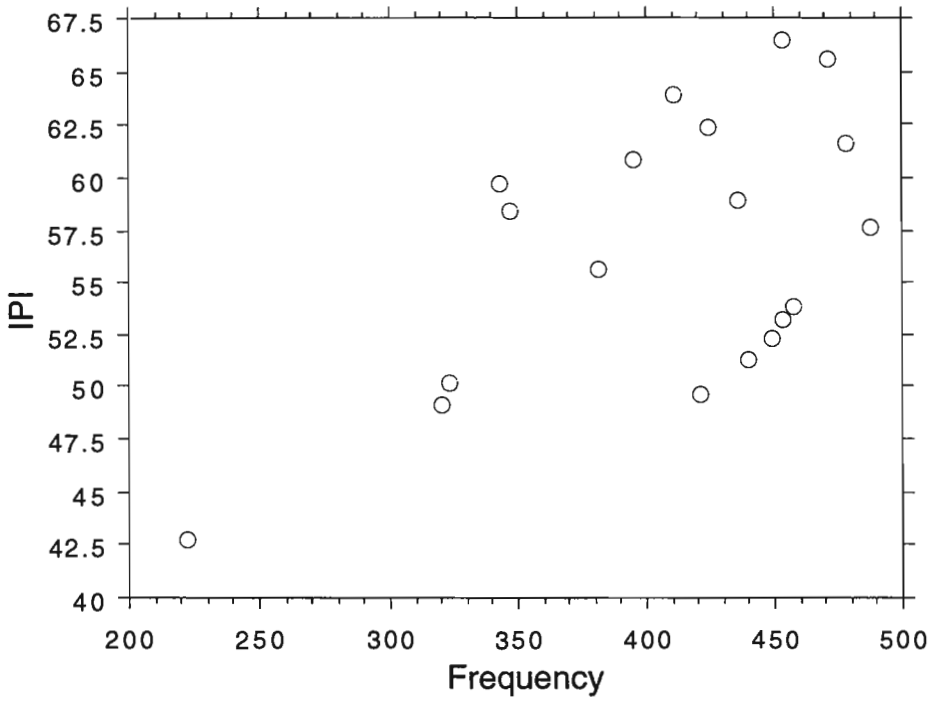

Figure 2. Plot of courtship song elements of wild-caught flies from Mather, California.

Noor, Mohamed A.F.[1], **John R. Wheatley**[2], **Kris A. Wetterstrand**[1], **and Hiroshi Akashi**[3]. [1]Section of Genetics and Development, Cornell University, Ithaca, NY 14853. [2]Department of Psychology, Indiana University, Bloomington, IN 47405. [3]Section of Evolution and Ecology, University of California, Davis, CA 95616. Western North America *obscura*-group *Drosophila* collection data, summer 1997.

We report here our collection data for *obscura*-group *Drosophila* species in Utah, Arizona, and California. Most notable is the rapid introduction and/or rise in frequency of *D. subobscura* in central Utah. Our collection in 1993 at this site in Utah yielded only *D. pseudoobscura*, suggesting this introduction is very recent. Also noteworthy is the drop in the relative abundance of *D. azteca* after a steady increase over several years (Noor, 1995). Finally, four of the ten *D. persimilis* females captured at Mount St. Helena appear to have been inseminated by males possessing the sex-ratio gene arrangement, hence producing all female offspring. In contrast, only 1 of the 30 *D. persimilis* females captured at Mather had been inseminated by an apparently sex-ratio male.

Obscura-group *Drosophila* were collected from five sites in the western United States in June/July, 1997:

American Fork, Utah- 40°26.71'N, 111°42.74'W- July 9-10, flies were collected from the Uinta National Forest in American Fork Canyon. (AFC)

Flagstaff, Arizona- 34°56.58'N, 111°29.53'W- June 20-22, flies were collected from the immediate vicinity of Mormon Lake. (FLAG)

Mather, California- 37°53.12'N, 119°50.78'W- June 26-29, flies were collected immediately outside the cabin maintained by the Carnegie Institute of Washington. (MATHER)

Mount St. Helena, California- 38°39.18'N, 122°35.96'W- July 1-3, flies were collected at Robert Louis Stevenson state park north of Calistoga. (MSH)

Paradise, California- 39°46.20'N, 121°37.58'W- July 6-7, flies were collected from Bille Park. (PARA)

We used buckets of fermenting bananas to attract flies for capture. These buckets were left out of doors overnight, and fresh bananas were added to the fermenting bananas daily. Males were identified to species using morphological criteria (Beckenbach and Prevosti, 1986), and females were identified using chromosome squashes of

offspring (Anderson *et al.*, 1977) and courtship songs of offspring (Noor, 1998). Flies were identified as *D. pseudoobscura* (pseudo), *D. persimilis*, *D. miranda*, *D. subobscura*, and *affinis*-subgroup *Drosophila*.

All *affinis*-subgroup flies captured in California are assumed to be *D. azteca*. Recently, Pascual *et al.* (1997) reported that *D. athabasca* had invaded California. We attempted to use the RAPD markers suggested by Pascual *et al.* (1997) to identify positively the *affinis*-subgroup species that we captured, but several individuals had combinations of bands that were suggested to be unique to each of the two species. Dr. Rhonda Snook positively identified several individuals that we captured as *D. azteca* using a genital comb characteristic.

Table 1. Proportions of *obscura*-group species collected

Site	%pseudo	%persimilis	%miranda	%subobscura	%"azteca"	N*
AFC, UT	24	0	0	75	<1**	252
FLAG, AZ	100	0	0	0	0	94
MATHER, CA	11	69	2	1	17	148/38
MSH, CA	12	8	2	30	47	273/27
PARA, CA	----------26----------			16	58	25***

* The first number is the total number of flies captured, while the second number denotes the number of females used to calculate the relative proportions of *D. pseudoobscura*, *D. persimilis*, and *D. miranda*.
** Probably *D. athabasca*, only 1 male captured.
*** No females that were *D. pseudoobscura*, *D. persimilis*, or *D. miranda* were captured.

The spread of *D. subobscura* into Utah is startling. Genetic studies of the recently established population(s) in Utah, the older populations in the northwest, and the ancestral populations in Europe may yield information on how this species has spread so quickly over such a vast region.

References: Anderson, W.W., F.J. Ayala, and R.E. Michod 1977, J. Hered. 68:71-74; Beckenbach, A.T., and A. Prevosti 1986, Am. Midl. Nat. 115:10-18; Noor, M.A., 1995, Pan-Pacif. Entomol. 71:71-74; Noor, M.A.F., 1998, Dros. Inf. Serv. 81:134-136; Pascual, M., J. Balanya, A. Latorre and L. Serra 1997, Mol. Ecol. 6:293-296.

Jones, C.D., and H.A. Orr. Department of Biology, University of Rochester, Rochester, NY 14620. Test of a *Drosophila simulans* balancer and a remapping of chromosome 3.

Although its genetics does not rival that of *D. melanogaster*, *D. simulans* has an large number of genetic markers, compound chromosomes, and other genetic tools. Most mutations in *D. simulans* are alleles of mutations in *D. melanogaster*. *D. simulans* is also karyotypically quite similar to *D. melanogaster*. However, the two species differ in a large inversion on *3*R. Unfortunately, this inversion difference has caused confusion about the *D. simulans* third chromosome map.

Here, we remap the *D. simulans* third chromosome using a newly created multiply marked stock and test the utility of inversion In(*3*R)*Ubx* (81F1 to 89E) as a balancer for *3*R (Coyne and Sniegowski 1994).

To remap chromosome 3, male *jv st e osp pe* flies were crossed to wildtype females (Solway-Hochman), and F_1 females were then backcrossed to *jv st e osp pe* males. The resulting progeny were genotyped. To test the balancer, male *jv st e osp pe* flies were crossed to female In(*3*R)*Ubx*, *Ubx/Dl*. *Ubx*/+ F_1 females were then backcrossed to *jv st e osp pe* males, and their progeny genotyped. We then compared the recombination distances between markers in these two cross to assess the possible use of In(*3*R)*Ubx* as a balancer.

Remapping of chromosome *3*: Sturtevant showed that *jv*, *st*, and *pe* (an allele of *pink*) are all allelomorphic to *D. melanogaster* mutations (Sturtevant 1929; Sturtevant and Novitski 1941). *e* is also allelic to *ebony* in *D. melanogaster* (J.A. Coyne, pers. comm.). *jv* is the most distal marker shared by both *D. simulans* and *D. melanogaster*. Thus, we anchored our map at *jv* (19.2 cM). The other markers were then positioned according to their recombination distances as determined in the present study (Table 1).

The order of the markers was checked and did not differ

Table 1. Marker map positions (*N* = 1014 flies). Kosambi's formula was used to correct recombination distances ("Corrected map position" column).

Marker	Uncorrected map position	Corrected map position
jv	19.2	19.2
st	46.3	49.5
e	59.4	63.0
osp	68.6	72.3
pe	97.3	104.9

Table 2. Test of In(*3*R)*Ubx* as balancer (*N* = 739 control flies and *N* = 584 experimental flies)

	Percent recombination	
Interval	Control Cross	Experimental Cross
st - e	13.1	12.0
e - osp	9.2	8.6
osp - pe	28.7	21.1