When citizens and scientists work together: a French collaborative science network on earthworms communities distribution

Sarah Guillocheau*[1], Muriel Guernion[1], Kevin Hoeffner[2], Hoël Hotte[1], Daniel Cylly[1], Jennifer Scimia[1], Yoann Vourc'h[1], Denis Piron[1], and Daniel Cluzeau†[3]

[1]Ecosystèmes, biodiversité, évolution (ECOBIO) – INEE, Universite de Rennes 1, CNRS : UMR6553, Observatoire des Sciences de l'Univers de Rennes – Station Biologique de Paimpont, France

[2]Ecosystèmes, biodiversité, évolution (UMR ECOBIO 6553) – Universite de Rennes 1, UMR 6553 CNRS – Bâtiment 14 - Université de Rennes 1 - Campus de Beaulieu - CS 74205 - 35042 Rennes Cedex - France, France

[3]Ecosystèmes, biodiversité, évolution (UMR ECOBIO 6553) – Universite de Rennes 1, UMR 6553 CNRS – Université de Rennes 1 - Station Biologique de Paimpont, Paimpont, France, France

Abstract

Scientists have become more and more interested in earthworms because of their impact on soil functioning and their importance in provision of many ecosystem services. In order to improve the knowledge on soil biodiversity and integrate earthworms in soil quality diagnostics, the University of Rennes 1 has been developing since 2011 a collaborative science project called "Observatoire Participatif des Vers de Terre" (participative earthworm observatory). It has several purposes : i) to offer, through earthworm assessment, a simple tool for soil biodiversity evaluation, ii) to offer training courses to farmers, territory managers, gardeners, iii) to build a databank on earthworms and iv) to propose a website (https://ecobiosoil.univ-rennes1.fr/OPVT_accueil.php) providing for example general scientific background (earthworm ecology and impacts of soil management), sampling protocols and online visualisation of results (data processing and earthworms mapping).

Different sampling protocols are proposed: Mustard, Spade test, Mustard + Spade test according to the objectives and available facilities of the participants. Participants can then count and classify the individuals collected according to their ecological category (epigeic, epi-anecic, strict anecic and endogeic). Some participants can also send the earthworms collected in 96% ethanol pill boxes to our laboratory of the University of Rennes 1 in order to obtain a precise analysis (species level, individual weight ...).
Up to now, more than 5000 plots have been prospected since the opening of the project in 2011. Citizen science approaches allow us to increase the number of observed taxa extant in some habitats: with 70 taxa sampled, 12 were found only with collaborative sampling. The first results confirm that earthworms' abundance and functional structure are influenced by land cover (gardens, grassland, crops,...) and land management (tillage, fertilisation...). Details of this collaborative project will be presented, i.e. the adaptation of the sampling protocols, tools for training, results and returns from end-users.

*Speaker

†Corresponding author: daniel.cluzeau@univ-rennes1.fr