rat does not possess a typical sex-steroid binding globulin, it does contain a similar protein which binds estradiol and estrone with high affinity (*17*). For these reasons we maintain that THC does not compete for cytoplasmic estrogen receptors.

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Genetic Self-Incompatibility in *Oenothera* subsect *Euoenothera*

Abstract. *Although it has been postulated that genetic self-incompatibility was involved in the origin of complex heterozygotes in* Oenothera *subsect* Euoenothera, *it has not been detected in any species of this well-studied group. It is now reported for populations of* Oenothera grandiflora *from west central Alabama, and should be sought in other populations of this species, which has been in cultivation for nearly two centuries.*

Complex heterozygosity in *Oenothera* subsect *Euoenothera* is a well-known evolutionary phenomenon that has been studied extensively since its discovery a half-century ago. Within this group, which we consider to consist of about a dozen species, half are complex heterozygotes. A mechanism for the immediate establishment of such heterozygotes in this group, following hybridization of plants with appropriate chromosome configurations, has been suggested by Steiner (*1*). He based his hypothesis on the presence of self-incompatibility (Si−) alleles in the chromosome complexes of *Oenothera biennis* L. that were normally transmitted via the egg, observations that he later extended to egg complexes of the complex heterozygotes *O. parviflora* L. and *O. villosa* Thunb. [*O. strigosa* (Rydb.) Mack. & Bush] (*2*).

Both Steiner (*1*) and Cleland (*3*) concluded on the basis of their observations that Si alleles were not present in any living populations of *Euoenothera* that were not complex heterozygotes, regardless of whether these populations had the AA, BB, or CC genotype (*4*). Of particular interest in this connection is *Oenothera grandiflora* L'Hér., a species that has been in cultivation for nearly two centuries (*5*), but which is rare and local in nature. It is the only outcrossing species that has the BB genotype from which the egg complex of *O. biennis* was derived. On morphological grounds, it is highly probable that *O. grandiflora* closely resembles one of the parents of *O. biennis* (*6*). It has not been shown, however, to possess Si alleles, and all plants reported have been self-compatible, although outcrossing. This led Cleland (*3*) to postulate that *O. grandiflora* as it exists at present is a remnant of a population (his "population 2") in which genes for self-incompatibility were present. This ancestral population, rather than living *O. grandiflora*, he believed, was the one that furnished the Si alleles to *O. biennis* when it was first formed.

As was pointed out by Steiner (*6*), all populations of *O. grandiflora* that have been available for study until recently came from a restricted area approximately 30 to 65 km north northeast of Mobile, Alabama, and from cultivated plants derived from these populations. In addition to occurring in this area, however, *O. grandiflora* also occurs in Franklin and Marion counties, Tennessee, some 500 km to the north; in Lowndes County, Mississippi, about 240 km north; and in Sumter County, Alabama, 140 km north of the south Alabama localities and 10 km southeast of the one in Mississippi. It probably also occurs as a native plant in still other regions.

We were able to grow two populations of the species from Sumter County, Alabama (*7*). In a series of eight individuals from 2.8 km south of York, grown at Stanford University in 1971, one individual was self-incompatible. In a group of about 70 individuals grown at Düsseldorf in 1977, from seeds collected at Bellamy in 1974, of 21 individuals tested, 20 were self-incompatible. These two localities are about 18 km apart.

This is the first report of genetic self-incompatibility in *Oenothera* subsect *Euoenothera*, in a species that has been in cultivation for two centuries and a group that has been under active genetical study for more than 90 years. In view of it, we may now hypothesize that populations identical to some of those of the living *O. grandiflora* were in fact one of the parents in the original cross that led to the origin of *O. biennis* (*8*), widespread in eastern North America and now a worldwide weed. In an effort to amplify these discoveries, it is necessary to screen as many additional populations of *O. grandiflora* as possible, especially for Si alleles that may be present in low numbers, even in the area from which the plants originally cultivated and studied were derived.

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7. We thank S. B. Jones, Jr., for providing us with these seeds.
8. That is, Biennis I, in which the B (*grandiflora*) complex is transmitted via the egg.
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