



# Evaluation of the antioxidant capacity of four Cannabis cultivars

Nadica Trajkovska<sup>1</sup>, Iskra Davkova<sup>1</sup>, Ivana Cvetkovik Karanfilova<sup>1</sup>, Gjoshe Stefkov<sup>1</sup>, Veronika Stoilkovska Gorgievaska<sup>1</sup>, Tanja Petrevska Ivanovska<sup>2</sup>, Svetlana Kulevanova<sup>1</sup>, Marija Karapandzova<sup>1</sup>

<sup>1</sup>Ss Cyril and Methodius University in Skopje, Faculty of Pharmacy, Institute of Pharmacognosy, Mother Theresa 47, 1000 Skopje, Republic of North Macedonia  
<sup>2</sup>Ss Cyril and Methodius University in Skopje, Faculty of Pharmacy, Institute of Applied Biochemistry, Mother Theresa 47, 1000 Skopje, Republic of North Macedonia

## 1. Introduction

Cannabis, commonly known as marijuana, is a product of the *Cannabis sativa* plant which has been used as an alternative medicine in many cultures for several centuries ago.

The active compounds, cannabinoids, have been under the extensive investigation, and their potent antioxidant and inflammatory properties have been reported, although the detailed mechanisms of their actions have not been fully clarified (Dalia M. Kopustinskiene, 2022).

Dried flowers from four different Cannabis strains were extracted with two different solvents, methanol and ethanol and antioxidant activity of extracts were compared to see if the antioxidant capacity varies from one solvent to other.



Fig. 1 Cannabis plant

## 2. Materials and methods

The plant materials were consisted of dried flowers from four different Cannabis cultivars: Amnesia Kush, Charlotte's Angels, Elleta Campana, and Orange Hill.

On both methanolic and ethanolic extracts the following tests were determined:

- Total phenolic content (TPC) using the Folin-Ciocalteu reagent
- Total flavonoid content (TFC) using AlCl<sub>3</sub>.
- Antioxidative capacity
  - DPPH free radical scavenging
  - β-carotene/linoleic acid bleaching test



## 3. Results and discussion

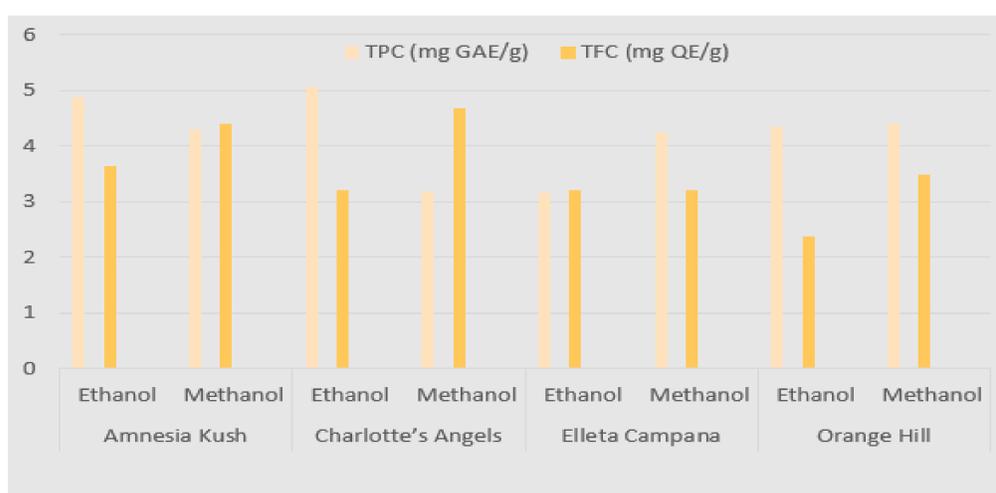


Fig. 2. TPC and TFC content in methanolic and ethanolic extracts

- Amnesia Kush and Charlottes Angels samples showed higher values for TPC in ethanolic extracts,  $4.88 \pm 0.33$  mg GAE/g and  $5.05 \pm 0.39$  mg GAE/g, respectively compared to the values in methanolic extract.
- Contrary to the previous results, methanolic extracts showed higher values for TPC for Eletta Campana and Orange Hill special extracts.
- All four extracts showed higher values for TFC when methanol was used as solvent
- The highest values for TFC were noticed in Charlottes Angel ( $4.68 \pm 0.29$ ), followed by Amnesia Kush ( $4.41 \pm 0.44$ ), Orange Hill special ( $3.48 \pm 0.14$ ) and Eletta Campana ( $3.22 \pm 0.65$ ).

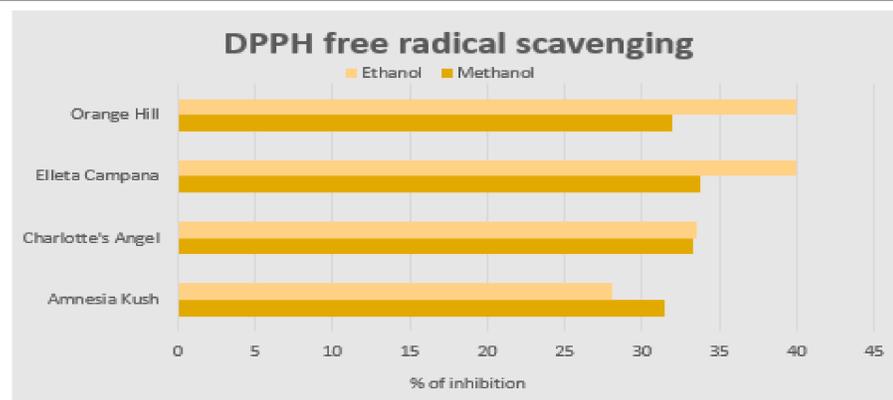


Fig. 3 Percentage of inhibition of methanolic and ethanolic extracts at concentration of 1 mg/mL

- The percentage of inhibition of the DPPH radicals was the highest in the etanolic extracts prepared from Elleta Campana as well as Orange Hill samples.

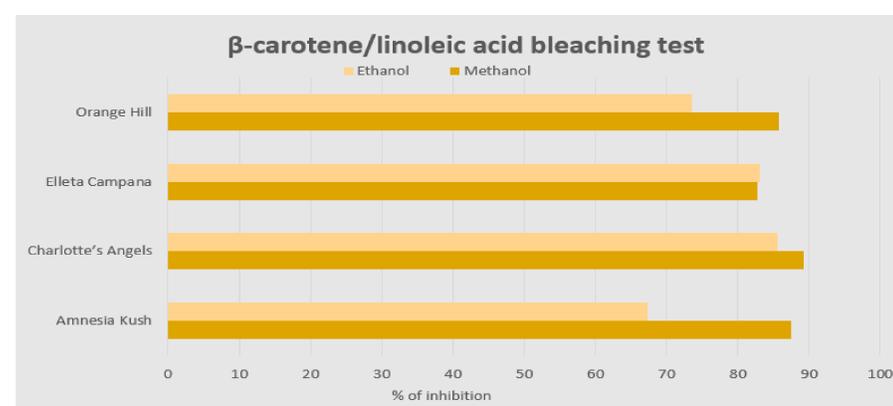


Fig. 4 Percentage of inhibition of methanolic and ethanolic extracts at concentration of 1 mg/mL

- According to the β-carotene/linoleic acid bleaching test, all methanolic extracts at concentration of 1 mg/mL showed percentage of inhibition between 80% and 90%. Charlotte's Angels showed highest percentage of inhibition for both extracts.

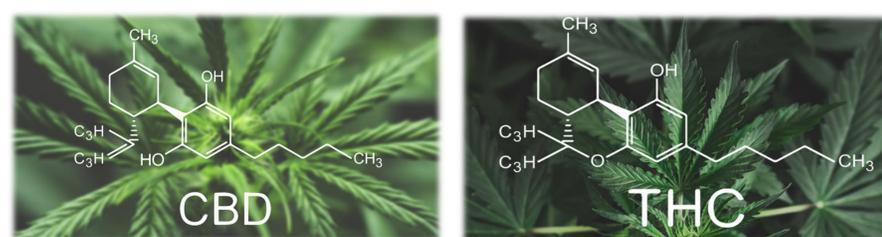


Fig. 5 Structures of cannabinoids

## 4. Conclusion

The type of the solvent which is used for the sample preparation influences the TPC and TFC, which also affects the antioxidant capacity of the prepared Cannabis extracts. Further examination, which take these variables into account, will need to be undertaken in order to see if there is a possible synergistic effects with some other compounds present in Cannabis flowers.

## References

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