HOW TO GET AN ECOLOGICAL INTEGRAL USE OF BLUEBERRIES FRUITS (*VACCINIUM MYRTILLUS* L.)

POSIBILITĂȚI DE VALORIFICARE ECOLOGICĂ INTEGRALĂ A FRUCTELOR DE AFIN NEGRU (*VACCINIUM MYRTILLUS* L.)

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Abstract: *The phyto-therapeutic virtues of blueberries–as fruits or as natural juices – are due to the richness of their "vital principles" induced by photosynthesis as: glucides, lipids, proteins, enzymes, vitamins (A, B1, B2, C, E, P, PP), minerals (K, Ca, Cl, Fe, P, Mg, S), pigments, organic acids, phyto - hormones etc. Blueberries are an ideal raw material - " noble fruits" – for making natural bio-stimulating juices, valorous and indispensable for the human body. The well-known american doctor, D.C,Jarwis, great fun of phyto-therapy stated that blueberries fruits are " vegetal blood". Knowing the chemical composition of blueberries fruits featured by a lot of phyto-therapeutic, bio-stimulating and nutritive qualities, we must capitalize them in large wide range of appreciated, natural products. The imperative aim and the efforts for capitalization of blueberries are paid back by the following range of products: natural juices; half-preserved juices; concentrates from natural juices; natural colorants - ingredients for food industry.*

Rezumat - *Virtuțile fitoterapeutice ale afinelor – ca atare sau sub formă de sucuri naturale – rezultă din bogăția ,,principiilor vitale" inoculate ,,fotosintetic" sub forma: glucidelor, lipidelor, protidelor, enzimelor, vitaminelor (A, B1, B2, C, E, P, PP) mineralelor (K, Ca, Cl, Fe, P, Mg, S), pigmentilor, acizilor organici, fitohormonilor etc. Afinele se prezintă ca materie primă ideală – ,,fructe nobile" – pentru obținerea sucurilor naturale biostimulatoare, atât de valoroase şi de indispensabile organismului, pe care cunoscutul medic american, adept al fitoterapiei, D.C. Jarwis, le-a denumit ,,sânge vegetal". În baza cunoaşterii compoziției chimice atât de complexe a fructelor de afin, din care se desprind valoroasele lor calități terapeutice, biostimulatoare şi nutritive, valorificarea lor integrală se impune cu atât mai mult cu cât ele generează o gamă de produse naturale dintre cele mai apreciate. Imperativul-deziderat al valorificării superioare integrale ale afinelor răsplăteşte efortul investit prin următoarea gamă de produse: sucuri naturale; sucuri semiconservate – produs semifinit; concentrate din sucuri naturale; coloranți naturali; ingrediente pentru industria alimentara.*

The blueberries' quality is due to their well-balanced complex composition on one hand, and to its small, very juicy fruits on the other hand; we all know that in the cells' membranes there are lots of vitamins, minerals, pigments and flavours, so that there is a very high contents of "noble" elements per surface-unit, higher than larger fruits. Blueberries are also rich in anti-oxidants, such as vitamins and anthocyanins, the latest are also very useful pigment with a synergic part. The blueberries' bio-chemical composition is described in the following table:

Table 1

Blueberries' Bio-Chemical Composition

Item No.	Composition	Content
1.	Dry matter %	13 – 15
2.	Total sugars %	5,5 – 7,0
3.	Total acidity (malic acid)	1,28 – 1,68
4.	Harmonic Ratio % Total sugars / % Total acidity	5,5 / 1,28 — 7,0 / 1,68
5.	Pectins %	1,98 – 2,76
6	Proteins %	1,94 – 2,70
7.	Tannins %	0,93 – 1,42
8.	Minerals %	2,92 – 3,56
9.	Potassium mg/100 g	187
10.	Calcium mg/100 g	20
11.	Magnesium mg/100 g	5
12.	Phosphorus mg/100 g	16
13.	Iron mg/100 g	1,38
14.	Copper mg/100 g	1,73
15.	Manganese mg/100 g	1,28
16.	Ascorbic acid mg/100 g	110 – 169
17	B Carotene mg/100 g	1,2
18	Anthocyanins %	0,736

In order to obtain more natural products with important therapeutic features, we included the following procedures into the blueberry processing technological scheme:

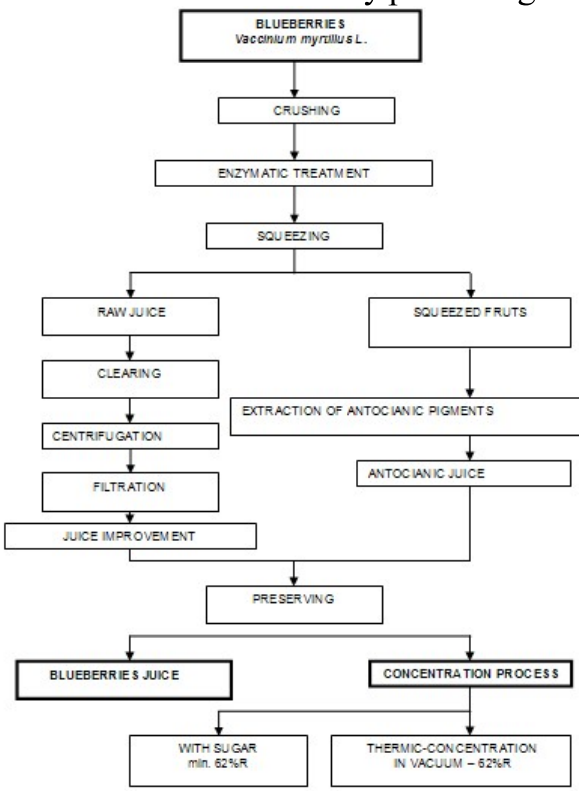

Fig. 1. Blueberry processing technological scheme

Products and sub-products got from the blueberries' processing

The following products and sub-products are gained thanks to the overall processing of blueberries.

Table 2

Products and sub-products got from the blueberries' processing

Item no	Products and sub-products	%
1	Fresh blueberry fruits	100,00
2	Selected fruits	93,07
3	Fruits pure'	22,82
4	Raw blueberry juice	67,63
5	"Blueberry cake" = blueberries leftovers	25,19
6	Structural wastes (seeds, peels)	10,25

As you can see in table no.2, we deal with major sub-products quantities and qualities obtained after the blueberries processing, featured by anthocyanins high content.

Various ways of capitalizing blueberries after its processing

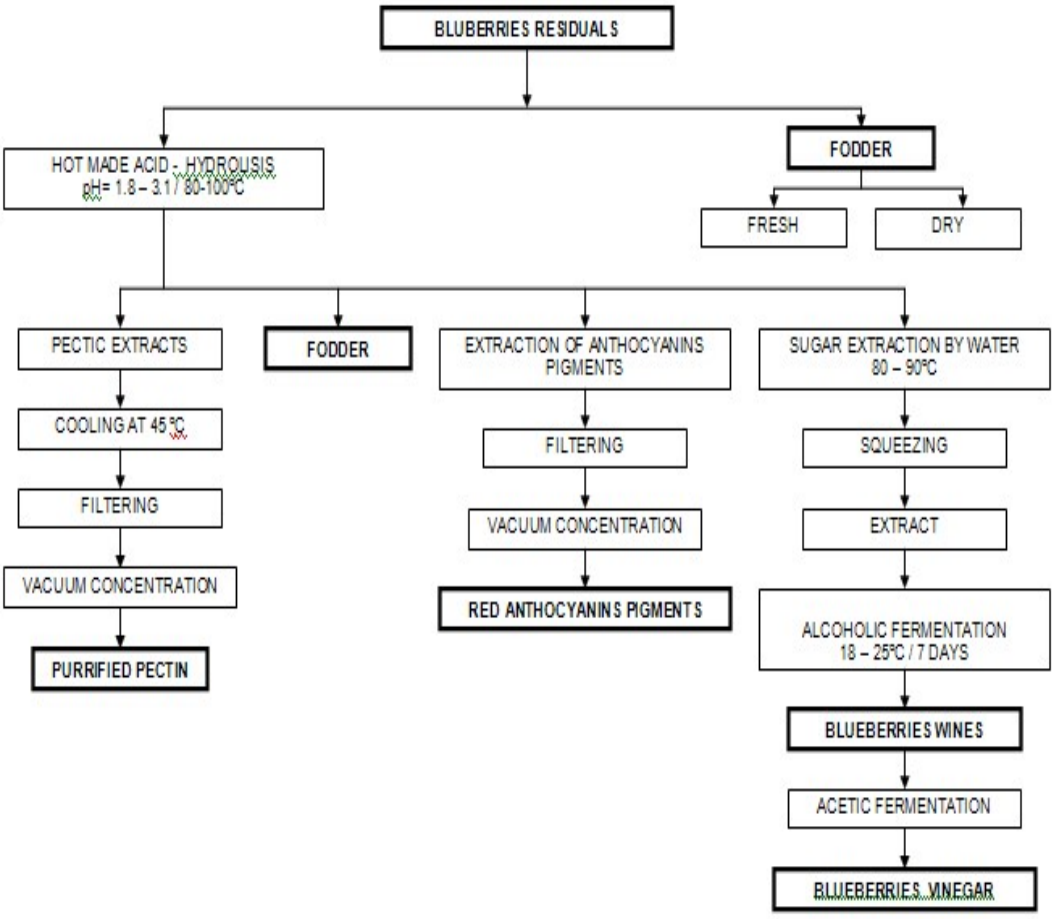

Fig. 2. Blueberries' residuals processing technological scheme

CONCLUSIONS

- This paper describes a pattern of better capitalizing blueberries, considering them a precious raw material from which we obtain – natural juice, in a first stage, and – after squeezing sub-products rich of anthocyanins, i.e. the "blueberry cake".
- The achievement of natural pigments for food products obtained from natural sources is a major purpose as we must substitute the chemical dyeing products harmful for health.
- The quite high acidity of the vacuolar juice (in the blueberry pulp) is a strong lasting pigment for purple red stabilizer for colouring juice and hydro-alcoholic extracts.
- The blueberry leftover cake is an ideal raw material with high uses and outputs.
- Other advantages: the technology used is low energy consumer and no polluting
- Wastes deriving from processing are used fresh or dry or powder because of their nutritional and bio-stimulating functions due to vitamins and minerals.

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