wild-type strain "Las Palmas 6/7". As a check proved that the desired chromosome was still the sex-determinating, well-aired cages were populated 50:50 each with combinations of sex-determining chromosomes as follows: I:III, I:II and II:III. After a period of 2 years the sex-determinating type of 100 males from each cage was examined, using suitable genetic markers. The first cage showed 98% of the males being sex-determined by chromosome III, the second 100% by chromosome I, and the third 96% by chromosome III. In accordance with earlier experiments chromosome II had been entirely or almost entirely eliminated. By contrast chromosome III held its own successfully against chromosome I with this genetic background.

References: 1. Mainx, F., 1964 Amer. Nat. 98:415-430; 2. Springer, R., 1967 Molec. Gen. Genetics 99:125-132.