SEA-BUCKTHORN: COMPLEX PROCESSING

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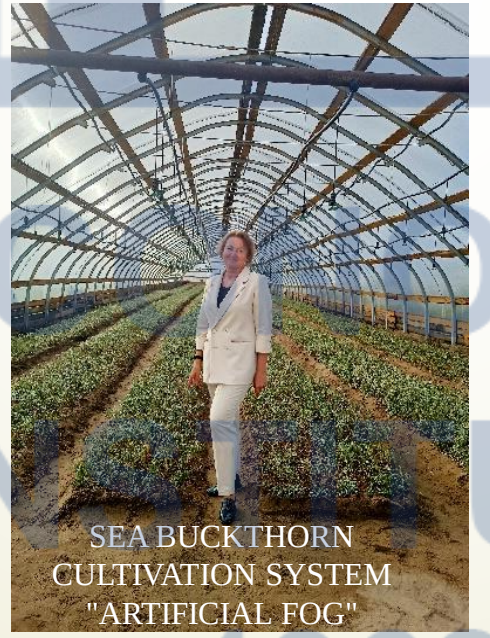
RELEVANCE

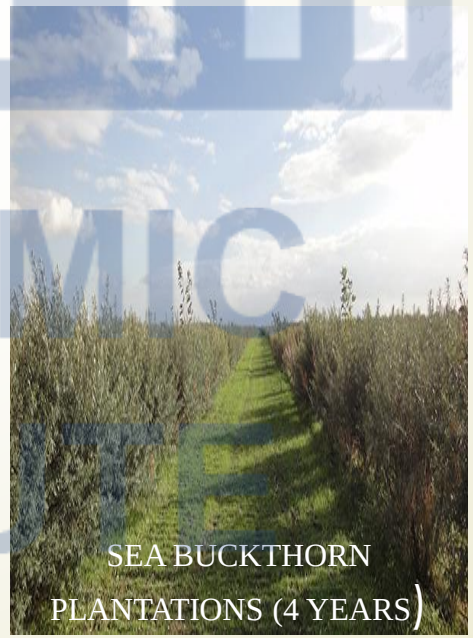
In the Baikal region, the industrial fruit and berry crop is sea buckthorn, known for its unique chemical composition and the content of valuable biologically active substances.

The areas occupied by sea buckthorn in the Republic of Buryatia amount to more than 650 hectares.

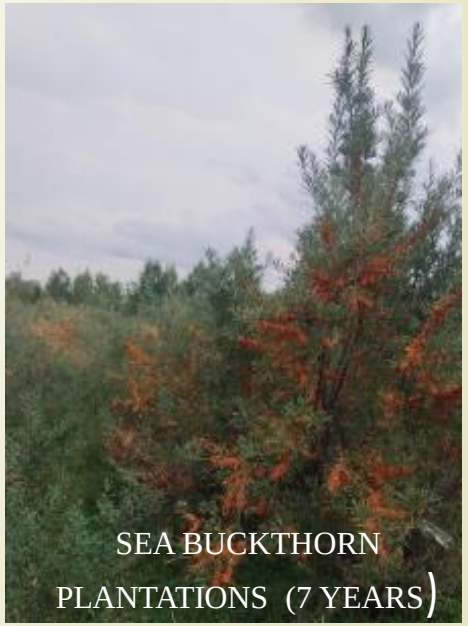
Potential of existing gardens annually allow growing and harvesting up to 600-900 tons of sea buckthorn fruits.



SEA BUCKTHORN CULTIVATION SYSTEM "ARTIFICIAL FOG"



SEA BUCKTHORN PLANTATIONS (4 YEARS)



SEA BUCKTHORN PLANTATIONS (7 YEARS)

PURPOSE:

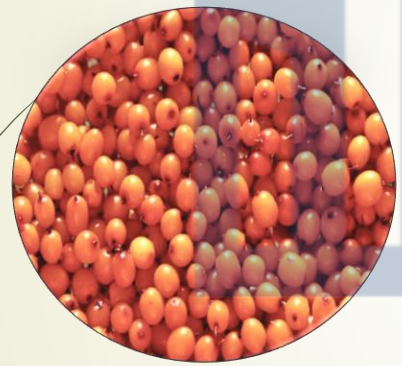
Scientific substantiation of the development of an innovative method for the complex processing of sea buckthorn fruits using microwave EMF.

TASKS:

- to determine the optimal parameters of the main technological operations of processing sea buckthorn fruits carried out using microwave EMF;
- to develop a technological scheme for the complex processing of sea buckthorn fruits.

MATERIALS AND METHODS

Sea buckthorn fruits frozen from the winter harvest (frozen naturally on the bush with a gradual decrease in ambient temperature to minus 25^0C)



Sea buckthorn fruits fresh from the autumn harvest

Sea buckthorn leaves and shoots

Sea buckthorn collected in the Selenginsky district of the Republic of Buryatia

MICROWAVE EQUIPMENT FOR SEA BUCKTHORN PROCESSING

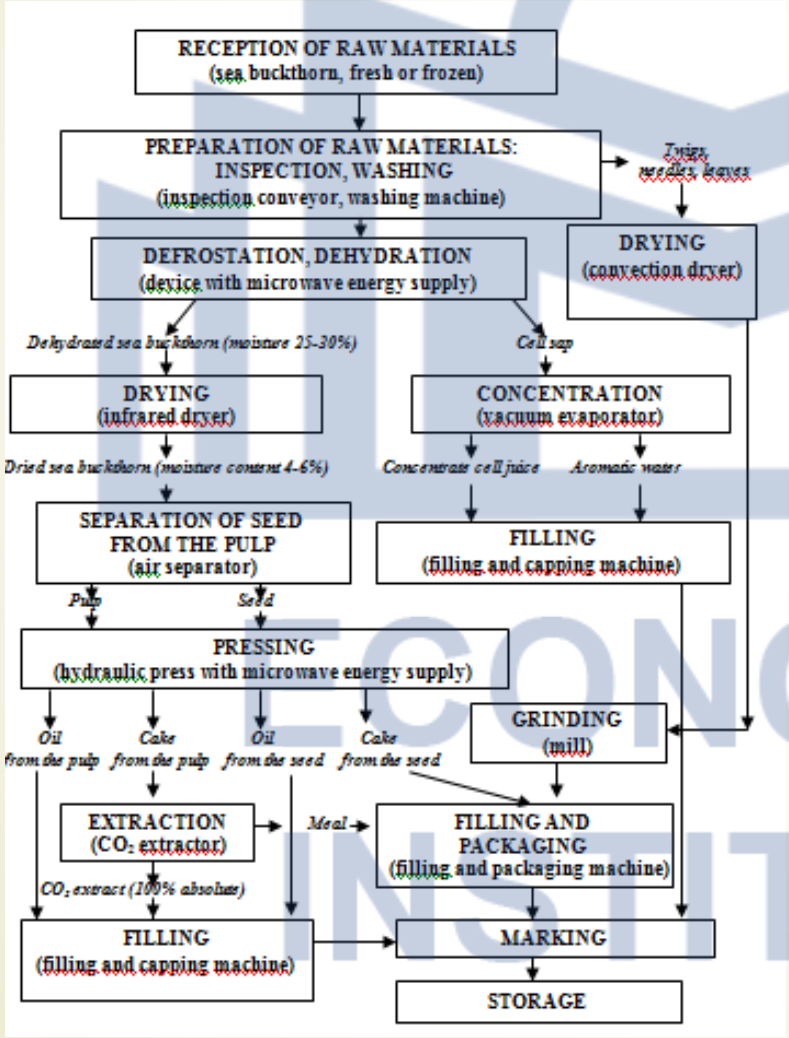
Microwave vacuum unit "Monsoon-2

Authors and designed for pressing fresh or dried sea buckthorn fruits to produce sea buckthorn oil or juice

OPTIMAL PARAMETERS OF DEFROSTING, DEHYDRATION AND PRESSING

Parameters	Experience number				
	1	2	3	4	5
Defrosting and dehydration (apparatus with microwave energy supply and vacuum)					
Temperature, ^{0}C	35	40	45	50	55
Pressure, kPa	8,2	8,5	8,8	9,1	9,4
Specific microwave power, W / kg	100	200	300	400	500
Duration of fresh fruit dehydration, minutes	85	80	75	70	65
Duration of defrostation of frozen fruit, minutes	12	10	8	6	4
Duration of fruit dehydration after defrostation, minutes	83	78	73	68	63
Product moisture (final),%	35±0, 12	30±0,13	25±0,12	20±0,12	15±0,13
Pressing (hydraulic press with microwave energy supply)					
Temperature, ^{0}C	35	40	45	50	55
Specific microwave power, W / kg	200	250	300	350	400
Duration, minutes	25	20	15	10	5
Oil yield,% - from pulp - from seeds	 80±0,12 70±0,14	 80±0,13 70±0,12	 80±0,12 70±0,14	 75±0,13 65±0,14	 75±0,12 65±0,13

TECHNOLOGICAL SCHEME OF COMPLEX PROCESSING OF SEA BUCKTHORN FRUITS



РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ИЗОБРЕТЕНИЕ

№ 2785625

СПОСОБ КОМПЛЕКСНОЙ ПЕРЕРАБОТКИ ПЛОДОВ ОБЛЕПИХИ

Патентообладатель: *Федеральное государственное бюджетное образовательное учреждение высшего образования «Восточно-Сибирский государственный университет технологий и управления» (RU)*

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Руководитель Федеральной службы по интеллектуальной собственности

Ю.С. Зубов

SEA BUCKTHORN PRODUCTS

PRODUCT TESTING

Research laboratories of the departments "Biomedical engineering. Processes and devices of food production", "Technological machines and equipment. Agroengineering" VSGUTU

The Center for collective use "PROGRESS" VSGUTU

Biotechnology Center VSGUTU

Federal Budgetary Institution "State Regional Center for Standardization, Metrology and Testing in the Republic of Buryatia and the Trans-Baikal Territory"

Veterinary Laboratory of the Republic of Buryatia

VECTOR TEST CENTER

SCIENTIFIC EDUCATIONAL CENTER "INDUSTRIAL BIOTECHNOLOGIES"

54 TEST REPORTS

THE RESULTS OF INTELLECTUAL ACTIVITY (RIA)

1	FRUIT AND BERRY DRYING LINE	RU №71059 16.10.2007
2	THE METHOD OF DRYING FRUIT AND BERRY RAW MATERIALS, MAINLY FROZEN	RU № 2322067 20.04.2008
3	A METHOD FOR OBTAINING POWDER FROM FROZEN FRUIT AND BERRY RAW MATERIALS	RU №2403791 20.11.2010
4	METHOD OF PRODUCTION OF DRY FRUIT AND BERRY JELLY	RU №2453220 20.06.2012
5	COSMETIC SOAP AND THE METHOD OF ITS MANUFACTURE	RU № 2471861 10.01.2013
6	HALVA PRODUCTION METHOD	RU № 2558287 27.07.2015
7	THE METHOD OF OBTAINING HONEY WITH ADDITIVES	RU № 2558286 27.07.2015
8	A METHOD FOR THE PRODUCTION OF A GUM-BASED CHEWING COMPOSITION	RU № 2558441 10.08.2015
9	METHOD OF PRODUCTION OF DRY TEA DRINK	RU № 2577124 10.03.2016
10	THE METHOD OF PRODUCTION OF DESSERT CEDAR PASTE	RU № 2636758 28.11.2017
11	A DEVICE FOR PRODUCING SEA BUCKTHORN OIL OR JUICE	RU № 187479 06.03.2019
12	A METHOD FOR OBTAINING A FOOD PROTEIN PRODUCT FROM PINE NUT CAKE	RU № 2730583 24.08.2020
13	**A METHOD OF COMPLEX PROCESSING OF SEA BUCKTHORN FRUITS**	RU № 2785625 09.12.2022
14	THE METHOD OF OBTAINING PLANT EXTRACTS	RU № 2810497 27.12.2023
15	HERBAL TEA WITH ADAPTOGENIC PROPERTIES	RU № 2826318 09.09.2024
16	THE METHOD OF OBTAINING A DRY INSTANT DRINK	RU № 2826732 16.09.2024

PRACTICAL IMPLEMENTATION

24 TECHNICAL CONDITIONS

28 TECHNOLOGICAL INSTRUCTIONS

36 ACTS OF APPROBATION, IMPLEMENTATION, RECEIPT OF PROTOTYPES AND BATCHES OF PRODUCTS

28 DECLARATIONS ABOUT COMPLIANCE

4 LICENSE AGREEMENTS

14 PATENTS FOR INVENTIONS

2 PATENTS FOR A UTILITY MODEL

3 KNOW-HOW

INDUSTRIAL PARTNERS

LLC
"SMALL INNOVATIVE ENTERPRISE
"BaikalEkoProdukt"

LLC
"SCIENTIFIC AND
PRODUCTION COMPANY
BAIKAL-BIOTECHNOLOGY

LLC
SEA BUCKTHORN PARADISE

AGROGROUP
"THE TEMNIK"

ADVANTAGES OF TECHNOLOGY

High quality products

Reducing the duration of the technological process

Receiving a wide range

Minutesimization of production waste

Energy and resource saving

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Thanks for your attention!