Designing a facility for butterfly display inside the zoo

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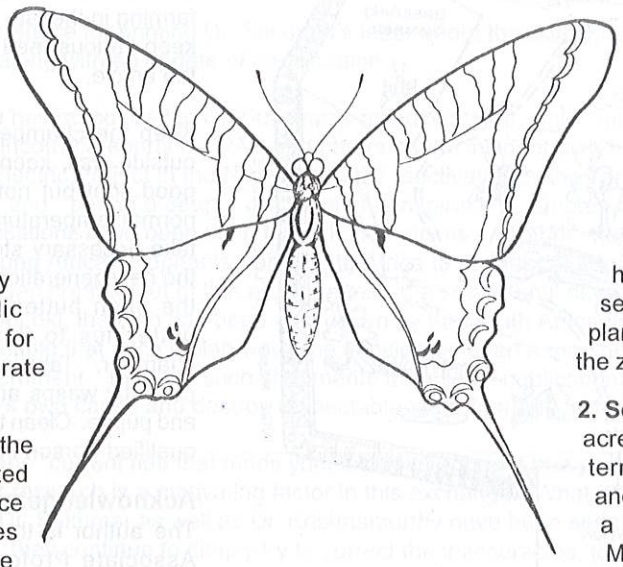

Introduction

In India *ex situ* conservation is largely confined to larger animals like mammals, birds and reptiles. But various zoos are also interested in invertebrate conservation now-a-days. Opening a butterfly facility in a zoo is not a difficult task. A facility for butterfly enclosure may easily attract public attention, and this could be utilised for propagating the ideals of invertebrate conservation.

Butterflies hold an important place in the web of life, and being closely associated with plant life, their presence or absence serves to monitor ecological changes in habitat, thus warning us about the deteriorating environment. These creatures are also threatned due to rapid decline in forest cover, vegetation and consequent depletion of their habitat; the situation has worsened by the increasing use of chemical fertilizers and pesticides.

The exact status of several species of Indian butterflies are still not clearly known. Most of the Indian butterfies are now protected by the Wildlife Protection Act of 1972. Laws on paper are not likely to save wildlife unless enough measures are taken simultaneously to protect their habitats and to generate awareness of their role and utility in maintaining the ecological balance. Certain endangered species of butterflies can also be bred as a conservation measure to restock their depleted population.

Butterfly is a winged insect belonging to the Phylum Arthropoda, Class Insecta, Order Lepidoptera. There are about 1500 species of butterflies identified in our country; the survival of many of which is threatened now. The common species of butterflies encountered in our day to day life are Common Mormon, Common Mime, Plain Tiger, Blue Tiger, Tawny Coaster, Blue Pansy, Common Gull, Common Emigrant, Common Jezebell etc. The list varies from place to place. Moreover any place in our country has at least 30 to 50 varieties of butterflies. The significant role that butterflies play in plant life is well known to all. Butterfly watching also invites much interest next to bird watching and they are more easily approachable. In this background, butterfly facility in a zoo can be utilized well for the cause of species conservation. Voluminous account on butterflies can be projected to the readers but the present account confines to the aspects of butterfly display facility and their farming. Taking advantage of little experience, exposure and field visit study combined with imagination and innovative ideas, the present article is written.

A butterfly facility involves designing a open butterfly enclosure and a closed chamber for butterfly farming. Unlike the temperate countries, we may go for a open enclosure for butterfly facility along with a closed display cum farming chamber.

Designing a butterfly enclosure (Fig. 1):

1. Species selection: First survey adjoining areas and make an inventory of species. Understand their feed preferences, food plants and host plants, life cycle etc.. Next, select display species that prefer plants that grow easily and fast in the zoo site.

2. Selection of site: Select site 0.5 acres to 2 acres in an undulating terrain interspersed with bushes and woody patches preferably with a patch of cool microclimate. Manipulate the area; in the long run it will be helpful. Certain species prefer meadows, certain species prefer wood land's edge and certain others dwell in the forest. The site may be manipulated by landscaping.

3. Manipulation of the area

a. Planting: Basing on the display species, select plant species. One or two tree groves in the area should be planted. For example, Lemon plant and Curry Leaf plant are helpful for egg laying of Common Mormon and Lime Butterfly. Plant species such as *Bauhinia purpurea*, *Bombax ceiba*, *Butea monosperma*, *Erythrina indica*, *Cassia fistula* and other *Cassia* species. These plants may add aesthetic look to the facility during their flowering season. But this may attract the birds which may cause damage to butterflies, but not all butterflies are preferred by insectivorous birds. We can explain the ecological role here. Plants like Custard Apple attract Tailed Jay and Nerium; Banyan and Peepal are host plants for the Common Crow.

b. Gardening the area:

i. Keep a rockery with xerophytic species.

ii. Bushes like *Poinsettia* and *Vitex negundo* attract milkweed butterflies.

iii. Arranging attractive flower beds: Plant attractive flower beds like Yellow Lantana, Pink Cocks' Comb and other species with purple, yellow and pink flowers. Select species like Marigold, Verbena etc.

iv. Add twines at a few places.

4. Water Facility: As shown in the design keep small water pools in the area. If possible arrange for flowing water. Keep one or two sprinklers.

5. Feed: Keep shallow tubs with food material at three or four places at different heights. Keep food materials like Banana and Pineapple fruits (for nymphalid butterflies) Guava, Rotting crab/Prawn (for Common Nawab, Tawny Raja), nector (honey) and wood sap. Keep wood ash, animal dung, urine, wet salt

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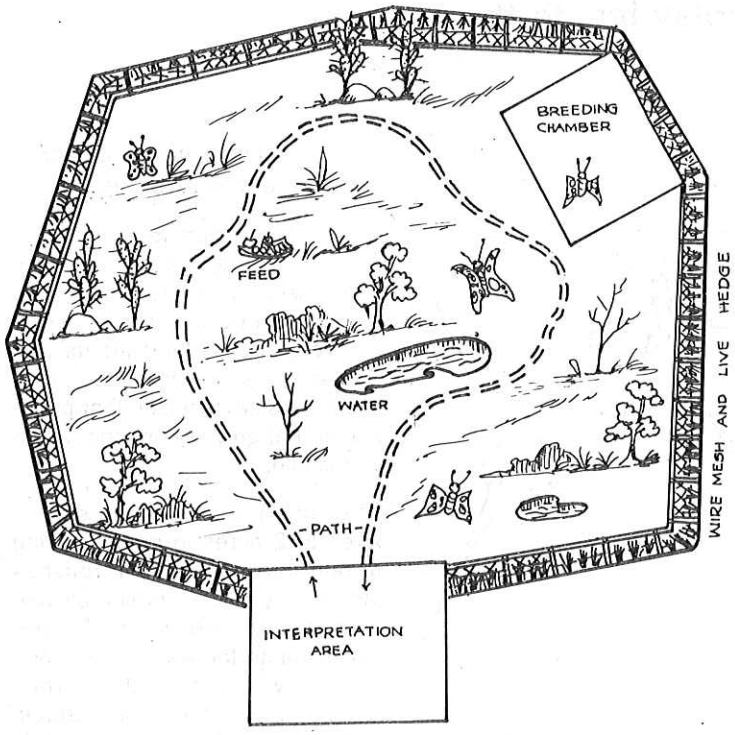

Figure 1. Diagramatic sketch of a butterfly house

licks etc. for attracting the butterflies. Certain species of butterflies consume juices of dead crabs and juices from ripe fruits. Keep honey dew on cotton or spongy material.

6. Display furniture: Keep dry perches. These can be used for keeping nectar material.

7. Nature trail: Design small nature trail in the area.

8. Protection and Maintenance: Protect total outer edge of the area with 1.2 m. high chain link and strengthen with live hedge. Maintain the area.

9. Interpretation: Make room for entry along with interpretation facility.

10. Stocking: Mark site for butterfly farming chamber.

11. Breeding chamber: Details are given in the sketch. A small structure of 10x8x8 ft. is enough. The lower two feet be closed with brick construction and the remaining 8ft. be covered with glass on two sides. The top and other two sides of the chamber maybe closed with 50% shade agronet. Aerator and mist facility be arranged inside. Chamber may be facilitated with double safety door and complete sterilisation be maintained inside. Keep some plastic bushy material here and there inside the chamber, along with perch material.

12. Farming: Study the life cycle of the species. Select the food plants of caterpillars. Check bushes for caterpillers. Collect larvae. Keep specific plant materials required for the species. Collect few adults. Watch for the egg laying female which is a good source for breeding and catch with butterfly net and release them into the chamber. Jam jars, plastic bread boxes etc. are useful as utensils for common emigrants or Common Mormon butterflies. Small airy cages covered with mosquito netting are very useful. Start farming in the late rainy season. For adult butterflies keep various feed materials as mentioned earlier in the article.

Keep the chamber clean, periodically disinfect the outside wall, keep the chamber well ventilated with good light but not under direct sunlight. Maintain normal temperature of the species. Follow life cycle, take necessary steps at appropriate time. Release the new generation of butterflies from the chamber to the open butterfly facility. Facilitate visibility of butterflies to the open area through the glass chamber. Take care of enemies of butterflies like parasitic wasps and fleas that feed on eggs, larvae and pupae. Clean the area regularly, keep a technically qualified person incharge of the facility.

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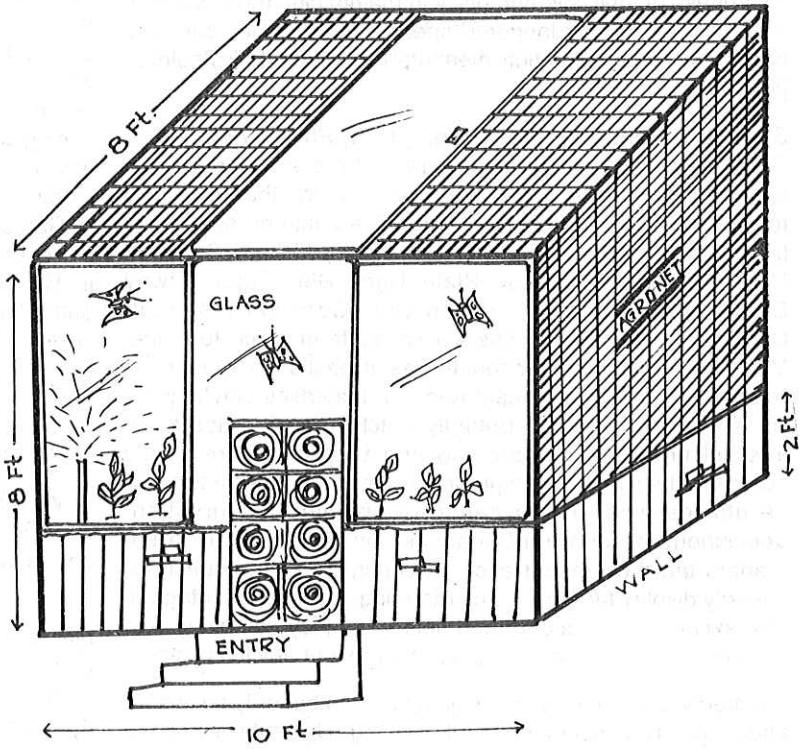

Figure 2. Butterfly breeding chamber