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## Lack of mite parasitism in natural populations of *Drosophila* of the cactophilic *D. martensis* cluster (*D. repleta* group).

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Parasitism is widespread among organisms. Thus, parasite-host associations may affect host population size (Anderson and May, 1979), demographic structure, and host population cycles (Goater and Holmes, 1997). Furthermore, several studies indicate that host-parasite associations influence body size, growth rate, longevity, fecundity and developmental stability (Møller, 1990; Polak, 1993, 1996; Markow and Polak, 1995; Polak and Starmer, 1998).

Mite parasitism studies in *Drosophila* have been restricted to few species. Furthermore, few investigations have characterized the extent of this interaction in natural populations. Thus, Markow and Polak (1995) assessed the dispersion pattern of the parasitic mite *Macrocheles subbadius*, and its impact on host sexual selection in natural populations of the cactophilic *D. nigrospiracula*. They reported nearly random to strongly aggregated mite distributions over the flies, as well as mean infestation intensities of up to 7.8 mites per fly. They further experimentally showed that parasitism by mites affected the copulating success of *D. nigrospiracula*. On the other hand, Polak (1993) found that mite-infested flies did not show significant increases in fluctuating asymmetry, but that nematode infestation increased fluctuating asymmetry above mite-infested and control flies. Valuable as these studies are, it remains an open question the extent of mite parasitism in other natural *Drosophila* populations.

We report here the results of a study aimed at evaluating mite parasitism in natural populations of *Drosophila uniseta* Wasserman, Koepfer & Ward 1973, in the *D. martensis* cluster of the *D. repleta* group. The cluster is endemic to Venezuela and Colombia (Wasserman and Koepfer, 1979), and *D. uniseta* is the only species that exploits the fermenting issues of the columnar cactus *Stenocereus griseus* ( Benado and Montero, 1988). We were interested in assessing the impact of mite parasitism on fluctuating asymmetry in the wings as a measure of developmental instability.

**Material and Methods and Results:** We sampled four localities on the North Central Coast of Venezuela. about 25 Km from each other. The flies were netted monthly from May 1999 to December 1999 over banana baits and transferred immediately to vials for further inspection. In addition, from January 1999 to April 1999 we collected rot pockets of *Stenocereus griseus* and daily harvested the 2018 flies that emerged in the laboratory for up to 10 days. The flies were inspected under the dissecting microscope for mites and/ or mite scars. None were found.

Table 1. Cumulative parasitism over eight months and four localities.
** D. sp.: D. starmeri and D. venezolana.*

| Species | Parasitized | Non Parasitized | % Parasitism | Total |
|---|---|---|---|---|
| D. uniseta | 3 | 215 | 1.40 | 218 |
| D. martensis | 7 | 613 | 1.13 | 620 |
| D. sp.* | 4 | 600 | 0.66 | 604 |
| Total | 14 | 1428 | 0.97 | 1442 |

In Table 1 we give the

results of the bait collections. It can be seen that the frequency of parasitism is low (0.66% – 1.40%). These results, together with the absence of mites on the flies that emerged from the rot pockets, indicate that mite infestation is very low indeed.

We suggest that parasitism by mites in cactophilic flies is not widespread in natural populations, and therefore it is not likely to be a factor modifying mating success and other fitness components in the field.

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## Adult maturation temperature and mating ability, fertility and fecundity of *Drosophila buzzatii*.

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Effects of different temperatures during egg-to-adult development of *D. melanogaster* are well-known – shorter development time as temperature increases (except at extreme high temperatures) and reduced survival at extreme high and low temperatures. Further, male sterility is induced at or below 13°C and at or above 30°C, but return to a normal permissive temperature may result in restoration of fertility (Young and Plough, 1927; David *et al.*, 1983).

Effects of different maturation temperatures after adult emergence on the fitness components of mating ability, fertility and fecundity are less well-known, but females raised at 25°C show decreasing total egg production if kept at temperatures above or below 25°C (David *et al.*, 1983). In the cactophilic *D. mojavensis*, Markow and Toolson (1990) found that for flies raised at 24°C and then matured for 8 days at either 17°C or 34°C, those matured at 17°C (particularly males) participated in significantly more matings than those matured at 34°C.

We examined mating ability, fertility and fecundity in another cactophilic species, *D. buzzatii*, using flies reared at 25°C, and allowed to mature for 6 days at either 18°C or 31°C. Preliminary tests showed that 31°C induced about 50% sterility, but no mortality during the treatment period. As previous studies have implicated temperature mediated selection as affecting allele frequencies at the *esterase-2* locus (Barker, 1994), four isochromosomal lines each homozygous for different *esterase-2* alleles (Barker, 1994), were used. Two of these alleles are at relatively high frequency in natural populations, and two are at low frequency.

Mating ability: Flies collected as virgins (< 24 h old) were placed (sexes separate) at either temperature. Five days later, they were removed briefly from the incubators, and those from one of the temperatures dusted with fluorescent dust. For each replicate, dusting alternated between