The determination of organic matter in river sediments

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With 6 figures and 4 tables in the text

Abstract

The importance of organic matter in ecosystems is characterized and the traditional methods for determining organic matter — wet oxidation and loss of weight on ignition — are shortly discussed. It is shown that both methods are inadequate for general use. Organic carbon is proposed for quantifying organic matter. The precision of organic carbon determinations with LECO LOW CARBON ANALYZER is described. The characterization of the nutritive quality of organic matter by means of nitrogen and phosphorus concentrations is discussed. A method for determining phosphorus and nitrogen in one sample as well as an approximation to differentiate between organic and inorganic bound nitrogen and phosphorus are described.

1. Introduction

Organic matter of any kind and origin plays a central role in running water ecosystems. BERRIE (1976) writes: “The fact that detritus is an important component of freshwater ecosystems has been stated by various authors since at least the 1920s but studies of detritus have proved difficult due to its complex nature and the lack of suitable analytical techniques.” The necessity to study the organic matter became even more important since the conception of the “River Continuum Concept” (CUMMINS 1979, VANNOTE e. a. 1980).

Organic matter comprises molecules of an extreme variety in size and composition. For analyzing organic matter en bloc properties common to all organic molecules are used. These are: oxidability, thermal dissociation at low temperatures, the element carbon.

None of the properties listed above are restricted to organic molecules, only. Besides various analytical difficulties, the measurement of any of these properties in a sample of a mixture of inorganic and organic matter is not correlated solely with organic matter, therefore.