ensheathing the first internode have been removed, and the stem surface dried.

In type 1 a rectangle of heavy-gauge polythene sheet ( 7 in. × twice the circumference of the stem) is wrapped around the stem in the form of a funnel, the upper circumference being 0·25–0·5 in. away from the stem surface. A small hole is cut in the sheeting near its lower edge and the flared end of a short length of stiff polythene pipe inserted and welded to the funnel wall while the flange is hot. The overlapping edges of the funnel are sealed with suitable plastic cement. The lower edge of the funnel is sealed to the stem in a similar manner and bound in place with wire. A length of flexible plastic tubing connects the exit pipe to a large storage tank sunk in the ground and shielded from the Sun.

In type 2, a large rubber bung with a hole in the centre slightly smaller than the plant stem is cut down one side, and clamped in position around the stem with wire. Any gap between stem and rubber is sealed with melted wax. This supports a rigid funnel made from a polystyrene specimen container of some 3 in. in diameter. The bottom of the container is removed and the remaining cylinder cut down one side with a hot wire. A piece of plastic tubing is sealed into the funnel near the lower edge to form an exit pipe similar to that of type 1. The split edge of the funnel is joined with polystyrene cement and the whole bedded down on to the rubber bung with wax. Melted wax is poured into the funnel to raise the level to the lower edge of the exit pipe which is connected to a sunken storage tank.

In view of the very large quantities of water obtained by the maize leaf catchment area from even very light showers, it is best to have large storage tanks available. These are emptied and the volume measured after each rainfall. Both funnels contain a dead volume of about 5 ml., but this amount is a negligible part of the total catch and represents 0·5–1·5 per cent of that obtained from mature maize plants in rains ranging from 0·3 to 0·1 in. The height of the funnels above ground ensures that they are free from splash effects in most light rains, while the closeness of fitting around the stem reduces the direct entry of rain to a minimum.

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## ENTOMOLOGY

### Double and Single Spermathecæ in Fleas (Siphonaptera)

Two spermathecæ (or receptacula seminis) in female fleas which normally possess only one have been noted on various occasions[1]. In such abnormal specimens or monstrosities one spermatheca is usually smaller than the other. The best published description of this condition in the rat flea, *Xenopsylla cheopis* Roths. (overlooked by M. I. D. Sharma and G. C. Joshi[2]), is that by Smit[3], who figures a specimen in which both spermathecæ and their ducts are fully developed and of almost equal size. A very much rarer abnormality is recorded by Stark[4,5], who discovered a specimen of *Hystrichopsylla linsdalei* Holland (which normally has two spermathecæ) with three spermathecæ.

The spermatheca is single in the majority of insects, although in certain genera, for example, *Blaps* (Coleoptera), *Phlebotomus* and *Dacus* (Diptera), there are two, and in many of the Calyptratae, in *Culex* and the Tabanidae (Diptera) three[6]. In the Siphonaptera there is generally one spermatheca, but two occur in various genera scattered throughout the order. These genera are, on the whole, those in which various but well-marked primitive morphological features have been retained. It would appear likely that paired spermathecæ was the condition in the ancestors of the order. This view is enhanced by the fact that in all the genera in which there is a single spermatheca the blind duct presumed to be that of the missing organ is generally present in varying degrees of reduction. The position of this blind duct indicates that it is the left organ which has been lost. In a few scattered genera two spermathecæ are present, which are normally of unequal size, one being distinctly smaller than the other. Jordan[7] described this condition as a "link between single and double receptacula seminis". In the very scanty, badly preserved material available for study at that time it was not possible to say whether it was the right or left organ which was reduced. In two species recently examined, *Ctenoparia jordani* Smit[8] and *Atyphloceras shogakii* Jameson and Sakaguti[5], it is now clear that the smaller of the two spermathecæ is situated on the left side.

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[1] Smit, F. G. A. M., *Tijdschr. Ent.*, **90**, 35 (1947).
[2] Sharma, M. I. D., and Joshi, G. C., *Nature*, **191**, 727 (1961).
[3] Smit, F. G. A. M., *Ent. Bericht.*, **12**, 436 (1949).
[4] Stark, H. E., *Pan-Pacific Entomol.*, **29**, 135 (1953).
[5] Hopkins, G. H. E., and Rothschild, Miriam, *Illustrated Catalogue of the Rothschild Collection of Fleas*, **3**, 9 (Fig. 7 by Smit, F. G. A. M.), 78, 95 (in the press).
[6] Imms, A. D., *A General Textbook of Entomology*, revised ninth ed., 187 (1957).
[7] Jordan, K., *Ectoparasites*, **1**, 127 (1921).
[8] Smit, F. G. A. M., *Trans. Roy. Entomol. Soc.*, **107**, 324 (1955).

### Acaricidal Properties of Di-(*p*-chlorophenyl)-trifluoromethylcarbinol

Di-(*p*-chlorophenyl)-trifluoromethylcarbinol, $(Cl.C_6H_4)_2C(OH).CF_3$ [1,2], has several interesting biological properties: it is a synergist for DDT in the house-fly[1,3–5] and inhibits oviposition, on tarsal contact, in house-flies[6] and mosquitoes[7]. Since it is the fluorine analogue of two acaricides, namely DMC [di-(*p*-chlorophenyl)-methylcarbinol] and 'Kelthane' [di-(*p*-chlorophenyl)-trichloromethylcarbinol], it seemed interesting to assay also its acaricidal properties. The compound was tested against adult females of the red spider mite *Tetranychus telarius* L. on beans, by a method described recently[8], and was compared with the commercial acaricides 'Kelthane' and chlorobenzilate (ethyl *p,p'*-dichlorobenzilate). The activity of the fluorine compound was intermediate between those of 'Kelthane' and chlorobenzilate (Table 1).

It has been demonstrated in field trials on orange trees (A. S. Tahori and E. Swirski, personal communication) that di-(*p*-chlorophenyl)-trifluoromethylcarbinol did not affect the citrus rust mite (*Phyllocoptruta oleivora* Ashm.), but it was noted incidentally