NOTE

Mineral Contents of Truffles (*Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin)

MEHMET HAMURCU¹, MEHMET MUSA ÖZCAN², NESİM DURSUN¹ and FAHAD AL-JUHAIMI^{3,*}

¹Department of Soil Science and Plant Fertilization, Faculty of Agriculture, Selçuk University, 42031 Konya, Turkey

²Department of Food Engineering, Faculty of Agriculture, University of Selçuk, 42031 Konya, Turkey

³Department of Food Science and Nutrition, College of Food and Agricultural Sciences, King Saud University, Riyadh, Saudi Arabia

*Corresponding author: Fax: +966 114678394; Tel: +966 114678408; E-mail: faljuhaimi@ksu.edu.sa

Received: 6 January 2014;

Accepted: 13 March 2014;

Published online: 16 September 2014;

AJC-15992

Elemental contents of *Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin growing in Konya (Karapınar and Çumra locations) province in Turkey were determined by inductively coupled plasma atomic emission spectrometry (ICP-AES). Potassium, phosphorus and magnesium contents of both truffles were found at high levels. While potassium content was found to be 12.9 and 11.9 g/Kg for *T. boudieri* and *T. clavaryi*, phosphorus contents of truffles ranged from 4.6 to 5.1 g/Kg, respectively.

Keywords: Truffle, Mineral, ICP-AES.

INTRODUCTION

Truffles are hypogeous ascomycetes fungi that have a mycorrhizal association with some vascular plants. This study was undertaken to increase our knowledge on mineral contents which could be important for characterizing their nutritional value¹. This is called "Kumi, Keme, Dümbelek, Domalan, Tombalak" in Turkish². Truffles are excellent nutritional sources with specific good taste³. *Terfezia clavaryi* has been reported to be useful in the treatment of some eye diseases⁴. Despite the economic importance of truffles, little work has been done regarding their chemical composition, such as amino acids, carbohydrates, organic acids, fatty acids, minerals and proteins^{4,6}. Due to limited information on mineral contents, the objective of this research was to obtain information on the minerals and heavy metals found in *Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin wild grown in Turkey.

EXPERIMENTAL

Desert truffles (*Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin) (about 1 Kg of each) were collected from Konya (Karapınar and Çumra locations) province in Turkey in May 2011. Collected samples were dried at 70 °C in a drying cabinet with air-circulation until they reached constant weight. Later, about 0.5 g dried and ground sample was digested by using 5 mL of 65 % HNO₃ and 2 mL of 35 % H₂O₂ in a closed microwave system. The volumes of the digested samples were made up to 20 mL with ultra-deionized water and mineral

concentrations were determined by inductively coupled plasma-optical emission spectroscopy (ICP AES; Varian-Vista, Australia)⁷.

Working conditions of ICP-AES: Instrument: ICP-AES (Varian-Vista); RF Power: 0.7-1.5 kw (1.2-1.3 kw for Axial); Plasma gas flow rate (Ar): 10.5-15 L/min. (radial) 15 " (Axial); Auxiliary gas flow rate (Ar): 1.5 "; Viewing height: 5-12 mm; Copy and reading time: 1-5 s (max. 60 s); Copy time: 3 s (max. 100 s). Results were analyzed for statistical significance by analysis of variance

RESULTS AND DISCUSSION

Mineral contents of *Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin growing in Konya (Karapınar and Çumra locations) province in Turkey are given in Table-1. Elemental contents of *Terfezia boudieri* Chatin and *Terfezia clavaryi* Chatin growing in Konya (Karapınar and Çumra locations) province in Turkey were determined by inductively coupled plasma atomic emission spectrometry (ICP-AES). Potassium, phosphorus and magnesium contents of both truffles were found at high levels. While K content was found to be 12.9 g/Kg and 11.9 g/Kg for *T. boudieri* and *T. clavaryi*, P contents of truffles ranged from 4.6 to 5.1 g/Kg, respectively. Cr was established at a high level in both truffles. In addition, the Cr content of *T. clavaryi* was found to be higher than that of *T. boudieri*. While the Cd content of *T. boudieri* was found to be 0.07 mg/Kg, the Cd content of *T. clavaryi* was determined

TABLE-1
MINERAL CONTENTS OF *Terfezia boudieri* CHATIN AND
Terfezia clavaryi CHATIN (n:3)

Minerals (mg kg ⁻¹)	Karapınar (<i>Terfezia boudieri</i> Chatin)	Çumra (<i>Terfezia clavaryi</i> Chatin)
K	12914.00 ± 1038*	11904.00 ± 719
Mg	676.30 ± 56.6	827.70 ± 29.1
P	4684.00 ± 663	5126.00 ± 933
S	736.80 ± 74.1	1049.40 ± 102.9
B	141.40 ± 31.1	148.08 ± 18.13
Cu	9.02 ± 5.20	19.14 ± 2.18
Fe	11.75 ± 0.98	15.94 ± 1.768
Na	685.90 ± 116.9	691.00 ± 47
Zn	18.52 ± 6.81	48.77 ± 4.73
Mo	0.24 ± 0.06	0.30 ± 0.14
Cd	0.07 ± 0.0300	0.24 ± 0.09
Cr	0.93 ± 0.196	2045.00 ± 0.35
Ni	0.53 ± 0.227	1063.00 ± 0.30

*mean ± standard deviation

as 0.24 mg/Kg. Ni contents of both truffles were between 0.53 and 1.06 mg/Kg, respectively. The Ca, Cd, Cu, Fe, K, Mg, Mn, Na, Pb and Zn contents of *T. clavaryi* were found to be

172.31 ± 3.20, 0.76 ± 0.06, 14.31 ± 0.81, 12.87 ± 0.69, 156.11 ± 3.06, 85.31 ± 1.87, 1.87 ± 0.19, 163.11 ± 3.96, 0.92 ± 0.06 and 10.92 ± 0.88, respectively⁸.

ACKNOWLEDGEMENTS

This Project was financially supported by King Saud University, Deanship of Scientific Research, College of Food and Agricultural Sciences, Research Center.

REFERENCES

1. A. Slama, Z. Fortas, A. Boudabous and M. Neffati, *African J. Microbiol. Res.*, **4**, 2350 (2010).
2. F. Gücin and B. Dülger, *Ecology Environ. J.*, **23**, 27 (1997).
3. K.S. Al-Delaimy, *Can. Inst. Food Sci. Technol. J.*, **10**, 221 (1977).
4. A. Shalhat, A. Al-Soair and M. Al-Mohamad, *J. Food Sci.*, **50**, 450 (1985).
5. H.A. Bokhary, A.A.A. Suleiman, M.O. Basalah and S. Parvez, *Can. Inst. Food Sci. Technol. J.*, **20**, 336 (1987).
6. H.A. Bokhary, A.A.A. Suleiman and M.O. Basalah, *J. Food Prot.*, **52**, 668 (1989).
7. S. Skujins, Handbook for ICP-AES (Varian-Vista). A Hort Guide To Vista Series ICP-AES Operation, Varian Int. AG Zug. Version 1.0. pp 29, Switzerland (1989).
8. A.R. Hashem and A.M. Al-Obaid, *J. King Saud. Univ.*, **8**, 5 (1996).