

Rigki, T.W., 1951,

Morphological differences between two sibling species,
Drosophila pseudoobscura and *Drosophila persimilis*

Proc. Nat. Acad. Sci., 37 :157-159

statistical comparison of certain morphological characters
in *D. pseudoobscura* and *D. persimilis*

Mather and Dobzhansky, Am. Nat. 73:5-25, 1939

Reed, Williams and Chadwick, Genetics, 27:349-361, 1942

Reed and Reed, Evolution, 2:40-48, 1948

The male flies were macerated in a 10% solution of KOH, washed in water, the genitalia removed, stained with carbol fuchsin and mounted in glycerin.

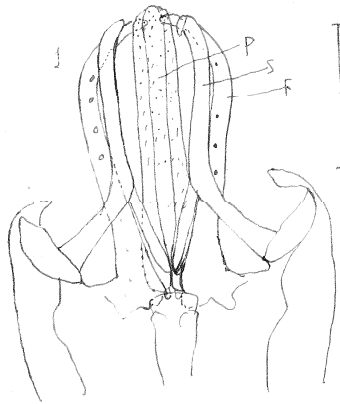
The structure of the genital arch and the hypandrium in the two species has been found to be alike. A clear-cut difference has, however, been noted in the dimensions and the proportions of ~~various parts of~~ the penis (Figs. 1 and 2). A description of the morphology and homologies of various parts of *Drosophila* male genitalia has been given by Salles.

Salles, H., Sum. Bras. Biol., 1:311-383 1947

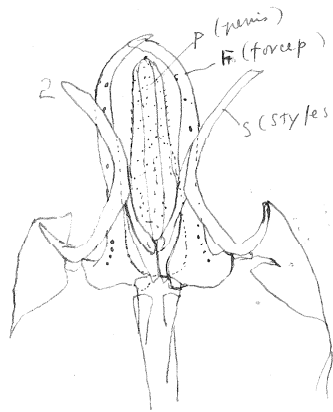
The penis of *D. pseudoobscura* is relatively long and cylindrical, whereas that of *D. persimilis* is shorter and broader at its base ~~of its lamina~~ with a tapering appearance. The length of the penis is measured from the base of its lamina, excluding the articular condyle, to the distal end of the lamina. Care was taken not to rupture the membrane at the tip of the penis.

The width was measured at the greatest curvature of the penis' lamina with respect to the mid antero-posterior axis of the penis. (Fig. 3) The penis index is computed as the ratio: length of the penis/width of lamina. The results of the measurements are summarized in table 1.

There is no significant difference among the geographical strains of *D. pseudoobscura*, nor among the strains of *D. persimilis*. However, the difference in the index of the two species is highly significant. The mean index for *D. pseudoobscura* is 8.61 ± 0.31 ; the mean index for *D. persimilis* is 6.48 ± 0.51 . Considering the extremes in the two species, we may conclude that any individual with a penis index equal to or above 7.64 is *pseudoobscura*; a penis index equal to or below 7.60 indicates *persimilis*. One *pseudoobscura* male out of 100 measurements had an index 7.64. This extreme was obtained from different absolute units than the 7.60 index of *persimilis*. Considering this situation, we should employ both criteria for classification. On the basis of the shape of the penis and also the index we are definitely able to identify males of the two species.



D. pseudoobscura



D. persimilis

