Eye pigment granules in *D. melanogaster* are known to belong to the biochemical groups of pterins (yellow and reds) and ommochromes (browns). Noltel has explored ultrastructural differences in the pigment granules of *D. melanogaster* wild type and several mutants, and was concerned primarily with the distribution of pigments.

Fig. 1. Clot. 90-hour-old pupa. Ommochrome (O), drosopterin (D) and sepiapterin (S) are present in this transverse section at the level of seventh retinular nucleus. At this stage, sepiapterin is morphologically similar to drosopterin but its size is consistently larger than drosopterin.

Fig. 2. Sepia. 54-hour-old pupa. This micrograph is a higher magnification of an ommochrome pigment granule. Some of the ommochrome pigment granules are completely electron opaque while others have an internal granular substructure indicating that they are still in the process of development. At this stage, no limiting membrane surrounding the pigment granule is present.

Fig. 3. Wild type. 72-hour-old pupa. Drosopterin pigment granules are made up of a fibrillar substructure, distributed in a whorled or parallel fashion with some of the fibers tending to clump together to produce fibrils of a coarser diameter. In most cases, membrane-enclosed drosopterin pigment granules are present.

Fig. 4. Sepia. 72-hour-old pupa. The internal substructure of a sepiapterin pigment granule appears to be an aggregation of minute round or amorphous particles which are uniformly distributed throughout the pigment body. The body is usually limited by a membrane.
pigment granules in adult eyes. In the only other previous ultrastructural report on the
development of pigment granules, Shoup\textsuperscript{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 dro-
soperin and sepiapterin were present at 72 and 90 hours—but morphologically became more dif-
ficult 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 that 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 micros-
copy of the pigment granules in these and other mutants has been initiated.

29:223-249.

This research was supported in part by NSF Institutional Grant Number 230539 from the
Graduate School of Bowling Green State University to D.C. Sun, and with funds provided by the
National Science Foundation (GB 29140) and the National Aeronautics and Space Administration
(NAS-6067) for the work of I.I. Oster and associates.

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Biologie, Vienna, Austria. Competition
between the three types of sex-determin-
ation 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 be-
tween 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-determining, 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 chrom-
osome III held its own successfully against chromosome I with this genetic background.