SLOVENSKI STANDARD
SIST-TS CEN ISO/TS 29843-1:2015

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Kakovost tal - Določanje mikrobne raznolikosti tal - 1. del: Analiza fosfolipidnih maščobnih kislin (PLFA) in fosfolipidnih etrov (PLEL) (ISO/TS 29843-1:2010)

Soil quality - Determination of soil microbial diversity - Part 1: Method by phospholipid fatty acid analysis (PLFA) and phospholipid ether lipids (PLEL) analysis (ISO/TS 29843-1:2010)

Qualité du sol - Détermination de la diversité microbienne du sol - Partie 1: Méthode par analyse des acides gras phospholipidiques (PLFA) et par analyse des lipides éther phospholipidiques (PLEL) (ISO/TS 29843-1:2010)

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English Version

Soil quality - Determination of soil microbial diversity - Part 1: Method by phospholipid fatty acid analysis (PLFA) and phospholipid ether lipids (PLEL) analysis (ISO/TS 29843-1:2010)

Qualité du sol - Détermination de la diversité microbienne du sol - Partie 1: Méthode par analyse des acides gras phospholipidiques (PLFA) et par analyse des lipides éther phospholipidiques (PLEL) (ISO/TS 29843-1:2010)

Bodenbeschaffenheit - Bestimmung der Diversität von Bodenmikroorganismen - Teil 1: Verfahren mittels Phospholipidfettsäure(PLFA)-Analyse und Phospholipidetherlipid(PLEL)-Analyse (ISO/TS 29843-1:2010)

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Foreword

The text of ISO/TS 29843-1:2010 has been prepared by Technical Committee ISO/TC 190 "Soil quality" of the International Organization for Standardization (ISO) and has been taken over as CEN ISO/TS 29843-1:2014 by Technical Committee CEN/TC 345 “Characterization of soils” the secretariat of which is held by NEN.

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Endorsement notice

The text of ISO/TS 29843-1:2010 has been approved by CEN as CEN ISO/TS 29843-1:2014 without any modification.

TECHNICAL SPECIFICATION

ISO/TS 29843-1

First edition
2010-10-01

Soil quality — Determination of soil microbial diversity —

Part 1: Method by phospholipid fatty acid analysis (PLFA) and phospholipid ether lipids (PLEL) analysis

Qualité du sol — Détermination de la diversité microbienne du sol — Partie 1: Méthode par analyse des acides gras phospholipidiques (PLFA) et par analyse des lipides éther phospholipidiques (PLEL)

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ISO/TS 29843-1:2010(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

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ISO/TS 29843-1 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological methods*.

ISO/TS 29843 consists of the following parts, under the general title *Soil quality — Determination of soil microbial diversity*:

— *Part 1: Method by phospholipid fatty acid analysis (PLFA) and phospholipid ether lipids (PLEL) analysis*

— *Part 2: Method by phospholipid fatty acid analysis (PLFA) using the "simple PLFA extraction method"*

Introduction

Phospholipids are essential components of membranes of all living cells, and their fatty acid (PLFA: phospholipid fatty acids) or ether-linked isoprenoid side chains (PLEL: phospholipid ether lipid) allow for taxonomic differentiation within complex microbial communities (References [5] and [7]). This approach is now well established in soil ecology and serves as a phenotypic and thus complementary tool to genotypic (molecular genetic) approaches for determining microbial diversity.

Different methodologies for determination of soil fatty acids are available. These methodologies present different levels of complexity when applied and provide different levels of resolution in the description of soil microbial communities.

The determination of total PLFA and PLEL provides a quantitative measure of the viable biomass of soil: microorganisms of all three domains of the biosphere (bacteria, fungi and archaebacteria). Viable microbes have an intact membrane, which contains phospholipids. Cellular enzymes hydrolyze and release the phosphate group within minutes or hours following cell death (Reference [6]).

Apart from taxonomic descriptions, the PLFA technique enables the determination of physiological changes within microbial consortia. For instance, the monoenic PLFA 16:1 ω7c and 18:1 ω7c are increasingly converted to the cyclopropyl fatty acids cy17:0 and cy19:0 in Gram-negative bacteria in response to environmental stress (Reference [2]).

Besides the method described in this part of ISO/TS 29843, other methods for the determination of PLFA are available (References [3] and [6]). With these methods, only bacterial and fungal PLFA can be estimated; the determination of hydroxy-substituted fatty acids (PLOH), non-ester-linked (NEL) fatty acids and PLEL is not possible.