

## ECOLOGICAL CULTIVATION OF SEA BUCKTHORN (*HIPPOPHAE RHAMNOIDES*), A PROFITABLE BUSINESS EVEN IN TIMES OF ECONOMIC CRISIS

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**Keywords:** sea buckthorn, oil, revenues, profitability

### ABSTRACT

*The fruits of sea buckthorn (*Hippophae rhamnoides*), considered by many a miracle of nature or a true “Romanian ginseng”, contain considerable amount of vitamin C and the vitamins A, B, E, F, P, K, minerals, calcium, phosphorus, magnesium, sodium, carbohydrates and organic acids as well as the oil of an exceptional therapeutic value. In fact, the most valuable it is oil that is obtained from the pulp of the fruits or from the seeds. The oil has a high content of nutrients essential for metabolism and regeneration of skin cells. Recently introduced in ecological culture in Romania, today the sea buckthorn is grown on more than 100000 hectares. The surfaces may be small, but the harnessing is extraordinarily high: from the fruits harvested from one hectare may be obtained 270 liters of oil, that can be sold with the a medium price of 250 euro / liter, which means revenues of approximately 70000 euro. It is indisputably the most profitable culture.*

*In this paper are some examples of certain Romanians enterprising that have succeeded, even in times of economic crisis, to achieve the spectacular revenues from the sea buckthorn culture.*

### INTRODUCTION

Sea buckthorn (*Hippophae rhamnoides* L.) is a thorny plant, with an incredible therapeutic value, a true miracle of nature. With its fruit, like pearls which ripen in autumn, sea buckthorn provides unexpected help us everyone regardless of age or condition. With an exceptional fortified effect, antioxidant and unequalled immune system stimulator, sea buckthorn still has many unknown valences for people.

In Romania, of over 30 years are doing systematic researches on the sea buckthorn by the Chemical-Pharmaceutical Research Institute and the Institute of Food Research. Researches aimed at capitalizing on the chemical constituents of the plant. The most valuable product is the so-called sea buckthorn oil, which contains essential fatty acids, lycopene, tocopherols and phytosterols. Sea buckthorn oil being used with a great success even under serious cases of thermal and chemical burns, or skin reactions from exposure to radiations. The oil is used to treat the gastric and duodenal ulcers, urticaria and allergic conditions, neuroendocrine diseases, rheumatism, circulatory and liver diseases, alcoholism, anemia, fatigue and even the stress. Use of sea buckthorn oil in geriatric care they gave spectacular results, and recent researches recommends the sea buckthorn even in oncology. Thus, researches conducted in the U.K have discovered sea buckthorn ability to inhibit the growth of tumors ([www.descopera.ro](http://www.descopera.ro)).

This plant is fixing lands which are most degraded (has many suckers), assimilate atmospherically nitrogen directly by roots (has an ameliorative effect to the soil). In Romania *Hippophae rhamnoides* L. was the object of many national research programs; now there are not serious investitures and are not mobilized foreign institutions which may use modern instruments for the obtaining all advantages of this plant (Proorocu, A., 2008).

In terms of plants modern improvement, sea buckthorn multiplication by *in vitro* micropropagation is an effective way to obtaining new valuable genotypes. At the sea buckthorn, this modern multiplication mode making prerogative of the breeding research laboratories (Bonea Dorina, 2011). *In vitro* culture systems include the culture of explants

(leaves, stems, hypocotile, flowers, roots, etc.). Following the excision of explant, induce an injury response at the level of sections, which in the presence of culture medium hormones form the callus (Bonea Dorina, 2013).

### MATERIAL AND METHODE

This is a documentation survey in which we tried to present the achievements of some small Romanians enterprising who have managed to have a very profitable business through the sea buckthorn culture. In general, the production goes to export to other European countries (for example Germany).

The sources of information for this survey have been represented by different internet sites and specialized publications, as well as some recently published scientific papers in this field.

### RESULTS

Eco-pedo-climatic conditions and adequate relief, shows Romania as being the perfect place for sea buckthorn cultivation. This thorny plant is resistant to cold and can stand the low temperatures of -40 degrees Celsius and over those raised. An ecological sea buckthorn culture largely be feasible in practice, easily adopted by farmers, provided that some basic technological conditions. The ecological pressures reduced of this miraculous plant, high tolerance of the species, together with the ability to fix the atmospheric nitrogen plant, make it possible a culture without fertilizers and especially without synthetic pesticides, which can hardly be achieved in other species of fruit shrubs.

The sea buckthorn culture already has earned the celebrity in terms of profitability in countries like Germany, Italy and Sweden. In Romania, sea buckthorn grows wildly in the Carpathian area from Moldavia and Wallachia, Siret River Basin to Olt. One of the biggest plantations in the country is located in Bacau region (<http://www.fermierul.ro>).

According to research conducted by prestigious specialists such as prof. PhD Chem. Ion Brad, PhD Luminita Brad, Eng. Stefan Manea and Eng. Florica Radu, the sea buckthorn that grows in our country has a exceptionally chemical content, maybe the richest in the world. The plant was studied and improved to Horticultural Station Mărăcineni, where they obtained the reduced spiky varieties. It should be mentioned that nowhere in the world nor of natural or improved varieties do not contain so many active principles, vitamins, minerals, microelements, flavonoids and aminoacids as it contains the sea buckthorn that increases in Romania, especially in the Carpathian area ([www.descopera.ro](http://www.descopera.ro)).



**Fig.1.** The fruits of the sea buckthorn (source: <http://menthor.6te.net/documents/c.html>)

Sea buckthorn berries are second only to *Rose hips* and *Acerola* in vitamin C content. The concentration of vitamin C in the berries juice reaches 2500mg/100g depending on the species. Sea buckthorn seed and pulp oils are considered the most valuable components of the berries comprising a unique fatty acid composition, fat-soluble vitamins and plant sterols. Furthermore, the fruit pulp oil has a remarkably high content of Omega essential fatty acids (<http://www.organic-4life.com>).

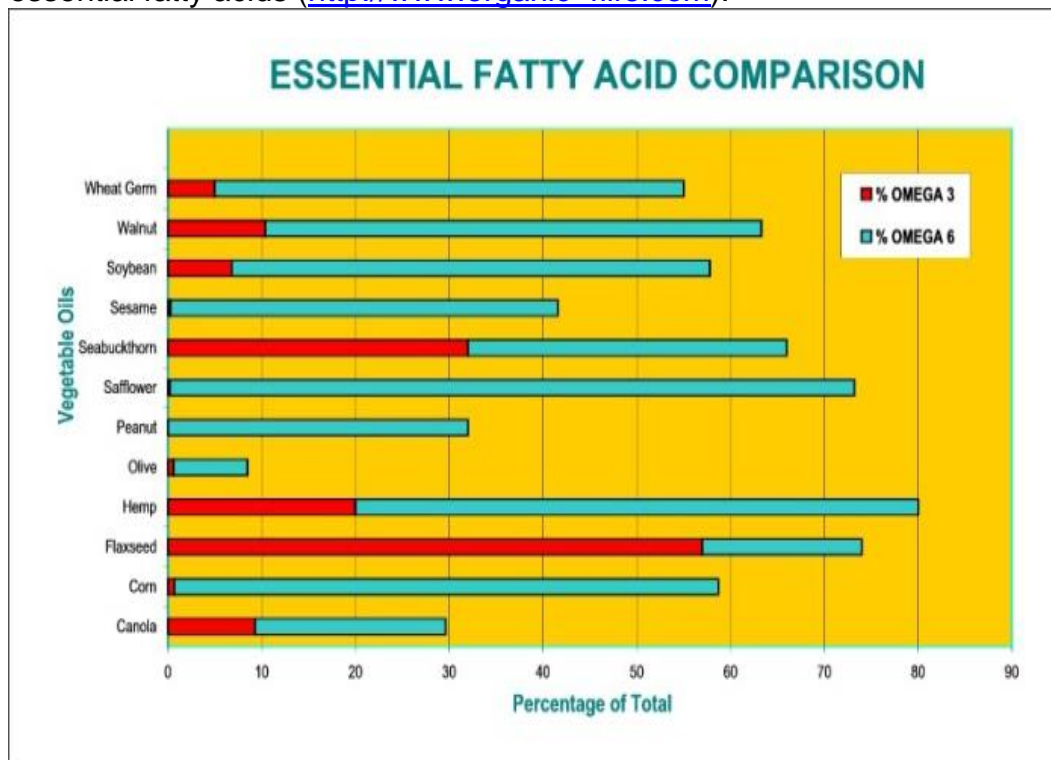


Fig.2. The essential fatty acids content of sea buckthorn oil, comparative with other vegetable oils (%) (source: <http://www.organic-4life.com>)



Fig.3. The natural distribution of sea buckthorn in Europe and Asia (source: Yang B. and Kallio H., 2002)

The plant grows in the wild flora of Eurasia, with the optimum ecological adaptation and distribution center in Central Asia, where she meets especially in mountainous areas. While in Asia occupies a huge area, in Europe is much less prevalent, just a tiny extension ([www.descopera.ro](http://www.descopera.ro)).

The lifetime of a holding shall of up to 20-25 years, with a growth period in the 10th year, followed by a period of degrees up to 25 years of. The sea buckthorn culture is very profitable starting with the year third of at planting. The productive potential is about 20 tones per hectare, and the selling price for fruit is 1.7-1.9 euro per kilo. Also, on the European market, the sea buckthorn fresh fruit BIO certificates and compulsory harvested by detaching the branches and fruit separation, in a frozen state, are sold for 1.6 to 1.8 euro / kilo, or may be marketed dried or in powder form. But the most profitable is the oil, which is sold at heap with a price between 150 and 250 euros / liter, from one hectare resulting approximately 250-270 liters (<http://afacerilacheie.manager.ro>).

The fruit quality is given by the concentration of oil. An ecological culture of sea buckthorn involves preparing the ground just like the any orchard, being forbidden to use 3-4 years before any chemical fertilizers and pesticides. In our country are still very few people who cultivate the sea buckthorn in ecological system (<http://www.fermierul.ro>).

In the following, are given by way of example some Romanian farmers who have succeeded to increase their business revenues from the sea buckthorn, a culture profitable even on the economic crisis time.

A Romanian researcher from the Arad area has reached after almost 35 years of working in fruit growing, the biggest sea buckthorn producer in the country. The production is selling to the Germans and make a profit of 10000 euro / ha. Thus, Alexandru Vulpe has started to be interested of sea buckthorn from the college time. It is true, had the chance to have teacher on the famous Victor Cireasa, promoter of culture in Romania, which was the first to notice that the plant can be taken from the spontaneous flora and placed in the culture (<http://www.agrointel.ro>). Alexandru Vulpe has experienced approximately 300 varieties of the sea buckthorn but remained in the end only 5 cultivars which have responded favourably to the culture technology. All 5 cultivars have been patented and registered in the Official Catalogue.

The farm is located in the Frumuseni, near Arad and is the first professional pilot farm from Romania, where grown noble cultivars. Here, the farmer has around 32 hectares of agricultural land where they work on several areas: improvement, nursery and fruit production. Almost half of the area is destined to sea buckthorn cultivation and the fruit production is sells entirely in Germany. However, Alexandru Vulpe is thinking to the processing of sea buckthorn fruit (especially in order to obtain the oil) because it would achieve much more than now. The sea buckthorn it is resistant to environmental factors and responds well to the culture technology. It is important however that the plants to be irrigated, but expense for the irrigation is of 20 times more cost effective as maize, as the farmer in question said. He for example, has around 20000 euro revenues per hectare. Of this amount, almost half represents the costs, but still it remains a substantial gain and the investment in one hectare of sea buckthorn is amortized after 7-8 years.

In 2011, the first year of production for plantation from Frumuseni, Alexandru Vulpe has participated to BioFach trade fair in Germany, where he found the customers. High demand is also for the planting material; the nursery plants from the Frumuseni arrive in Germany, France, Greece and Hungary.

In the Lechinta village of Bistrita-Nasaud, Simion Pasca is the promoter of the ecological culture of the sea buckthorn and provide overall guidance for hundreds of people interested in this field. The manufacturer spent with a few hectares of sea buckthorn almost 50 thousand RON, but plantation will produce 25 years so that the profit is assured ([www.adevarul.ro](http://www.adevarul.ro)). In the last years, Lechinta region has become from a national wine producing region into region of the ecological sea buckthorn culture. There



are only three plantations of the organic sea buckthorn the entire county. Simion Pasca grows the organic sea buckthorn on five hectares and another investor, Ion Trifu, the other five hectares in the close proximity. Another grower, S.C. Sicran Company, has another 6 hectares of organic sea buckthorn in the same community. They all receiving subsidies from the Agency for Payments in Agriculture for Organic Crops. The farmers recognize that initially the sea buckthorn is a culture in which must be invested a lot of money, but the durability of 25 years plus the summaries maintenance work make it a profitable crop.

Concerning the fruit processing and sea buckthorn oil extraction, also in Bistrita Nasaud region, Iacob Rosca opened his own business with a processing factory for sea buckthorn brought from all the land. The investment cost him 400000 euros. The sea buckthorn arrives in the dry state, then grind and after getting into the extraction tank. And here begins the extraction process of oil, which lasts 24 hours. From the fruits harvested from one hectare may be obtained 270 liters of oil, that can be sold with a medium price of 250 euro/liter, which means revenues of approximately 70000 euro, so investment will be recovered in a few years ([www.adevarul.ro](http://www.adevarul.ro)).

Since the start of the financial crisis the profit moved into agriculture, namely in the culture of sea buckthorn. Thus, Ioan Morar from Cluj region chose this type of culture for one simple reason – the rentability. At this moment, the farmer owns a 40-hectares area cultivated in the counties of Mures, Bihor, Botosani, Bistrita, Aiud and undertakes for the following years to establish 100 hectares of sea buckthorn. Last year, Ioan Morar obtained a yield than 10 tones per hectare; the entire production is exported mainly in the Nordic countries (<http://www.wall-street.ro>).

## CONCLUSIONS

The fruits of the sea buckthorn but especially the oil obtained from these are considered rightfully a miraculous remedy of nature through the extraordinary therapeutic benefits. The culture is very profitable, even on small surface areas. The prices for sale are very good, especially if it sell the oil obtained from the fruit. From the fruits harvested from one hectare may be obtained 270 liters of oil that can be sold with a medium price of 250 euro/liter, which means revenues of approximately 70000 euro/year.

This culture already has earned the celebrity in terms of profitability in countries like Germany, Italy and Sweden. In Romania there are more farmers interested by the sea buckthorn culture; in different areas of the country they were able to have very profitable business.

The culture of sea buckthorn is a long-term deal with a lifetime of up to 25 years, the investment pays off as soon as the plantation begins to bear fruit (namely in the year 3 of the planting), and then up to 25 years is only the profit.

The sea buckthorn is an eminently ecological culture, perfectly achieved in practice involving elementary and easily processes adopted by growers. Due to smaller costs per hectare and high sales prices the sea buckthorn culture is indisputably the most profitable crop.

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