# VERTICAL DISTRIBUTION OF OVIPOSITING *TOXORHYNCHITES MOCTEZUMA* IN TRINIDAD

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*Toxorhynchites moctezuma* (Dyar and Knab) is one of three species of the genus found in Trinidad. The species has a wide distribution in Trinidad and has been collected from rot holes, bamboo pots, cut bamboo, coconut shell, calabash, tires, concrete tanks, barrels, drums, tin cans and buckets (Heinemann et al. 1980). The other two species, *Tx. superbus* (Dyar and Knab) and *Tx. iris* (Dyar) have been collected mainly from bracts and leaf axils of bromeliads and *Heliconia* (Heinemann et al. 1980).

Recent relative successes of *Toxorhynchites* mosquitoes as biological control agents have heightened interest in this genus (Steffan and Evenhuis 1981, Gerberg and Visser 1978, Focks et al. 1980, 1982, 1983; Bailey et al. 1983, Toohey et al. 1985). Consequently, in 1984, we started studies on the biology of *Tx. moctezuma* with a view to possible use of the larvae of this mosquito to control *Aedes aegypti* (Linn.). Although *Tx. moctezuma* has now been colonized (Tikasingh, unpublished data), there is very little published data on the biology of the species except for the recent paper by Chadee (1985) confirming the occurrence of the species in peridomestic habitats. We present here data obtained on the vertical distribution of ovipositing *Tx. moctezuma* obtained in 1979 during studies on *Haemagogus* and yellow fever in the Moruga Forest, Trinidad.

Moruga Forest is situated in southcentral Trinidad; it is an evergreen seasonal forest of the crappo-guatecare (*Carapa-Eschweilera*) type. During the period of study, logging operations were being carried out when some of the more desirable hardwoods were removed. Consequently, there were occasional breaks in the canopy of the forest in some of the areas. In 1979, the rain gauge of the Ministry of Works at Moruga Village, some 3 km from the nearest study area, recorded 1,909 mm of rain. Most of the rain (1,656 mm) came in the period June through December, the normal rainy season.

Two tree stations were selected; one at Saunders Road and the other at Cachipe approximately 8 km south. At Saunders Road 30 ovitraps (Fay and Eliason 1966) and 14 cut bamboo pots were attached to the trunk of a guatecare tree. The canopy in the immediate area of this tree was fairly closed. The ovitraps were placed at ground level and every 30 cm thereafter up a height of 870 cm which is the level just below the canopy of the forest. Similarly, the bamboo pots were placed on the opposite side of the ovitraps starting at ground level and at approximately every 60 cm thereafter, reaching to a height of 720 cm. Bamboo pots varied in lengths from 15 to 30 cm. Likewise, their diameters varied between 5 and 8 cm. At Cachipe, 24 ovitraps were attached to the trunk of a crappo tree, but the canopy here was open due to greater logging operations in this area. During the dry season, both the ovitraps and bamboo pots were half-filled with water, but early in the rainy season (June), both types of containers became easily filled and overflowed with water during heavy rains so that the amount of water added during the rest of the rainy season was reduced to about one-third of the container. Ovitraps and bamboo pots were serviced weekly when each of their contents were emptied into a basin, and all larvae collected were placed in vials with labels giving pot number, date and height. Collections at Saunders Road started January 25 and ended September 9, 1979. At Cachipe collections started January 17, 1979 and ended January 9, 1980. The results are presented on Fig. 1.

At Saunders Road 49 pots (25 ovitraps and 24 bamboo pots) were found positive for *Tx. moctezuma* larvae. Larvae were collected from ovipots at ground level and throughout the vertical range of this tree station up to a height of 870 cm. However, 17 of the 49 positive results (34.7%) were obtained with pots placed within 120 cm of ground level. At Cachipe, where collections were made over a period of one year, 25 ovitraps were positive and these were also found throughout the vertical range up to height of 720 cm. However, 13 (53%) were found within 120 cm of ground level. Comparison between collections in ovitraps and those of bamboo pots were not possible as the latter were larger and held more water with a consequence that overflow in ovitraps was more frequent resulting in the greater loss of *Tx. moctezuma* eggs. The failure to collect *Tx. moctezuma* larvae in ovitraps from the last week of May through June might possibly be due to the heavy rainfall at this time resulting in the overflowing of containers. The ability of *Tx. moctezuma* to locate artificial containers near the ground suggest it might be a good biocontrol agent for *Aedes aegypti*. It should be noted however, that Focks et

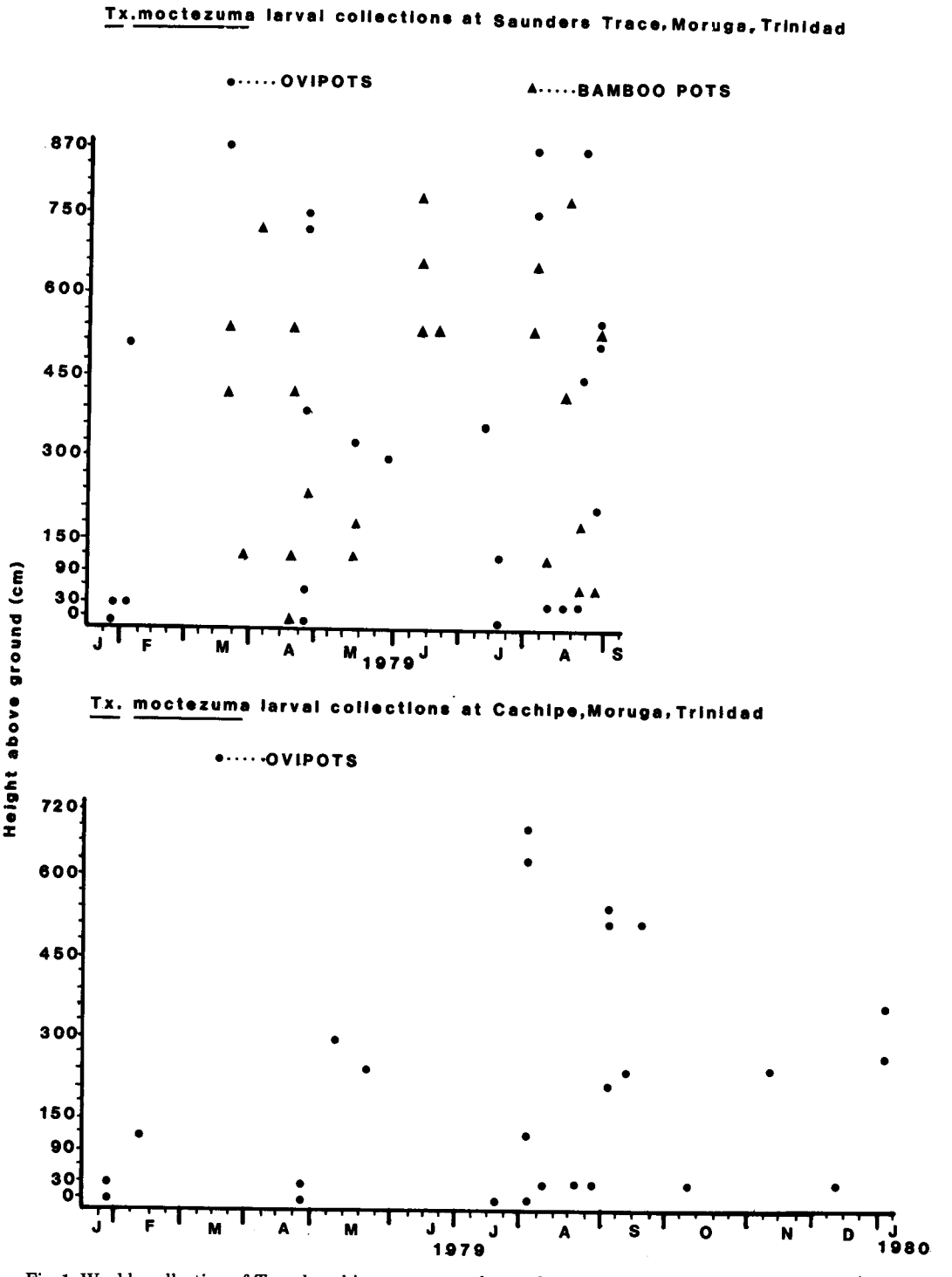


Fig. 1. Weekly collection of *Toxorhynchites moctezuma* larvae from ovipots (●) and bamboo pots (▲) attached to a tree in Saunders Rd. (January 25–September 9, 1979) and from ovipots (●) at Cachipe January 17, 1979–January 9, 1980), Moruga Forest, Trinidad and Tobago.

al. (1983) described experiments in which another species *Toxorhynchites rutilus rutilus* (Coquillett) was able to locate artificial containers at ground level, but preferred tree holes for oviposition and on this basis the authors concluded it was not a good species to control *Aedes aegypti* in an urban situation. In addition to its ability to locate containers at ground level, *Tx. moctezuma* was also found breeding in artificial containers at ground level in peridomestic situations (Chadee 1985, Tikasingh, unpublished data). Studies involving releases of adult *Toxorhynchites moctezuma* should now be undertaken to determine what proportions would be able to find and oviposit in artificial containers in a peridomestic setting.

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