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A MICROPIPETTE FOR THE TOPICAL APPLICATION
OF VERY SMALL QUANTITIES OF INSECTICIDE

by

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A full description of the various methods and apparatus used for the topical application of insecticides was published by Busvine in 1957.¹ In 1956, Ungureanu and Ungureanu² constructed a micropipette using a magnifier to read the movement of the insecticide in a capillary tube, placed against a scale graduated in millimetres.

In 1957, we developed a simpler, lighter and more accurate apparatus.

Components necessary:

- capillary tube with internal diameter 0.02 - 0.03 mm;
- a piece of plastic or rubber tubing 3 cm long, whose diameter is such that it fits tightly over the end of the capillary tube (Fig. 1);
- a small glass rod of the same diameter as the capillary tube (Fig. 1);
- a knob carrying a threaded spindle and nut;
- 25 cm of cotton or nylon thread;
- a stand with clamps for fixing the pipettes;
- paper graduated in millimetres;
- sellotape.

Calibration of the micropipette; some well-washed mercury is introduced into the capillary tube.^a

- Place the capillary tube on the graduated paper and mark off the exact number of divisions corresponding to the mercury column.
- Note the temperature in °C.
- Weigh the mercury column on a very sensitive balance. Knowing the weight of the mercury, the volume can easily be calculated. To find the value of one division on the graduated scale, the volume is divided by the number of millimetres on the scale.
- Check whether the calibre of the capillary tube is the same throughout its length; introduce a column of alcohol containing an air bubble about 3-4 mm long into the capillary tube and allow the bubble to pass all along the length of the pipette. If the length of the bubble does not change, this signifies that the capillary tube is uniform in diameter.
- Next, the capillary tube must be drawn out at one end; heat the end of the capillary tube in order to seal it. When the glass is thoroughly molten, blow out a small bulb about 3 mm in diameter, then, by attaching a small glass tube, draw out the end until it is about one-tenth of a millimetre in diameter. Next, affix a strip of the graduated paper to the capillary tube. To use the micropipette, the capillary tube is fixed vertically; the rubber tubing is attached and the small glass rod then inserted into the upper end of the tube.
- Fix the knob with the threaded spindle and nut to the metal stand by means of a clamp below the clamp carrying the micropipette.
- Connect one end of the thread to the free end of the glass rod (see detail in Fig. 1); the other end of the thread is attached to the threaded spindle. To fill the micropipette, the threaded spindle is turned until the glass rod is horizontal. The end of the pipette is introduced into the solution and the threaded spindle is turned until the glass rod is vertical. When the liquid has risen to the end of the graduated scale, it is stopped by turning the spindle.

^aIn order to introduce the mercury easily, the capillary tube is connected with the tip of a syringe, through a small piece of rubber tubing.

- For topical application, a lens must be used to read the movement of the liquid meniscus. The advantage of this pipette is that the amount of liquid used can be read off directly and a large number of mosquitos can be rapidly tested.

The micropipette is washed with acetone and then with ether. To ensure vigorous cleaning, the small glass rod is removed, a syringe is inserted in its place and the wash liquid aspirated in the syringe.

As support, a metal rod can be constructed for attachment to the edge of the bench.

REFERENCES

1. Busvine, J. R. A critical review of the techniques for testing insecticides - Commonwealth Inst. of Entomology, London.
2. Ungureanu Er. & Ungureanu Lucretia (1957) Bul. Acad. R.P.R. - filiale Iassy No 3-4

MICROPIPETETTE FIXED IN VERTICAL POSITION
MICROPIPETETTE FIXÉE EN POSITION VERTICALE

