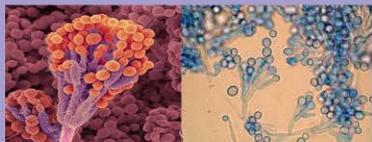


Differences in abundance and biomass of earthworms (Oligochaeta: Lumbricidae) under different soil tillage systems

D.K. Hackenberger, O. Jovanović Glavaš, B.K. Hackenberger



Microfauna & Microflora



Mesofauna



Macrofauna



Megafauna



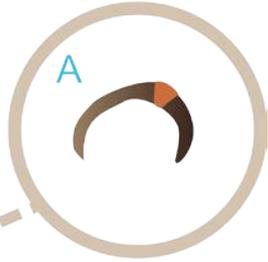
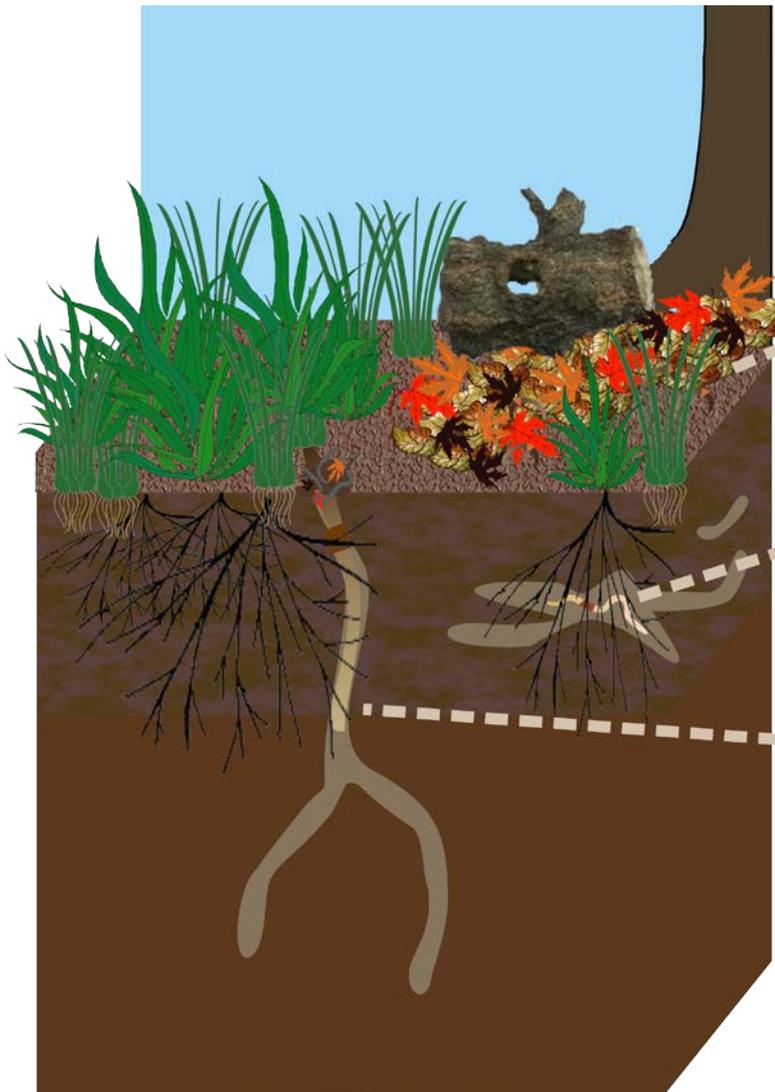
1 μ m

100 μ m

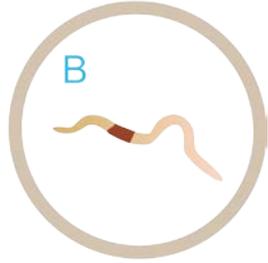
2 mm

20 mm

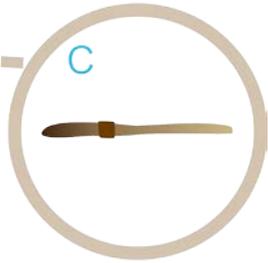
20 cm



epigeic



endogeic



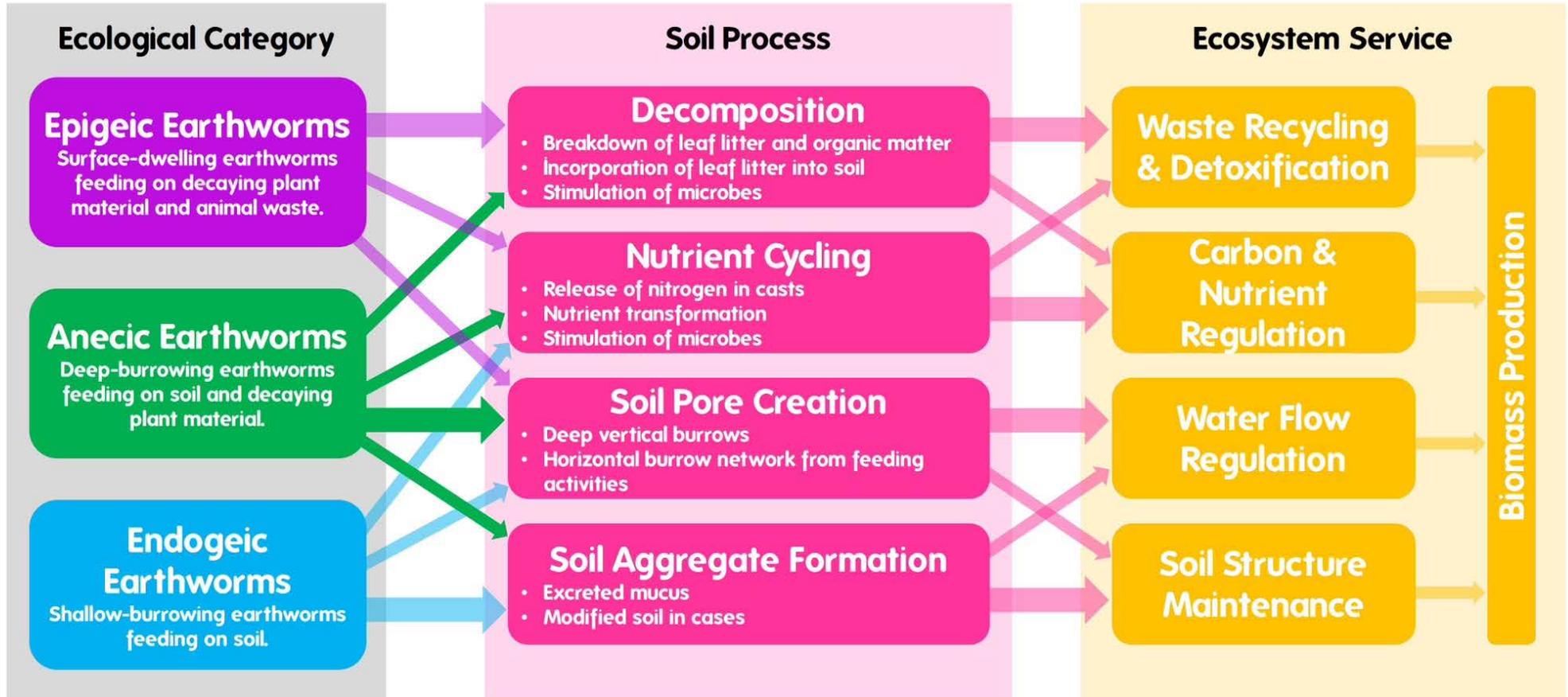
anecic

Earthworm Ecosystem Services

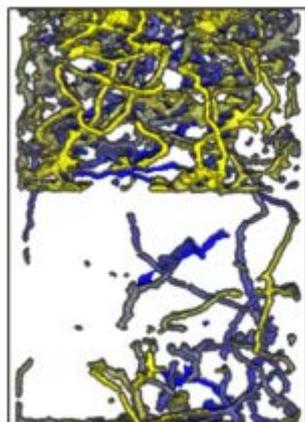
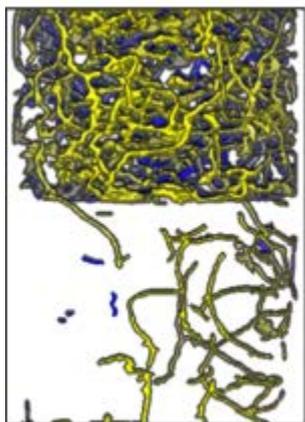


References

Keith, A. H. & Robinson, D. A. (2012) "Earthworms as Natural Capital: Ecosystem Service Providers in Agricultural Soils", *Economology Journal* 2, 91-99.



Endogeic earthworms



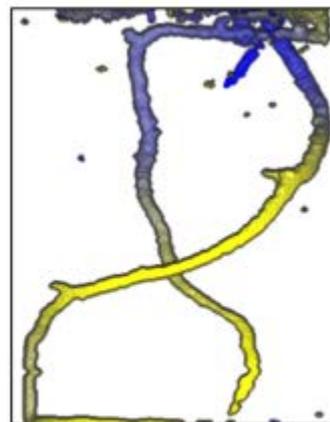
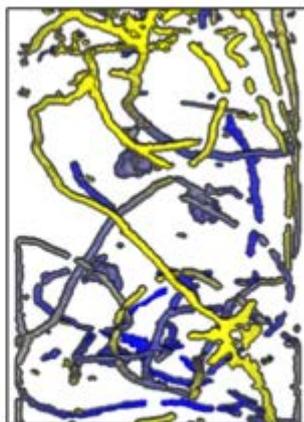
Top soil

Deep soil

A. caliginosa
(11 ind.)

A. icterica
(8 ind.)

Anecic earthworms



A. nocturna
(3 ind.)

L. terrestris
(2 ind.)

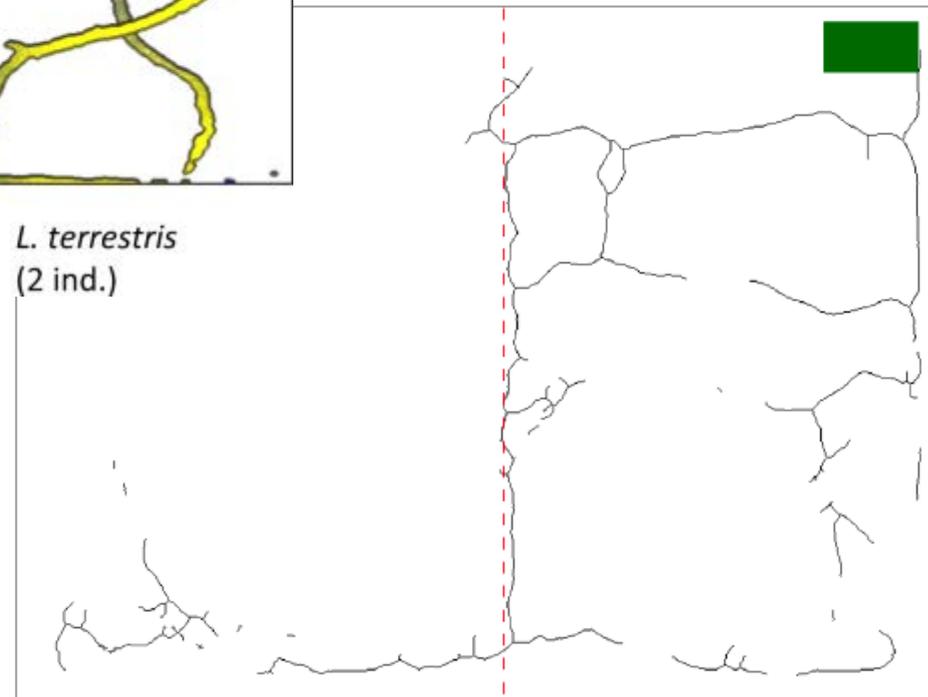
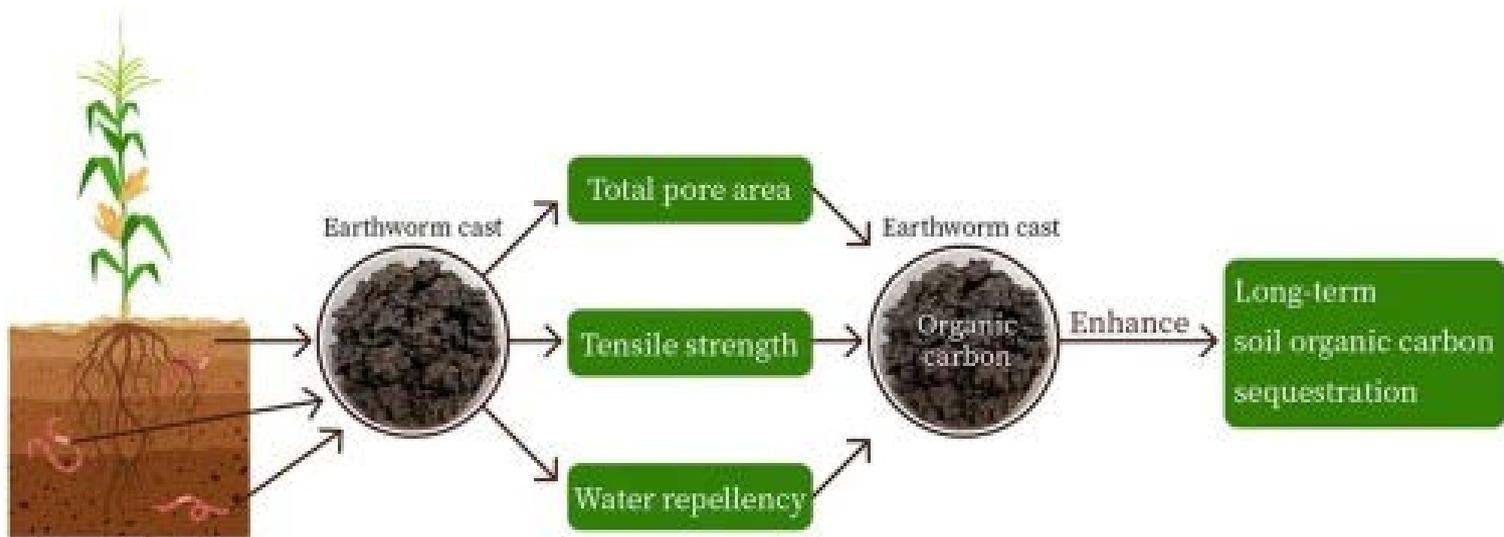
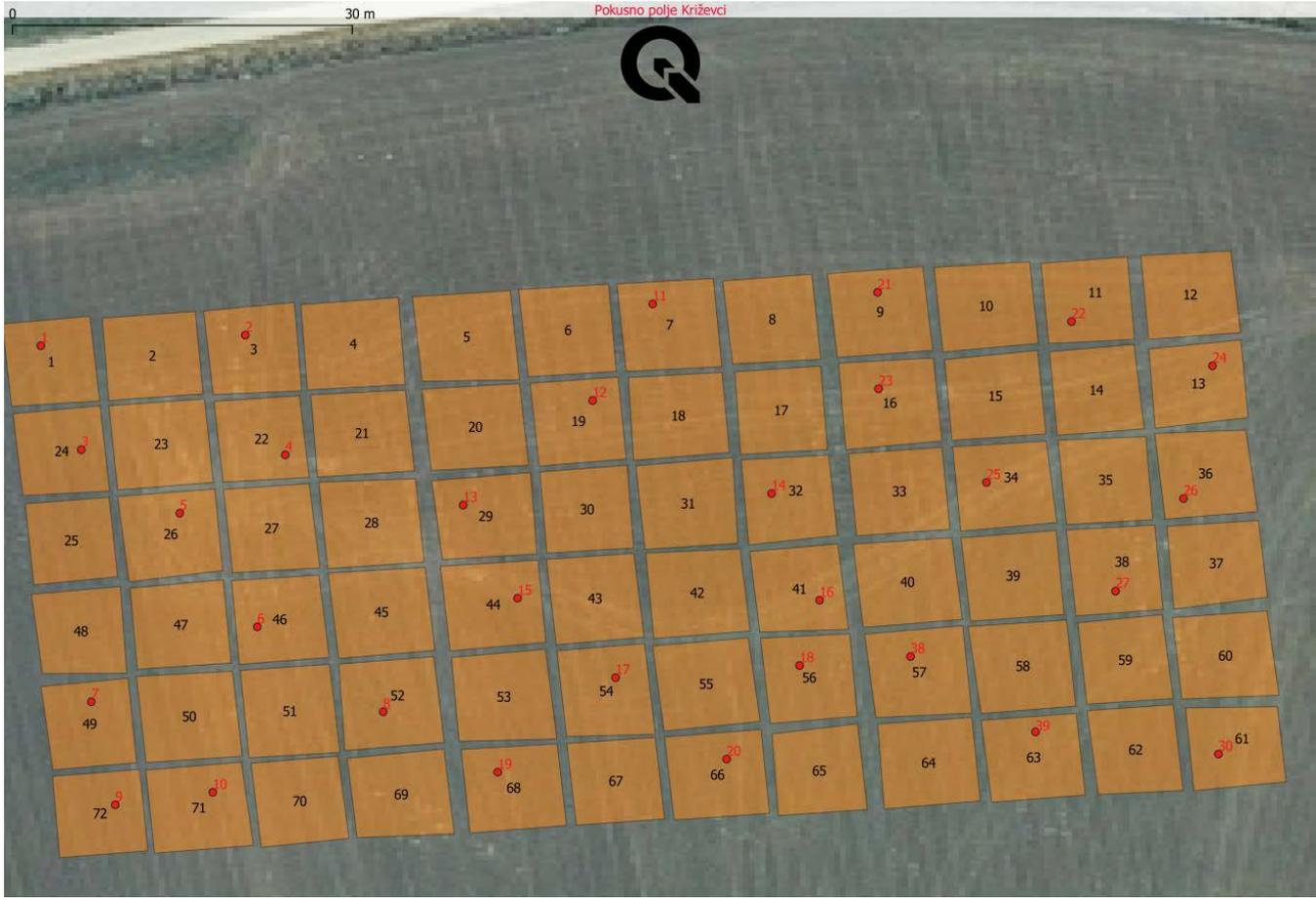


Fig. 8. A burrow system reconstructed after merging all predictions of earthworm locations in the 2D terrarium model made during the exposure time and applying skeletonization. The left side of the terrarium is filled with polluted soil ($750 \text{ mg kg}^{-1} \text{ H}_3\text{BO}_3$) and the right side is the control soil (artificial soil).



≈ 100 days





SAMPLING

Sampling twice a year (spring and autumn)

Hand sorting 25x25 cm soil block

Fresh weight, total abundance, adult : juvenile ratio

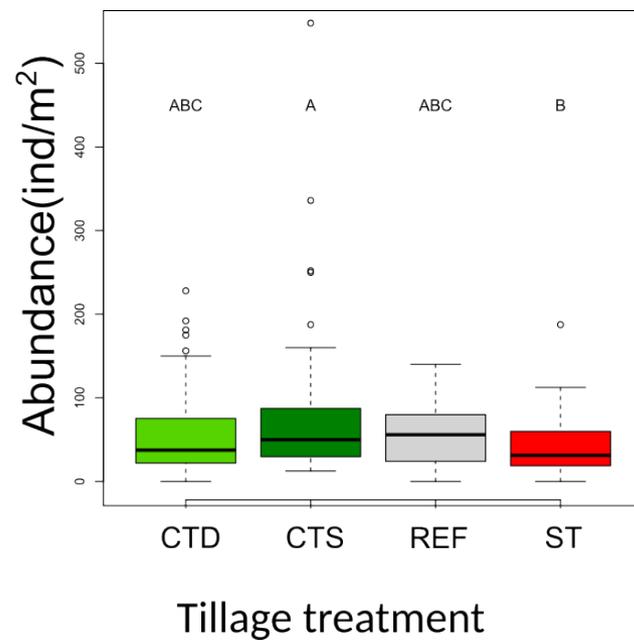
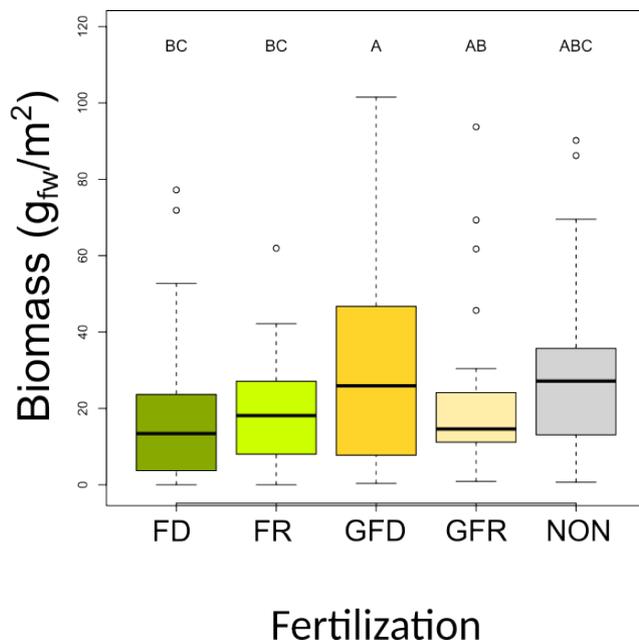
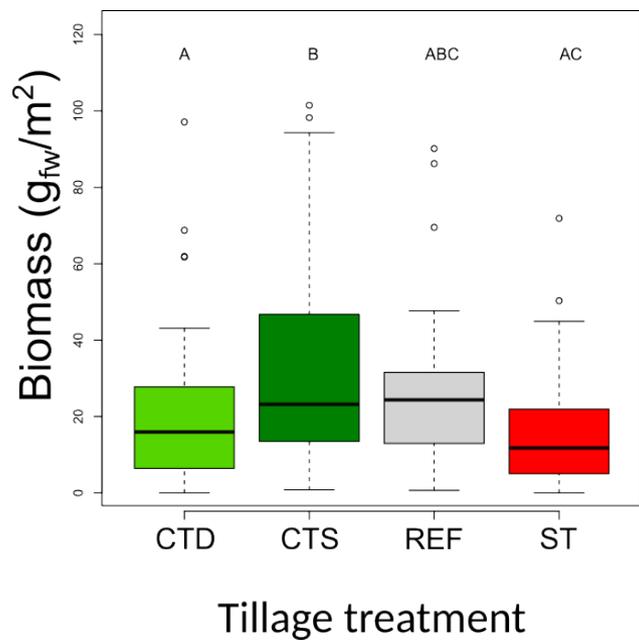
Adults to species level and ecological category

Čačinci

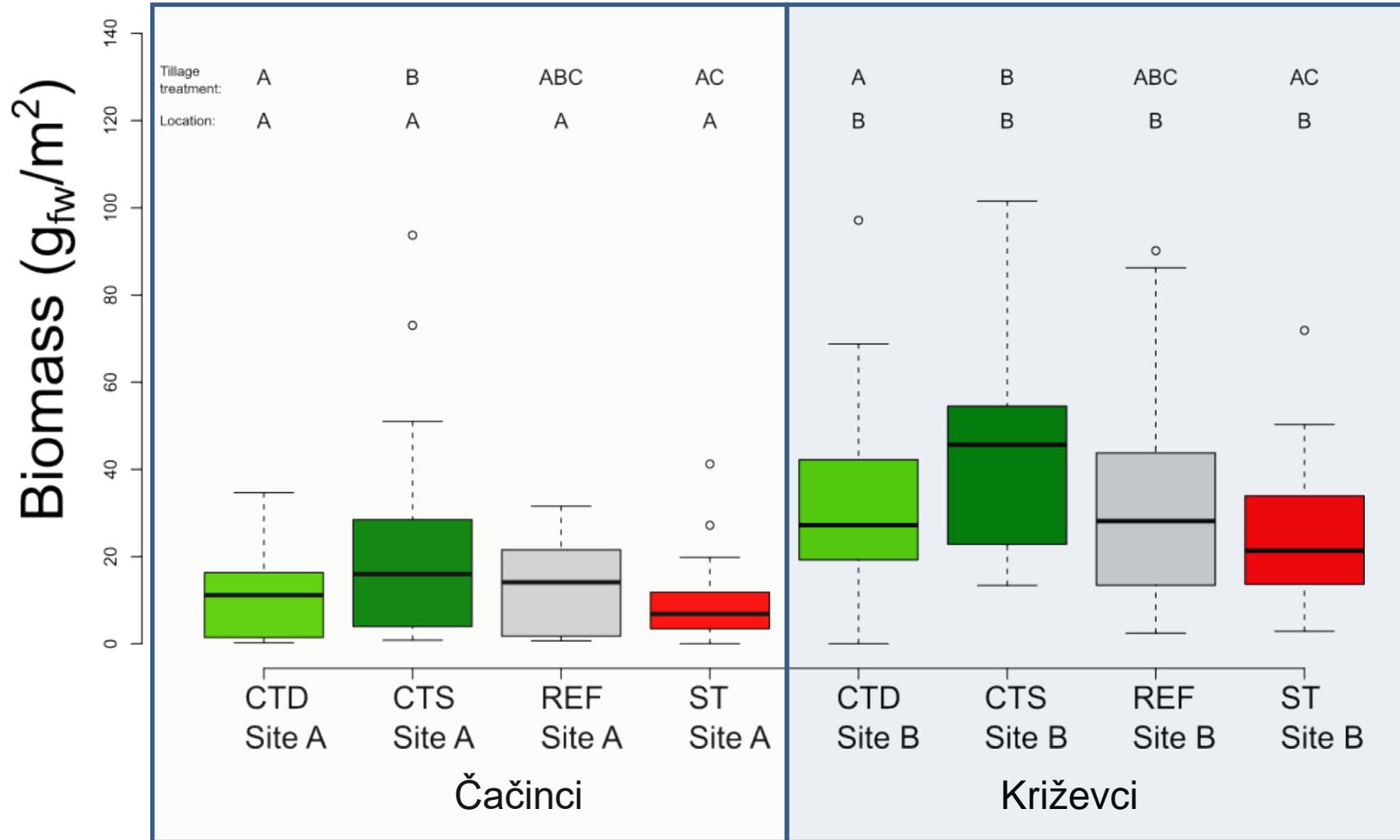
<i>Lumbricus rubellus</i>	epigeic
<i>Aporrectodea caliginosa</i>	endogeic
<i>Octodrilus transpadanus</i>	endogeic
<i>Octolasion lacteum</i>	endogeic
<i>Proctodrilus antipai</i>	endogeic
<i>Lumbricus terrestris</i>	anecic

Križevci

<i>Lumbricus rubellus</i>	epigeic
<i>Aporrectodea caliginosa</i>	endogeic
<i>Perelia nematogena</i>	endogeic
<i>Proctodrilus antipai</i>	endogeic
<i>Lumbricus terrestris</i>	anecic



Tillage treatment : Location



- Regardless of the location both biomass and abundance were significantly higher in CTS tillage system.
- Additionally, reduced fertilization treatment with the addition of GeO₂ significantly affected biomass increase.
- A significant difference in earthworm biomass between sites is observed.
- However, the difference is due to earthworm species composition.
- Namely, the most abundant species at Čačinci is *Proctodrilus antipai* – a very small endogeic species, while at Križevci the most abundant species is *Aporrectodea caliginosa*.
- The earthworm abundance is not significantly different between sites.
- The number of species is similar (5 and 6).



This work has been fully supported by Croatian Science Foundation under the project "Assessment of conservation soil tillage as advanced methods for crop production and prevention of soil degradation – ACTIVEsoil" (IP-2020-02-2647)