5.2 ZOOPLANKTON
(by W. Zoufal)

5.2.1 Equipment

A Schindler plankton trap (Schindler, 1969) was adapted to the special situation of the backwater area. Because of the expected low zooplankton densities (Schallgruber, 1944; Naidenow & Saiz, 1975; Naidenow, 1985) a volume of 50 litres was chosen. To facilitate the correct function at high flow velocities (at the upstream end of the backwater area, velocities of 1m sec^{-1} can be attained even at low discharge; Fig. 3.1), the weight of the sampler was increased by lead-plates to 18 kg (Plate 5.2.1). The water was filtered through nylon netting (mesh size 30 μm) to ensure that neither small rotifers nor rotifer eggs were lost.
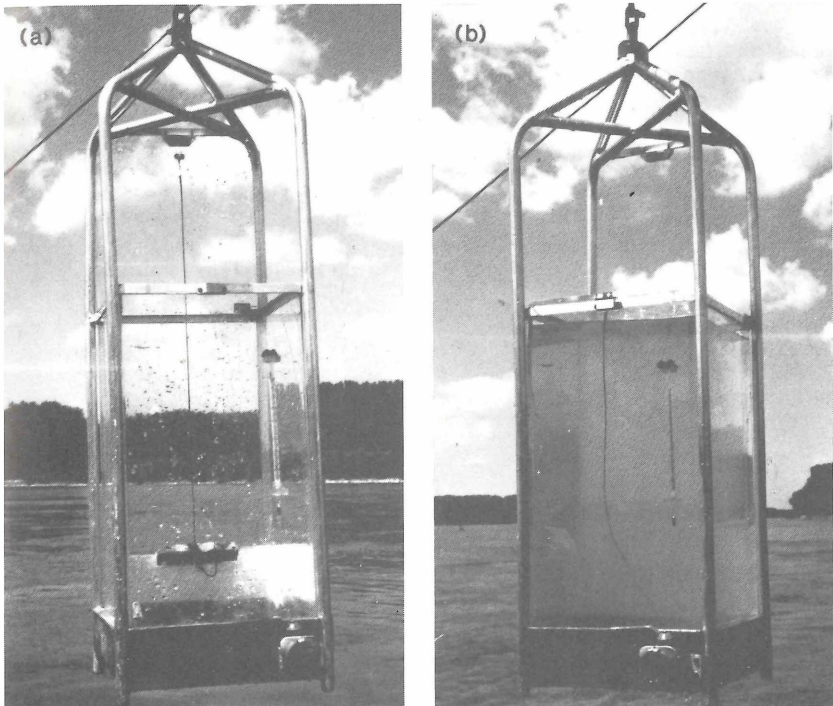

Plate 5.2.1. Schindler plankton trap (modified by R. Niederreiter). (a) Before lowering. (b) After lifting

25

5.2.2 Quantitative sampling

The results show that for more abundant zooplankton rotifers, only two sampling units are sufficient to obtain an error of 20 %. For less abundant rotifers (planktonic as well as littoral), three to fifteen sampling units need to be taken to obtain reliable estimates of abundance.

Table 5.2.1. The number [$n_{(20\,\%)}$] of sampling units per sample required for a level of 20 % precision for the sample geometric mean with lower and upper 95 % C.L. (X_g with lower and upper confidence limits) given as individuals per 100 litres. χ^2 = chi squared. (a) River kilometre 1984 (n = 5); (b) River kilometre 1984 (n = 6).

a)	X_g	(LCL-UCL)	χ^2	$n_{(20\%)}$
All rotifers	3145.0	2260.6 – 4375.1	1026.5	2
Synchaeta oblonga	2163.2	1483.3 – 3154.5	1014.9	3
Keratella cochlearis	307.6	254.5 – 307.6	28.5	1
Trichocerca spp.	13.8	3.1 – 52.3	46.3	15
Colurella spp.	62.1	34.6 – 110.9	64.3	6
b)	X_g	(LCL-UCL)	χ^2	$n_{(20\%)}$
All rotifers	3658.8	2938.3 – 4555.8	1026.5	8
Synchaeta oblonga	2046.1	1585.2 – 2640.8	433.7	1
Keratella cochlearis	300.6	231.1 – 390.9	79.5	1
Trichocerca spp.	28.4	15.7 – 50.8	55.3	9
Colurella spp.	137.0	100.1 – 187.2	73.5	3

5.2.3 Precision

On 15 November 1985, five and six sampling units were taken at km 1984 and 1994 from the river mouth respectively. On this day, stratification or other differences in abundance could be expected because of the low discharge of only 1213 m^3 sec^{-1}. The results of calculating the number of sampling units necessary to reach an error of 20 % for some rotifers are shown in Table 5.2.1. The confidence limits were calculated using a logarithmic transformation. The high values of χ^2 indicate a contagious distribution and therefore the number of sampling units was calculated by the formula for a negative binomial (Elliott, 1977).

26

References

Elliott, J.M. (1977): Some methods for the statistical analysis of samples of benthic inverte-brates. – Freshwater Biological Association Scientific Publication 25. 2nd ed.

Naidenow, W. (1985): Die Auswirkungen der wasserbaulichen Maßnahmen und der Bela-stung auf das Plankton und Benthos derDonau. – Verlag der Bulgarischen Akademie der Wissenschaften.

Naidenow, W., Saiz, D. (1975): Der Einfluß des regulierten Abflusses auf das Plankton der Oberen Donau. – Wissenschaftliche Kurzreferate. Berichte der 18. Tagung der IAD. Regensburg, 1. Teil, 239-243.

Schallgruber, F. (1944): Das Plankton des Donaustromes bei Wien in qualitativer und quan-titativer Hinsicht. – Arch. Hydrobiol. 39, 665-689.

Schindler, D.W. (1969): Two useful devices for vertical plankton and water sampling. – J.Fish. Res. Board Can. 26, 1948-1955.

Correspondence: W. Zoufal, Schweglerstraße 42/4, A-1150 Wien.