DESCRIPTION OF THE SALIVARY GLAND OF THE LACE BUG: *Stephanitis typica* (Distant)

K. MATHEN, P. RAJAN & C. P. RADHAKRISHNAN NAIR
Central Plantation Crops Research Institute, Regional Station, Kayangulam, Krishnapuram-690533.

Stephanitis typica (Fig. 1) was suspected as vector of coconut root (wilt) disease even from the early days of investigations on the spread of the disease. Several evidences - both direct and indirect - are today available to strengthen the surmise. One of such evidences is the recent report of the presence of mycoplasma-like organisms (MLOs) in tissues of root (wilt) affected coconut palms (Solomon *et al.* 1983) and in the salivary gland tissue of the insect caged on diseased palms to permit them acquire the pathogen, recollected after five days and incubated for periods varying from 13 to 17 days (Anonymous, 1985; 1986). Absence of MLOs in disease-free palms and in salivary gland of lace bug collected from two disease-free localities, one in the mainland at Kasaragod and another in Minicoy, Lakshadweep, further lent support to the condition that the organisms were only acquired by the bugs feeding on MLO - harbouring diseased palms. It was therefore thought worthwhile to study the structure of the salivary apparatus of the lace bug so that Electron Microscopy and Fluorescence technique employed for locating MLOs in infective vectors could be made easy.

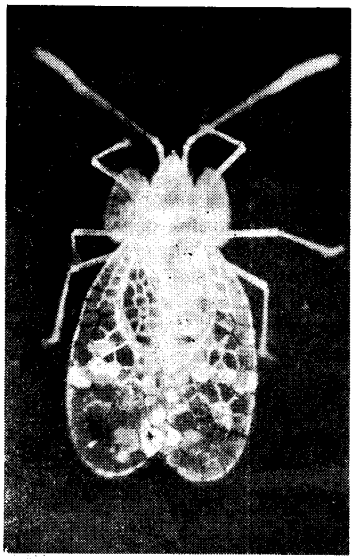

Fig. 1. Lace bug (*Stephanitis typica*) - adult

Dissections were made with the help of a stereomicroscope under a magnification of x 40. Fig. 2 is the photograph of the dissected out salivary gland with rostrum and portion of the head. Structural details are given in the illustrative sketch (Fig. 3).

The salivary apparatus consists of a pair of principal and accessory glands and their ducts. Each principal gland (PG) is bilobed; the anterior smaller lobe (AL) is distinctly separate from the posterior (PL) by a deep constriction on its inner side, the hilum (H). Both lobes are made of lobules.

The terminal ends of the anterior lobes are drawn out into thin conical caps (TC), which are held together by their tips. Leading out from each hilus is the du$_c$

Fig. 2. Salivary gland of lace bug, dissected out

CPCRI Contribution No. 566

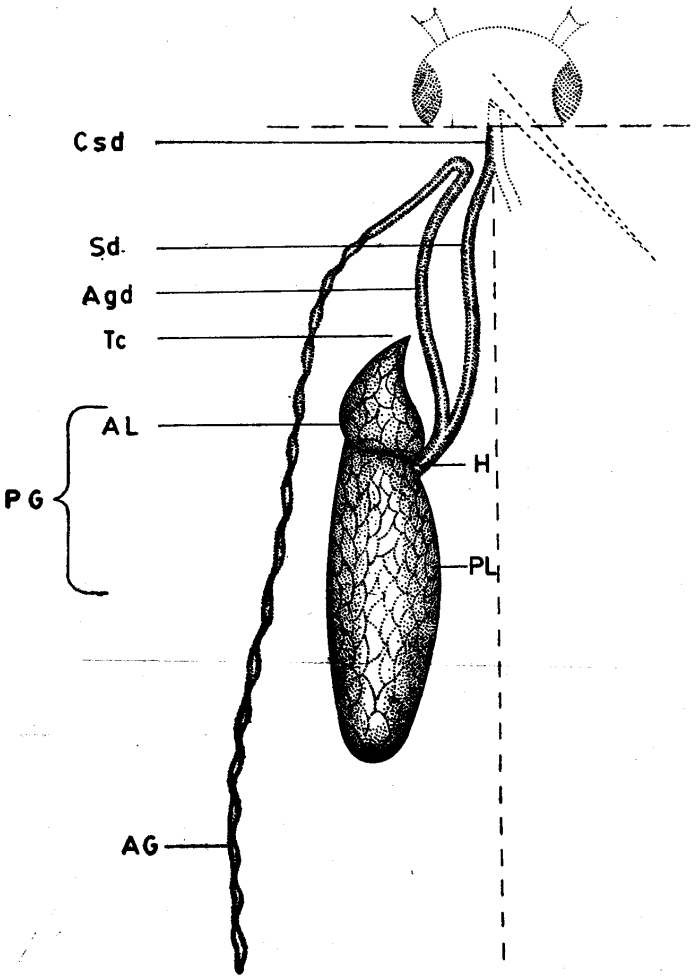

Fig. 3. Salivary gland of lace bug, (left side) (diagramatic)
AG - Accessory gland, Agd - Accessory gland duct, AL - Anterior Lobe
Csd - Common salivary duct, H - Hilus, PG - Principal gland
PL - Posterior Lobe, Sd - Salivary duct (of one side), Tc - Terminal cone

of the principal gland (Sd). Immediately after the emergence from the hilus, it is joined by the duct of the accessory gland (Agd) on that side. The right and left salivary ducts unite anteriorly into a common salivary duct (Csd) and is continued to the base of the rostrum. Each accessory gland (AG) is an elongated structure lying close to the principal gland on its outer side. The beaded hind part is distinctly glandular and the anterior part forms the duct opening into the duct leading out from the principal gland immediately after the hilus. Before doing so, the duct of the accessory gland forms a long loop reaching up to the base of the common salivary duct.

An understanding of the structural details of the salivary apparatus is very helpful in reducing the workload of preparing and examining the serial sections of the anterior region of the insect containing the salivary gland to fewer number of ultrathin sections of the dissected out gland. Similarly, the gland of the infective insect can be removed and tested for fluorescence to determine the presence of MLOs or used for culturing the organisms.

Miles (1968) gave an account of the variations in the structure of salivary glands in phytophagous Hemiptera including Tingidae. The present description of the salivary system in *S. typica* is not basically different from the general organisation cited by him or the description of the salivary system of *Tingis buddleiae*, another lace bug belonging to Tingidae (Livingstone, 1967).

We are thankful to Dr. J. J. Solomon, Project Leader for encouragement.

REFERENCES

Anonymous 1985, 1986. *Research Highlights*, CPCRI, Kasaragod, 1984, 1985.

Livingstone, D. 1967. On the morphology and bilogy of *Tingis buddleiae* Drake, IV. Functional anatomy of the digestive system. *J. Animal Physiology 14* (2) : 171-179.

Miles, PW 1968. Insect secretions in plants. *Ann. Rev. Phytopath.* 6 : 137-164.

Solomon JJ, Govindankutty, MP and Neinhaus, F. 1983. Association of Mycoplasma like organisms with Coconut root (wilt) disease in India. *Z. Pflanzenkr. Pflanzenschutz* 90 : 295-297.