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Allelopathic potential of weeds from different conservation tillage systems under climate change conditions

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Introduction

◇ Allelopathy & allelopathically active plants

donor plant



receptor plant



Introduction

- ◇ Allelopathic potential and concentration of allelochemicals in plants depend on various environmental factors:
- ◇ Location
- ◇ Light
- ◇ Temperature
- ◇ Nutrient availability
- ◇ Other abiotic & biotic factors

Conservation tillage
& allelopathy?

Aim of the study

- ◇ to determine the influence of different conservation tillage systems on the allelopathic potential of weed species

Materials & Methods

◇ Donor species :

◇ barnyardgrass (*Echinochloa crus-galli* (L.) P.Beauv.) – location: Čačinci

◇ green foxtail (*Setaria viridis* (L.) P.Beauv.) – location: Križevci

◇ Treatments:

◇ conventional (**ST**), deep conservation (**CTD**) and shallow conservation (**CTS**) tillage

◇ Water extracts:

◇ aboveground weed dry biomass – 5 g per 100 ml → 5% water extract

◇ Test species:

◇ lettuce

Materials & Methods

◇ Experiment:

◇ Petri dish bioassay on filter paper

◇ Treatment:

◇ 3 ml of each water extract

◇ control – 3 ml of distilled water

◇ Allelopathic effect:

◇ germination (%), root and shoot length (cm), fresh weight (mg)

◇ ANOVA, LSD test

Results & Discussion

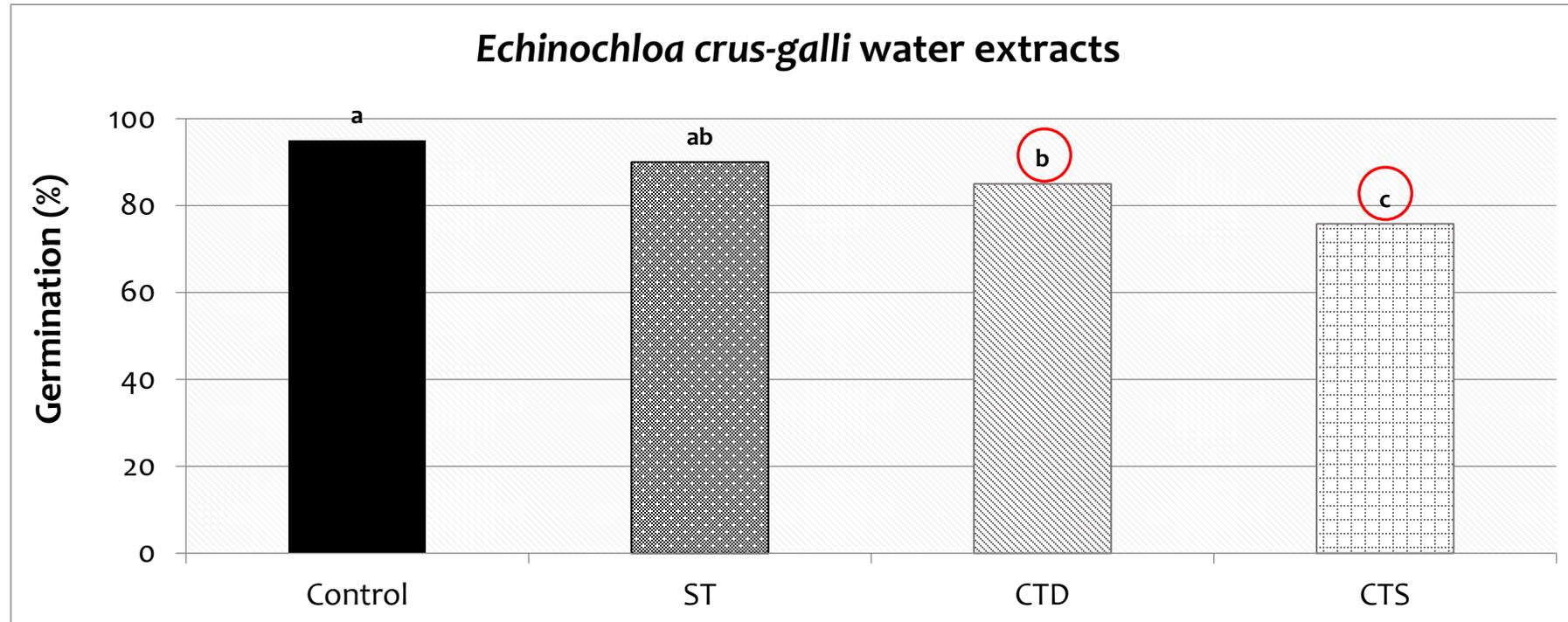


Figure 1. Allelopathic potential of water extracts from barnyardgrass (*Echinochloa crus-galli*) collected in different conservation tillage systems on lettuce seed germination

Results & Discussion

Table 1. Allelopathic potential of water extracts from barnyardgrass (*Echinochloa crus-galli*) collected in different conservation tillage systems on growth of lettuce seedlings

Treatment	Root length (cm)	Shoot length (cm)	Fresh weight (mg)
Control	1.86 a	1.72 a	7.06 a
ST	0.63 b	1.29 b	5.04 b
CTD	0.32 c	0.81 c	4.90 b
CTS	0.67 b	1.04 bc	7.15 a

Results & Discussion

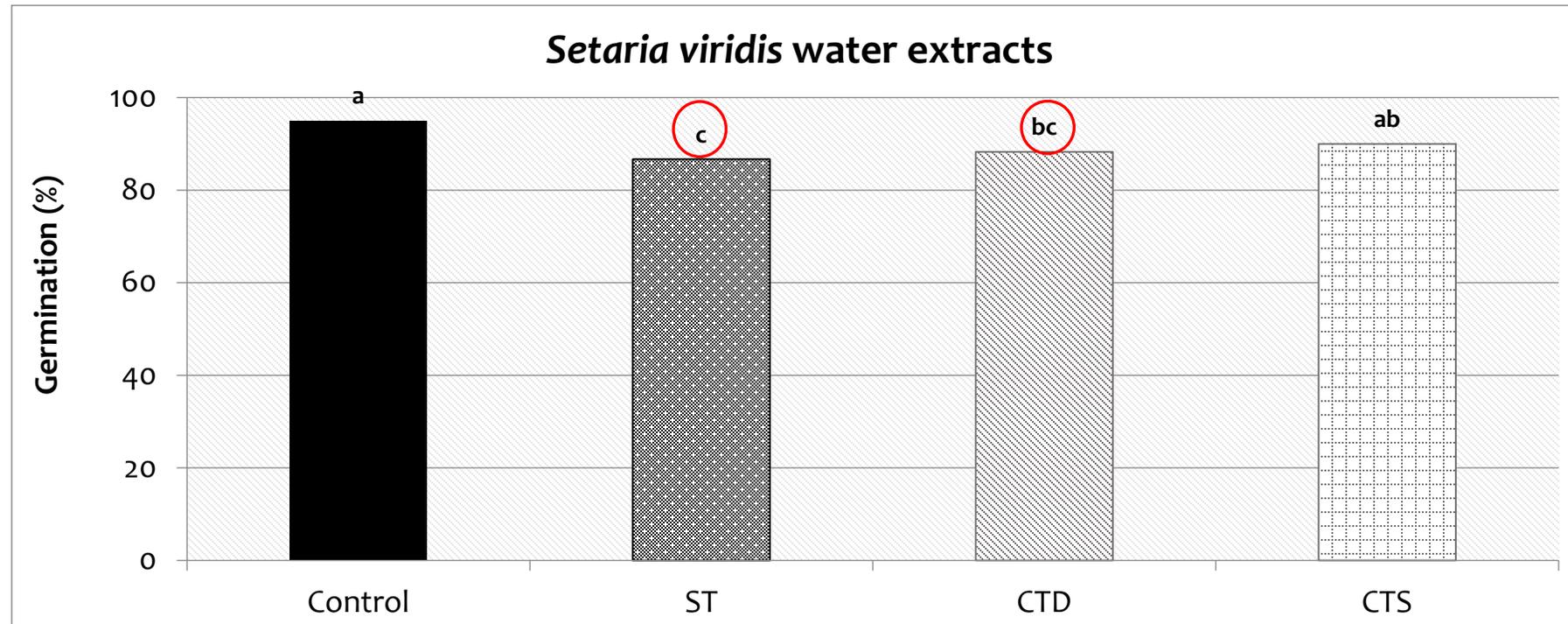


Figure 2. Allelopathic potential of water extracts from green foxtail (*Setaria viridis*) collected in different conservation tillage systems on lettuce seed germination

Results & Discussion

Table 2. Allelopathic potential of water extracts from green foxtail (*Setaria viridis*) collected in different conservation tillage systems on growth of lettuce seedlings

Treatment	Root length (cm)	Shoot length (cm)	Fresh weight (mg)
Control	1.86 a	1.72 a	7.06 a
ST	0.69 b	1.63 a	5.85 ab
CTD	0.41 c	0.69 c	4.97 b
CTS	0.61 bc	1.16 b	7.33 a

Results & Discussion

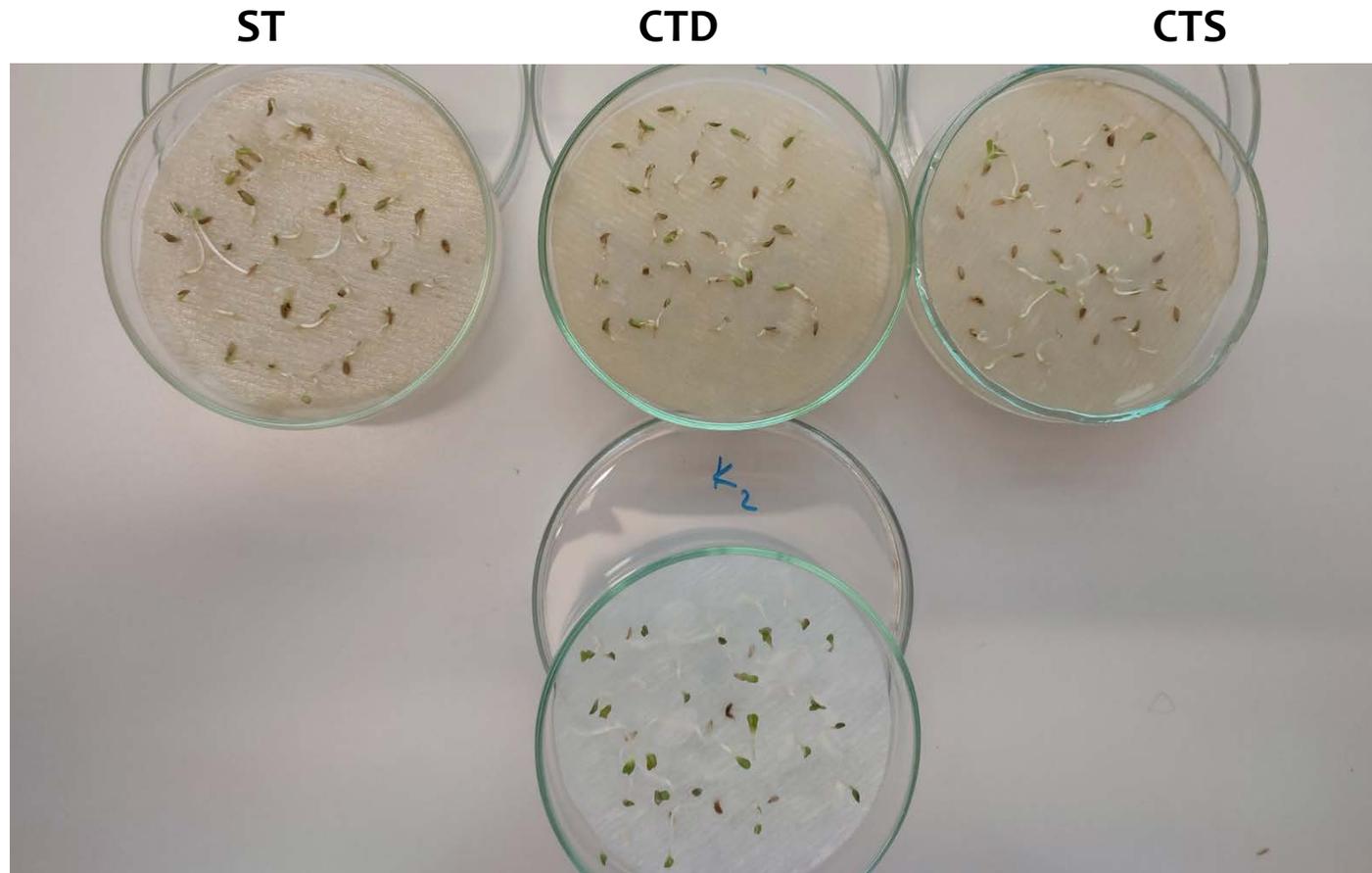


Figure 3. Allelopathic potential of water extracts from barnyardgrass (*Echinochloa crus-galli*) collected in different conservation tillage systems

Results & Discussion

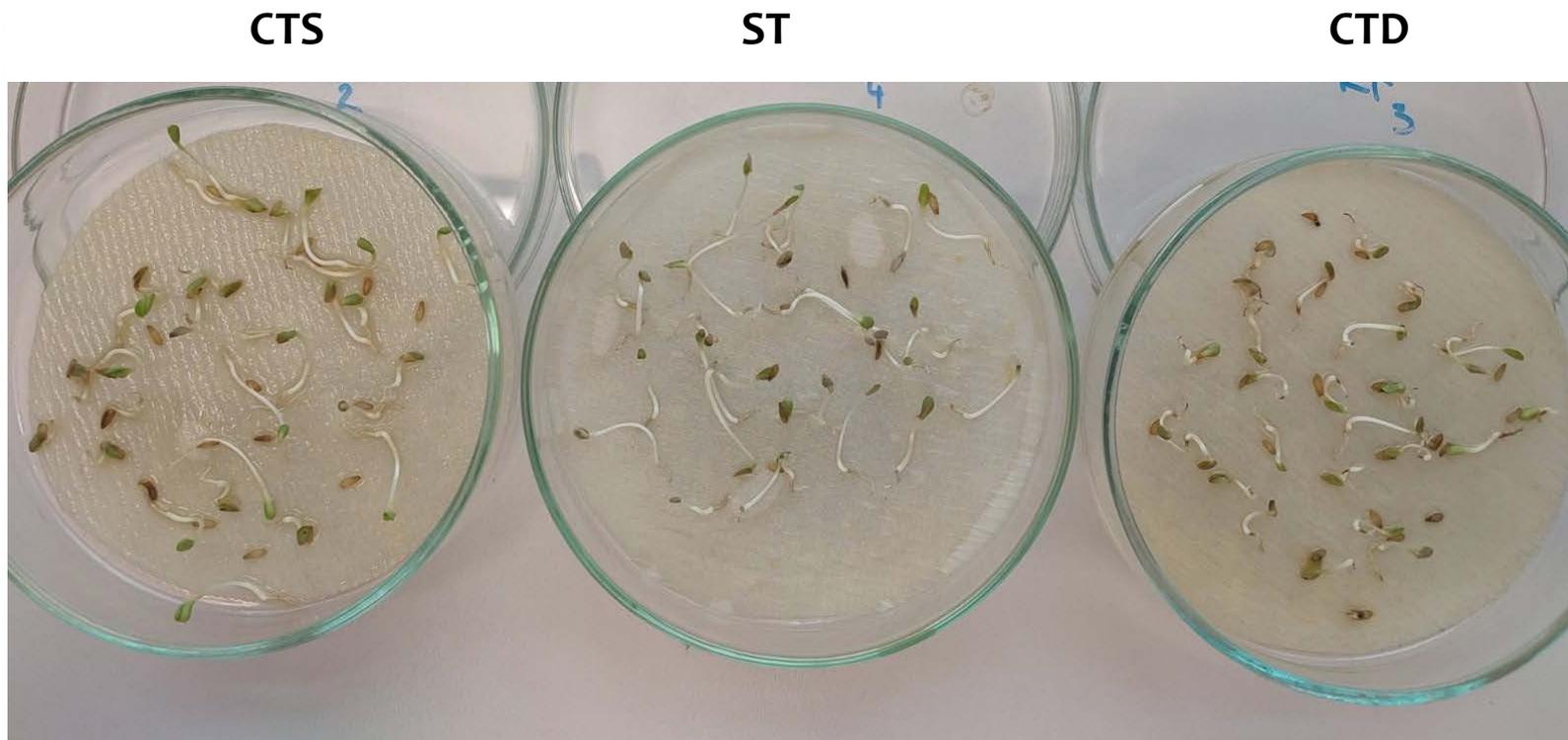


Figure 4. Allelopathic potential of water extracts from green foxtail (*Setaria viridis*) collected in different conservation tillage systems

Conclusions

- ◇ inhibitory allelopathic effect of both weed species
- ◇ dependent on tillage system
- ◇ highest allelopathic potential – weeds collected from CTD treatment



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**Thank you
for your
attention!**



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