Takamura,T. & Y.Fuyama 1980, Behav.Genet. 10:105-120; Weisbrot, R.D. 1966, Genetics 53:427-435.

Sondergaard, L. University of Copenhagen, Denmark. Mating capacity of e/e and e/+ males under non-competitive conditions.

It is well-known that the mutant ebony (e) has several pleiotropic behavioural effects. Some of these have been thought to be the reason why the e gene, in contrast to most other mutant genes, stabilizes at a certain level in population cage experiments. One factor which is rarely considered is what one might call the "Don-Juan" factor, i.e., the number of females a male can mate within a given period. A male with a very efficient courtship could be at a selective disadvantage if he needs too long a recovery period after copulation compared to a male with a less effective courtship, but with a very short recovery period. To test the mating capacity, single unexperienced ♂♂ (12-24 hrs of age) were confined for 24 hrs with 12 one-week-old ♀♀ in light or complete darkness. e/e, e/+ and +/+ ♂♂ were mated with e/e; e/+ and +/+ ♀♀also to test the effect of the female genotype on male performance. Results are shown in Table 1. The overall tendency is that e/+ and +/+ ♂♂ perform better in light, whereas e/e ♂♂ perform equally well in light and darkness when mated to e/+ and e/e ♀♀. In the light the order of the D.J. factor is e/+ > e/e > +/+, indicating overdominance for this trait.

Table 1. D.J. factor ± s.d. (see text) for males confined for 24 hrs with 12 of the indicated genotype; experiments were performed in 24 hrs light and 24 hrs of darkness. In each experiment 75-100 were tested individually.

	darkness	light
+/+ ♀ x e/+ ♂	3.3±1.5	4.8±2.0
e/e ♀ x e/+ ♂	3.6±1.7	5.9±2.0
e/+ ♀ x e/+ ♂	3.4±1.9	5.7±2.4
+/+ ♀ x e/e ♂	2.9±1.3	3.7±1.9
e/e ♀ x e/e ♂	4.3±2.1	4.5±2.0
e/+ ♀ x e/e ♂	4.3±1.9	4.4±2.1
+/+ ♀ x +/+ ♂	1.8±1.1	2.4±1.6
e/e ♀ x +/+ ♂	2.5±1.3	3.1±1.5
e/+ ♀ x +/+ ♂	1.7±1.5	3.2±1.5

These observations are explainable by the fact that e/e flies are blind and that e/+ and e/e have a more efficient courtship behaviour (Kyriacou et al. 1978). However, this does not explain the observed differences between different females when tested to the same male genotype: in the light the scores are lower with +/+ ♀♀. In darkness the results are more complex: no differences were observed between ♀♀ mated to e/+ ♂♂; e/e ♂♂ show lower scores with +/+ ♀♀; +/+ ♂♂ have a higher mating frequency with e/e ♀♀. These differences could be explained by differences in female heat. A more possible explanation is a difference in the activity levels of both males and females. That is, increasing spontaneous activity in the order +/+; e/+; e/e. In the light +/+ ♀♀ do not move around as much and therefore rarely meet a male; in the darkness they move around even less. However, with e/+ males this is compensated for by the higher activity of these males also in the dark. In the experiment with +/+ ♂♂ sluggishness is only compensated for by the high activity of the e/e ♀♀ in darkness. In the dark the high activity of e/e ♂♂ compensates for differences between e/e ♀♀ and e/+ ♀♀ activity.

Reference: Kyriacou,C.P., B.Burnet & K.J.Connolly 1978, Anim.Behav. 26:1195.

Spiess, E.B. University of Illinois, Chicago, Illinois. Discrete generation populations of D.persimilis selected for female receptivity and frequencies of KL-MD karyotypes.

Population box experiments were designed in 1979 with selection for early maturation of females (D.persimilis) in order to substantiate the relative frequency changes expected of KL and MD arrangements that had been characterized for female "switch-on" of receptivity by Yu & Spiess (1978). Three strains of KL (4,11,17) with amylase variant amy-1.09 and 3 strains of MD (7,16,35) with amy-1.00 derived from a McDonald Ranch, CA, population were intercrossed within homokaryotypes and introduced into plastic refrigeration boxes ("Bennett cages") with 8 holes for as many food vials to provide oviposition area for 200 initial pairs of flies. Females were virgins of 1-2 days past eclosion while males were as old or slightly older. Initial frequencies were approximately 90%: 10% of either arrangement and four populations were monitored by electrophoresing a sample of