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Evaluation of Phenolic and Carotenoid Content of Turf Grass Clippings

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Introduction

With the increased consciousness of modern society to recreational green areas in cities, turf cultivation is becoming a significant agricultural sector. Thus, nowadays, turf cultivation is expanding to meet the demand for city parks, gardens and sports pitches. To meet the special requirements of a selected area for turf cultivation nowadays, a wide variety of species are used in turf mixtures depending on the climatic and environmental conditions. Nowadays, especially in temperate climates, species of *Festuca*, *Lolium* and *Poa* genera are the main preferred turf seeds for green areas. To maintain the green areas, grass cutting is applied from which clippings are obtained as wastes. In the present study, the phenolic and carotenoid content of grass clippings of three main turf types were investigated.

Materials and Methods

Plant Materials: Grass clippings from turf grasses grown in the the experimental fields of Bayramic Vocational College (COMU) were cut and then air-dried.

Preparation of Grass Clippings Extracts: The dried turf grass clippings were extracted with ethanol (80%, v/v) for 6 hour by continuous agitation (250 rpm at room temperature.

Analysis of Phenolic Content: The total phenolic content of the samples was measured according to the Folin-Ciocalteu reagent method of Djeridane et al. (2006).

Analysis of Total Carotenoid Content: The total carotenoid content of the extracts was determined spectrophotometrically according to Lichtenthaler and Buschmann (2001).

Results

In the present study, the grass clippings of three industrially significant turfs were evaluated for their total phenolic and carotenoid content. As can be seen from Table 1, the highest phenolic content was found in the *Festuca arundinacea* clippings, while the lowest value was in the *Poa pratensis* clippings. On the other hand, the total carotenoid content of the turf grass clippings varied between 195.89 and 277.38 mg / kg grass clippings.

Table 1. Total phenolic and carotenoid content of the turf grass clippings*

Turf Grass Types	Total Phenolics ** mg GAE / kg grass clippings	Total Carotenoids ** mg / kg grass clippings
<i>Poa pratensis</i>	764.57±21.09c	234.95±15.73
<i>Lolium perenne</i>	990.52±32.81b	277.38±19.48
<i>Festuca arundinacea</i>	1208.73±29.65a	195.89±16.32

*The values are given as mean ± standard deviation (n=3).

**Means with different letters in a row are significantly different at p<0.05.



Festuca arundinacea



Lolium perenne



Poa pratensis



Conclusion

The results revealed that turf grass clippings contain phenolics carotenoids. Since turf grass clippings arise as wastes of the maintenance of green areas, it might be of interest to further evaluate these bio-wastes as sources of valuable bioactive compounds.

References

- Djeridane A, Yousfi M, Nadjemi B, Boutassouna D, Stocher, Vidal N. (2006) *Food Chemistry*, 97, 654–660.
Lichtenthaler HK, Buschmann C. (2001) *Current Protocols in Food Analytical Chemistry*. J. Wiley and Sons, New York, F4.3.1-F4.3.8.

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