

浮游植物叶绿素a浓度测定方法的比较研究

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Comparison of Methods for Determination of Phytoplankton Chlorophyll-a

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摘要

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摘要 叶绿素a作为浮游植物生物量的表征, 其在水体中的浓度常被用作评价水环境富营养程度的指标, 但其测定方法多样, 尚未形成统一的标准方法。回顾了水体中浮游植物叶绿素a测定方法的发展历程, 对细胞破碎方法和提取液种类等方面的研究作了比较, 结合不同测定方法的优缺点提出了目前最合适使用的方法——热乙醇法, 该方法操作简便, 提取效率高, 稳定可靠, 且对操作者的健康无危害。介绍了荧光法、高效液相色谱法和分光光度法3种常用测定方法的简要步骤、适用性和优缺点。经过对多种方法的比较, 认为用热乙醇法提取和分光光度法测定是一种值得推广应用的测定方法, 以期为国内制定叶绿素a测定的标准方法提供依据。

关键词: 叶绿素a 提取液 热乙醇法 分光光度法

Abstract: As chlorophyll-a (Chl-a) is used to characterize phytoplankton biomass, its content in a waterbody is commonly used as an indicator of eutrophication level of the waterbody. Although there are a number of measurement procedures currently in use, not a unified standard method is developed. A retrospect is presented here of the development history of the methods for determination of Chl-a. On such a basis, a comparative study was done of the methods in cell disruption technique and type of extractant. By comparing advantages and disadvantages of the various determination methods, a relatively effective method, hot-ethanol method, is proposed. This method is easy to operate, high in extracting rate, stable, reliable and harmless to human health. Besides, a brief introduction is presented the three commonly-used determination methods, i.e. spectrofluorometry, high efficiency liquid chromatographic and spectrophotometry, and their respective procedures, applicabilities, advantages and disadvantages. The comparison demonstrates that the combination of the hot ethanol extraction method with the spectrophotometry is a good method, worth extrapolating. It is expected that the review may provide some bases for development of a standard method for determination of Chl-a concentration in China.

Keywords: chlorophyll-a extracting solvent hot-ethanol extraction spectrophotometry

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