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Invertebrate Drift in a Mountain Stream in Norway

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In August 1964 drift was sampled in a small mountain stream (300 metres above sea level) on a north facing slope. The stream consists of short runs and waterfalls, finally entering the river Lo at the east end of the Nordfjord.

Sampling was by means of a small net (15.5 meshes per cm) which floated on the surface of the water and sampled to a depth of 8 cms, with a total sampling area of 100 sq. cms. The net was placed in a run with an average velocity of 90 cm per sec., and thus strained 194,400 litres per 6 hours. Over a period of 24 hours, the net was emptied every 6 hours to give a total of four samples. As sampling started at 1700 h. (Norwegian summer time), the second sample from 2300 h. to 500h. coincided with night (sunset c. 2230h. and sunrise c. 530h.)

Table 1. *Numbers of animals in each drift sample.*

	Sample 1 17—23 h.	Sample 2 23—5 h.	Sample 3 5—11 h.	Sample 4 11—17 h.
Baetis sp.	57	277	93	71
Simulium spp.	2	10	3	3
Chironomidae.	3	3	8	6
Plecoptera.			3	
Rhyacophila sp.		1		
Dytiscidae larvae.	1	1	1	
Total aquatic.	63	292	108	80
Terrestrial inverts.	1	5	1	11

The results show (Table 1) that there was a continuous drift of animals downstream and that this was greatest at night when over 50 % of the total was taken in a single sample. Similar results have been obtained by Waters (1962), Müller (1963a, b), Södergren (1963), and Elliott (1965). The dominant member of both drift and benthos was *Baetis* sp. (possibly *B. subalpinus* Bengtsson 1917). The bottom of the stream was covered with a dense carpet of bryophytes and six bottom samples were taken, each of 400 sq. cms. (20 cm × 20 cm), using a small Surber sampler. With the exception of sample 3, the bottom samples showed little variation in faunal numbers.

Table 2. Number of animals per bottom sample (400 sq. cms.)

Sample	1	2	3	4	5	6
<i>Baetis</i> sp.	9	8	2	9	11	9
<i>Simulium</i> spp.	2	3	2	1	3	
<i>Rhyacophila</i> sp.		1		1		
Polycentropidae		1				1
Plecoptera.					2	3

An estimate was made of the proportion of a population present in the drift at any instant in time, using *Baetis* sp. only. Let the concentration of animals in the drift be x individuals per cubic metre and on the bottom X individuals per square metre. If the average depth of the stream is D metres, then the proportion of the benthos in the drift ($P\%$) is given by the formula: —

$$P = \frac{xD \cdot 100}{X - xD}$$

At the sampling point $D = 0.14$ metres, there was a mean of 8 *Baetis* sp. per 400 sq. cm and thus $X = 200$. The values for x varied with each drift sample thus: —

sample 1, $x = \frac{53}{194.4}$; sample 2 $x = \frac{277}{194.4}$; sample 3, $x = \frac{93}{194.4}$;
and sample 4, $x = \frac{59}{194.4}$.

The corresponding values of P were therefore respectively — 0.02, 0.11, 0.03 and 0.02.

These values are all extremely low and indicate that there were very few animals in a column of water above a square metre of bottom at any instant in time. The same conclusion was reached in a recent study on a high moorland stream on Dartmoor, England (Elliott 1965, unpublished).

Summary

In a mountain tributary of the river Lo, there was a continuous downstream drift of invertebrates, this being markedly greatest at night. Although large numbers of *Baetis* sp. drifted downstream per day, only a small proportion of the population was in the drift at any instant in time.

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