

rancesca Oliveri^c, Patrizia Brancato^c, Valentina Gottuso ^c, Mario Cosenza^c, Rosario Pitti ^c, Daniel Giuseppe Bua^a, Giovanni Annuario^a, Stefano Reale^{c,d}, Nicola Cicero^{a,b*}, Giacomo Dugo^{a,b,c}

^a Department of Biomedical Sciences, Dental and Morphological and Functional Images, University of Messina, V.Ie F. Stagno d'Alcontres 31, 98166- Messina, Italy ^b Science4Life S.r.I., a Spin-off of the University of Messina, V.Ie F. Stagno d'Alcontres 31, 98166- Messina, Italy ^cConsorzio di Ricerca sul Rischio Biologico in Agricoltura (Co.Ri.Bi.A.), Via G. Marinuzzi 3, 90129 Palermo

^dIstituto Zooprofilattico di Palermo, dipartimento di Tecnologie Diagnostiche Innovative, Via G. Marinuzzi 3, 90129 Palermo

Introduction

In this work, samples of *Triticum obrum* wheat and pasta from an ancient sicilian millstone (Antico Mulino Lazzara, Messina) were studied. Heavy metals, antioxidant properties and total polyphenols content were investigated. All samples were analized by molecular markers, preliminary data

Method

All samples were pre-treated by a microwave digestion system and the content of Cd, Hg, Pb and As was detected by ICP-MS (inductively coupled plasm mass spectrometry). The total antioxidant activity (mMol teac/100g) on the same samples was determined by the method of the DPPH (2,2-diphenyl-1-picrylhydrazyl) and the content of total polyphenols (expressed in mg/kg of equivalents of acid gallic-GAE) by the method of Folin Ciocalteau.









Bibliographic References

Mangini G., Taranto F., Giove S.L., Gadaleta A. and Blanco A. 2010. Identification of Durum Whe ultivars by a Minimum Number of Microsatellite Markers Cereal Research Communications 38(2

Results and discussion

All samples studied have shown the presence of heavy metals in traces. The concentration of lead, mercury, arsenic and cadmium is lower than the legal limits. In fact, the regulation 1881/2006 establishes for Pb and Cd a maximum allowable amount of 0.20 ppm (Reg. 1881/2006), and the obtained results are below the threshold limit. The average concentration of Pb in pasta is 0,050 ppm and 0,032 ppm in flours, while the content of Cd is less than 0,015 ppm in all samples. Analysis about Hg shows mean value of 0,020 ppm in pasta samples and 0.018 ppm in flour samples, and about as in pasta the medium value is 0,020 ppm while in the flour the medium value is 0,015 ppm (there is no regulations concerning content in cereals). Analytical data obtained indicate that wheat and flour samples of Tumminia variety have higher antioxidant capacity than other varieties (Simeto and Sen. Cappelli), which basically are the same. Making a comparison among values obtained in the Simeto chain, it was observed that the amount of antioxidant activity results higher in the integral flour (66.30 mMol teac/100g) than pasta, probably this depends on transformation processes to which it is subjected. Major concentration of TAA was founded in bran sample (123.09 mMol teac/100g). The content of polyphenols, in Senatore Cappelli flour sample is higher (331.00 mg/kg), decreases in Tumminia, in Simeto wholemeal flour and in Simeto flour (247,12 mg/kg). Very high is the content in the bran (944 mg/kg). For the genetic profile, all samples were analized using 10 ssr (simple sequence repeats): 8 Xgwm (Gatersleben Wheat Microsatellite) and 2 Xwmc (Wheat Microsatellite Consortium) appropriately selected from a public database (http://wheat.pw.usda.gov). Only four ssr are selected: Xwmc 415 Xwmc 597, Xwmc 544 and 368 Xwmc markers.

Samples	As (ppm)	Cd (ppm)	Pb (ppm)	Hg (ppm)
Farina Simeto	0,014	<0,015	0,026	0,019
Farina Integrale Simeto	0,012	<0,015	0,050	0,015
Farina grano tenero	0,018	<0,015	0,025	0,016
Farina Tumminia	0,013	<0,015	0,036	0,019
Crusca	0,020	<0,015	0,024	0,024
Spaghetti	0,022	<0,015	0,030	0,018
Strozzapreti	0,024	<0,015	0,055	0,022
Deppette	0.014	10.015	0.066	

XXV SILAE Congress "Pac September 11-15, 2016