MEASURING MINIMAL CONCENTRATIONS OF ATTRACTANTS DETECTED BY THE NEMATODE *Panagrellus redivivus*

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(Received October 6, 1983; revised June 1, 1984)

**Abstract**—A simple method for the experimental determination of minimal concentrations of attractants detected by the nematode *Panagrellus redivivus* is described. The lowest concentrations of methyl, ethyl, propyl, butyl, and amyl acetate as well as the minimal differences in concentrations of these attractants detectable by *Panagrellus redivivus* are presented.

**Key Words**—Attraction, attractants, assay, *Panagrellus redivivus*, methyl acetate, ethyl acetate, propyl acetate, butyl acetate, amyl acetate, nematodes.

**INTRODUCTION**

In one of our previous papers (Balanová et al., 1979) the attraction of *Panagrellus redivivus* to some metabolites of yeasts and fungi and a computerized estimation of concentration gradients of the attractants to which the nematodes are subjected during assay (Balan and Gerber, 1972) were presented. The simulated computation of concentration profiles in the assay assembly indicated that the nematodes reacted to attractants (methyl, ethyl, propyl, butyl, and amyl acetate) in concentrations ranging from $1 \times 10^{-7}$ to $1 \times 10^{-10}$ mol/liter.

We wanted to verify this computerized estimation experimentally, but no suitable method for such work was known. The obvious problem in work of this type is to detect the exact moment at which the random movement of a nematode in an attractant gradient changes to a directed movement towards the attractant and to determine the threshold concentration of the attractant to which the nematode was subjected at that very moment.

A slightly different problem in studying attraction is the determination of the lowest increment of an attractant which can still affect the movement of a
nematode. This value can be useful in estimating appropriate gradients for effective attraction.

A novel bioassay was developed for the experimental determination of minimal concentrations (or increments) of attractants which nematodes are able to detect.

METHODS AND MATERIALS

Procedure. In the center of a 3-mm layer of plain 3% agar in a 80-mm-diameter Petri dish two 3-mm-thick, 1-cm-diameter 2% agar disks with the attractant (A) and two similar control disks not containing the attractant (C) are positioned alternately and next to each other forming a square (Figure 1).

The needed concentration of the attractant (all are liquids sparingly soluble in water) in agar is obtained by the dilution of the saturated solution of the attractant in water at 20°C and by further dilution (1:1) with melted agar cooled to 40°C. After perfect mixing, the agar is poured into a Petri dish and forms a 3-mm layer of 2% agar containing the needed concentration of the attractant. From the solidified agar, disks are cut with a cork borer, and they, along with

![FIG. 1. Experimental arrangement for determining minimal concentrations of attractants detected by the nematode Panagrellus redivivus. (For details see “Procedure” in Methods and Materials).](image-url)