

## Dr Phil's Flightless Flies

Note that all of the strains start out quite pale when they emerge from the pupa (eclosion). Eye and body color typically deepen as they age. When a fly first emerges, in addition to being pale, the abdomen is elongated – almost 'larvae-like'; it takes an hour or more before they look like a mature fly.

4189 ap[56f]

*apterous* (ap) - the *apterous* mutation is on chromosome II at position 55.2. This strain is essentially our 'wild-type' strain. It is missing wings and halteres and has normal ('brick-red') eye and body (tan) color. Ocelli are pinkish-red-orange. Its eye color will not deepen with age.

93396 ap[56f]; se[1]

*apterous sepia* (ap, se) – at first, the eyes are pale brown that deepen to almost black with age. *sepia* (se) is on chromosome III at position 26.0. They have normal body color and their ocelli are brown.

93397 ap[56f]; st[1]

*apterous, scarlet* (ap, st) – these mutants have bright-red eyes, which darken slightly with age. The ocelli are colorless, which is the best way to distinguish older individuals from wild-type. The *scarlet* (st) mutation is on chromosome III at position 44.0. The flies typically have paler bodies than wild-type.

93398 w[1118]; ap[56f]; e[1]

*apterous, white, ebony* (ap, w, e) white eyes, dark bodies – a triple mutant; can be used to demonstrate independent assortment with sex-linkage. *ebony* (e) is on chromosome III at position 70.7, *white* (w) is on chromosome I (the 'X' chromosome) on the left end, at position 1.5. The *white* mutation is the first mutant isolated in *Drosophila* and was used to demonstrate that a gene is located on a chromosome. The flies have white eyes, colorless ocelli and their bodies are darker than wild-type, ranging from grey to black as they age.

93399 ap[56f] bw[1]; se[1]

*apterous, brown, sepia* (ap, bw, se) has pale orange-brown eyes, that deepen to brown with age; body color is normal. The phenotype is indistinguishable from *brown* due to recessive epistasis. *brown* (bw) is on chromosome II at position 103 and *sepia* (se) on chromosome III at position 26.0. Body color is slightly paler than wild-type and the ocelli are pale brown/pink.

93400 ap[56f]; se[1] e[1]

*apterous, sepia, ebony* (ap, se, e) - dark bodies, dark eyes, both getting deeper with age. The ocelli are brown. A striking phenotype, *sepia* (se) and *ebony* (e) are linked on chromosome III and are separated by about 45 map units.

93401 y[1] w[1118]; ap[56f]; e[1]

*apterous, yellow, white, ebony* (ap, y, w, e) – is a quadruple mutant. It has 'coffee with crème' colored bodies, due to the interaction of the two body color genes, *yellow* (y) and *ebony* (e); the color deepens with age. It also has the X-linked white-eye (w) mutation. The ocelli are colorless. *yellow* is also a sex-linked trait; it is very close (position 0) to *white*, on X chromosome. *ebony* is on chromosome III

93402 ap[56f] bw[1]; st[1]

*apterous, brown, scarlet (ap, bw, st)* – have white eyes due to the interaction of the *brown* and *scarlet* alleles. *brown* is on chromosome II. *scarlet* is on chromosome III at position 44.0 and assort independently from *brown*. This strain, in general, has paler bodies than wild-type.

93403 ap[56f]; se[1] st[1]

*apterous, sepia, scarlet (ap, se, st)* – The *sepia (se)* and *scarlet (st)* genes are linked on chromosome III (18 map units apart). These flies have a beautiful golden eye color when they eclose, which deepens as they age to become indistinguishable from *sepia (se)*. Their ocelli, however, remain colorless.

93404 ap[56f]; se[1] st[1] e[1]

*apterous, sepia, scarlet, ebony (ap, se, st, e)* – Another quadruple mutant. Eye color as above (colorless ocelli). This strain can be used for three-point mapping, as the *se, st* and *e* genes are all linked on chromosome III.