Evaluation of *Tanacetum vulgare* L. and *Juniperus communis* L. biocompatibility limitations in eukaryotic cells

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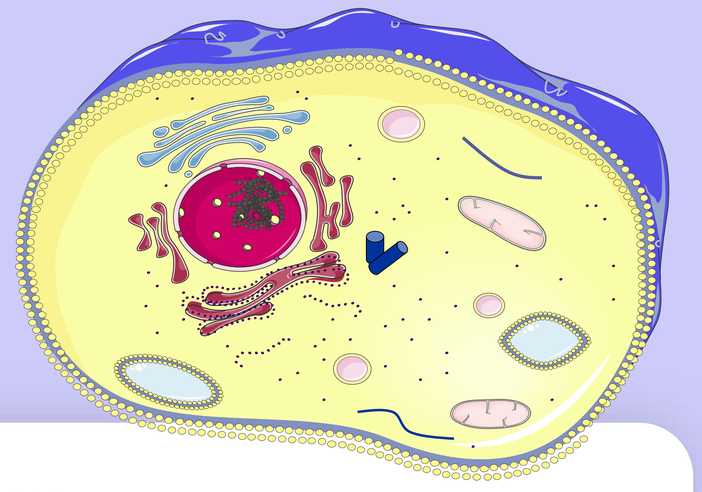


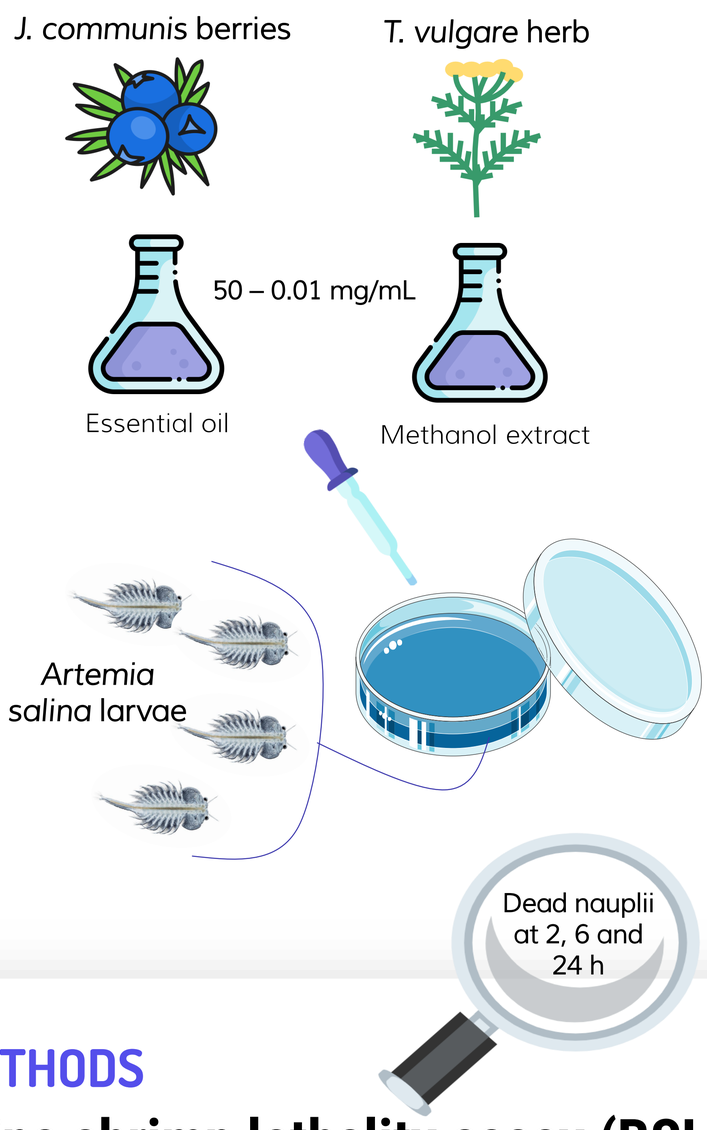
BACKGROUND & AIM

The rich phytochemical composition of *Tanacetum* and *Juniperus* genus has made their use to be considerable in both conventional and modern medicine. They have a wide therapeutical application. We have aimed to obtain more information for the safety of *T. vulgare* methanolic extracts and *J. communis* essential oils, and bioactivity concentration range to assess the biocompatibility limits in eukaryotic cells.

CONCLUSION

Both *T. vulgare* and *J. communis* have shown toxic effects due to their chemical composition (mostly probable to the presence of thujone and α-pinene, respectively).

Biocompatible limit concentration (< 0.01 mg/mL) was determined in eukaryotic cells as an important safety information.



METHODS

Brine shrimp lethality assay (BSLA)

Plant material

T. vulgare plant material was collected from Kozhuf and Berovo and then subjected to extraction with methanol. *J. communis* EO were commercial products obtained from *J. communis* berries collected from Berovo and Mavrovo.

BSLA

Artemia larvae were exposed to 5 mL of methanolic extracts of *T. vulgare* and *J. communis* essential oils in a concentration range 50-0.01 mg/mL. The median lethal concentration (LC_{50}) was determined by calculating the percentage of dead shrimps against the logarithm of the sample concentration. Finney's Probit analysis was used to determine the LC_{50}.

Table 1. LC5o values at different time points for *T. vulgare* extracts from Berovo and Kozhuf.

Time (h)	LC_{50} (mg/mL) - Berovo	LC_{50} (mg/mL) - Kozhuf
2	3.39638	3.29390
6	2.966714	2.46212
24	0.001571	0.00894

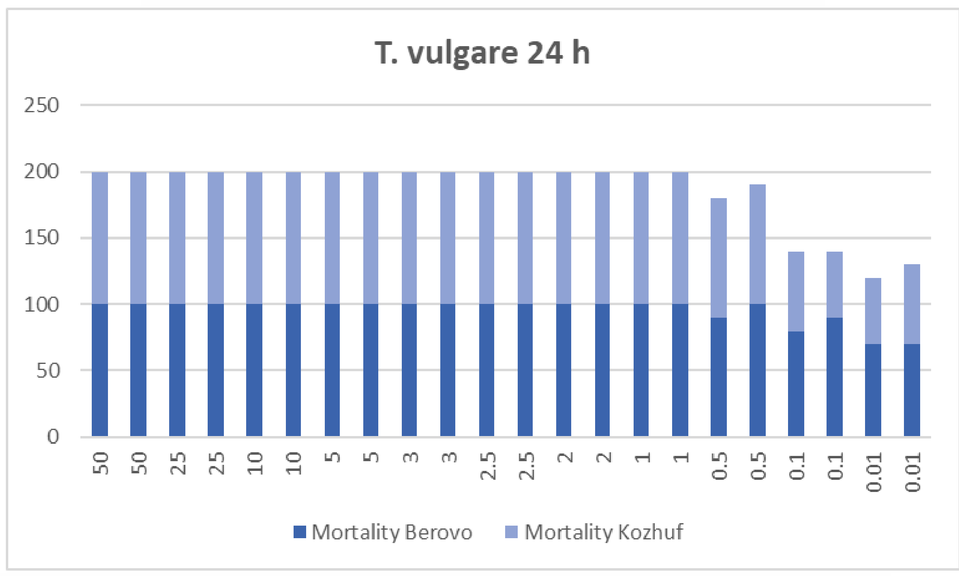


Figure 1. Mortality rate of larvae exposed to different concentrations of *T. vulgare* extracts from Berovo and Kozhuf.

RESULTS

The lowest mortality rate for both *T. vulgare* and *J. communis* was detected when the larvae were exposed to a concentration of 0.01 mg/mL for 24 h.

No toxicity was observed after 2 and 6 h of exposure of the Artemia larvae to all examined extracts obtained from *T. vulgare* (Figure 1). The extracts exhibited considerable toxicity after 24 h of exposure, when the larvae were exposed to the extract originating from Berovo. This *T. vulgare* extract has shown to be much more toxic (LC_{50} 16 μg/mL) than the extract obtained from the same species collected on Kozhuf (89 μg/mL) (Table 1).

Both *J. communis* essential oils showed a high degree of toxicity at all-time points, with LC_{50} values < 1 mg/mL (Table 2). After exposure of 24 h, the EO obtained from Mavrovo showed significantly higher toxicity (Figure 2) than the EO originating from Berovo (LC_{50} 0.02 and 0.95 μg/mL, respectively).

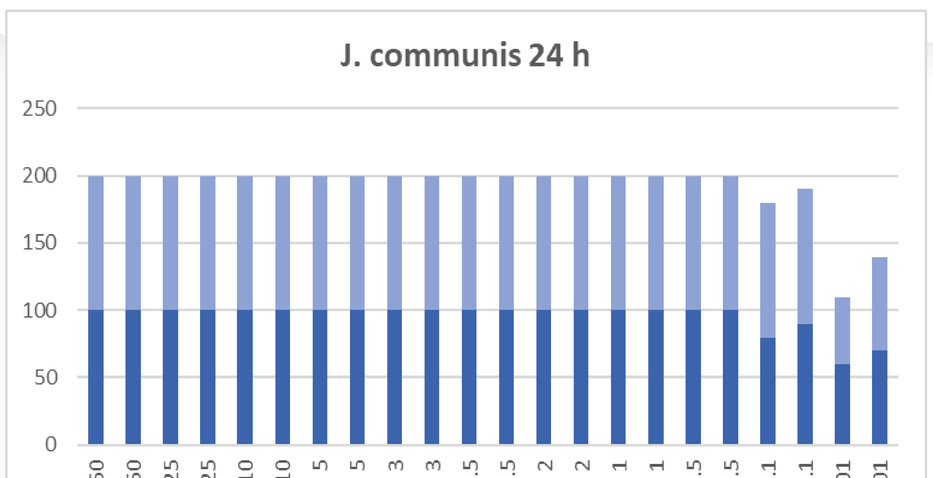


Figure 2. Mortality rate of larvae exposed to different concentrations of *J. communis* EOs from Berovo and Mavrovo.

Table 2. LC5o values at different time points for *J. communis* EO from Berovo and Mavrovo.

Time (h)	LC_{50} (mg/mL) - Berovo	LC_{50} (mg/mL) - Mavrovo
2	0.07319	0.10757
6	0.04299	0.05870
24	0.00095	0.00002

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