Entomology Circular 282
April 1986

Florida Dept. Agric. & Consumer Serv.
Division of Plant Industry

Larvae of Fruit Flies. III.
TOXOTRYPANA CURVICAUDA (PAPAYA FRUIT FLY) (DIPTERA:TEPHRITIDAE)[1]

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INTRODUCTION: The papaya fruit fly, Toxotrypana curvicauda Gerstraecker, is primarily of concern only in papaya growing areas of the United States and the neotropics. It is the most destructive pest encountered by papaya growers. The papaya fruit fly was introduced into Florida in 1905, probably from the West Indies (Weems, 1969). The species is known to occur in southern Florida (as far north as Hillsborough and Volusia counties where papaya may be grown), southern Texas, and south through Mexico and the West Indies to Brazil. Papayas, both cultivated and wild varieties, are the principal hosts of the fruit fly, but occasional infestations of mangos have been reported as well. Toxotrypana curvicauda is the only species in the genus.

LARVAL DIAGNOSIS: The primary diagnostic characters for papaya fruit fly larvae involve the large anterior spiracles, the number of narrow buccal carinae (13-15), the lack of prominent tubercles on the caudal end of the larva, and a bifid anal elevation. The anterior spiracles are longer than in most other known fruit fly larvae. The caudal end of the body is particulrly distinctive in lacking any prominent tubercles or papillules and has only the spiracular region as a depressed plate, but some indistinct and small tubercles and papillules are present. In general however, relative to other tephritid larvae the species has the appearance of a smooth caudal end. The pharyngeal skeleton is particularly distinctive due to the sclerotization along the dorsal margin of the pharyngeal plate.

LARVAL DESCRIPTION: Larva white and typical fruit fly shape (cylindrical-maggot-shape, elongate, anterior end narrowed and somewhat recurved ventrally, with anterior mouth hooks, ventral fusiform areas and flattened caudal end); last instar usually large compared to other species, 13-15 mm in length; venter with fusiform areas on segments 4-11; anterior buccal carinae narrow, long and usually 13-15 in number (Fig. 1); anterior spiracles (Fig. 2) nearly straight on dorsal edge but with noticeable depression centrally, with tubules numerous, varying from 22-28 and usually with some tubules in a somewhat secondary dorsal row.

Cephalo-pharyngeal skeleton (Fig. 3) with large convex mouth hook (approx. 2X hypostome length), having a large bulbous lower muscle attachment; hypostomium long, with bulbous subhypostomium; post-hypostomial plates curved dorsally to dorsal bridge sclerotizations; parastomium prominent, pointed; anterior of dorsal bridge with a slightly sclerotized point, more extensive internally towards dorsal wing plate; pharyngeal plate somewhat shorter than dorsal wing plate, both with relatively extensive sclerotizations, especially distinctive along the mid-dorsal margin of the pharyngeal plate beneath median hood.

Caudal end (Fig. 4) lacking any prominent tubercles or papillules but with several small papillules; the caudal end generally convex, with depressed subquadratic spiracular plate; all papillules not easily seen, with paired dorsal papillules (D1 and D2) angled dorsally, an obtuse triangle of three intermediate papillules (I1-3) ventral to spiracular plate, and a single small V1; all tubercles or raised plates very slightly elevated to maintain an overall impression of a relatively smooth caudal end; L1 papillule not evident; I1 somewhat more prominent than all other papillules; posterior spiracles (Fig. 5) elongate (approx. 4X-5X width), with central spiracles nearly straight, dorsal pair slightly angled, and ventral pair angled ventrally; interspiracular processes (hairs) in small tufts with needle-like extensions; spiracular wall thick and internal bars prominent; anal elevation with lobes bifid (Fig. 6), rounded.

DISCUSSION: The sclerotizations of the cephalo-pharyngeal skeleton vary to some extent (see Fig. 35 in Phillips, 1946) but the prominent sclerotization of the dorsal margin of the pharyngeal plate, the strong central sclerotizations and the large mouth hooks are distinctive for the species. The anterior spiracles usually have a large number of tubules when there is an apparent secondary row of tubules. Illustrations and descriptions of the caudal end of the larva of this species have been incorrect in past works (Berg, 1979; Phillips, 1946) in not noting the small D1-2 and triangle of L1-3 papillules. Compared to other fruit fly larvae these papillules, as well as the small tubercle for papillule V1, are not readily evident; thus, the larvae appear to have a nondescript smooth caudal end. Careful examination, however, reveals the papillules, tubercles and raised plates as illustrated herein. Published keys to larvae (e.g., Berg, 1979) are not compromised, however, since routine identification efforts will not generally make note of the small papillules and tubercles. Larvae examined came from verified samples from Florida in the larval collection of the Florida State Collection of Arthropods.

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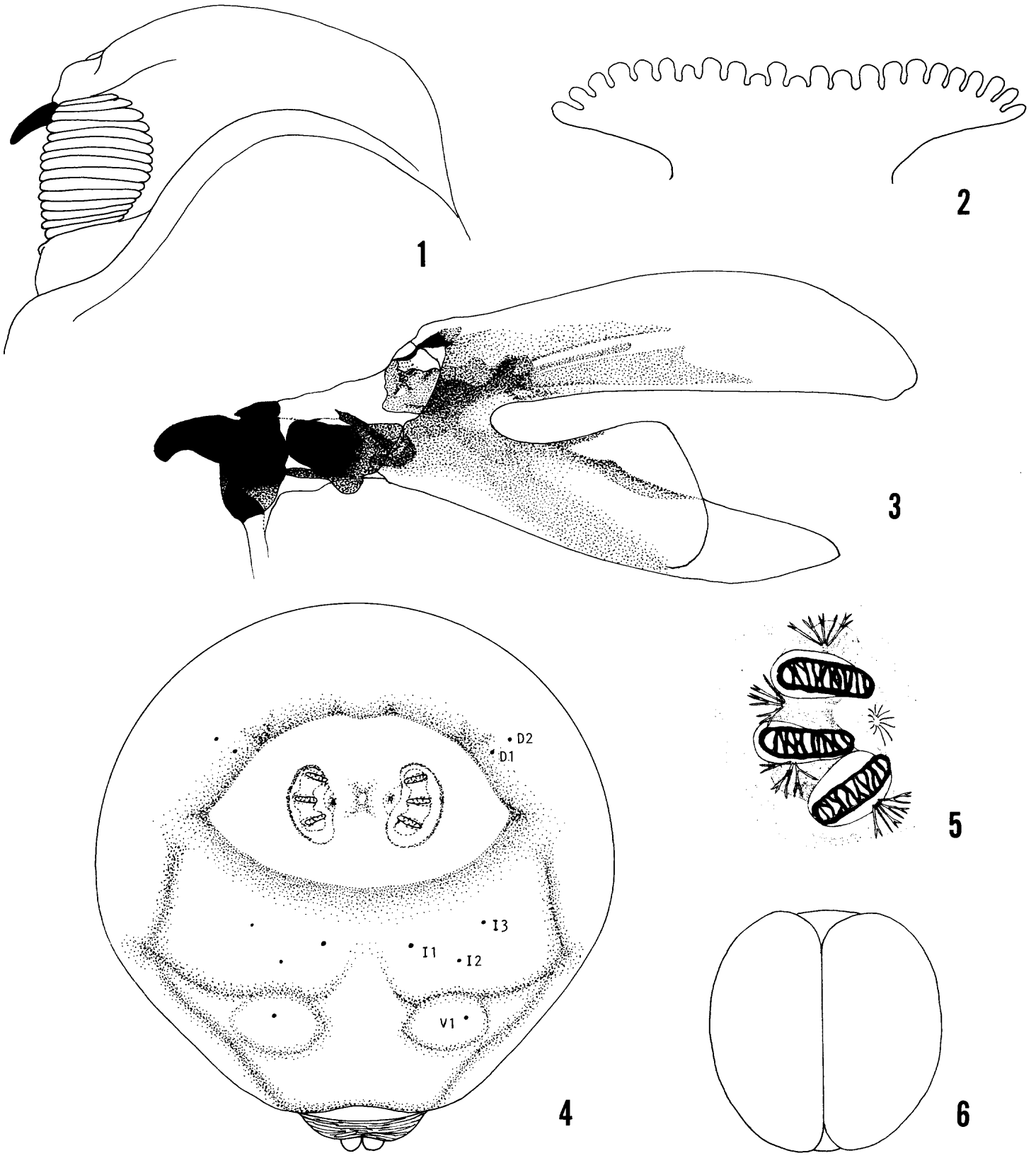

Fig. 1-6. Toxotrypana curvicauda: 1, head and buccal carinae; 2, anterior spiracle; 3, cephalo-pharyngeal skeleton (left side); 4, caudal end of larva; 5, posterior spiracles (left side; after Phillips, 1946); 6, anal lobes.