SENSORY RECEPTORS OF THE OVIPOSITOR
OF TRICHOGRAMMA MAIDIS [HYM. : TRICHOGRAMMATIDAE]

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Sensory receptors of the ovipositor of Trichogramma maidis are described. Sense organs are found on the 2nd valvifers (1 type), on the tip of the 3rd valvulae (2 types) and on the 1st valvulae (4 types). The nature and possible functions of these sensilla are discussed.

KEY-WORDS : Trichogramma, ovipositor, sensory receptors.

The ability to discriminate between unparasitized and parasitized hosts is a very common feature among hymenopterous parasitoids. Such a discrimination ability implicates that the wasp is able to obtain informations from the external and/or internal part of the host. In the latter case, this is done with some sensory receptors used during a probing of the host with the ovipositor (King & Rafai, 1970; Wylie, 1971; Greany & Oatman, 1972; Van Lenteren, 1972; Ganesalingam, 1974; Hofsvang, 1988).

Trichogramma species are known to recognize healthy hosts this way (Strand, 1986), and this observation has led some authors to suggest the existence of sensilla on the ovipositor (Salt, 1937; Klomp et al., 1980). Nevertheless, such sensory receptors have never been observed.

The present work has been done to know if such receptors could be found in Trichogramma maidis Pintureau & Voegelé.

MATERIALS AND METHODS

The T. maidis strain used originated from Antibes (Biological Control Station, I.N.R.A., France) where it has been reared for many generations on Ephestia kuehniella Zeller (Lep. : Pyralidae) eggs at 25 °C.

Scanning electron microscopy : Freshly emerged females were fixed in 2.5 % glutaraldehyde buffered to pH 7.4 for 2 h, washed in 0.1 M sodium cacodylate buffer, gradually dehydrated in alcohol and critical point dried. After dissection, samples were sputter-coated with fine gold and observed in a JEOL J.S.M.35 microscope.

RESULTS

The basic organization of female genitalia shows a remarkable uniformity among Hymenoptera (Smith, 1970; Matsuda, 1976). It consists of 2 pairs of valvifers and 3 pairs
of valvulae derived from the 8th and the 9th abdominal segments. The 1st valvifers (gonocoxites VIII) are continuous with the rami of the 1st valvulae (gonapophyses VIII). The 2nd valvifers (gonocoxites IX) extend as the 3rd valvulae (gonostyli) and ventrally bear the fused 2nd valvulae (gonapophyses IX). The interlocked 1st and 2nd valvulae, surrounded with the 3rd, form the shaft of the ovipositor.

*T. maidis* female's genitalia follow this basic organization (fig. 1). The shaft of the ovipositor is on average 160 μm long (about a third of the whole adult body length) and 6 μm thick. It is a rigid structure that ends in a pointed tip. The 2nd valvula is showing its double origin in a dorsal membraneous fold and ends in series of teeth that form a perforating lancet (fig. 3); there are 4 cuticular spines on each side of the lancet (fig. 2). A

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**Fig. 1.** Diagram of the ovipositor of *T. maidis*. (V1, V2 & V3: 1st, 2nd and 3rd valvulae; Vf1 & Vf2: 1st and 2nd valvifers).

**Fig. 2.** Tip of the ovipositor showing the 4 types (A, B, C, D) of sensilla on a 1st valvula (f: dorsal fold of the 2nd valvula; n: notch of the 1st valvula; sp: cuticular spine; t: tooth of the perforating lancet; V1: 1st valvula; V2: 2nd valvula).

Scale bars in micrometers