

Earthworms – their role in soil ecosystems

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Introduction

- Biodiversity and ecology
- Role in soil ecosystems
- Strategies for enhancing earthworms for producers

How many are there?

Globally about 3000 species

In the UK, 26 species living freely

About another 20 exotic species have been recorded from glasshouses and other human habitats

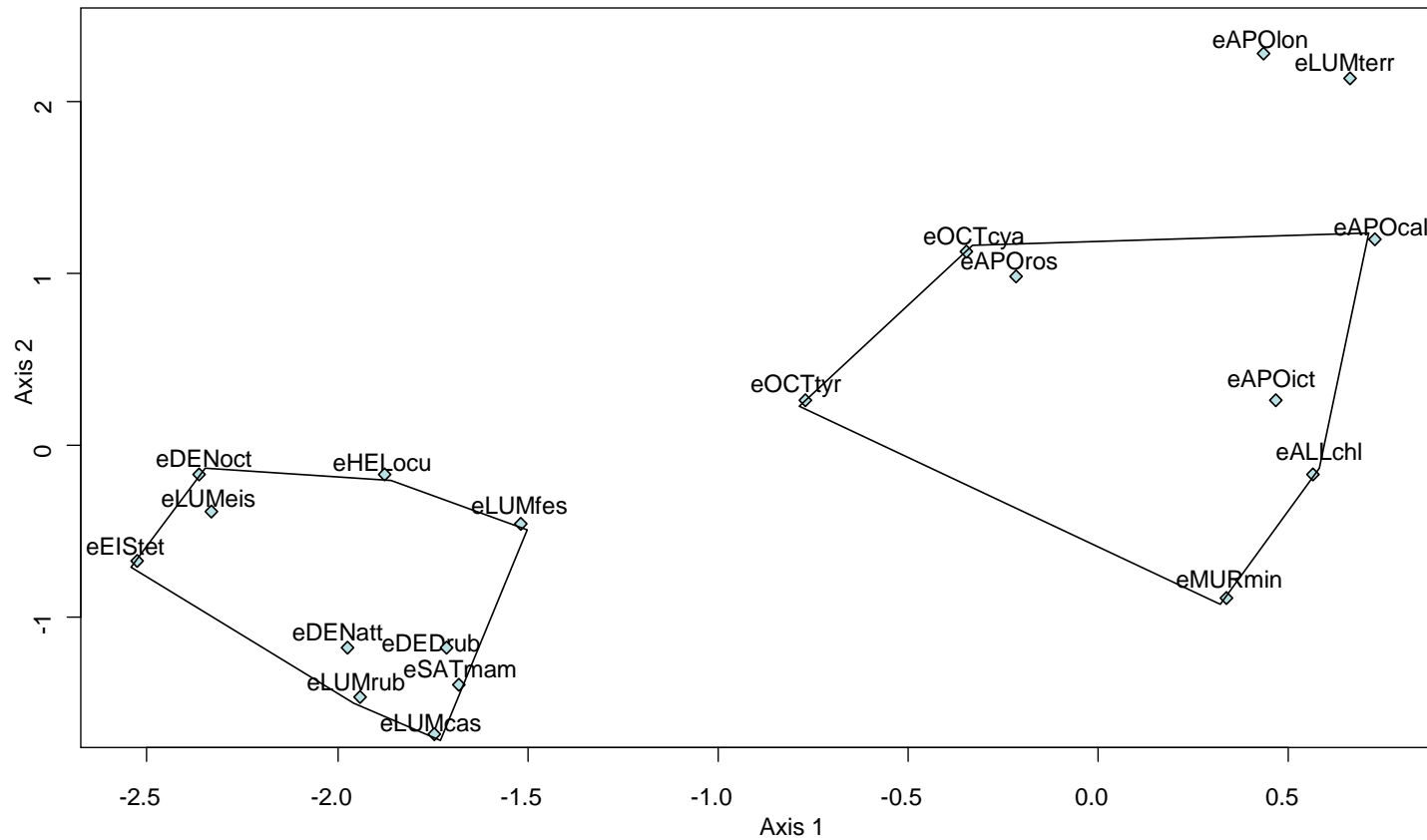
Earthworm ecological types

UK earthworms can be split into four ecological groups

Group classification based on physiology, ecology, biology and morphology - *traits*

Works very well for Lumbricidae in UK / Europe

Ecological groups



Ecotypes – Compost earthworms

Eisenia species

Feed on compost,
manure, sewage

Stripy

Introduced species -
originally from
central Europe



Ecotypes - epigeic



Live on or near the surface, usually amongst leaf litter

Usually red or brown in colour

Feed on leaves

Either temporary burrows or none at all

Ecotypes - endogeic



Live in mineral soil
Horizontal temporary
burrows

Usually pale in
colour, pink, grey,
white, green

Feed on soil with
organic matter in

Ecotypes - anecic



Permanent vertical burrows

Large species, usually red, brown or even black at head end

Feed on leaves pulled into burrows

Form middens at burrow entrance



Where do earthworms live?

Epigeic

Endogeic

Anecic

Colder
wetter
habitats

Warmer,
drier
habitats

Woodlands,
mires,
heaths,
hedges

Crops,
setaside,
gardens,
field
margins

grasslands

What do earthworms do?

- 'Ecosystem engineers'
- Alter physical structure of soil through burrowing and casting activities
- Increase soil pores
- Mix soil horizons
- Incorporate organic matter into mineral soil

What do earthworms do?

- Mix soil horizons
- Incorporate organic matter
- Mull humus – organic matter mixed with mineral soil
- Mor humus – organic matter in layer on top of mineral soil

What do earthworms do?



Humusform: Mårty 2

Foto: Åke Nilsson



Humusform: Mull

Foto: Åke Nilsson

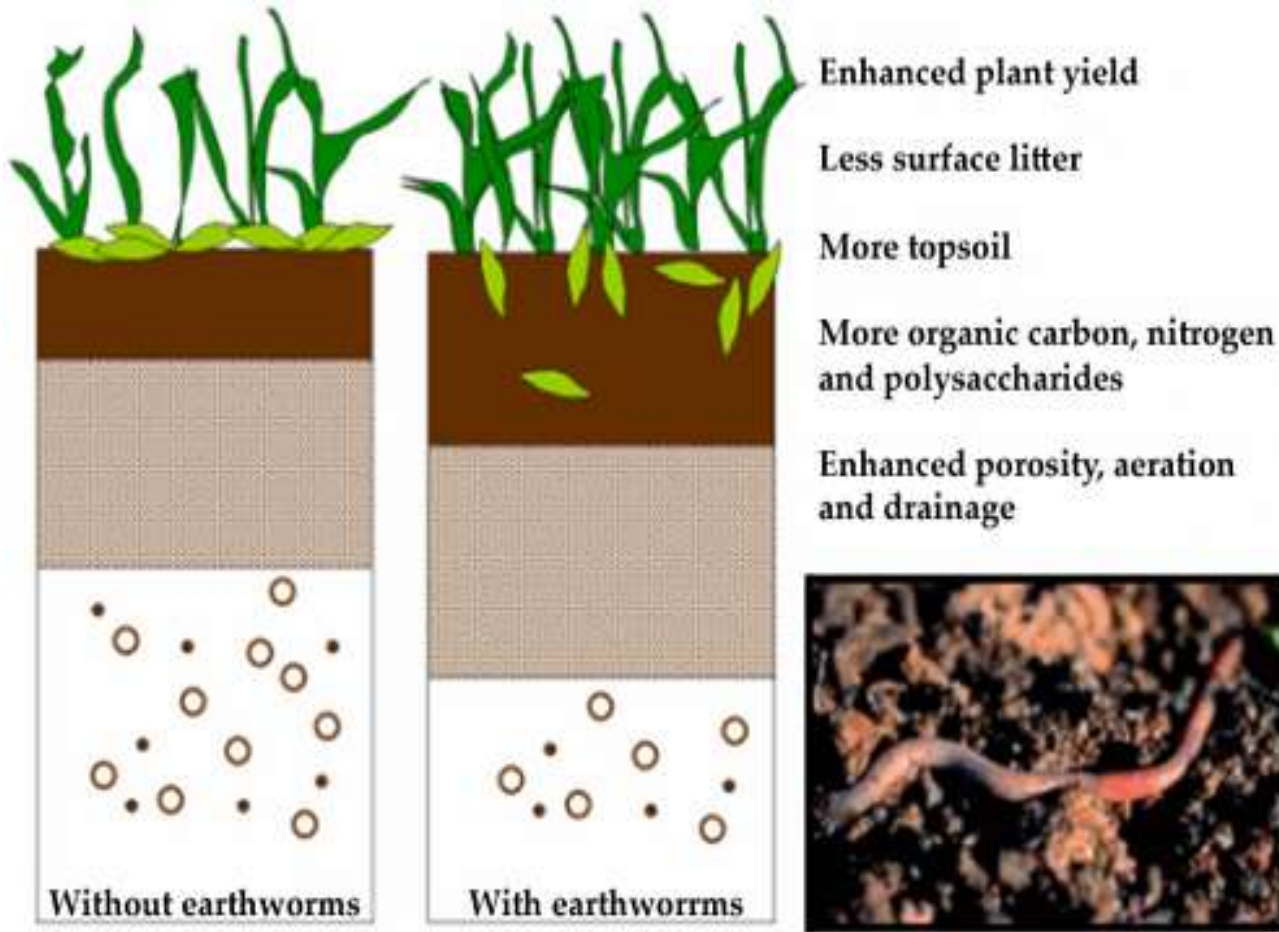
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What do earthworms do?



Value of earthworm produced topsoil is \$25 billion per year globally

Factors affecting earthworms

- Soil disturbance – earthworms are particularly sensitive to disturbance
- Organic matter content – food!
- Soil moisture – variable tolerance to moisture, but cannot survive very dry conditions
- Soil texture – earthworms require a minimum clay content in order to create burrows, cannot tolerate very sandy soils

Strategies for managing soils for earthworms

- Minimise soil disturbance – minimum or no till, direct drill seeds
- Organic matter – add compost or manure as a food source
- Water management – irrigation in dry conditions, addition of clay to sandy soils?
- Soil pH – addition of lime? or other calcareous substrate e.g. chalk

How can you get involved?

- Earthworm Society of Britain launched on October 31st 2009
- The Society aims to:
 - Conduct earthworm research
 - Inform people about earthworms
 - Administer a recording scheme

How can you get involved?

- Become a member of the Society
- Encourage others to join
- Attend a training course
- Collect earthworms and contribute your records to the recording scheme
- Take part in our projects