McInnis, D.O. Screwworm Research Laboratory, Mission, Texas. Drosophila collections from Raleigh, North Carolina.

A shaded glen on the campus of North Carolina State University at Raleigh, NC provided a suitable and convenient area for Drosophila collections. A fixed trap site was the source of data from October 1975 to June 1977. During evening activity periods Drosophila were netted above a bucket containing fermenting banana. Collections were taken at least once a week except for the months of December (1976) and January (1977) when the weather was extremely unfavorable for Drosophila. The results of the samples are shown in Table 1 [preceding pages].

Several comments can be made about the seasonal variations in abundance of the 15 species trapped. Typically, the arrival of warm spring temperatures heralded the arrival of large numbers of Drosophila, occasionally with suddenness. Populations of the most numerous species, D. tripunctata, D. immigrans, D. affinis appear to increase swiftly during March or April before tapering off gradually into the winter months. Two of these species, D. tripunctata and D. affinis, seem to have continuity year-round, though their means of overwintering is not known. Interestingly, D. duncani was trapped almost exclusively during the winter months, albeit at low numbers. Of the two sibling species, D. melanogaster and D. simulans, the latter appeared later in the spring yet lasted longer during the fall. However, the spring catch of D. melanogaster could have been at least partly due to escaped laboratory flies from a campus building only 1/4 mile from the trap site (known multiply marked laboratory mutants were sometimes trapped). The female members of these siblings are not reliably distinguished on morphological grounds so only a single total is given for them. With the exception of D. quinaria, males were consistently trapped in greater numbers than females. D. putrida was the most extreme example of this.

McInnis, D.O. Screwworm Research Laboratory, Mission, Texas. The seasonal spread of D. melanogaster and D. simulans in Raleigh, North Carolina.

During the summer and fall of 1977, Drosophila were collected at various sites around the city of Raleigh, NC. One site was maintained on the campus of North Carolina State University, another sustained in a residential park, and two others set in suburban pine (Schenck Forest) or hardwood (Umstead State Park) areas. A difference between the campus and residential park data was noted in the timing of the onset of relatively high frequencies of D. melanogaster and D. simulans. For the campus site, combined frequencies (ca. 75%) of D.melanogaster and D. simulans were observed by early June, but at the residential park the peak did not occur until late June or early July. The phenomenon of a gradual spread of "domesticated" species of Drosophila from source areas of human habitation into wilder habitats has already been observed for D. melanogaster, D. hydei and D. busckii by McCoy (1962) in Indiana. The relevancy of this notion to the Raleigh area of North Carolina is further strengthened by the Schenck Forest and Umstead Park data. The peak populations of the siblings appeared in August or September at Schenck Forest, sometime after their appearance at the campus and residential park sites. At the most isolated of collecting areas (the experimental field at Umstead Park) the siblings never attained ascendancy over the class of other Drosophila combined, while their greatest abundance came in October. As a result of the late arriving pulse of D. melanogaster and D. simulans in the study areas, the peak populations of the sibling species are correspondingly more short-lived than in the two urban sites. By the end of November, colder temperatures apparently reduced numbers of Drosophila to near zero at all four trap sites.

Reference: McCoy, C.E. 1962, Jour. Econ. Ent. 55:978-985.

Miglani, G.S. and F.R. Ampy. Howard University, Washington, D.C. A possible cline between the body weight and altitude in Mexian populations of D. melanogaster.

Mean body weight (mg) per 40 males was measured for 12 Adh I/Adh I and 40 Adh II/Adh II isochromosomal lines extracted from 16 Mexican populations of D. melanogaster (Pipkin et al. 1976) raised at 25°C. A significant correlation ($r = 0.627$; $p < 0.05$) was observed between the altitude and mean body weight of the populations representing the Adh II/Adh II lines. The sites located at higher altitudes were in northern Mexico where the mean annual temperatures were low as compared to the sites located at lower altitudes in southern Mexico (Atlas Climatologico de Mexico, 1921-30). This

relationship suggested that the increased body weight at low temperatures may be due to the slower development of the individual. This view was supported by highly significant differences ($p < 0.001$) in mean body weight among three developmental stages (third instar larvae > pre-emergency pupae > adult) raised at 18°C and 28°C. It was also observed that the rate of development at 18°C was approximately one half the rate at 28°C. The above relationship suggested a possible cline between the body weight and altitude in Mexican populations of D. melanogaster.

Reference: Pipkin et al. 1976, J. Hered. 67:258-266.

Miglani, G.S. and F.R. Ampy. Howard University, Washington, D.C. ADH denaturation depends on native ADH activity levels in D. melanogaster.

Native ADH activity (nM of NADH produced/ml/min/mg of live weight) was determined spectrophotometrically for 12 Adh I/Adh I and 40 Adh II/Adh II isochromosomal lines extracted from 16 Mexican populations of D. melanogaster (Pipkin et al. 1976) raised at 25°C. The native ADH activity was compared with the activity of ADH for each line after treatment with 0.7M guanidine hydrochloride (GuHCl) or 1.0M urea (UR) for 40 seconds or with heat for 15 minutes at 45°C. The relationship between native ADH activity and ADH activity after treatments with denaturants was investigated. A significant correlation ($r = 0.63$; $p < 0.05$) was observed between native ADH activity for the 12 Adh I/Adh I lines and ADH activity after treatment with UR. Significant correlations were observed between native ADH activity for the 40 Adh II/Adh II lines and ADH activity after treatment with GuHCl ($r = 0.59$; $p < 0.01$) and UR ($r = 0.71$; $p < 0.01$). These relationships suggested that the degree of ADH denaturation was possibly dependent on the native ADH activity levels of the strain.

Reference: Pipkin et al. 1976, J. Hered. 67:258-266.

Moss, L.J. and E.A. Carlson. State University of New York, Stony Brook. EMS induced yellow mosaics in D. melanogaster.

Wild type Ore-R males were fed EMS (ethyl methane sulfonate) using an 0.0125M concentration for 24 hours. These males were mated to virgin y w f females and the $F_1$ flies were observed for mutations of yellow body, white eyes, or forked bristles. Altogether 21 yellow, 5 forked (all mosaic), and 5 white (all mosaic, one of which was an apricot) mutations were found among 9638 $F_1$ progeny.

The yellow mutations were classified as mosaic or complete in phenotype and then mated to y w f males for a test of transmissibility. Of the 21 yellow mutations, 7 were transmitted, 4 were probably gynandromorphs involving (y f) $F_1$ mosaic phenotypes with non-white head areas. Of these 4 gynandromorphs, 2 were sterile, and the 2 which were fertile segregated the y w f and Ore R wild type X (along with some f crossovers). Of the 17 yellow phenotypes not due to chromosome loss, 6 were sterile. Of the 11 fertile yellow mutants, 10 were mosaic and 1 was complete. The complete transmitted as did 6 of these 10 mosaics. The transmissibility data for the yellows are shown in Table 1.

Table 1. Frequency of mutation chart.

| | yellow phenotypes | $F_1$ females |
|---|---|---|
| EMS run #1 | 3 | 1235 |
| EMS run #2 | 11 | 5162 |
| EMS run #3 | 3 | 854 |
| EMS run #4 | 4* | 2387 |
| total | 21 | 9638 |

*Includes one yellow complete; all others in runs 1-4 are mosaic.

Total yellow phenotypes = (21/9638)(100) = 0.217% frequency of yellow phenotypes.

Total $F_1$ females = (17/9638)(100) = 0.176% frequency of yellow mutations.

These results show that EMS induces chromosome loss as well as gene mutations affecting yellow (none of the transmitted viable yellows showed achaete or scute mutations in association with the yellow). One of the two lethals is not associated with an lJl lethal because