Selection of Substrates for Pupation of *Drosophila* Larvae

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**Abstract:** Larval substrate selection for pupation was studied on horizontal plane in different species of *Drosophila* by interchanging the substrates. The analysis revealed that the larvae of *D. simulans, D. yakuba, D. mauritiana, D. bipectinata* and *D. malerkotliana* significantly prefer media for pupation. *D. melanogaster* and *D. rajasekari* prefer cotton for pupation. *D. ananassae, D. virilis, D. novamexicana* and *D. hydei* did not prefer any specific substrate, the preference of the substrate selection varies in these species for pupation. The larval substrate selection is independent of the geotaxis effect.

**Keywords:** *Drosophila*, Larvae, Site Selection, Substrates, Pupation

**Introduction:**

The larval pupation site preference (PSP) is an important event in *Drosophila* preadult development, because the place selected by the larva can have decisive influence on their subsequent survival as pupae (Sameoto, Miller 1968). Habitat choice occurs through differences in behavioural preference as well as in selection (Powel, Taylor 1979). *D. melanogaster* larvae react to humidity, light, texture and consistency of the substrates, these factors have influence on the selection of pupation sites (Wong et al. 1985, Godoy-Herrera et al. 1989). Behaviour, like morphology, is a phenotype. A behavioural phenotype is influenced by both genotype and environment. The behavioural mechanisms by which the larvae select pupation site are described in terms of larval substrate preference. The larval substrate preference has been studied in wild species of *Drosophila* (Godoy-Herrera, Silva-Caudra 1998, Beltrami, Godoy-Herrera 2001). The information on species maintained in the laboratory for many years is not available.

The PSP has been studied by analyzing the percentage of pupae pupated at different sites, respectively: cotton, glass and medium at constant culture conditions. The species were classified into three patterns based on the quantity of glue protein synthesized by the larval salivary gland and the percentage of pupation (Shirk et al. 1988, Shivanna et al. 1996). They also reported that most of the species prefer to pupate maximum on media. Shivanna, Ramesh (1997) reported lack of intraspecific variation in PSP of *D. melanogaster*. The food medium rapidly becomes very moist and soggy in cultures, individuals pupating on or close to the surface of the medium have an increased chance of being dislodged and drowned.