

**Soil quality - Sampling of soil invertebrates - Part 1:  
Hand-sorting and formalin extraction of earthworms  
(ISO 23611-1:2006)**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 23611-1:2011 sisaldab Euroopa standardi EN ISO 23611-1:2011 ingliskeelset teksti.

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ICS 13.080.30; 13.080.05

English Version

**Soil quality - Sampling of soil invertebrates - Part 1: Hand-sorting and formalin extraction of earthworms (ISO 23611-1:2006)**

Qualité du sol - Prélèvement des invertébrés du sol - Partie 1 : Tri manuel et extraction au formol des vers de terre (ISO 23611-1:2006)

Bodenbeschaffenheit - Probenahme von Wirbellosen im Boden - Teil 1: Handauslese und Formalinextraktion von Regenwürmern (ISO 23611-1:2006)

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**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of ISO 23611-1:2006 has been prepared by Technical Committee ISO/TC 190 “Soil quality” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 23611-1:2011 by Technical Committee CEN/TC 345 “Characterization of soils” 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of an identical text or by endorsement, at the latest by January 2012, and conflicting national standards shall be withdrawn at the latest by January 2012.

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### Endorsement notice

The text of ISO 23611-1:2006 has been approved by CEN as a EN ISO 23611-1:2011 without any modification.

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## Introduction

This part of ISO 23611 has been drawn up since there is a growing need for the standardisation of terrestrial zoological field methods. Such methods, mainly covering the sampling, extraction and handling of soil invertebrates, are necessary for the following purposes:

- biological classification of soils including soil quality assessment [21], [26], [34];
- terrestrial bioindication and long-term monitoring [9], [12], [28];
- evaluation of the effects of chemicals on soil animals (ISO 11268-3).

Data for these purposes are gained by standardized methods since they can form the basis for far-reaching decisions (e.g. whether a given site should be remediated or not). In fact, the lack of such standardised methods is one of the most important reasons why bio-classification and bio-assessment in terrestrial (i.e. soil) habitats has so far relatively rarely been used in comparison to aquatic sites.

Originally, the methods described here were developed for taxonomical and ecological studies, investigating the role of earthworms in various soil ecosystems. These animals are without doubt the most important soil invertebrates in temperate regions and, to a lesser extent, in tropical soils [25], [13], [15]. Since Darwin (1881), their influence on soil structure (e.g. aeration, water holding capacity) and soil functions like litter decomposition and nutrient cycling is well-known [8]. Due to their often very high biomass they are also important in many terrestrial food-webs.

Since it is neither possible nor useful to standardize methods for all soil organisms, the most important ones have been selected.

# Soil quality — Sampling of soil invertebrates —

## Part 1:

## Hand-sorting and formalin extraction of earthworms

### 1 Scope

This part of ISO 23611 specifies a method for sampling and handling earthworms from field soils as a prerequisite for using these animals as bioindicators (e.g. to assess the quality of a soil as a habitat for organisms).

Basic information on the ecology of earthworms and their use as bioindicators in the terrestrial environment can be found in the references listed in the bibliography.

This part of ISO 23611 applies to all terrestrial biotopes in which earthworms occur. The sampling design of field studies in general is specified in ISO 10381-1 (see also Reference [38]) and guidance on the determination of effects of pollutants on earthworms in field situations is given in ISO 11268-3. These details can vary according to the national requirements or the climatic/regional conditions of the site to be sampled (see also Annex C).

This part of ISO 23611 is not applicable for semi-terrestrial soils and it can be difficult to use under extreme climatic or geographical conditions (e.g. in high mountains). Methods for some other soil organism groups, such as collembolans, are covered in other parts of ISO 23611.

This part of ISO 23611 does not cover the pedological characterization of the site which is highly recommendable when sampling soil invertebrates. ISO 10390, ISO 10694, ISO 11272, ISO 11274, ISO 11277, ISO 11461 and ISO 11465 are more suitable for measuring pH, particle size distribution, C/N ratio, organic carbon content and water-holding capacity.

### 2 Terms and definitions

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

#### 2.1

##### **earthworm**

megadrile soil-inhabiting earthworms (length of adult individuals: few centimetres to more than 1 m) belonging to the order Oligochaeta (class Clitellata, phylum Annelida)

EXAMPLE Species of the families Lumbricidae (Holarctic), Glossoscolecidae (Latin America), Eudrilidae (Africa) or Megascolecidae [Asia, North America (Pacific Coast)].

#### 2.2

##### **peregrine species**

earthworms occurring in many regions world-wide today, usually introduced by man

NOTE 1 Well-known examples of peregrine species are several lumbricid species like *Aporrectodea caliginosa* (originally coming from Eurasia, but now living also in the Americas and Australia) or the pan-tropical species *Pontoscolex corethrurus* (probably coming from Northern Brazil and/or the Guyanas).

NOTE 2 See Reference [15].