BANGALORE UNIVERSITY

A comparative energetic studies of Butterfly *Danaus genutia* (Fam: Nymphalidae) Larvae on three different host plants Including *Holostemma ada-kodien*- A medicinally important plant.

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INTRODUCTION

§The butterfly *Danaus genutia*, commonly called as Striped Tiger belonging to the Family Nymphalidae are one of the common butterflies found in India, Sri Lanka, Myanmar, Australia and South East Asia

§The larvae of these butterfly is use to feed on high alkaloid containing plants of the family Asclepiadaceae

§Both larvae and adults acquire toxic substance from their food plants so that they become non palatable for their predators and hence protect themselves from there predators

§*Holostemma ada-kodien* (Family Asclepiadaceae) is a rare laticiferous perennial shrub which is indigenous to India and is popularly known as Jivanti .

§The plant is known to provide raw materials for almost 34 Ayurvedic preparations including the drug Jivanthi which is listed in the indigenous system of medicine

§The plant was listed out as vulnerable and rare species in the Foundation for Revitalization of Local Health Traditions (FRLHT) red lists of medicinal plants in 1997

§In the present study we investigated the energetic of *Danaus genutia* larvae with two different milk weed plants viz. *Cynanchum dalhousiee* and *Asclepias curassavica* as against *Holostemma ada-kodien*.

OBJECTIVES

- To study the feeding behavior of *Danaus genutia* larvae on three different host plants including *Holostemma ada-kodien* – a medicinally important herb.

- To study the relation between Pupation time and host plant selection of the *Danaus genutia* larvae

- To study the *Danaus genutia* larval preference for its three different host plants.

MATERIALS AND METHOD

Collection and rearing of *Danaus genutia*:

Experimental setup:

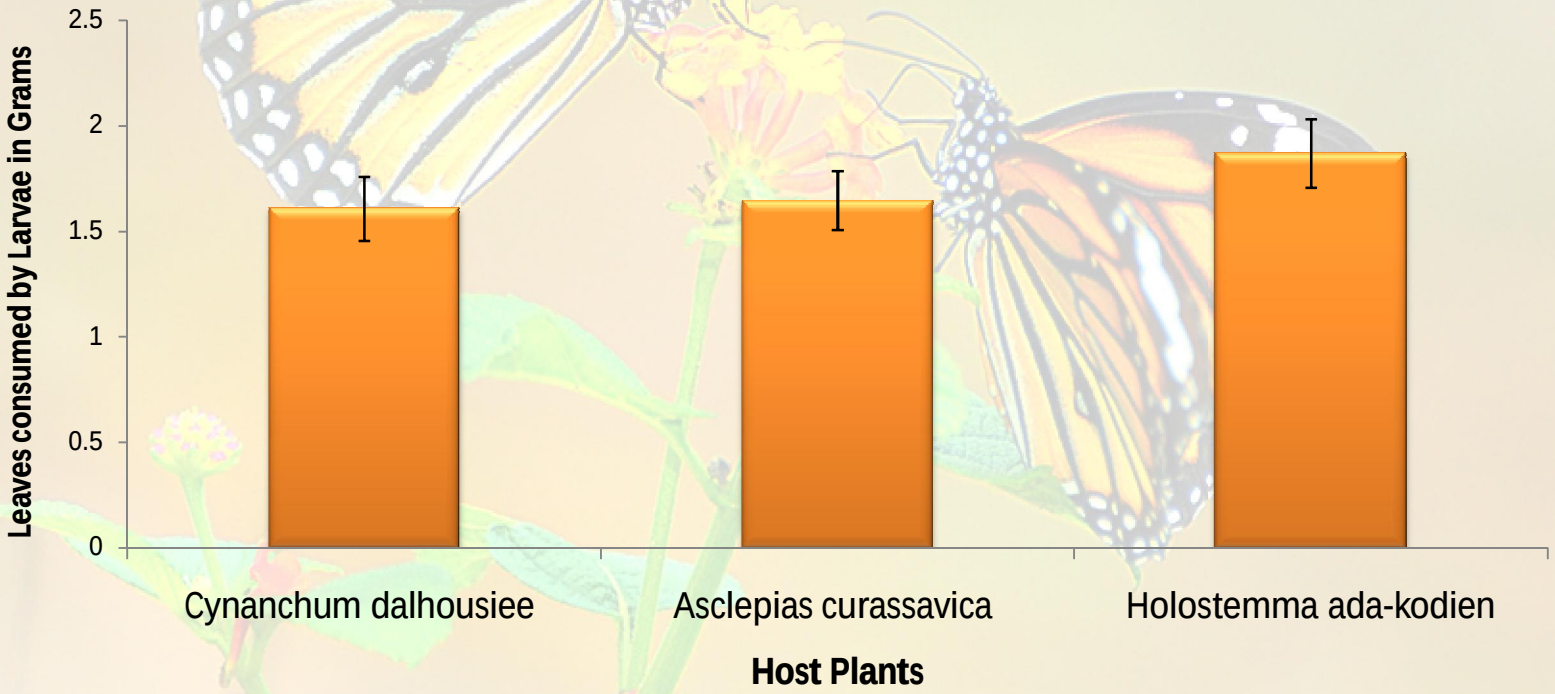
- The experimental setup was done with three sets K1, K2 and K3 each containing 30 newly emerged *Danaus genutia* larvae
- The larvae from K1 and K2were fed with the known quantities of *Cynanchum dalhousiee* and *Asclepias curassavica* leaves where as the larvae in K3 were fed with known quantities of *Holostemma ada-kodien* leaves.
- The leaves are weighed on an electronic balance to know the weight of the leaves in grams an then the larvae were allowed to feed on them uptil they pupate.
- Each larva from all the 3 experimental sets (K1, K2, K3) were observed for their time taken for pupation.

Larval preference for their host plants:

- 10 larvae from the stock population were tested for their behavior of host plants selection. Each larva was kept in an aerated box with the leaf of all the 3 host plants used for the study and allowed the larvae to feed on them.
- These boxes were kept under keen observation for several days until the larvae undergo pupation.

RESULTS

No of experimental sets	No. of larvae used	Host plants	Leaves consumed	Time taken for pupation
K1	30	*Cynanchum dalhousiee*	1.6068±0.15	7.55±1.05
K2	30	*Asclepias curassavica*	1.6464±0.13	7.15±0.26
K3	30	*Holostemma ada-kodien*	1.868±0.16	7.45±0.88



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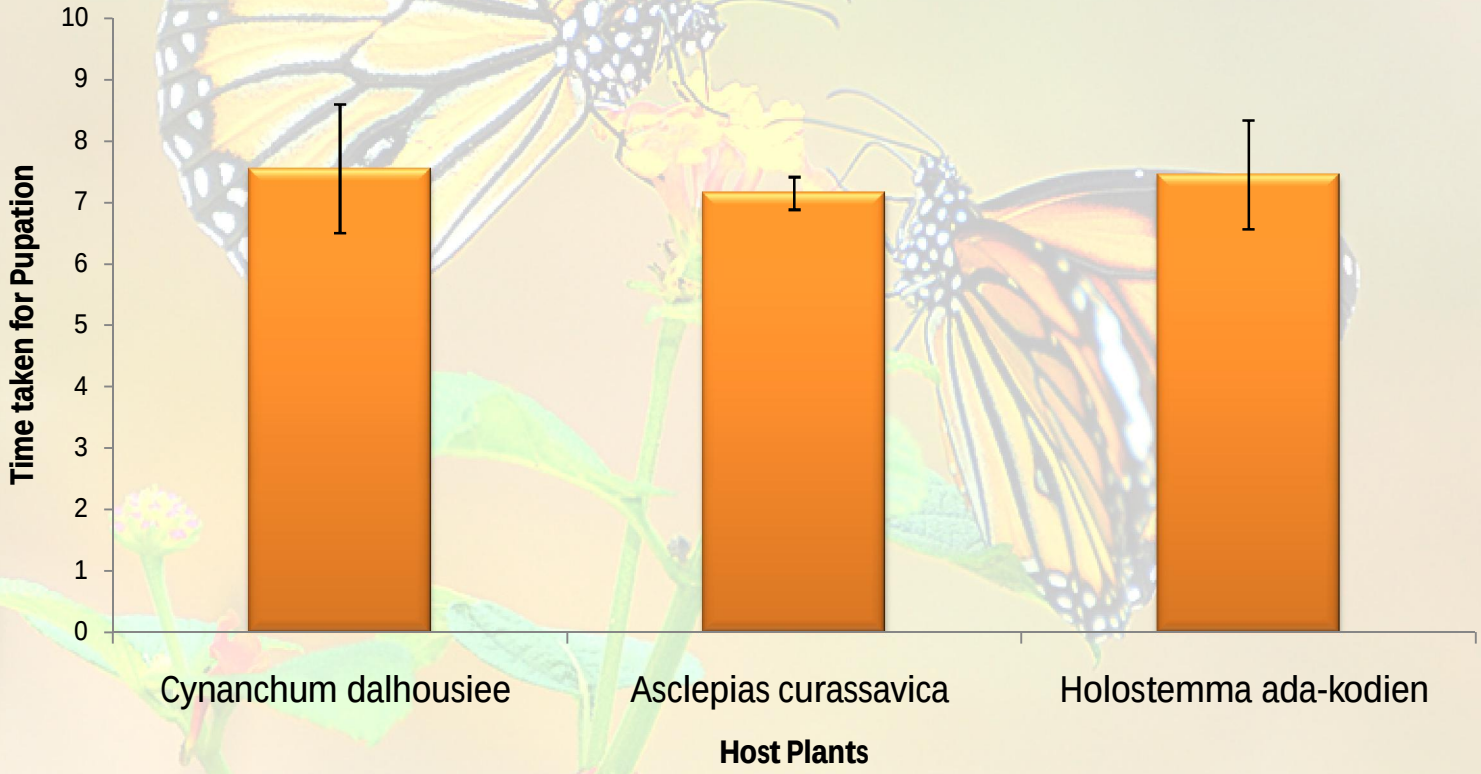

- **It was observed that, majority of the *Danaus genutia* larvae prefer *Cynanchum dalhousiee* and *Holostemma ada-kodien* leaves than *Asclepias curassavica* leaves.**
- **In the initial stages (immediately after coming out from the eggs) *Danaus genutia* larvae never eat the *Asclepias curassavica* leaves if ether of the other two plants leaves were there in the vicinity.**
- **It was also observed that some *Danaus genutia* larvae after 3rd instar, successfully fed on the leaves of *Asclepias curassavica* for the completion of their rest of the instar and get pupated.**
- **Among the *Cynanchum dalhousiee* and *Holostemma ada-kodien*, the larvae prefer *Cynanchum dalhousiee* more in their initial instar. However the larvae use the leaves from both these plants equally for their feeding.**

DISCUSSION

- ***Danaus genutia*** **larvae are observed to feed more on the** ***Holostemma ada-kodien*** **leaves than the other two plants. This may be due to the presence of more alkaloid contents in** ***Holostemma ada-kodien*** **leaves than that in other two plants leaves.**
- **The larvae of** ***Danaus genutia*** **prefers** ***Cynanchum dalhousiee*** **and** ***Holostemma ada-kodien*** **more than that of** ***Asclepias curassavica.*** **This may be due to the presence of less alkaloid content in** ***Asclepias curassavica.***
- **Some larvae feed on** ***Asclepias curassavica*** **after 3rd instar onwards. The reason for this behavior is not known.**
- **It was also observed that among the** ***Cynanchum dalhousiee*** **and** ***Holostemma ada-kodien*****, larvae prefers** ***Cynanchum dalhousiee*** **more than the** ***Holostemma ada-kodien.*** **But the larvae eat leaves from both these plants considerably.**

- **The above obtained result from the current study clearly reveals that there must be a chemical signal sensed by the larvae to choose its host plant when two or more host plants are in the vicinity.**
- **The larvae prefer those plants more which contain high alkaloid contents in them. As a result of this the *Asclepias curassavica* plant is considered less likely as host plant of *Danaus genutia* larvae in its natural habitat.**
- **There is no much difference between the time taken for the pupation from *Danaus genutia* larvae in all 3 experimental sets. This result reveals that there is no relation between the host plants and the time taken for pupation for *Danaus genutia*.**
- **Another interesting thing what we observed during present study was the existence of female biased sex ratio in *Danaus genutia*.**
- **This kind of the sex ratio distortion and female biased sex ratio is previously seen in other butterfly species like common grass yellow (Hiroki M. et al. 2004), *Acraea encedon* (Jiggins F.M. et al. 2001), *Hypolimnas bolina* (Charlat S. et al. 2005) etc. are known to be caused by some of the endosymbiotic bacterial infection.**

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THANK YOU