

Zaitin, A.I. A Third Chromosome Balancer

The lines carrying numerous mutant genes in the third chromosome may be

balanced by means of the chromosome ru h D (Fiodorova), carry- in the inversion which almost completely suppresses crossing over (to be described in one of the following issues of C.R. Ac. Sc. U.S.S.R.). The stock is : ru h D inv/ru cu ca; Cy sp/L².

Muller, H.J. Labor-Saving Method of Starting Homozygous or Balanced Stocks of -fertile Sex-linked Genes

(1) Balancer stock "Patroclinous" ("Pat")
P₁ ClB, sc v/sc v lx f bb/Y ♀ (non-disjunction)

X dl-49, lz^S/Y ♂

Eggs: ClB, sc v (half carry Y) sc v lx f bb (half carry Y)
ClB sc v/sc v lx f bb (non-disjunction) Y (non-dis.)

Sperm: lz^S dl-49 Y

F₁ ClB, sc v/dl-49, lz^S ♀ (1/2 carry Y) ClB, sc v/Y (1/2 YY) (dies)
sc v lx f bb/dl-49, lz^S ♀ (" " ") sc v lx f bb/Y (" " ")
ClB, sc v/sc v lx f bb/dl-49, lz^S ♀ (dies) ClB, sc v/sc v lx f bb/Y ♀
dl-49, lz^S/Y ♂ Y/Y (dies)

To perpetuate, breed sc v B ♀ ♀ (need not be virgin) by dl-49, lz^S brothers or fathers (Selection needed to retain sc v lx f bb).

(2) Let "a" represent sex-linked gene or combination of genes.

Then:

P₁ ClB, sc v/sc v lx f bb/Y ♀ X a/Y ♂

Eggs: ClB, sc v (1/2 carry Y) sc v lx f bb (1/2 carry Y)
ClB, sc v/sc v lx f bb (non-disjunction) Y (non-dis.)

Sperm: a Y

F₁ ClB sc v/a ♀ (1/2 carry Y) ClB, sc v/Y ♂ (1/2 YY) (dies)
sc v lx f bb/a ♀ (" " ") sc v lx f bb/Y ♂ (1/2 YY) (dies)
ClB, sc v/sc v lx f bb/a ♀ ClB, sc v/sc v lx f bb/Y
(3X ♀, dies or sterile) Y/Y (noX- dies)
a/Y ♂

To form stock of "a", breed B (not sc or v) ♀ ♀ (need not be virgin) by any brothers or fathers: ClB, sc v/a ♀ (1/2 carry Y) X a/Y ♂.

If "a" has good viability and fertility when homozygous, this stock will automatically become a/a/(Y) ♀ X a/Y/(Y) ♂ after a few generations; otherwise, it will remain balanced and this will then be the more desirable condition to have it in. If presence of supernumerary Y in stock is undesirable, a stock of "Patroclinous" should be used in which the Y is marked by Cy owing to a translocation between Y and a chromosome 2 containing Cy. In this case only the non-Cy B F₁ ♀ ♀ are used for breeding. This stock is called "Curly Pat".

Muller, H.J. Balancing of Duplications by Deficiencies or Lethals and Vice versa - (Bridges, Muller)

Example: P₁ y w/sc^{J1}
ljl ♀ X y/dcl-24/Y ♂
(dcl-24 is a deleted-X = duplication covering

locus of ljl, y and sc).

F₁ sc^{J1} ljl/dcl-24/Y ♂ X Y ♀