son—that is, for maximum physical intimacy between catalytic components—an acidic base of 69 m^2/g surface area silica-alumina was used, *impregnated* with 0.2 percent Pt. Thus, the amount of "acidic" surface in the reactor was approximately the same here as with the mixtures. The thermodynamic limit to the partial pressure of *n*-heptenes is calculated to be of the order of 10^{-2} to 10^{-3} atm. For maximum reaction rate, the diffusion criterion discussed in the previous report (*1*) indicates that particle size should be less than about 100μ. The experimental results are shown in Fig. 1 and are in good agreement with this prediction, based on reaction via gas-phase olefin molecules which travel by ordinary diffusion between the two distinct types of catalytic sites.

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Infective Transfer of Maternally Inherited Abnormal Sex-Ratio in Drosophila willistoni

Deviations from the normal 1/1 ratio of sexes are known in natural populations of several species of *Drosophila*. These deviations usually take the form of production of unisexual progenies which consist mainly or exclusively of daughters. In *D. obscura, D. pseudoobscura, D. persimilis,* and *D. azteca,* this condition is inherited through the X-chromosome (*1*). On the other hand, Cavalcanti (*2*), Magni (*3*), and Carson (*4*) discovered in *D. prosaltans, D. bifasciata,* and *D. borealis,* respectively, deviations from the normal sex-ratio which appear to be inherited through the cytoplasm. Females of certain strains produce progenies that consist mainly or only of daughters, regardless of which males they are crossed to, and this condition is transmitted, in turn, to all of their female offspring. This cytoplasmically inherited "sex-ratio" condition resembles, in many ways, the oversensitivity to CO_2 that was studied by l'Heritier and his school (*5*). Recently, B. Spassky observed that a single female of *D. willistoni,* from Jamaica, and a single female of *D. paulistorum,* from Sierra Nevada de Santa Marta, Colombia, produced nearly unisexual female progenies and that this peculiarity was inherited by their offspring. Spassky has very generously given these stocks to one of us (C.M.) for study.

The "sex-ratio" condition of *D. willistoni* has been examined in some detail. Females from the "sex-ratio" strain produce nothing but daughters in outcrosses to males from most of the strains which have been tested in this respect. However, outcrosses to males from three strains collected at Recife, Brazil, from one strain from the island of Saint Lucia, West Indies, from one strain from Costa Rica, and from a laboratory strain that contains the second chromosome mutants Star, Hooked, abbreviated, and brown, produce intermediate or normal (1♀/1♂) sex-ratios after one or more generations of crossing and backcrossing. Thus, the "sex-ratio" condition is not transmitted through the usual chromosomal inheritance, but it is not independent of chromosomal genes (*6*).

Eggs deposited by "sex-ratio" females fall into two readily distinguishable classes when they are dechorionated about 2 to 4 hours after deposition. Approximately half of the eggs begin to show translucent areas, both anteriorly and posteriorly, following formation of the blastoderm. These eggs show no further normal development and yield no larvae. Presumably, they represent dying male zygotes. A fraction of eggs which appear normal in early stages produce embryos which fail to hatch and darken markedly between 24 and 36 hours after being laid. Although the sex of these embryos is not yet certain, it seems probable that they are female.

To test the possibility of the transfer of the "sex-ratio" condition to normal females, early abnormal eggs from "sex-ratio" females were punctured (about 3 to 6 hours after deposition) with a micropipette. Ooplasm was taken into the pipette and injected into the abdomens of young virgin females from the Recife strain. Uninjected females from this strain give, with great regularity, a normal 1/1 ratio of the sexes. The injected females were then mated to males of their own strain and transferred, at 2-day intervals, to a fresh culture medium. Eggs were collected in this way until the end of the life of each of the injected females. In most of the cases the broods from each of the females for the first 2 weeks of egg production yielded normal proportions of males and females. However, at the end of this period, five out of the 16 females began to produce mainly daughters, and finally they produced daughters exclusively. One of the females showed a ratio of 2♀/1♂ from the beginning and, at the end of the first 2 weeks, began to produce only females. Daughters of the injected females derived from the successive broods of eggs were then tested by mating to brothers or to males from the normal Recife strain. In the two most thoroughly tested cases of broods from the later period, when only females were being produced, 17 daughters of one injected female all showed "sex-ratio" in their progeny, 11 giving no males at all; the others, only a few males. Twelve daughters of the other injected female all gave "sex-ratio" progeny; among them were five that gave no males at all. In all cases the progenies were sufficiently large to leave no doubt of the presence of the "sex-ratio" condition in these flies. Subsequently, the F_2 daughters have produced "sex-ratio" progenies; hence, it is clear that the original infection has now been transmitted through three generations. Stocks of these new "sex-ratio" strains are now being maintained.

Examination of the eggs of the new "sex-ratio" females shows the same abnormalities that were encountered in the original "sex-ratio" strain of Jamaican origin (*7*).

A series of controls was carried out, along with the "sex-ratio" injections. For these, ooplasm of unfertilized 3- to 6-hour eggs from virgin females of the Recife strain was injected into young virgin females of this strain, by means of the same procedures that were followed in the experimental series. Broods from eggs laid at 2-day intervals were raised, and the sex ratio was determined. In none of the 15 females of this control were there any significant deviations from the normal ratio of 1/1, even after the 2-week period in which the experimental series showed the striking changes that have been described in this report.

It is therefore clearly demonstrated that the "sex-ratio" condition in *Drosophila willistoni* can be transferred to normal females, and that it is essentially infectious in nature.

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