

VARIATION IN DIET WITH GROWTH

In order to determine whether there was any change in food related to changes in the size of the fish, data were divided into six groups on the basis of standard length as follows: below 30mm, 30–39mm, 40–49mm, 50–59mm, 60–69mm, above 69mm. These divisions were entirely arbitrary. Data were tabulated according to the standard length of the fish, and are shown in Table II. Initial data analysis was based on the importance of the various food types at each fish size category. In Fig. 6, the different food types are graphed against their percentage at each fish size grouping, to show the composition of the food for fish of each size—i.e., the data are taken from the vertical percentage columns in Table II.

For fish less than 30mm S.L., Diptera were by far the most important food organisms, making up 67% of the diet. Amphipoda were second in importance at 14%, followed by *Potamopyrgus* at 4%. *Deleatidium*, *Hydrobiosis*, Ostracoda and *Oxyethira* each amounted to between 2% and 3% each. The same order of importance was found for sizes 30–39mm and 40–49mm, but at 50–59mm the numbers of *Deleatidium* surpassed those of Amphipoda (11% compared with 8%). The importance of Diptera remained high in all these size groupings (68%, 61% and 60% respectively). At 60–69mm, Diptera maintained greatest importance at 39%, with *G. huttoni* eggs at 20%, *Deleatidium* 13% and Ostracoda 10%. At above 69mm there were further changes in proportion with Diptera 28%, *Deleatidium* 23%, *Oxyethira* 13%, Ostracoda 12% and *Potamopyrgus* 8%.

The percentages of each food type in the diet of each size grouping were graphed (Fig. 7). These show the relative significance of each food type at each size grouping—i.e., data from the horizontal percentage columns contained in Table II. Frequency of occurrence data, taken as percentages of the total number of fish examined in each size grouping, have been superimposed on this series of graphs. Clear trends are apparent. The high frequency of occurrence of Diptera at small fish sizes (67% at below 30mm) became less marked with increasing fish size, and was reduced to 28% at the greatest size category. Reduction was also characteristic of Amphipoda—from 14% to 4%. Compensatory increase was marked for *Deleatidium* (from 3%–23%) and increases occurred in irregular fashion for *Oxyethira* (3%–13%) and Ostracoda (3%–12%). Values for percentage frequency of occurrence showed similar trends to those of percentage number of organisms present. Trends in frequency of occurrence tended to be more conspicuous, but at the same time more irregular.

The data suggested that the increase in *Deleatidium* and reduction in Diptera and Amphipoda with increasing fish size was related to the ability of larger fish to devour larger organisms. The increase in abundance of the tiny Ostracoda at the same time threw some doubt on this conjecture. It is more probable that these changes in diet were related to changes in habitat type as the fish grew. Younger (smaller) fish tended to concentrate in the lowland stream where Amphipods were especially abundant in the vegetation and Diptera in the muddy pools and backwaters. The larger fish lived more frequently in faster flowing water where the stream substrate was rocky and the predominant organisms were *Deleatidium*, *Potamopyrgus* and Ostracoda.