

OBSERVATIONS ON THE MIGRATORY PATTERNS OF THE BUTTERFLY *PHOEBIS STATIRA* (CRAM) IN NORTH AND SOUTH TRINIDAD

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The yellow migrant, *Phoebis statira* (Cram) is distributed throughout Latin America and the Caribbean region, including the Guianas, Brazil, Venezuela, Ecuador, Peru, Panama and Trinidad and Tobago (Barcant, 1970). *Phoebis statira* usually are greatly attracted to flowers and are found generally in open areas with sunshine. In addition, they usually migrate each year with the onset of the rainy season and this migratory behaviour has been documented in 1918, 1919, 1926, 1932, 1947, 1954, 1962 (Quesnel 1971) and in 1960 in Rio Claro (Barcant 1970). In 1969, observations were made at Nariva, Petit Valley, Valsayn Park, Sangre Grande, Manzanilla, and Mayaro (Quesnel 1971). This paper describes the migratory patterns of *P. statira* observed over three days in August 1995 in the small village of Tableland, located east of San Fernando on the Naparima-Mayaro Road and at Champ Fleurs, a town located along the Eastern Main Road in north Trinidad (Fig. 1).

From 10.40 a.m. on Saturday 19 August, 1995 a swarm of *P. statira* first appeared in a band or column approximately 50 metres wide and from approximately four meters above ground level to just below the tree tops circa 25 m. The sunshine was brilliant and their characteristic bright yellow green coloration was very evident. Swarms of five to 10 butterflies were seen while many were scattered in the moving column, with a definite lead group and frequent changing of positions as individuals moved in a zigzag pattern within the group. It is estimated that over 9,000 *P. statira* butterflies were observed migrating in an easterly direction with numerous pairs observed copulating on the wing. At noon rain began falling which resulted in the complete cessation of flight. As the rains subsided at 12:45 p.m. the swarming activity re-emerged until 2.05 p.m. after which only a few stragglers could be observed.

On Sunday 20 August, 1995 activity began at 10.00 a.m. but the density of the swarm was considerably reduced. On both days numerous butterflies were observed feeding on the nectar of both ornamental and wild flowers along the roadside. The column of *P. statira* was followed by car along the Naparima Mayaro Road and numerous clusters were observed drinking from puddles and pools of water at Poole and San Pedro. In addition, many *P. statira* were seen as far east as Mayaro, located on the south eastern coast of Trinidad. (Fig.1).

In addition, on Monday 22 August 1995 while driving along the Eastern Main Road at Champ Fleurs I observed a

small swarm flying from west to east. The time of this activity was 11.45 a.m. Figure 1 shows the flight patterns observed for *P. statira* at Tableland and at Champ Fleurs, Trinidad, West Indies.

Based on the observations of these three days it would appear that this annual migration of *P. statira* followed the west to east direction (Fig.1) but occurred in August (1995) rather than in June, the month rainy season begins, as reported by Barcant (1970). It is clear that the migration of this butterfly population must be advantageous to the species. For example, migration provides a means of avoiding adverse environmental conditions and thus may enhance finding alternative habitats, thereby increasing the butterfly's life-history options. However, migration carries costs as well as benefits.

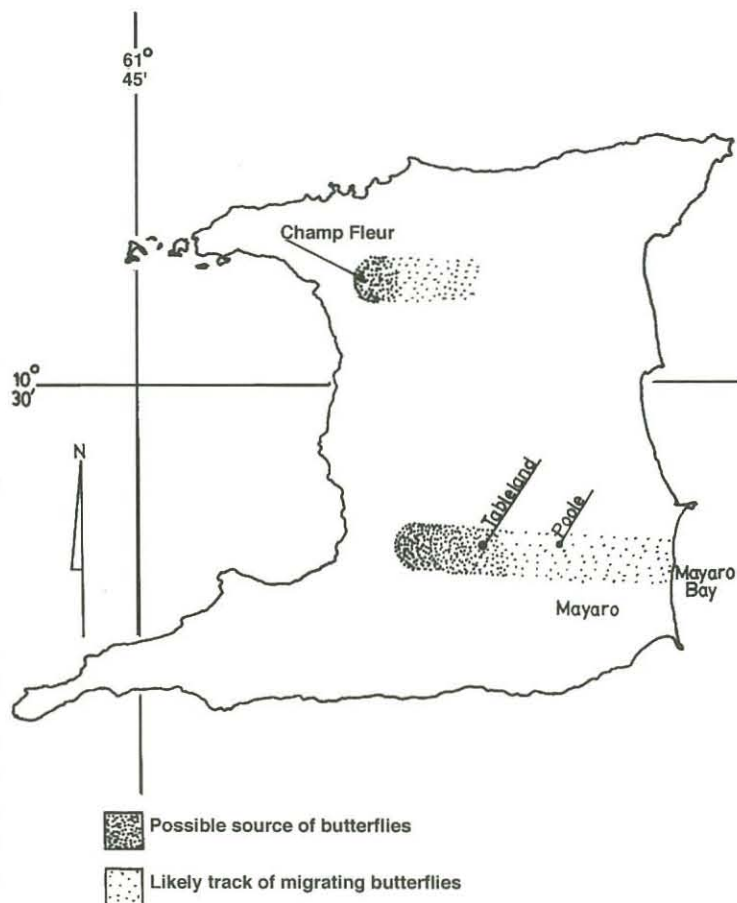


Figure 1. Map of Trinidad showing path of migration of *Phoebis statira* butterflies in August, 1995.

These include:

- a. the actual metabolic cost which involves the utilization of energy to support flight;
- b. risks of increased predation and not finding a suitable habitat, and
- c. potential reproductive cost owing to increased time to first oviposition, decreased energy reserves available for reproduction, shortened lifespan, and/or a decrease in overall fecundity.

However, the observations of copulating pairs of *P. statira* at Tableland and Champ Fleurs suggest an oogenesis-flight syndrome which also has been observed among many insects (Rankin and Burchsted 1992). This behaviour activity (copulation) suggests that swarming increases or enhances male-female contact and thus provides better copulating opportunities. In addition, with migration, the weak and genetically inferior individuals usually die, or fail to successfully join the swarm or mate, thus, leaving only robust males with reproductive vigour to copulate with females, thereby improving the *P. statira* genetic constitution.

It should be noted that *P. statira* butterflies were observed migrating and copulating at the same time thus providing an evolved advantage, for in most populations flight and reproduction are physiologically antagonistic (Rankin and Burchsted 1992). Thus, when the *P. statira* migrants arrive at their new habitat they are ready to begin reproduction imme-

diately and any reproductive delay due to migration are minimized. In addition, based on these three observations we are unable to determine the exact breeding habitats of *P. statira* but their eastward migration suggest that new habitats are found. However, it is unlikely that the next generation would migrate further eastward because this would take the butterfly population over the Atlantic Ocean (Fig.1). There is a possibility that following the eastward migration and copulation the *P. statira* population may migrate westwards but this migration event has never been recorded and no literature is currently available on this unique migration pattern.

It is recommended that further observations be conducted on the *P. statira* migration patterns, population dynamics and kinetics to examine further the oogenesis-flight syndrome, the body size requirements for migration, metabolic costs, flight fuels and the reproductive cost of flight.

References

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