

zhansky and Epling 1944). Recombinants between SR and ST are known from that region (Wallace 1948; Anderson, pers. comm.), isolating the small distal inversion. The "sex-ratio" phenotype is carried in the proximal pair of inversions (Wallace 1948). It is quite likely that the recombination in the homosequential region accounts for much of the recombination found by Sturtevant and Dobzhansky. Since over 90 map units separate est-5 from sh, it is likely that most recombinants occur distal to est-5, beyond the region conferring the "sex-ratio" phenotype.

References: Anderson and Norman 1977, DIS 52:11-12; Cobbs 1976, Genetics 82:53-62; Curtsinger and Feldman 1979, Genetics, in press; Dobzhansky and Epling 1944, Carnegie Inst. Wash. Publ. 554, Part II, Plate 4; Sturtevant and Dobzhansky 1936, Genetics 21:473-490; Sturtevant and Tan 1937, J. of Genetics 34:415-432; Wallace 1948, Evolution 2:189-217.

Carton, Y., J. Roualt and H. Kitano.
Lab. Gén. Evolutive C.N.R.S., Gif-sur-Yvette, France. Susceptibility of the seven sibling species of sub-group melanogaster infected with a Cynipide parasite.

pidae specific to *Drosophila* (Barbotin et al. 1979) might play a role in this process. *Cothonaspis boulardi* is a solitary, endophagous parasite (parasitoid) that oviposits into larvae of several species of *Drosophila*. We have tried to estimate the differential susceptibility of the seven sibling species of *Drosophila* towards this parasite. For this purpose we retained the following experimental procedure. Females of this solitary parasite lay their eggs (at 25°C) in the second instar larvae of the host; consequently, the exposure of host larvae to the parasite was limited to 24 hrs. Ten wasp females were introduced into a plexi-

Specific parasites are an important component of the niche and it has been assumed that development of genetic defense mechanisms could play a role during the speciation process. The seven sibling species of the melanogaster sub-group appear to originate from West Africa where speciation process occurs (Tsacas 1979).

The existence in this area of parasitic Cynipidae specific to *Drosophila* (Barbotin et al. 1979) might play a role in this process. *Cothonaspis boulardi* is a solitary, endophagous parasite (parasitoid) that oviposits into larvae of several species of *Drosophila*. We have tried to estimate the differential susceptibility of the seven sibling species of *Drosophila* towards this parasite. For this purpose we retained the following experimental procedure. Females of this solitary parasite lay their eggs (at 25°C) in the second instar larvae of the host; consequently, the exposure of host larvae to the parasite was limited to 24 hrs. Ten wasp females were introduced into a plexi-

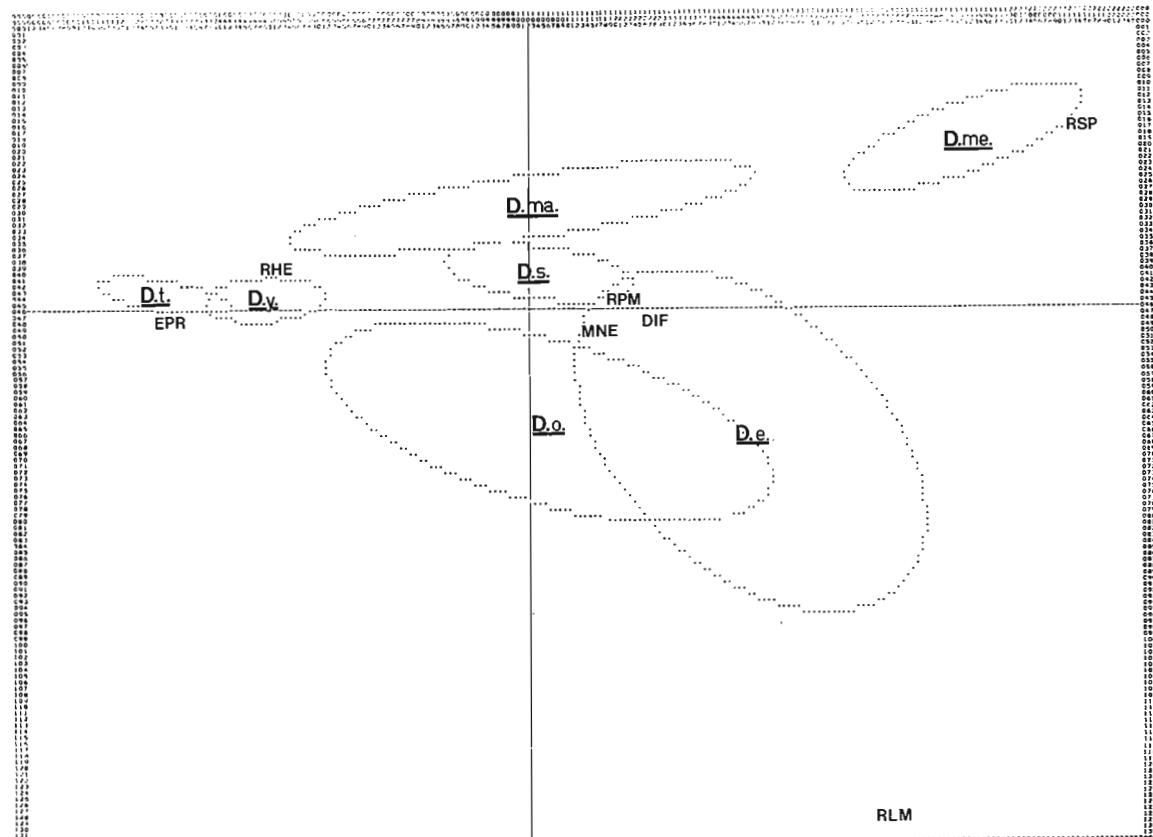


Fig. 1

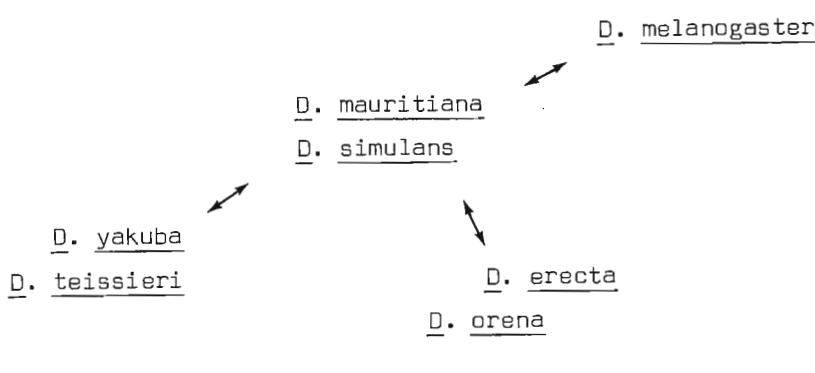
glas box containing 40 second instar larvae deposited on a thin disc of medium. 24 hrs. later, the larvae were collected and divided into two equal batches. The first replicate batch was dissected 48 hrs. after the beginning of infestation; we were able to estimate the experimental mortality (RLM), the degree of infestation (DIF), the average number of parasite eggs per parasitized larva (MNE) and the encapsulation rate (EPR), i.e., the intensity of cellular immunity of *Drosophila* species against the parasite (% of larvae which encapsulated all the parasite eggs).

For the second replicate batch, observed on the 21st day, information was obtained on the following: number of hosts surviving (RHE: rate of host emergence) comprising non-infested hosts plus infested hosts with successful immune reaction, experimental pupal mortality (RPM: rate of pupal mortality) including the hosts with remains of developing parasites, nonemerged fully developed parasites, and "mummified" pupae where no distinguishable parasite or fly remains were evident, and number of hosts producing parasite progeny (RSP: rate of successful parasitism). We must point out that the values for RLM and RPM were obtained from the experimental mortality subtracted from mortality obtained in controls. For each *Drosophila* species, the test was replicated eight times (i.e., 640 larvae).

The data were treated by a multivariate analysis. The analysis of correspondence has the advantage of allowing the simultaneous study and projection of the experimental results ($n = 56$, since eight experiments at least were performed for each *Drosophila* species) and of the seven variables (DIF, MNE, EPR, RHE, RSP, RLM and RHM). To each group of experimental results showing the same characteristics (i.e., the same species of *Drosophila*) it is possible to associate a gravity center and an equidensity ellipse (50%) (Fig. 1). In the same figure, we can observe the repartition of the different species, the localization of the different variables and the degree of association between the last two. It is therefore interesting to point out the main physiological features which characterize *Drosophila* species in response to *C. bou*lardi.

Concerning defense capacity, *D. yakuba* and *D. teissieri* are the most effective (association with EPR); consequently these two species have the highest rate of host emergence (association with RHE). On the contrary, *D. melanogaster* has no encapsulation reaction; this species is the best host for *C. bou*lardi (association with RSP on the graph). The other species present an intermediate position. *D. erecta* and *D. orena* are more susceptible to infestation; there is a good association on the graph between the two species and RLM. On the contrary, *D. simulans* presents susceptibility only at the pupal stage.

In this representative graph (Fig. 1) we observe the following correlations:



This representation, in some way, parallels the phylogenetic relationships established by chromosomal analysis (Lemeunier et al. 1976). This parallelism strongly suggests that such specific host divergences played a role in the present situation. In other words, differences in susceptibility to the parasite would require long evolutionary periods and would be genetically stable.

References: Tsacas, L. 1979, C.R. Soc. Biogeogr. Paris 480:29-51; Barbotin, F., Y. Carton and S. Kelner-Pillaud 1979, Bull. Soc. Ent. Fr. 84:20; Lemeunier, F. and M. Ashburner 1976, Proc. Roy. Soc. Lond. B 193:275.