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Soil quality - Sampling of soil invertebrates - Part 5: Sampling and extraction of soil macro-invertebrates (ISO 23611-5:2024)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

**Soil quality - Sampling of soil invertebrates - Part 5:
Sampling and extraction of soil macro-invertebrates (ISO
23611-5:2024)**

Qualité du sol - Prélèvement des invertébrés du sol -
Partie 5: Prélèvement et extraction des macro-
invertébrés du sol (ISO 23611-5:2024)

Bodenbeschaffenheit - Probenahme von Wirbellosen
im Boden - Teil 5: Probenahme und Extraktion von
Makroinvertebraten (Großwirbellosen) im Boden (ISO
23611-5:2024)

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EN ISO 23611-5:2024 (E)

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European foreword

This document (EN ISO 23611-5:2024) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 444 "Environmental characterization of solid matrices" the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by February 2025, and conflicting national standards shall be withdrawn at the latest by February 2025.

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Endorsement notice

The text of ISO 23611-5:2024 has been approved by CEN as EN ISO 23611-5:2024 without any modification.



International Standard

ISO 23611-5

Soil quality — Sampling of soil invertebrates —

Part 5: Sampling and extraction of soil macro-invertebrates

*Qualité du sol — Prélèvement des invertébrés du sol —
Partie 5: Prélèvement et extraction des macro-invertébrés du sol*

**Second edition
2024-08**

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ISO 23611-5:2024(en)**Foreword**

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological characterization*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, *Environmental characterization of solid matrices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 23611-5:2011), which has been technically revised.

The main changes are as follows:

- Two informative Annexes were added at the end of the document. [Annex B](#) describes the procedures to be adopted when sampling macro-fauna using pitfall traps and [Annex C](#) presents a monitoring example with pitfall traps.
- The bibliographic references list was revised and updated in the entire document.

A list of all parts in the ISO 23611 series can be found on the ISO website.

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ISO 23611-5:2024(en)

Introduction

This document was prepared in response to a need to standardize sampling and extraction methods for soil macro-invertebrates globally. These methods are needed for the following purposes:

- biological classification of soils, including soil quality assessment (e.g. References [14], [28] and [37]);
- terrestrial bio-indication and long-term monitoring (e.g. References [65], [74], [75] and [76]).

Data collected using standardized methods can be evaluated more accurately as they allow more reliable comparison between sites (e.g. polluted vs non-polluted sites, changes in land-use practices).

Soils of the world host an abundance of highly diverse macro-invertebrate communities. Their biology and ecology have been widely studied. Soil invertebrates are irreplaceable actors of soil formation and conservation in natural ecosystems. Their relevance to the soil system comes from their abundance and diversity, and also from their role in key biological processes. They are sensitive indicators of soil quality and recognized actors of its fertility (e.g. References [58] and [52]). Among the wide diversity of species, adaptive strategies and size ranges represented, one specific group, also called “soil ecosystem engineers”, includes large invertebrates that determine the activities of other smaller organisms through the mechanical activities they produce in soil (e.g. References [18] and [46]).

Soil macro-invertebrates span a wide range of ecological functions in soil: decomposition of organic matter, through their own activity and by stimulating the soil's microbiological activity (e.g. References [2], [3] and [36]), predation that plays an important part in food webs (e.g. References [9], [51], [56], [59] and [63]), soil aggregation by the production of organo-mineral structures (e.g. nests, galleries, casts) that can last for days, months or years, soil bioturbation (e.g. Reference [28]), etc. These characteristics, coupled with in-depth taxonomic knowledge, have enabled their use as study organisms in several research programmes dealing with the impacts of forest practices (e.g. References [11], [36], [47], [57], [60] and [70]) or crop management practices (e.g. References [8], [19], [27], [29], [30], [33], [38], [55] and [62]). These features make them suitable organisms for use as bio-indicators of changes in soil quality, especially with respect to land-use practices and pollution (e.g. References [21], [35], [45], [48], [49], [54], [60] and [74]).

The method proposed in this document covers the sampling of all soil macro-invertebrates. However, the sampling of earthworms is already covered in ISO 23611-1. This alternative sampling method for earthworms is described in ISO 23611-1:2018, Annex C.

The method proposed in this document is a prerequisite for using macro-invertebrates as bio-indicators (e.g. to assess the quality of a soil as a habitat for organisms). The main premise of this method is rapid assessment (completing the sampling of a plot in one or two days with only basic equipment and a small number of field assistants) in order to be able to address all the taxonomic groups of soil macro-invertebrates at the same time and in the same place. The Tropical Soil Biology and Fertility (TSBF) method has evolved and some modifications have been introduced in order to use it in temperate regions.

A sampling design is specified in ISO 23611-6.

NOTE The method specified in this document is based on guidelines developed under the Tropical Soil Biology and Fertility Program (TSBF method).^[1]

Soil quality — Sampling of soil invertebrates —

Part 5:

Sampling and extraction of soil macro-invertebrates

1 Scope

This document specifies a method for sampling, extracting and preserving macro-invertebrates from soils, including the litter zone.

The sampling and extraction methods in this document are applicable to almost all types of soil, with the exception of soils in extreme climatic conditions (hard, frozen or flooded soils) and matrices other than soil, e.g. tree trunks, plants or lichens.

2 Normative references

There are no normative references in this document.

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