A new sampler for collecting water for dissolved oxygen or hydrogen sulphide analysis in the micro layers of shallow water column

by

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Abstract : A new water sampler is designed to collect duplicate water samples from microlayer of a shallow water column for determination of dissolved oxygen or hydrogen sulphide content. The new device allows for an automatic complete flush of the BOD bottles for several times before obtaining the samples .

Résumé : Un nouvel appareil est conçu pour le double prélèvement d'échantillons d'eau dans les zones côtières peu profondes. Cet appareil permet l'échantillonnage des micro-couches d'eau pour la détermination de l'oxygène ou du sulfure d'hydrogène en solution.

Introduction : On surveying the numerous samplers in use for collecting the water samples for dissolved oxygen or hydrogen sulphide analysis, it is found that they all fall in two categories; either reversible or non-reversible. Most of these samplers are lowered into the sea parallel to the hydrographic wire. The length of the bottle (e.g. Nansen's, NIO-PVC PVC-Nisken's bottles) is of about half a meter. Such bottles, therefore only sample a water layer not less than half meter thick. This could be acceptable for open sea where the water column is hundreds of meters deep. But in shallow coastal waters, lakes, reservoirs, lagoons, rivers and estuaries of about 20 m depth or less and where discontinuity layers of a pycnocline or anoxic conditions are prevailing, sampling of discrete or micro layers of less than 50 cm in thickness is very desirable. Where anoxic conditions exists, sampling from microlayers is very necessary to define the boundary layers of oxic and anoxic environments . Earlier investigations in the coastal waters of Jeddah (Red Sea) El-Rayis et al (1982); and in lake Mariut (Saad et al, 1981) have failed to make sharp distinction between oxic and anoxic conditions. This is mostly because the sampling were made at wider intervals due to the lack of suitable samplers to collect water samples at close intervals. In order to sample microlayers of thickness less than 30 cm in a shallow water column and to faciliate precise demarkation of the oxic and anoxic layers, a new sampler has been designed and tested .

Description of the sampler :

The schematic diagram of the sampler is shown in Fig. 1. The sampler consists of two BOD bottles connected to a metal bottle of about one liter capacity through 0.2 cm diameter siphon tube. The metal bottle is fitted with

a polyethylene tube, the free end of which is held above the surface of the water column. The tube is closed at the free end with Mohr's clip. The apparatus is fixed in a metal frame tied to a (marked) rope. For collecting the water samples, the instrument is lowered to the desired depth and the Mohr's clip is released to allow the air in the bottles to escape; water that first enters the BOD bottles is then transfered into the metal bottle . The number of flushes of the BOD bottles are controlled by the Mohr's clip release. Therefore, for each sampling depth duplicate samples could be obtained. By testing the apparatus using a big bucket filled with water saturated with oxygen, the percentage coefficient of variations for the duplicate sample analysis with that sampled from the bucket directly was found to be less than 2% .

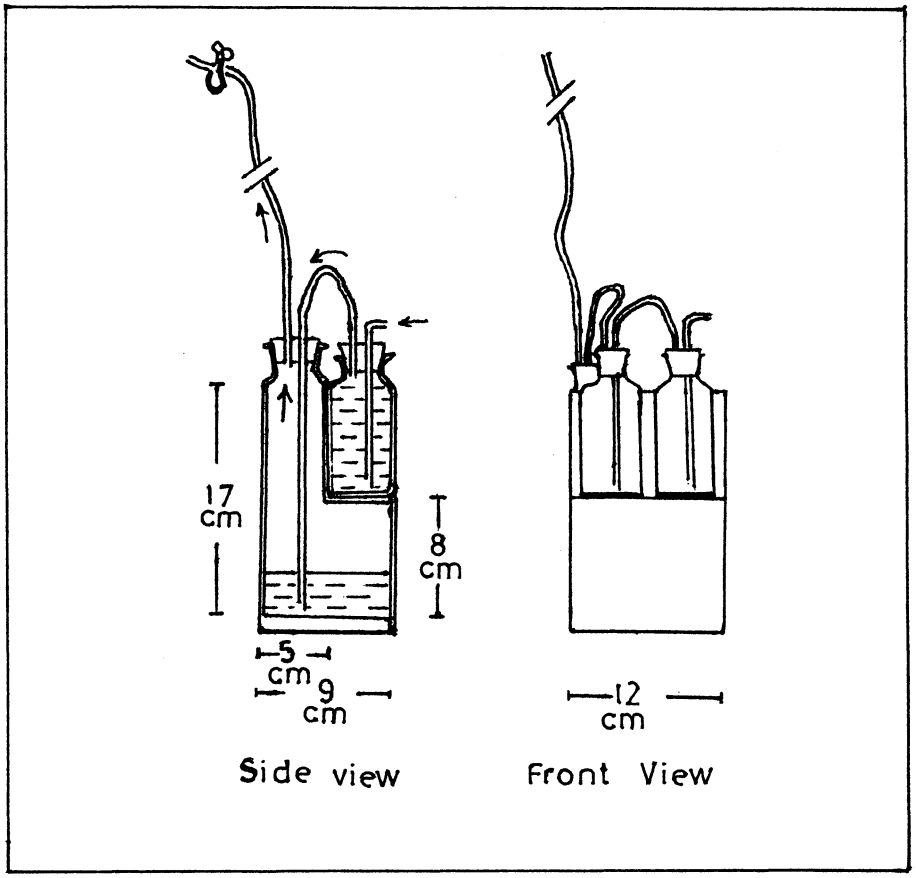

Fig. 1 : Schematic diogram of the Sampler .

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Paper presented by Y. Halim (Egypt)

Discussion

M. Branica: What is the volume of the large and small parts of the bottle?

Y. Halim: The total volume of the bottle is about 1.25 litres.