

Water quality - Guidance standard for designing and selecting taxonomic keys

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ICS 13.060.99

English Version

**Water quality - Guidance standard for designing and selecting
taxonomic keys**

Qualité de l'eau - Guide pour la conception et le choix des
clés taxonomiques

Wasserbeschaffenheit - Anleitung zur Gestaltung und
Auswahl von taxonomischen Bestimmungsschlüsseln

This European Standard was approved by CEN on 24 November 2012.

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Contents

Page

Foreword.....	3
Introduction	4
1 Scope.....	5
2 Terms and definitions	5
3 Principles of biological identification.....	5
4 Requirements for taxonomic keys	5
4.1 General principles.....	5
4.2 Title and scope.....	6
4.3 Characters	7
4.4 Layout.....	7
4.5 Description of Morphology	7
4.5.1 Couplets	7
4.5.2 Illustrations.....	8
4.5.3 Binding	9
4.6 Linguistics.....	9
5 Summarised criteria.....	9
6 Glossary	10
7 Synopsis of classification.....	10
8 Methods for collecting, preserving and examining samples	11
9 Testing and validation of a key.....	11
Bibliography.....	12

Foreword

This document (EN 16164:2013) has been prepared by Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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Introduction

The importance of ecology in new legislation such as the EC Water Framework Directive (2000/60/EC) means, that ecological data from aquatic environments shall be of a known and verifiable quality. European Standards recognise the need for ecologists to use reliable and up-to-date taxonomic keys when performing their assessments. However, determining the most appropriate literature to use for any particular analysis is not always straightforward. This guidance standard is designed to provide an overview of the characteristics of a taxonomic key appropriate to applied ecological analyses. This has two goals: first, to help end-users to determine the most suitable taxonomic literature to use for a particular analysis and, second, to help those commissioning new identification guides to produce 'fit-for-purpose' specifications, and those writing keys to meet such specifications.

It is important to state very clearly at the outset that the role of this document is not to replace but rather to complement the guidance on nomenclature and taxonomy given by ICBN [3] and ICZN [4].

Identification materials are increasingly being presented using electronic, rather than conventional printed, media. The general principles are the same, regardless of the media.

1 Scope

This European Standard defines standard principles for the design of taxonomic keys to ensure proper use of nomenclatural rules and reproducible and traceable identification. These principles also allow for the selection of the best key available.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

accuracy

correct identification of a specimen to the relevant taxonomic category (e.g. family, genus, species)

Note 1 to entry: The definition refers to the context of this European Standard.

2.2

International Code of Botanical Nomenclature

ICBN

official international taxonomic code for botany

2.3

International Code of Zoological Nomenclature

ICZN

official international taxonomic code for zoology

2.4

nomenclatural rules

rules for naming of organisms that are laid down in official taxonomic codes

2.5

traceable identification

identification of a taxon which can be traced back to its original publication either directly or indirectly

3 Principles of biological identification

The objective of all biological identification is to assign the correct biological name to a specimen, irrespective of the amount of morphological or other variability shown by the taxon in question. This should be done as efficiently as possible, in order to minimise time and resources. Identification provides a link between a specimen of an organism and the original 'type specimen' of that taxon. This is often one or more individuals of the species, preserved in a museum collection (or, in the case of many algae, an illustration), which has been described according to the rules of the ICBN or ICZN using text, measurements and illustrations.

There are two methods of identifying organisms: by 'matching' (pattern recognition) and by 'logical comparison' (typically through the use of keys). The academic taxonomic literature often assumes that logical reasoning is used exclusively but, in practice, most biologists use a combination of approaches: relying on memory for naming common organisms and a mix of pattern recognition and logical reasoning for the less common organisms. It is arguably the poor quality of identification literature that causes biologists to switch from logical reasoning to pattern recognition.

4 Requirements for taxonomic keys

4.1 General principles

Most identification guides assume that logical comparison plays a large part in the identification of organisms, and the guides have a key, or similar device, at their core. These work by presenting users with a limited number of choices from which to choose either in sequence ('dichotomous keys') or in parallel ('multiaccess keys'). The same principles apply, regardless of the type of key.