
**Soil quality — Effects of pollutants
on juvenile land snails (Helicidae) —
Determination of the effects on growth
by soil contamination**

*Qualité du sol — Effets des polluants vis-à-vis des escargots juvéniles
(Helicidae) — Détermination des effets sur la croissance par
contamination du sol*

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 15952:2018

<https://standards.iteh.ai/catalog/standards/iso/5e2a2ed5-04ea-4365-8e6b-cf8531f87ff1/iso-15952-2018>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 15952:2018

<https://standards.iteh.ai/catalog/standards/iso/5e2a2ed5-04ea-4365-8e6b-cf8531f87ff1/iso-15952-2018>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	3
5 Test environment	3
6 Reagents	3
7 Apparatus	5
8 Storage and preparation of the samples	6
8.1 Soil to be tested	6
8.2 Waste material	6
9 Procedure	6
9.1 Preparation of the test	6
9.1.1 Selection of the concentrations to be tested	6
9.1.2 Preparation of test mixtures	7
9.2 Distribution of test mixture	8
9.3 Introduction of the feed	8
9.4 Introduction of the biological reagent	8
9.5 Handling during the tests	8
9.5.1 General	8
9.5.2 Routine care	9
9.5.3 Weekly task	9
10 Reference substance	10
11 Calculations and expression of results	10
11.1 Calculations	10
11.2 Expression of results	12
12 Validity of test	13
13 Test report	13
Annex A (informative) Static method	15
Annex B (informative) Breeding technique for snails	16
Annex C (informative) Example of composition of snail feed	21
Annex D (informative) Example of table of data	22
Annex E (informative) Example of results with <i>Helix aspersa aspersa</i>	23
Annex F (informative) Determination of the effects on growth by food contamination	27
Annex G (informative) Suitable other snail species	30
Bibliography	31

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological characterization*.

This second edition cancels and replaces the first edition (ISO 15952:2006), which has been technically revised.

[ISO 15952:2018](https://standards.iteh.ai/catalog/standards/iso/5e2a2ed5-04ea-4365-8e6b-cf8531f87ff1/iso-15952-2018)

<https://standards.iteh.ai/catalog/standards/iso/5e2a2ed5-04ea-4365-8e6b-cf8531f87ff1/iso-15952-2018>

Introduction

Because of the limited amount of data available concerning toxicity of contaminants on soil organisms, the ecotoxicity of soils and waste are cause for serious concern at both national and international levels. Currently available tests use soil-fauna organisms restricted to annelid (earthworms and *Enchytraeidae*) and arthropod phyla (insects: Collembola and Coleoptera). Among the latter, two standards assess acute toxicity [earthworms (ISO 11268-1) and coleoptera larvae^[6] and three other standards address sublethal effects of soil contaminants on reproduction (earthworms^[3], Collembola^[2], *Enchytraeidae*^[4]). In the biological cycles of organisms, it appears that growth is, like reproduction, a fundamental ecophysiological parameter to be taken into consideration for the sustainability of species and ecosystems^[38].

Snails are relevant ecological indicators for assessing the quality of soils (See References ^[16]^[18] to ^[20]^[32]^[33]^[40] to ^[42]), as they are characteristic of the soil surface layer (saprophagous and phytophagous) of which a large part of the biological cycle takes place in the soil (egg-laying, hatching, initial stages of development, hibernation, etc.)^[7]^[18]^[29]. During the other phases of their cycle, they eat soil and are in contact with the soil via their moist pedal sole (foot) covered with mucus and participate in the permanent exchanges with the soil (water, mineral salts, excrement and finally shell and organic matter when they die)^[7]^[18]^[31]. In addition, they constitute an important link between plants, fauna and soil microorganisms. They correspond fully to the criteria for a good biological indicator: easy to sample and identify, they are widely distributed; they accumulate contaminants (See References^[9],^[11] to ^[15],^[17]^[18]^[22]^[24]^[29]^[30],^[33] to ^[48]); their ecological and physiological characteristics are well-known^[7]^[10]^[32]; and they are now easy to breed under controlled conditions^[22]^[26]^[32]. Their susceptibility to common contaminants of their environment has been demonstrated (See References ^[11] to ^[16],^[19] to ^[28],^[30],^[33] to ^[38],^[37] to ^[48]).

This International Standard describes a method for determining the effects on survival and growth of young snails of substances, preparations (i.e. a mixture or solution composed of two or more substances), soils or waste materials added to an artificial or a natural soil. The described method is thus applicable to test contaminated soils or to compare different uncontaminated soils. The recommended species is *Helix aspersa aspersa* Müller (also commonly called: common garden snail, brown garden snail, garden snail, land snail, "Petit-Gris"; synonyms: *Cantareus aspersus*, *Cornu aspersum*^[56]). Among land snails (stylommatophoran pulmonate gastropod molluscs of the *Helicidae* family), *Helix aspersa aspersa* Müller is the most ubiquitous. This palearctic species can be acclimated to regions with different types of climate: Mediterranean, oceanic temperate, midcontinental temperate and even tropical. *Helix aspersa aspersa* Müller is of European origin and has been introduced into all parts of the world. They are now on all continents except Antarctica^[10].

Indeed, in their natural environment, snails integrate the contaminants by contact (with various substrates such as soil, soil leachates, plant litter), by ingestion (of plants and soil), as well as through the respiratory tract^[7]^[29]. So, for specific testing purposes (evaluation of pesticide toxicity, for example), another test design, which is focussed on exposure via food uptake, is optionally available ([Annex F](#) and Reference ^[6]).

