TECHNICAL PAPERS

An Alternative Method for the Culture of *Sciara* Larvae

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In the course of a study of chromosomes with the electron microscope it became advisable to have in the laboratory stock cultures of the so-called fungus gnat, genus *Sciara*. Certain features of the salivary gland of the larva of this insect made its culture desirable for this work. The following method of culture developed in our laboratory seemed to be somewhat more satisfactory than that which had previously been described (*1*). In the earlier method the food supply was largely powdered dry yeast and powdered dry mushrooms, whereas in this method it is a living fungus.

The first step in the procedure is to initiate the growth of the fungus culture. The customary half-pint milk bottles were filled to a depth of about 1½″ with Sabouraud's media. After autoclaving, the media was slanted before cooling to provide more surface for the fungal growth which served as food for the developing larvae. The agar surface was then streaked with the fungus material. Pure cultures[2] of the genera *Haplosporangia, Allescheria,* and *Chaetoconidia* were used. All of them provided a satisfactory nutrition for the *Sciara* cultures, but somewhat better success was obtained with the *Chaetoconidia.*

The fungus was allowed to grow several days before the *Sciara* flies were introduced. By the time the larvae appeared, usually about 7 days after the flies were introduced, the fungus had formed a luxuriant mat over the media surface. Apparently most of the feeding is done in the larval stage, for the larvae feed voraciously on the fungus, which then begins to disappear. The growth of the fungus is adequate to provide food throughout the larval stage. The life cycle of the *Sciara* flies occupies about a month, the egg stage taking 5–6 days; larva, 14–15 days; pupa, 3–4 days; adult, 5–8 days. A new fungus culture is necessary for each new generation of flies, and therefore the fungus culture must also be maintained in stock on the Sabouraud media.

The *Sciara* cultures can be kept in the laboratory at ordinary room temperatures provided the temperature does not rise above about 29° C, since it is known that a higher temperature is lethal if maintained for more than a short time (*1*). The larval stage is particularly sensitive to heat, and if it is convenient, the cultures should be kept in an incubator at 22°–24° C.

The advantages which this method seems to offer over the previous one are: (1) a greater biological constancy in the nature of the food supply, (2) elimination of the necessity of repeated periodic feedings during the larval stage and (3) greater ease in maintaining an adequate moisture supply.

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[2] The initial fungus cultures were kindly provided by Prof. O. A. Plunkett, Division of Botany, University of California, Los Angeles.

Reference

1. SMITH-STOCKING, HELEN. *Genetics,* 1936, **21**, 421.

Discontinuities in Properties of Water as a Function of Temperature

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It was shown by the author long ago (*1*) that a plot of the densities of many liquids vs. temperature gives a curve that is not smooth, but exhibits inflection points, or kinks, at some intervals. This can be shown to be true for any liquid for which there exist accurate experimental data. But water seemed an exception since the temperature-density curve is perfectly smooth according to figures given in tables used at the present time.

These kinks are often ignored, one reason being that they are not predictable on the basis of current theories. Another is that the previous experimentalists were not aware of them and performed the measurements of densities at regular intervals of temperature. But the kinks, or places of deviation from the smooth path, frequently fall between the observed points, and thus remain unnoticed. Some may attribute these effects to conditions which cause experimental errors of more or less systematic character. This view, in the light of the present data, seems absurd.

It would not be easy to repeat the work of Ramsey and Sydney Young (*3*) for this requires complicated apparatus and takes much time. But there is an easy method of demonstrating these phenomena at moderate temperatures (*2*). The density of propyl alcohol, which had been purified by the procedure of Sidney Young, was determined in a pycnometer at various temperatures between 20° and 80° C. The curve so obtained showed a kink in the same place as it had appeared in the data of Sidney Young. Other liquids also show kinks in this region of temperature, e.g. benzene at 45° C. The temperature was carefully regulated during these experiments, and, by weighing a 25-cc pycnometer, the density can be determined to five decimal places. But this is not