A Manuscript Microscope 'Sentence Audit' of:

Invasive Earthworms Alter Forest Soil Microbiomes and Nitrogen Cycling

What is the Manuscript Microscope Sentence Audit?

The Manuscript Microscope Sentence Audit is a research paper introspection system that parses the text of your manuscript into minimal sentence components for faster, more accurate, enhanced proofreading.

Why use a Sentence Audit to proofread your manuscript?

- Accelerated Proofreading: Review long technical papers in a fraction of the usual time.
- Superior Proofreading: Detect subtle errors that are invisible to traditional methods.
- Focused Proofreading: Inspect each individual sentence component, one at a time.
- Easier Proofreading: Take the hardship out of examining complex academic text.
- Safer Proofreading: Ensure every single word of your manuscript is correct.

+ Bonus 1: Improved Productivity: Rapidly refine rough drafts to polished papers.
+ Bonus 2: Improved Authorship: Cultivate a clear, concise, consistent, writing style.
+ Bonus 3: Improved Reputation: Become known for rigorously precise publications.

Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.07.433105v1

Manuscript Authors: Jeonghwan Jang, Xianyi Xiong, Chang Liu, Kyungsoo Yoo & Satoshi Ishii

Audit Date: 19/03/21 **Audit Identifier:** 3751PYR973J3UI7 **Code Version:** 3.6

Features of the Sentence Audit:

The Sentence Audit combines two complementary proofreading approaches:

1. Each sentence of your text is parsed and displayed in isolation for focused inspection.
2. Each individual sentence is further parsed into Minimal Sentence Components for a deeper review of the clarity, composition and consistency of the language you used.

The Minimal Sentence Components shown are the smallest coherent elements of each sentence of your text as derived from it's conjunctions, prepositions and selected punctuation symbols (i.e. commas, semicolons, round and square brackets).

The combined approaches ensure easier, faster, more effective proofreading.

Comments and Caveats:

• The sentence parsing is achieved using a prototype Python natural language processing pipeline and may result in occasional sentence segmentation or parsing errors.

• Depending on the source of the input text, the Sentence Audit may contain occasional html artefacts that are parsed as sentences (E.g. "Download figure. Open in new tab").

• Always consult the original research paper as the true reference source of the text.

Contact Information:

To get a Manuscript Microscope Sentence Audit of any other research paper, simply forward any copy of the text to John.James@OxfordResearchServices.com.

All queries, feedback or suggestions are also very welcome.

Research Paper Sections:

The sections of the research paper input text parsed in this audit.

Section No.	Headings	Sentences
Section: 1	Abstract	10
Section: 2	Introduction	25
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title # Invasive Earthworms Alter Forest Soil Microbiomes and Nitrogen Cycling

S1 [001] Abstract

S1 [002] Northern hardwood forests in formerly glaciated areas had been free of earthworms until exotic European earthworms were introduced by human activities.

Northern hardwood forests ...
... in formerly glaciated areas had been free ...
... of earthworms until exotic European earthworms were introduced ...
... by human activities.

S1 [003] The invasion of exotic earthworms is known to dramatically alter soil physical, geochemical, and biological properties, but its impacts on soil microbiomes are still unclear.

The invasion ...
... of exotic earthworms is known ...
... to dramatically alter soil physical, ...
... geochemical, ...
... and biological properties, ...
... but its impacts ...
... on soil microbiomes are still unclear.

S1 [004] Here we show that the invasive earthworms alter soil microbiomes and ecosystem functioning, especially for nitrogen cycling.

Here we show ...
... that the invasive earthworms alter soil microbiomes ...
... and ecosystem functioning, ...
... especially ...
... for nitrogen cycling.

S1 [005] We collected soil samples at different depths from three sites across an active earthworm invasion chronosequence in a hardwood forest in Minnesota, USA.

We collected soil samples ...
... at different depths ...
... from three sites ...
... across an active earthworm invasion chronosequence ...
... in a hardwood forest ...
... in Minnesota, USA.

S1 [006] We analyzed the structures and the functional potentials of the soil microbiomes by using amplicon sequencing, high-throughput nitrogen cycle gene quantification (NiCE chip), and shotgun metagenomics.

We analyzed the structures ...
... and the functional potentials ...

... of the soil microbiomes ...
... by using amplicon sequencing, ...
... high-throughput nitrogen cycle gene quantification ...
... (NiCE chip), ...
... and shotgun metagenomics.

S1 [007] Both the levels of earthworm invasion and soil depth influenced the microbiome structures.

Both the levels ...
... of earthworm invasion ...
... and soil depth influenced the microbiome structures.

S1 [008] In the most recently and minimally invaded soils, Nitrososphaera and Nitrospira as well as the genes related to nitrification were more abundant than in the heavily invaded soils.

In the most recently ...
... and minimally invaded soils, ...
... Nitrososphaera ...
... and Nitrospira ...
... as well ...
... as the genes related ...
... to nitrification were more abundant ...
... than in the heavily invaded soils.

S1 [009] By contrast, genes related to denitrification and nitrogen fixation were more abundant in the heavily invaded than the minimally invaded soils.

By contrast, ...
... genes related ...
... to denitrification ...
... and nitrogen fixation were more abundant ...
... in the heavily invaded ...
... than the minimally invaded soils.

S1 [010] Our results suggest that the N cycling in forest soils is mostly nitrification driven before earthworm invasion, whereas it becomes denitrification driven after earthworm invasion.

Our results suggest ...
... that the N cycling ...
... in forest soils is mostly nitrification driven ...
... before earthworm invasion, ...
... whereas it becomes denitrification driven ...
... after earthworm invasion.

S2 [011] Introduction

S2 [012] Earthworms are well-known ecosystem engineers that shape soil structure and drive nutrient dynamics in soil ecosystem [1].

Earthworms are well-known ecosystem engineers ...

... that shape soil structure ...
... and drive nutrient dynamics ...
... in soil ecosystem ...
... [1].

S2 [013] They feed on litter and soil, burrow horizontally and vertically through soils, and release fecal materials to mix nutrients in soils, altering soil porosity, bulk density, water infiltration, gas emission, nutrient mineralization, and plant productivity [2].

They feed ...
... on litter ...
... and soil, ...
... burrow horizontally ...
... and vertically ...
... through soils, ...
... and release fecal materials ...
... to mix nutrients ...
... in soils, ...
... altering soil porosity, ...
... bulk density, ...
... water infiltration, ...
... gas emission, ...
... nutrient mineralization, ...
... and plant productivity ...
... [2].

S2 [014] Although earthworms are widely considered ubiquitous across the forest, grassland, agricultural, and garden ecosystems in the world, their global distribution is only beginning to be synthesized [3].

Although earthworms are widely considered ubiquitous ...
... across the forest, ...
... grassland, ...
... agricultural, ...
... and garden ecosystems ...
... in the world, ...
... their global distribution is ...
... only beginning ...
... to be synthesized ...
... [3].

S2 [015] Glaciers and peri-glacial environments cleared out native earthworm populations from large areas in the northern USA and Canada as well as other Arctic areas in Eurasia during the last Ice Age [4].

Glaciers ...
... and peri-glacial environments cleared out native earthworm populations ...
... from large areas ...
... in the northern USA ...
... and Canada ...
... as well ...
... as other Arctic areas ...
... in Eurasia ...
... during the last Ice Age ...

... [4].

S2 [016] Since then, most of these areas had remained earthworm-free until European earthworm species were introduced by human activities [5].

Since then, ...
... most of these areas had remained earthworm-free until European earthworm species were introduced ...
... by human activities ...
... [5].

S2 [017] The earthworm invasion is now widely regarded as a force that substantially alters physical, geochemical, and biological properties of soils in northern hardwood forests [6, 7], and its ecosystem effects are believed to harm plant diversity [8] and be increasingly detrimental with ongoing changes in land uses and climates [9].

The earthworm invasion is now widely regarded ...
... as a force ...
... that substantially alters physical, ...
... geochemical, ...
... and biological properties ...
... of soils ...
... in northern hardwood forests ...
... [6, 7]...
... , ...
... and its ecosystem effects are believed ...
... to harm plant diversity ...
... [8] ...
... and be increasingly detrimental ...
... with ongoing changes ...
... in land uses ...
... and climates ...
... [9].

S2 [018] Invasive earthworms are known to reduce the litter layer (O horizon) while mixing organic matter with underlying minerals to create A horizon [10].

Invasive earthworms are known ...
... to reduce the litter layer ...
... (O horizon) ...
... while mixing organic matter ...
... with underlying minerals ...
... to create A horizon ...
... [10].

S2 [019] Presumably coupled with the loss of O horizon, invasion of European earthworms results in increased leaching of nitrates in the formerly glaciated deciduous forests [11].

Presumably coupled ...
... with the loss ...
... of O horizon, ...
... invasion ...
... of European earthworms results ...
... in increased leaching ...
... of nitrates ...

End of Sample Audit

This is a truncated Manuscript Microscope Sample Audit.

To get the full audit of this text (or any other research paper),
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