collecting seed and the American Philosophical Society for financing a collecting trip to Guatemala. The National Science Foundation (DEB 76-06048) provided additional travel money that made this project feasible.—JOHN M. MILLER, Department of Biology, Sul Ross State University, Alpine, TX 79832. (Received 17 Sep 82; accepted 16 Feb 83.)

NOTES ON THE MENTOR EFFECT AND MALE STERILITY IN *Malacothrix* (ASTERACEAE).—During biosystematic studies in *Malacothrix* (Lactuceae) plants resulting from interspecific crosses have been grown in cultivation, and most of them have been judged to be hybrid because they have had intermediate morphology, abnormalities in meiosis, and low percentages of stainable pollen. In a few such crosses plants were produced that were morphologically like the female parent rather than hybrid in appearance, even in cases where the female parent had been found to be self-incompatible. Apparently, the presence of foreign compatible pollen had allowed the self-incompatibility mechanism to be bypassed, a phenomenon known as the mentor effect (D. de Nettancourt, *Incompatibility in Angiosperms,* p. 70, 1977). This effect has been found in a variety of angiosperm families, including Asteraceae, and I have observed it in four self-incompatible species of *Malacothrix.* One interesting case concerns the bringing together of recessive male sterility alleles by the mentor effect, the first report of such alleles in *Malacothrix.* Crosses between plants of *M. floccifera* (DC.) Blake and *M. phaeocarpa* Davis (ined.) were involved. The former is a small, white-flowered annual that is widely distributed within the California Floristic Province, and the latter is a rarely collected, white-flowered, annual species that is presently known from only 16 populations in the southwestern portion of the range of *M. floccifera.* Twenty-four plants of *M. floccifera* representing three natural populations were grown in cultivation and all were self-incompatible. Ten plants of *M. phaeocarpa* from one population were grown in cultivation and all were autogamous and strongly self-pollinating, as evidenced from fruit set in undisturbed heads. Crosses between the two species with *M. floccifera* as the female parent were generally unsuccessful, but six hybrid plants were produced and all had stainable pollen of less than 5% and meiotic irregularities including a ring of four chromosomes. A seventh plant, which is assumed to have resulted from self-fertilization, had the morphology of *M. floccifera* and was found to have no pollen. A few stained protoplasts without nuclei were found after 24 hr of staining with 1% cotton blue-lactophenol and spore wall development had not taken place. Meiosis in the plant was visibly normal and seven bivalents were present at diakinesis. Regular first and second division segregation occurred and four, normal-appearing, nucleated cells enclosed within the PMC wall were produced. Gametophytic breakdown apparently occurred beyond this stage.

The male sterile plant was used as the female parent in the crosses indicated below, which also include the original P-1 crosses (garden numbers for individual plants are given in parentheses; the female parent is on the left in each cross).

P-1	*M. floccifera* × *M. phaeocarpa*		*M. floccifera* × *M. floccifera*
	(515-3) ↓ (592-3)		(515-1) ↓ (515-3)
F-1	Male Sterile	×	*M. floccifera*
	(618-1B)	↓	(665-1)
F-2	Male fertile (723-1A) 98% stainable pollen		
	Male sterile (723-1B) No pollen		
	Male sterile (723-1C) No pollen		

Male fertile (723-2A) 95% stainable pollen
Male sterile (723-2B) No pollen
Male sterile (723-2C) No pollen
Male sterile (723-1C) × Male fertile (723-2A)
↓
F-3 3 Male fertile; 2 Male sterile

All of the male sterile plants had normal-appearing meiotic patterns through telophase II. The ratios of 4 male sterile: 2 male fertile in the F-2 and 3 male fertile: 2 male sterile in the F-3 are not significantly different from the ratios expected on the basis of an exact test based on the binomial distribution using the appropriate values for probability and sample size.

In another self-incompatible species, *M. californica* DC., the mentor effect has disclosed other apparently recessive genes that are lethal or have an effect on fitness. Twenty-three plants resulting from crosses involving four other species of *Malacothrix* as the male parent were grown in cultivation. All had the morphology of *M. californica* and those that flowered had over 90% stainable pollen and normal meiosis. Six of the plants lacked green pigment and died before reaching maturity and one plant displayed a phenotype in which flower heads remained almost completely closed at maturity.—W. S. Davis, Department of Biology, University of Louisville, Louisville, KY 40292. (Received 4 May 83; accepted 20 Sep 83.)