All the experimental observations so far tempted us to speculate that cannibalistic behavior of the larvae is not restricted to *D. melanogaster* only, it is not the resultant of intraspecific competition among larvae for limited amount of food resources, and there is no species and genus specificity with respect to larval cannibalism. The last point we would like to add is that the feeding on *Musca* sp., *Parasarcophaga* sp., and raw chicken meat although allowed us to use the term, "partial carnivorism" in *Drosophila* larvae; we thus far failed to culture the flies in vials containing only raw chicken meat.

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The natural breeding sites of *Drosophila funebris* in Chile.

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Drosophila funebris, an Holoartic, cosmopolitan species, can be collected in Chile to South of the latitude 43°- 44°. There, natural populations of the species live in extreme climatic conditions near the Strait of Magellan (53° 10´S) and in Caleta Josefina in Tierra del Fuego (53° 40´S). *D. funebris* is one of the Southernmost *Drosophilidae* (Brncic and Dobzhansky, 1957; Brncic and Sanchez, 1958). On the other hand, *D. funebris* adult flies can emerge from fungi, walnut husks, decaying fruits, potatoes, and onions (Carson, 1965).

In Central Valley of Chile, latitude 29°- 37° S, *D. funebris* larvae and adults exploit a variety of decaying materials in a diversity of habitats very different to those of Tierra del Fuego, attesting to the versatility and flexibility of *D. funebris* genome. For example, populations of *D. funebris* utilize decaying pumpkin (*Cucurbita maxima*), prickly pear decaying tissue (*Opuntia ficus-indica*), and decaying tissue of a Chilean cactus (*Echinopsis chilensis*). Depending on the locality, the three types of breeding sites may be separated for a few meters as in Pelequén (34° 28´S) and Melipilla (33° 31' S) or scattered over a surface of about 50 km^2 as in Til-Til (33° 06' S).

The Pelequén, Melipilla, and Til-Til localities also differ in climate. For example, in annual rain: (i) Pelequén, 563.4 mm; (ii) Melipilla, 397.7 mm; (iii) Til-Til, 318.7 mm. Annual mean temperature in these three localities is: (i) Pelequén, 13.5°C, (ii) Melipilla, 14°C, and (iii) Til-Til, 17°C.

On the other hand, depending on the type of decaying fruit, larvae of D. *funebris* coexist with larvae of other *Drosophila* species. In pumpkin, *D. funebris* shares the fruit with *D. immigrans*. In prickly pear tissues, *D. funebris* lives together with the Chilean endemic *D. pavani* and the cosmopolitan *D. buzzatii*. From decaying cactus tissue *E. chilensis*, adults of *D. funebris* emerge together with *D. busckii* and *D. buzzatii*.

The ecology of Chilean natural populations of *D. funebris* offers an opportunity to investigate the role of ecological factors in the origin of new species. Likewise, these populations are a good biological material to study behavioral barriers that restrict gene flow. Recent results (unpublished data) suggest that there are gene flow restrictions between natural populations of *D. funebris* that live in sympatry on different substrates (pumpkin, cactus, and prickly pear). These restrictions also exist between allopatric populations of *D. funebris* reared on the same type of fruit. That is, sexes prefer to copulate with individuals emerged from the same type

of food and locality. Chilean populations of *D. funebris* are good to investigate the role of *Drosophila* breeding sites in isolation between populations and our understanding of the speciation process in animal species.

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The development of hooks in larvae of the two isolates of *Drosophila gaucha*.

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Complex behaviors as food ingestion depend on movements of mouth anatomical components coordinated by the nervous system. In *Drosophila* larvae, the hook movement has a crucial role in ingestion of feeding items allowing food to get into the larval gut (Sewell, Burnet, and Connolly, 1974). Thus, investigations focused on the development of larval hooks are important to understand properly the larval age-related changes in feeding rate (Godoy-Herrera, Burnet, and Connolly, 2005). On the other hand, a comprehension of population variation in development patterns of *Drosophila* larva hooks may clarify the role of genetic and ecological factors in the origin and maintenance of morphological differences linked with food ingestion. We investigated the genetics of morphological changes of hooks through the whole of larval period in two isolates of *Drosophila gaucha* separated by over 1200 km. Specifically, we measured hook width through the whole of larval period of *D. gaucha*, a Neotropical, Latin American endemic species, belonging to the *mesophragmatica* group of species of *Drosophila* (Brncic and Koref-Santibañez, 1957). Populations of the species distribute from South Brazil (Campos de Jordan, CJ), through Uruguay and Argentina (Buenos Aires, BA). We conjectured that geographic variation in development patterns of hook morphology of *D. gaucha* larvae could be indicative of inter population genetic differences in larval feeding rates (Okada, 1963).

Climatic differences

The populations examined live in contrasting environments. The climate in Buenos Aires is temperate-humid (1147 mm of mean rain per year; annual mean temperature is 17.6ºC; 25 m over the sea level). In Campos de Jordan (Brazil) the climate is tropical-height (1700 m over the sea level; 1566 mm of mean rain per year; annual mean temperature 13.6ºC; Campos de Jordan is the only place in Brazil where snow falls in winter).

Crosses and collection of larvae

We established cultures of the BA and CJ isolates at 18ºC. After 12 months, once the cultures were well established, we collected virgin individuals of the two sexes. Fifteen-day-old virgin males and females of the two populations were reciprocally crossed. Homogametic crosses within the strains were also made as controls for the inter-population crosses. We examined N = 50 larvae per each: (i) parental population, (ii) the two reciprocal F_1, (iii) the two out four F_2, and (iv) each one of the 4 out 8 backcrosses. That is, N = 50 per each of the 10 groups of genotypes. Groups of 30-40 inseminated females were allowed to oviposit for 3-4 h on plastic spoons filled with culture medium. Larvae eclosed around 48 h after the eggs are laid. Larvae were collected at successive 24 h intervals after emergence until 192 h of larval age.