



# *In vitro* evaluation genotoxic activity of methanolic extracts *Onobrichys viciifolia* plant

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## AIM

The aim of this study was to investigate the genotoxic effect of methanolic extracts obtained from the root and inflorescence of *O. viciifolia* (Fig. 1) and determine effect of quality of the soil in relation to the quantity of heavy metals on which the plant grew (as uncontaminated locality at Gornji Milanovac and tailing site at Žitkovac near Kosovska Mitrovica) (Fig. 2).



Figure 1. *Onobrichys viciifolia*



Figure 2. The geographical sampling position of plants and soil

## MATERIALS AND METHODS

- Plants material were collected in June 2020 from two localities.
- The methanolic extracts of root and inflorescence of plants were prepared in a Soxhlet extractor.
- The genotoxic activity of extracts was investigated *in vitro* on human peripheral blood lymphocytes using the comet assay.
- The effects of four different concentrations (125, 250, 500 and 1000 µg/ml) for root and inflorescence extracts were tested.
- The heavy metals in the soil were analyzed by atomic absorption spectrophotometry.

## RESULTS

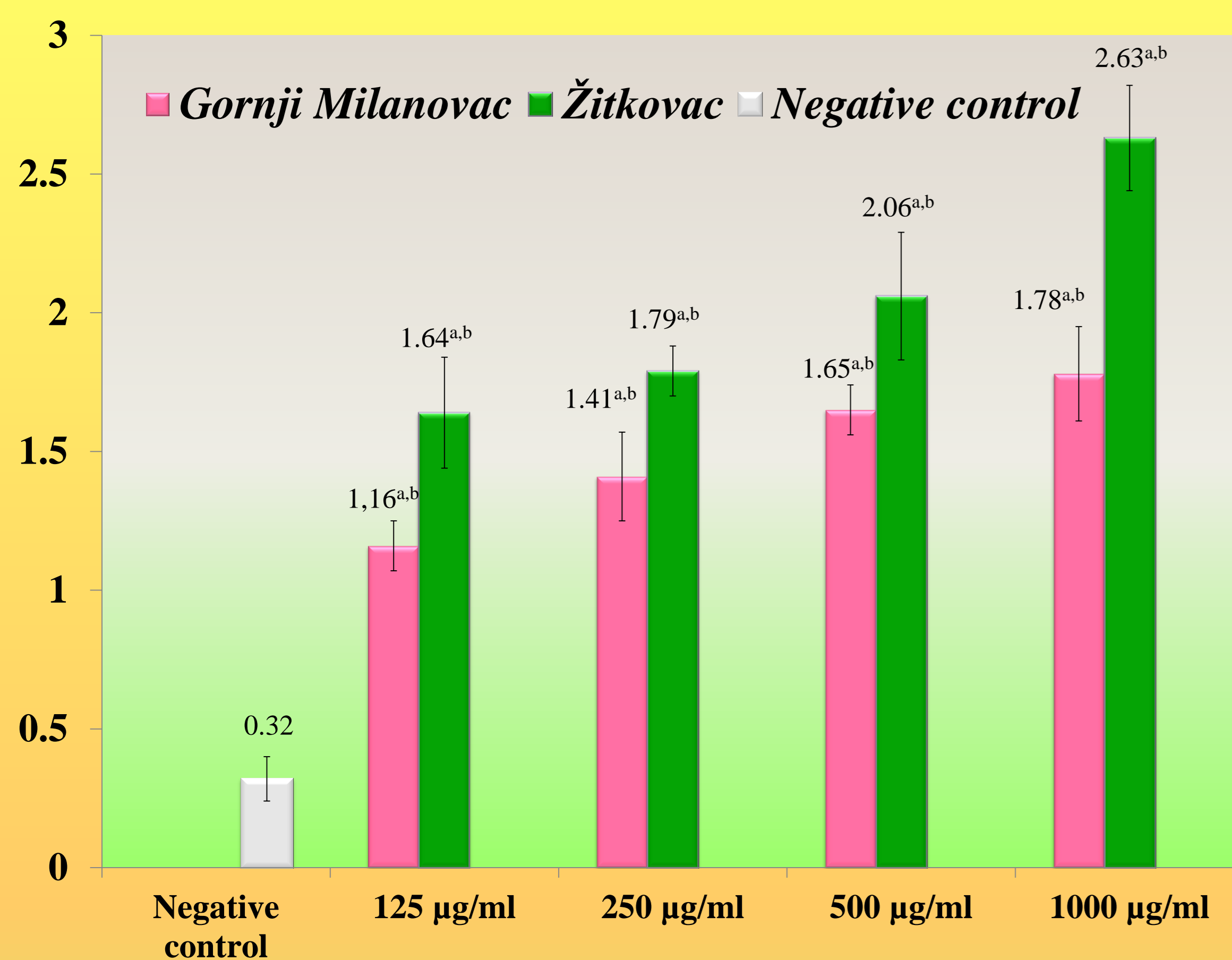


Figure 2. Level of DNA damage in human lymphocytes in treatments with methanolic extracts from the root of *Onobrichys viciifolia* originating two localities

<sup>a</sup>Significant increase of genetic damage index (GDI) in comparison to control cells (ANOVA,  $p < 0.05$ )

<sup>b</sup>Significant difference between genetic damage index (GDI) in human lymphocytes in treatments with root extracts (Student's *t*-test,  $p < 0.05$ )

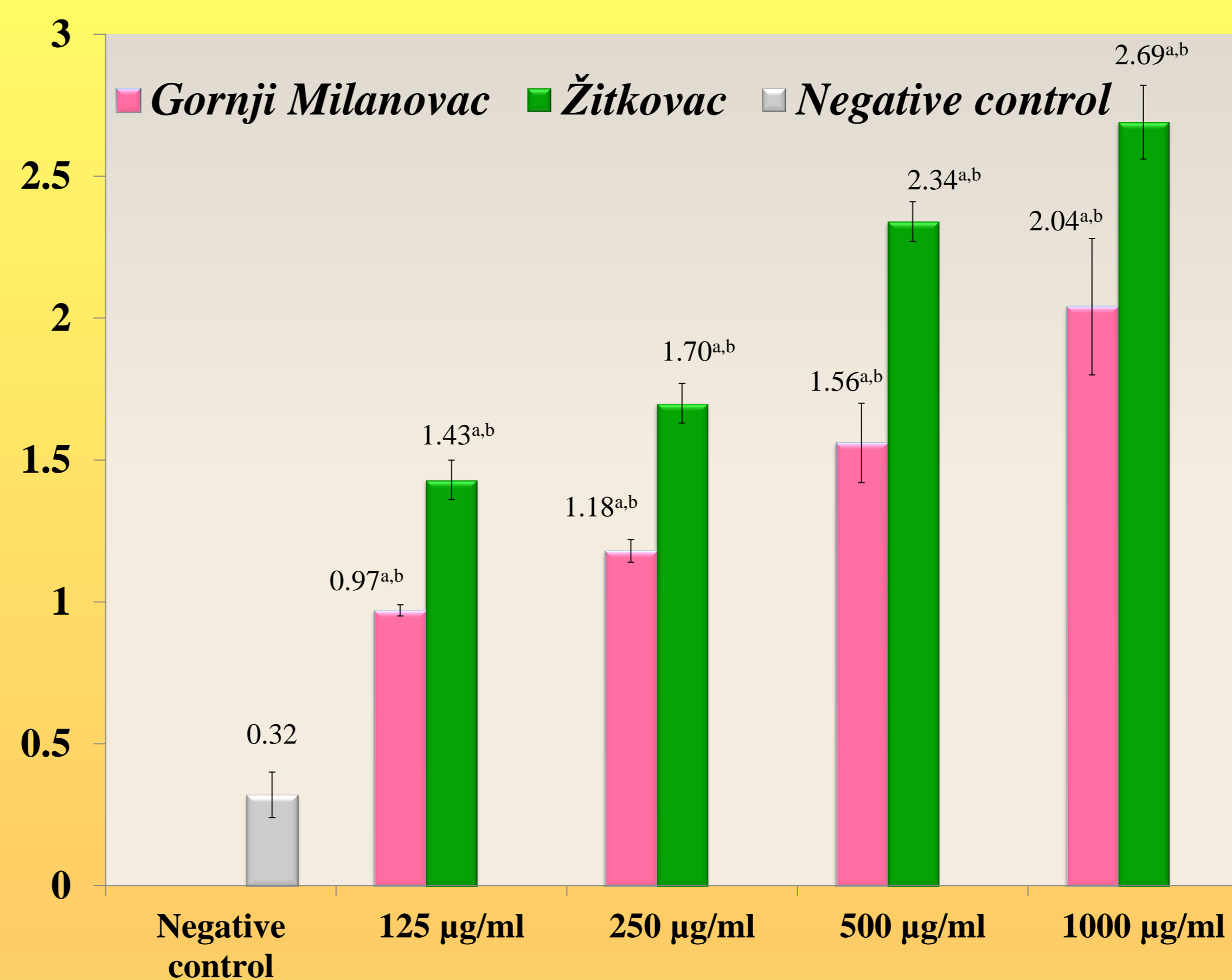


Figure 3. Level of DNA damage in human lymphocytes in treatments with methanolic extracts from the inflorescence of *Onobrichys viciifolia* originating two localities

<sup>a</sup>Significant increase of genetic damage index in comparison to control cells (ANOVA,  $p < 0.05$ )

<sup>b</sup>Significant difference between genetic damage index (GDI) in human lymphocytes in treatments with inflorescence extracts (Student's *t*-test,  $p < 0.05$ )

Table 1. Analysis of heavy metals content in the soil samples from two localities (µg g<sup>-1</sup>)

Heavy metals	Gornji Milanovac	Žitkovac
Mn	676.24 ± 5.87	2685.58 ± 0.00
Ni	38.74 ± 0.57	198.00 ± 0.99
Ca	4837.16 ± 32.95	3649.76 ± 3.89
Mg	2236.86 ± 36.42	4540.54 ± 37.05
Fe	24332.84 ± 19.59	77363.08 ± 177.20
Zn	25.48 ± 0.42	176.24 ± 0.21
Cr	27.64 ± 0.14	453.36 ± 0.35
Pb	11.38 ± 0.07	873.66 ± 3.18
Cu	10.44 ± 0.28	113.88 ± 0.21

## CONCLUSION

Based on the results methanolic extracts of root and inflorescence of *Onobrichys viciifolia* originating from environmental uncontaminated soil and tailing site had genotoxic effect in all tested concentrations, but both extracts of plants from the tailing site (of root and of inflorescence) showed a greater genotoxic effect than the extracts of the plants from environmental uncontaminated soil. For safety reasons this plant should not be used in folk medicine until more extensive genotoxicity studies and *in vivo* studies.

## Acknowledgements

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