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V. Running waters

Trophic relationships in a small woodland stream[1]

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With 2 figures and 5 tables in the text

Introduction

Linesville Creek, a small woodland stream located in Crawford County in Northwestern Pennsylvania, has been under investigation for three years. In the course of a study aimed at delineating the factors which determine the microdistribution patterns of the macrobenthic invertebrates of the stream, extensive data have been gathered on the trophic relations of the species encountered in riffle habitats.

Various aspects of the trophic relations of stream invertebrates have been studied previously by a number of workers (LEATHERS 1922; WISSMEYER 1926; MUTTKOWSKI 1929; PERCIVAL and WHITEHEAD 1929; CAVENAUGH and TILDEN 1930; SLACK 1936; JONES 1950; WALSHE 1950; BADCOCK 1951; NAGAGAWA 1952; BROWN 1960, 1961 a, 1961 b; DEMORY 1961; HYNES 1961; CHAPMAN and DEMORY 1963; CUSHING 1963; DAVIS 1963; MINCKLEY 1963; CUMMINS 1964; MECOM and CUMMINS 1964; WARREN et al. 1964; CHAPMAN 1965; CUMMINS 1965) but as yet no one has completely defined the trophic structure of a lotic community.

It must be emphasized that the results described below represent an attempt to determine the ingestion food web of riffle areas in the stream. Undoubtedly when an assimilation food web is constructed it will be somewhat different. However, ingestion data must be gathered preliminary to assimilation studies and such data are of ecological interest. First, an ingestion food web for a stream community is probably a reasonable approximation of the assimilation food web and, second, the impact of a consumer on its food source is independent of assimilation, except in those few cases in which viable cells are released in the feces.

Methods

Field Samples

A five sample transect is collected each month from a riffle section of the stream. Each sample taken with a special riffle sampler, consists of all substrate materials down to a depth of 5 cm and a surface area of 900 cm^2. The sampling device, which is constructed of plexiglass with a foam rubber base is designed to shut off the current around the sampling area. All sediments and associated benthic organisms are removed from the sample area with a scoop and a 0.064 mm mesh dip net. Prior to the placement of the sampler, current velocity is measured at the substrate water interface with a

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