

COPPER AND ZINC CONTENT OF SEA BERRY, WHEAT GERMS AND FISH

— short report —

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Abstract: This report presents the composition in two microelements (copper and zinc) of three foods with high vitamins content: sea berry fruits, wheat germs and fish meat and in their oils. The content in copper and zinc was measure using the atomic absorption spectrometry with graffito oven. The results indicates that sea berry fruits, wheat germs and fish meat are rich in microelements. A part of microelements content of these foods is founded again in sea berry, wheat germs and fish oils. The wheat germs oil has the highest content in microelements.

Keywords: sea berry oil, wheat germs oil, fish oil, microelements, atomic absorption spectrometry

INTRODUCTION

Sea berry, wheat germs and fish oil are very rich in fat-soluble vitamins. We purpose to measure also the microelements content of these oils. Some study about the copper and zinc content were made on sea berry fruits by Cojocaru, 1973 (cited by Radulescu, 2003). According to him, the average copper content in dried sea berry fruits was 5.77 mg/kg and the average zinc content was 12 mg/kg. A part of copper and zinc content it is found in sea berry oil. The microelements are biologic active substances which could activate biochemical processes of body like coenzymes, near enzymes. The copper, zinc, iron, chromium, fluorine, molybdenum, and selenium are microelements. The most important microelements are copper and zinc.

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The copper play a prominent part in hemoglobin synthesis. Also, copper compose important enzymes which take part in bonds, nerves and collagen formation (Banu et al., 1982). The copper maintain the optimum function of heart and arteries and provides the healthy of immune system. The copper daily recommended dose is from 1.5 till 3 mg (Banu et al., 2007).

The zinc is spread in all cells of body and the highest zinc content is in eyes, liver, bonds, skin, hair and nails.

Zinc is considered a fortifying of body immunity which could help to prevent colds and neck pains. Also, zinc could protect the body from noxious effects of lead and cadmium. Zinc participates in genetics materials synthesis like RNA and DNA. Zinc is also a part of ant oxidizing enzyme which prevents the free radicals formation. In the absence of zinc, a decrease of spermatozoids and ovules viability, a slowly healing of wounds and a decrease of taste and smell sensibility are ascertained (Brad and Brad, 2002). The daily recommended dose of zinc is around 15 mg (Banu et al., 2007).

Due to the high content in fat-soluble vitamins of sea berry fruits, wheat germs and fish meat, in this paper we purpose to determine the microelements copper and zinc in these products and in their oils obtained by extraction with supercritical liquids.

MATERIALS AND METHODS

The sea berry fruits used for oils excerpt were harvest from Prahova Valley and dried at 65°C.

The wheat germs were obtained from wheat cultivated on Braila plain. The fish oil comes from Northern Sea fishes.

For measurement of copper and zinc content were used sea berry and wheat germs oils excerpt by modern methods (supercritical liquids extraction) and the fish oil was excerpt by classical method. They were prepared two samples from each sort of oil. All chemicals were analytical grade. It proceeded like in method described below (SR EN 14082/2003).

Five grams of sea berry, wheat germs and fish oils, preciously weighed in weigh crucibles were burnt on the warming plate and calcined at 550°C for five hours. The obtained ashes were dissolved in 5 ml of nitric acid diluted in water 1 to 6 and these solutions were evaporated near dry and brought in six 25 ml volumetric flasks to the mark. In the same way was made a blank of reagents. The measurement of content in zinc and copper from obtained solutions was made using an atomic absorption spectrometer with graffito oven Varian 220G.

RESULTS AND DISCUSSION

The computation of the concentration of Zn has been accomplished with the help of the standard line in Figure 1 and concentration of copper with the standard line in Figure 2.

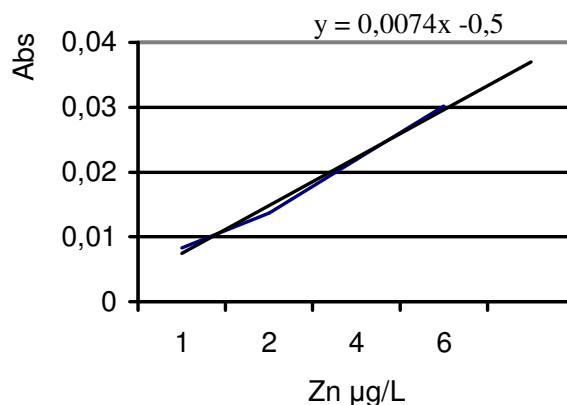


Figure 1. The standard curve for establish the content of Zn

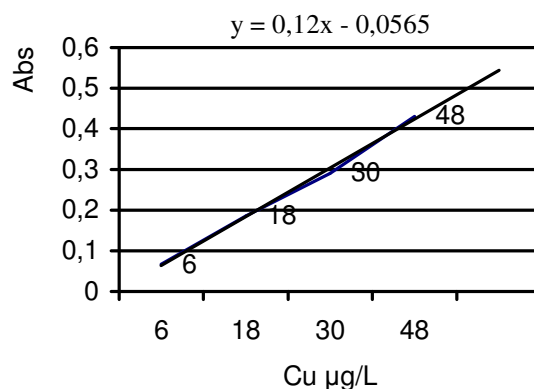


Figure 1. The standard curve for establish the content of Cu

From extrapolation the value of concentration of Zn and Cu from each samples see in table 1. Using the data of spectral reports was counted the content in copper and zinc from sea berry, heat germs and fish oils. See table 2. The content is calculated with the formula:

$$\text{Cu, Zn} = c \cdot D/m \cdot 1000$$

where: c - concentration; D – dilution; m - weight of each samples

Table 1. Concentration of Zn and Cu from samples

Oil	Weight g	Zn µg/L	Cu µg/L
Sea berry sample 1	5.15353	16.119	26.23
Sea berry sample 2	6.84985	17.116	34.77
Wheat germs sample 1	3.05391	20.568	76.29
Wheat germs sample 2	4.15331	7.400	97.84
Fish sample 1	5.59046	9.250	14.17
Fish sample 2	10.18841	15.757	23.64

Table 2. Concentration of Zn and Cu from each samples in ppm

Oil	Zn ppm	Cu ppm
Sea berry	3.32	0.127
Wheat germs	5.2	0.583
Fish	2.0	0.061

Sea berry fruits, wheat germs and fish meat are rich in microelements. A part of microelements content of these foods are founded again in sea berry, wheat germs and fish oils.

The wheat germs oil has the highest content in microelements.

Because of smallest microelements content of sea berry, wheat germs and fish oils and their highest fat-soluble vitamins content, those oils could not assure the daily recommended dose of copper and zinc but could be used like food supplements because could cover the daily vitamins needs of body.

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