Y-I5

A SELECTIVE SAMPLING METHOD FOR THE HARD BOTTOM VAGILE FAUNA

Adriana GIANGRANDE°, Renata MANCONI°° and Roberto PRONZATO°°°

° Istituto di Biologia Marina, Via Volta 6, Pisa (Italia)
°° Istituto di Zoologia, Via Muroni 23, Sassari (Italia)
°°° Istituto di Zoologia, Via Balbi 5, Genova (Italia)

The hard bottom vagile fauna is generally collected by the technique of complete scraping from standard surfaces. This method, that has been designed for the sampling of phytobenthos and sessile zoobenthos, shows some inconveniences for the collection of vagile forms. For instance it starts escape reactions of many organisms and provides no information about the stratification and the activity of the various species.

In order to solve these problems suction samplers or mixed techniques of scraping and suction have been utilized. The suction samplers were designed for soft bottoms (Brett, 1964) and they are cumbersome and difficult to handle in unfavourable conditions such as those encountered on vertical rocky walls or on vaults . A combination of suction and scraping was utilized by Hiscock and Hoare (1973). This technique can avoid the escape reaction of vagile fauna, but no separation was made between sucked and scraped samples.

In order to have comprehensive data on the stratification and the activity of various species, samples can be taken first by a compact and handy suction sampler on a standard surface (for instance: 400 cm²) and, after, by scraping completely the same area. These results have to be compared with a traditional scraping sample.

The suction sampler here described is small, modular and made of PVC (Fig. 1), it can be easily used with precision on small surfaces and at a shallow depth. Compressed air is injected through a quick release pipe, connected to an air tank by a regulator. Suction power is regulated by an air-tap and can be also modified by using different mouthpieces according to the type of substratum to be sampled. For instance,for samples on vaults, a flexible pipe can be fitted to the fore part of the sampler in order to maintain it in a proper vertical position providing the maximum power of suction and, in the same time, to point the mouthpiece in every direction. The collecting bag is made of a nylon net with a mesh of 250 µ. Samplings have been carried out by sucking for one minute on a 400 cm² area.

A first test of this suction device consisted in a series of samplings from a vertical cliff. After a first sampling by suction, the substrate has then been scraped completely. Another sample by scraping has then been carried out nearby. Preliminary results indicate that the loss of information caused by the escape of motile organisms during scraping, is, probably, negligible. In fact the total number of specimens collected by scraping only (Polychaetes, Molluscs and Crustaceans) is very similar to that obtained by suction and scraping. On the other hand, the number of specimens collected by suction can be considered as high enough to allow considerations about the possible migrations of vagile organisms on algal or animal canopies. A subsequent phase of testing will be the comparison between day and night samples.

Our preliminary results, in fact, suggest that suction samplers can be useful for qualitative research on the activity of the vagile fauna.

REFERENCES

Brett, C.E., 1964. A portable hydraulic diver-operated dredge-sieve for sampling subtidal macrofauna. Jour. Mar. Res.,22 (1-3): 205-209.

Hiscock, K. & Hoare, 1973. A portable suction sampler for rock epibiota. Helgol. wiss. Meeresunters. 25: 35-38.

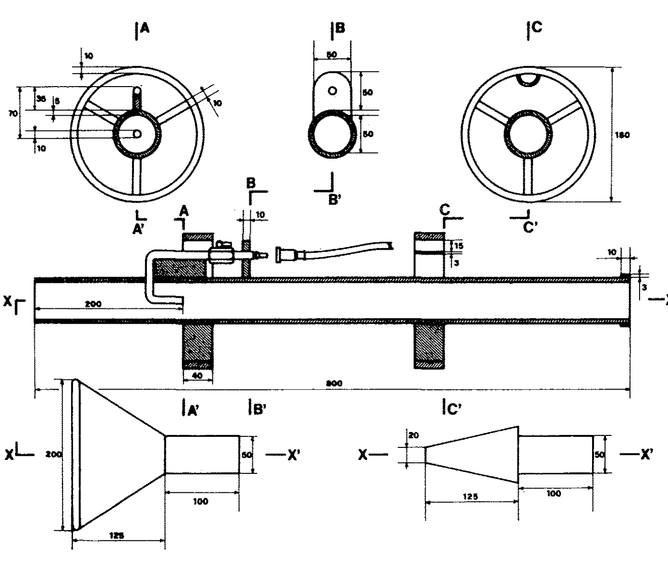

Fig. 1. Suction sampler. A,B,C: transversal section. X: longitudinal section. Low: two examples of mouthpieces.

Y-I6

IN SITU MEASUREMENTS AND SAMPLING TECHNIQUES ON CYMODOCEA NODOSA (UCRIA) ASCHERSON PRAIRIES

Lucia MAZZELLA, Maria Beatrice SCIPIONE,
Maria Cristina BUIA and Giovanni Fulvio RUSSO

Laboratorio di Ecologia del Benthos,
Stazione Zoologica di Napoli, Ischia (Italia)

Résumé: On donne des exemples d'application des techniques "in situ" pour étudier la microdistribution des herbiers de *Cymodocea nodosa*(Ucria)Ascherson et rechercher sur la phénologie de cette phanérogame.

Underwater sampling techniques and measurements were used to study the *Cymodocea nodosa*(Ucria)Ascherson prairies distributed in shallow and deep waters around the Island of Ischia, Bay of Naples (Castello Aragonese,-6m; San Pietro,-4m; San Montano, -15m)(BUIA et al.,1985b). The structure of the prairies, the phenological features of different strata of the plant, its reproductive strategy and finally the vagile fauna that inhabits the prairies were studied. With the methods used it is possible to follow long-term scale phenomena (different reproductive strategy in colonizing new bare substrata, frequency of sexual reproduction)(BUIA et al.,1985a; CAYE et MEINESZ,1984) which have not yet been completely clarified in *Cymodocea nodosa*, and, by quantifying these events, to define their ecological importance. The results reported below are an example of the application of these techniques.

In order to study the microdistribution of the prairie, a 1 m² quadrat, divided into units of 12.5 x 12.5 cm, was used to determine the density and the distribution pattern of Cymodocea shoots. For a shallow prairie, in late spring, the density was 525 shoots/m², with a minimum of 0 to a maximum of 24 shoots in each 12.5 x 12.5 cm quadrat. Five distribution classes were selected as illustrated in Fig.1.A coefficient of dispersion (I= variance/mean), previously used for *Posidonia oceanica*(L.)Delile(PANAYOTIDIS et al.,1980), was calculated for gradually increasing sample units,doubling the units each time. Figure 2 shows the pattern of coefficient I. The values of this coefficient indicate a contagious distribution confirmed by X^2- test (the observed values are significantly higher than the expected values for all sampling units)(KERSHAW, 1973). As shown in Fig.2,the sampling area can be included between 300 and 1200 cm². The same underwater method can be used to investigate the microdistribution of male and female flowers of the plant over an area of 1 m², and it can provide information on the pattern distribution of the flowering shoots in a prairie.

A different method was used to investigate plant features of a shallow prairie (San Pietro). To collect both hypogeum (roots and rhizomes) and epigeum (leaves)parts of the plant, a cylinder, 45 cm high, with a diameter of 30 cm and a total surface of 706 cm², was used (Fig.3). The cylinder, pushed with a rotating movement into the sediment for several centimeters(about 20 cm), samples a sod of the prairie. This technique has been successfully used on beds formed by other phanerogames (PIRC, 1983). Different parameters can be measured using this technique (Table 1), which is particularly useful in comparative studies on mixed prairies of *Cymodocea nodosa* and *Zostera noltii* Hornem.

References

BUIA M.C.,L.MAZZELLA e G.F.RUSSO,1985a.Fenomeni riproduttivi della *Cymodocea nodosa* (Ucria)Aschers. in rapporto alla struttura della prateria. Oebalia, XI,N.S., 377.

BUIA M.C.,L.MAZZELLA,G.F.RUSSO & M.B.SCIPIONE,1985b. Observations on the distribution of *Cymodocea nodosa*(Ucria)Aschers. prairies around the Island of Ischia (Gulf of Naples). Rapp.Comm.int.Mer Médit., 29(6), 205-208.

CAYE G. et A.MEINESZ, 1984.Floraison et fructification des phanérogames marines *Cymodocea nodosa*(Ucria)Ascherson et *Zostera noltii* Hornemann a Port-Cros(France). Trav. sci.Parc nation. Port-Cros, Fr., Notes brèves 10, 153-156.

KERSHAW K.A.,1973.Quantitative and dynamic plant ecology.E.Arnold Publ.,London,308 pp.

PANAYOTIDIS P.,C.-F.BOUDOURESQUE et J.MARCOT-COQUEUGNIOT,1980. Végétation marine de l'île de Port-Cros(Parc National). XX:Répartition spatiale des fasceaux de *Posidonia oceanica*(Linnaeus)Delile. Trav.sci.Parc nation.Port-Cros, Fr., 6, 223-237.

PIRC H.,1983. Belowground biomass of *Posidonia oceanica*(L.)Delile and its importance to the growth dynamics. Proc.Inter.Symp.Aquatic Macrophytes, Nijmegen, 177-181.

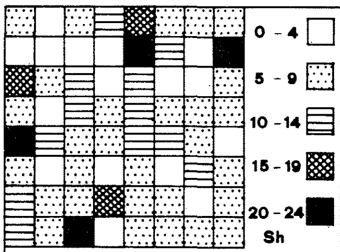

Fig.1. Contagious distribution of shoots (12.5 x 12.5 cm quadrats)

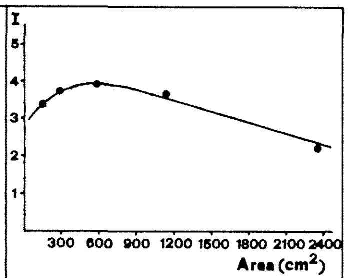

Fig.2.Coefficient of dispersion (I) trend

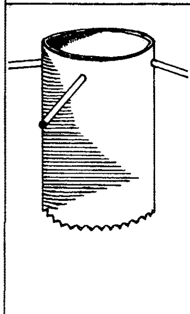

Fig.3.The cylinder used to collect *Cymodocea nodosa* plants

St. of S.Pietro prairie	2		4		6		7	
Cymodocea, Zostera	C	Z	C	Z	C	Z	C	Z
Number of shoots	55	20	82	-	51	-	23	302
Number of male flowers	15	-	1	-	-	-	1	-
Leaves biomass (gr)	7	.19	6.9	-	2.7	-	3.8	4
Rhizomes biomass(gr)	4.9	.22	14.3	-	7.5	-	1.9	.18
Roots biomass (gr)	2.2	.37	14.9	-	10.3	-	1.4	2.4
Number of seeds	-	-	2	-	5	-	-	-
Photosynthetic surface (cm² in 706 cm²)	-	-	596	-	373	-	308	-
Leaf Area Index (m²/m²)	-	-	.84	-	.528	-	.44	-

Table 1.Different parameters measured in 4 stations (st.2, -2.5m; st.4, -2m; st.6 & 7, -4m) of the S.Pietro prairie

Y