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АКТУАЛЬНЫЕ ПРОБЛЕМЫ ЕСТЕСТВЕННЫХ И ГЕОГРАФИЧЕСКИХ НАУК
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PRELIMINARY DATA DETERMINING THE NATURAL SEABUCKTHORN FROM BAYAN-ULGII AIMAG

Abstract

The oil contained in the Seabuckthorn seeds are significantly different in geographic regions and it is necessary to evaluate and make studies on the quality and quantity of Seabuckthorn oil in different regions depending on the criteria to discover natural ecotype and selective forms, usage of an additional raw material for producing the brand oils.

The natural Seabuckthorn oil studies in heights in Bayan-Ulgii Aimag have not been carried out, yet. Therefore, the oil analysis for samples collected from over 20 points in Altantsugts, Bugat, Bulgan and Tsengel Soums were determined by Agriculture Research Institute and National University of Mongolia in order to compare the Seabuckthorn fat in Khovd, Bulgan and Tsagaan rivers. Seabuckthorn oil of the rivers involved to the study in dry weight in autumn was 21.5% (16.9-30.0%), in winter 29.4% (18.7-34.6%) and in wet weight 3.77% (1.90-5.35%) and 4.56% (2.8-5.78%), respectively. The increase of 0.79% in winter is caused by the addition during the autumn. The dry weight of the fruit is 9.87-11.55%. Above indications were compared with the references determined by Mongolian and Russian joint researchers and were consistent with them and most of them were congruently. Fat content is uneven; therefore, it is possible that different natural types with their fat content could be discovered in the same river valley. Types of bigger fruit and more fat have been noticed in Tsagaan and Bulgan rivers. It was new aspect for the study that in points where the heights increase up to 1641-1986m the fruit fat content was increased with 2.8-5.0%. The seed oil in total rivers is 11.4% (9.4-14.0%) and it was emphasized that it is reverse content with 1000 seed weight. It is considered that repeated studies for the results mentioned above are necessary to carry out, continuously, especially to focus the biological active substances of the fruit oil which are vital for medicines and treatment.

Keywords: Bayan-Ulgii rivers, Seabuckthorn, seeds and fruits, volume and oil.

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БАЯН-ӨЛГИЙ АЙМАҒЫНЫҢ ШЫРҒАНАҚТАРЫНЫҢ ТАБИҒИ МАЙЛЫЛЫҒЫН АНЫҚТАУДЫҢ АЛҒАШҚЫ НӘТИЖЕЛЕРІ

Аңдатпа

Шырғанақтың жемісі, тұқымы және май құрамы географиялық зоналық айырмашылыққа ие. Шырғанақты бренд маркалы майлар өндіруде қосымша шикізат ретінде пайдалану үшін оның табиғи экотиптері мен селективті формаларын игерудің критерийлеріне байланысты әр түрлі аймақтарда шырғанақ майының сапасы мен санына баға беріп, зерттеулер жүргізу қажет болып табылады.

Баян-Өлгий аймағының таулы жерлеріндегі табиғи шырғанақтың майлылығын зерттеу жұмысы бұрын-соңды жүргізілмеген. Сондықтан Ховда, Булган, Цагаан өзендерінің бойындағы шырғанақтардың майлылығын салыстырып зерттеу мақсатында, жиырмаға жуық орыннан алынған үлгілерден майлылық талдау жұмыстарын «Мал шаруашылығы ғылыми зерттеу орталығы» мен «Монголдың ұлттық университетінде» сараптама жасалынды. Зерттеуге алынған өзендердің шырғанақ жемістерінің құрғақ салмағы күзде 21.5% (16.9-30.0% арасында), қыста 29.4% (18.7-34.6% арасында), ылғалды салмағы сәйкесінше 3.77% (1.90-5.35% арасында) және 4.56% (2.8-5.78% арасында) болатыны жеке жеке анықталды. Ал қыста 0.79%-пен қосылуы күз бойы сақталған қосынды болып табылады. Жемістердің құрғақ салмағы 9.87-11.55%. Бұл көрсеткіштерді монгол және орыс зерттеушілерінің сараптамаларымен салыстырғанымызда көпшілігі бірдей нәтиже көрсетіп отыр.

Шырғанақтың майлылығының құрамы әр жерде әртүрлі болатындықтан, қайсы өзен бойында қандай майлылыққа ие табиғи шырғанақ түрлерінің бар екендігін анықтауға болады. Үлкен жемісті майлылығы жоғары түрлері Цагаан, Булган өзен бойларында анықталды. Шырғанақ биіктігі 1641-1986 м дейін өсетін жерлерде жеміс майының 2.8-5.0%-ке артуы ғылыми зерттеу үшін жаңа аспект болып отыр. Барлық өзендерде шырғанақтың тұқым майлылығы 11.4% (9.4-14.0% арасында) болсада, 1000 тұқым салмағы бойынша жоғары көрсеткішті көрсетуі назар аудартып отыр. Жоғарыда көрсеткендей жақсы нәтижелерге жету үшін зерттеу жұмыстарын жалғастыру қажет. Бұл ең алдымен дәрілік заттар мен емдеу үшін маңызды жеміс майының биологиялық белсенді заттарын зерттеуде тіпті де маңызды деп тұжырымдаудамыз.

Түйін сөздер: Баян-Өлгий өзендері, шырғанақ, тұқым және жеміс, көлемі, майы.

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ПРЕДВАРИТЕЛЬНЫЕ РЕЗУЛЬТАТЫ ОПРЕДЕЛЕНИЯ ПРИРОДНОЙ ЖИРНОСТИ ОБЛЕПИХИ БАЯН-УЛГИЙСКОГО РЕГИОНА

Аннотация

Плоды, семена и содержание жира облепихи имеют географическую зональную разницу. Для использования облепихи в качестве дополнительного сырья при производстве масел торговой марки необходимо провести исследования и оценить качество и количество облепихового масла в различных регионах в зависимости от критериев осовения его природных экотипов и селективных форм.

В горных районах Баян-Ульгийского региона никогда ранее не проводились работы по изучению жирности дикой облепихи. Поэтому в целях сравнительного изучения жирности облепихи были собраны образцы с 20 мест вдоль рек Ховда, Булган, Цагаан и были проведены экпертизные работы в «Научно-исследовательском центре животноводства» и «Монгольском национальном университете». Было установлено, что масса сухих плодов облепихи взятых вдоль рек составляет осенью 21.5% (между 16.9-30.0%), зимой 29.4% (между 18.7-34.6%), масса свежих плодов 3.77% (между 1.90-5.35%) и 4.56% (между 2.8-5.78%) соответственно. А прибавка зимой с 0.79% это сумма, которая сохранялась всю осень. Сухой вес плодов 9.87-11.55%. Сравнивая эти показатели с экспертизами монгольских и российских исследователей, большинство исследовании показли один и тот же результат.

Поскольку жирность облепихи везде разная есть возможность определить жирность плодов у каждой реки. Крупноплодные высокожировые виды были обнаружены вдоль рек Цагаан, Булган. Также было выявлено что высоких местностях 1641-1986 м жирность плодов увеличилось от 2.8% до 5.0 %, это является новым аспектом для научных исследований. Во всех реках жирность облепихи составляет 11.4% (между 9.4-14.0%). Для достижения наилучших результатов, как мы показали выше, необходимо продолжить исследования. Мы считаем изучение биологический активных веществ содержащихся в масле облепихи важно, особенно для использования в лекарствах и лечения.

Ключевые слова: Реки Баян-Ульгий, облепиха, семена и плоды, размер и жирность.

Introduction. The oil content of the Mongilka subspecies (ssp. Mongolica Rousi) has a great evolution and fluctuation. The fruits of this subspecies, concentrated in Mongolia, are oiler than the Chinese and European subspecies, but are does not reach the cultivar value. The first 5 cultivars bred by natural selection in the south of Siberian Altai Russia. Currently, in Mongolia, the reason for studying the oiliness of natural sea buckthorn is the fact that natural sea buckthorn is of great importance as a valuable breeding material as the oil content and its quality, as a source for identifying species of selected ecological type, and is also a valuable raw material for the production of brand oils. In Bayan-Ulgiy aimak, the content of natural sea buckthorn oil has not yet been studied. Bayn-Ulgii aimak is the highest mountainous area where sea buckthorn is common, so our goal is to study the oiliness in fruits and seeds. This article presents preliminary comparative results of the oil of the fruit and seabuckthorn seed of the Khovd, Bulgan and Tsagaan rivers passing through several aimag sums.

Material and research methodology. Although it is one of the few plants with oil in the soft tissue of its fruit, sea buckthorn is only found in northern latitudes. The oil, which is mostly utilized to spread the fruit, may be related to its resistance to the cold. Sea buckthorn always grows up around areas of water including rivers and oceans. The fruit will consequently die in the water as soon as it drops from the bush.

A possible biological mechanism from this is that fruits need to reduce their specific gravity in order to float and spread over long distances in water rather than sink. For this reason, the writer of this line believes that it has evolved through the historical process of accumulating oil in the fruit to lighten its weight. The speed, duration, content and dynamic changes of oil synthesis in sea buckthorn fruit vary significantly, and this is largely dependent on the differences in classifications such as plant species, soil and climate, and other external environmental influences, and the geographical and climatic conditions of the growing regions. The maximum amount of oil accumulation in the fruit is highly dependent on its timing due to regional differences in growing season.

There are reports of the fall of the sea buckthorn leaves in Mongolia from September 25th (from September 15th in Bayan-Olgii, from October 13th in Kazakhstan, from October 8th in Belarus, and from the end of September in the North Caucasus. The vegetation period for this plant is 177 days in the North Caucasus, 146 days in Ulaan-Ud and 155 days in Alma-Ata. According to a recent study [1,3], oil in fruit increases above 2750 d.t.d) altitude, while seed oil decreases above 2500m. V.V.Mochalov (1973) said that sea buckthorn fruit oil tends to increase with age, but it accumulates intensively after the air temperature reaches minus degrees.

However, as we have determined in our country's conditions, the air temperature is warm, when fruits and juices are not frozen, oil accumulates a lot, which does not correspond to the above fact. All this is undoubtedly related to the problem of harvesting the fruit when it is rich in oil. The reasons for the variation in the amount of fruit oil extracted from sea buckthorn are the methods used, the calculation, the time of sampling, the unique environmental conditions of the region, and sometimes uncertainty. Grease averages are generally realistic and comparable. However, due to the variation in the average oil content of sea buckthorn berries, many researchers have compared dry and wet weight. It includes the calculation of dry weight:

-37.0% (V.N.Ruchkin 1929)
-20.0-37.15% (E.E.Shishkina 1977)
-15-50.0% (Y.Jamyansan 1971)
-20.0-25.0% (L.O.Shneidman 1973)
-15.7-32.6% (C.Tsenduru 1978)
-17.3-22.4% (C.Tsenduru 1996)
-34.0% (Chen at all. 1990. Quiren Gerald 1993)
2.0-2.1% (B.Dave Oomah 2003)
By counting the wet weight:
2.8-7.8% (V.A.Devyatinin; D.A.Obodovskaya 1955)
2.8-5.2% (D.A.Ovodovskaya 1957)
3.7-7.0% (D.Badga 1966)
2.7-6.1% (L.Schneidmon 1973)
4.1-13.1% (N.S.Salatovo Md 1974)
2.1-5.4% (P.Tsevegmed 1983)
2.7-6.6% (D.K.Shapiro 1985)
2.8-7.9% (C.Avdai; G.Chimed-Ochar 2012)
1.7-6.6% (Thomas C.S.Li 2003)
2.1-.3.5% (Thomas C.S.Li 2003 Europe and China)
By counting the wet weight in the varieties:
3.2-7.1% (B.Laghan 1986)

5.6- 6.9% (I.P.Yeliseev 1985)
4.49-5.15% (P.Tsevegmed 1987)
4.0-5.8 (O.Juperelma 2012)

You can see quite fluctuating amounts that are similar or different from the above mentioned indicators. Notably, the Chinese and European subspecies *(ssp.sinensis.ssp.rhamnoides)* are highly variable. But according to their calculations, the weight of one fruit is 270-400mg *(the average is 350mg)* the juice is 60-85% (the average is 73%).

So, 350mg of fruit has 16mg of oil, one seed has 16mg, it contains 1.6-2.4mg of oil, the juice has 1-2% oil, but the juice extracted from the fruit has 2.44-4.88% oil, etc. It is considered a Chinese sea buckthorn. Peeling oil is not included.

When calculating fruit oil as dry weight, the weight of one fruit was taken in two ways. The oil content of one fruit with seeds was 24.9% in Ulaangom and 25.34% in Zavkhan Borhgol, while the oil content of one fruit without seeds was 27.55% and 32.60% in both conditions [6].

In Bayan-Ulgii aimag, as a method of studying the identification of a natural polymorphic species, resource, distribution of natural sea buckthorn, during 2017 and in the beginning of 2018, when conducting research in the rivers Hovd (Bugat, Altantsuts, Bayannuur, Nogoonnuur), Nariin (Nogoonnuur), Tsagaan (Tsengel sum), Bulgan (Bulgan sum), samples of 500g each were taken 19 points, each point's GPS was marked, RILB (Research Institute of livestock breeding), MSU (Mongolian State University) laboratories were transferred and oiliness was determined. According to the common method of determining the oil, in the apparatus of Sakslet distilled with methanol for 6-8 hours, determined by the method of evaluation without oil residue.

The result of the study. From samples collected in august, september, in the Tsagaan, Bulgan rivers, oil content was determined in the RILB laboratory (Table 1).

Table 1 - The rate of oil in the sample of the autumn fruit

Place taken samples, different values of the bush		Altitude м	100 mass of fruit, g	Oil content, %	
				In dry weight	In wet weight
Hovd river	Altantsugts sum	1641			
	1		22.0	30.0	2.26
	2		24.0	18.9	5.07
	Average		23.0	24.45	3.65
	Bugat sum	1705			
	1		24.0	19.8	4.75
	2		23.0	21.6	2.76
	3		32.0	21.6	4.60
	4		21.0	18.3	1.90
	Average		25.0	20.32	3.50
	Nogoonnuur sum	1643			
	1		22.0	18.0	2.32
	2		23.0	19.6	2.25
	3		24.0	19.9	2.27
	Average		23.0	19.16	2.28
Tsagaan river	Tsengel sum	1986			
	1		42.0	20.1	4.22
	2		40.0	16.9	4.22
	3		41.0	19.9	3.88
	Average		41.0	18.96	4.10
Bulgan river	Bulgan sum	1935	32.0	25.1	5.35
Total variation	13		28.46 21.0-41.0	21.58 16.9-30.0	3.77 1.90-5.35

As shown in Table 1, in dry weight, the average oil content in the total sample is unimodal, but varies in each river valley. In samples taken in the Bugat sum, the weight of 100 fruits is different, but the oil content is unimodal, on the contrary, the samples in Nogoonnuur and Tsengel sum have a unimodal oil level, but the weight of 100 fruits is different. When calculating in wet weight, in Altantsugts and Bugat sums, the samples vary greatly, but in samples in Nogoonnurr sum the oil level is unimodal, moreover in Tsengel, Bulgan sum the oiliness of the fruit is higher than in other places and in general, all samples vary in oil content, weight of 100 fruits.

The study was conducted in early winter and late autumn, samples were collected from the Tsagaan, Hovd, Bulgan, Nariin rivers and oil content was determined in the MSU biochemical laboratory (Table 2).

Table 2 - Determination of oil index for winter fruit and seed sample

Place the sample, the appearance of the fruits	Dry part of the fruit, %	Fruit oil, %		Seed	
		In dry weight	In wet weight	Oil, %	1000 seed weight /g
Tsagaan river (Tsengel) Fruit color is orange, small size, oval shape	11.17	32.80	5.78	11.0	14.6
Hovd river (Altantsugts) reddish yellow, medium, rounded	9.87	34.6	4.98	9.8	14.3
Bulgan river (Bulgan) Bright yellow, small, rounded , sour	11.55	18.70	2.80	9.4	13.0
Nariin river (Nogoonnuur) Yellow, small, rounded	10.47	31.5	4.68	14.0	11.4
Average	10.76	29.4	4.56	11.05	13.3

Table 2 shows that the amount of fruit oil in dry weight increased by 7.82% than autumn, in wet weight increased by 0.79%. Only in the river Bulgan decreased. In the river Tsagaan, Hovd, Nariin are almost the same. In these 3 rivers it was found that the weight of seed oil is less, and the weight of 1000 seeds is more. Only in the river Nariin, when seed oil was high, the weight of 1000 seeds was low. The average oil content was 29.4% (18.70-34.6%) and 24.56% (2.8-5.7%), and seed oil was 11.05% (9.4-14.0%), the weight of 1000 seeds is 13.3% (13.0-14.6%). Seeds in the Nariin River are the most fat.

Reviewing. The Mongolika *(ssp.mongolica Rousi)* subspecies with a feature of Mongolia is the center of our country and the natural sea buckthorn Bayan-Ulgii belongs to this. When comparing studies of Mongolia and Russia, in the rivers of Bayan-Ulgii during the period of biochemical maturation, the oil of the fruits is 16.9-30%, and by *(Ts.Tsendeekhuu 1978)* is 15.7-32.6%. When comparing in winter, it is 18.7-34.6%, and by *(E.E.Shishkina, 1977)* it is 20.0-37.1%, which is almost the same. And according to *(Ya.Jamiyansuren, 1971),* it is 15-50%, here the upper volume is high, this is due to the fact that the cultivar was included. When calculating the oil in wet weight, 2 volumes 1.90-5.35% and 2.8-5.7%, which we determined are almost the same from 2.1-5.4% *(P.Tsevegmid, 1983)*, 2.8-5.2% by *(D.A.Obodovskaya, 1957)*. In addition, in terms of 2.8-7.9% *(Ch.Avdai, G.Chimed-Ochir, 2012)*; 3.2-7.1% *(B.Laagan, 1986)*; 4.0-5.8% *(U.Juuperelmaa, 2005)*; 2.7-6.6% *(D.K.Shapiro, 1985),* the upper volumes are high, perhaps this is due to the fact that cultivars mixed or were identified according to one cultivar [2,3,4].

Thus, the level of oil content of natural sea buckthorn in Bayan-ulgii and its fluctuations are characteristic of the Mongolian subspecies. The tendency to increase the oil of fruits at an altitude of 1641-1986m is a new case and similar regularities have been investigated in the highlands of Tibet [3,7,8]. In its work, from the altitude of 2300m the content of soft tissue's oil of sea buckthorn steadily increases, from 2900m to 3000m it increases sharply and reaches a maximum at an altitude of 3200m. In contrast, seed oil decreases with increasing altitude Along the Hovd River,

in the Altantsugts sum (1641m), the oil content is 2.83% and 6.95%, in the Bugat sum is 2.74% and 5.94%, the difference is due to the fact that there are hidden stocks of sea-buckthorn with different contents oils. Sea buckthorn fruits in Tsengel and Bulgan sum have a high oil content, this is probably due to the altitude. It is important that further multilateral studies be carried out, because fruit oil is a very volatile subject and depends on internal and external causes. The fruit weight (100 fruit mass) for research collected from rivers averages 28.46g (21-41g), is on average somewhat less, the variation is greater from the rivers Selenge, Zavkhan, Tes, Hovd (Erdeneburen), Bulgan (Hovd), which is a feature [6,9,10]. According to the researchers, a weak inverse correlation dependence was found between the mass of the fruis and the oil content, and this dependence was not observed in Bayan-Ulgii. what further attention needs to be paid to is that in Bayan-Ulgii mountain range, there is an inverse dependence between the mass of the fruit (1000 fruit mass) and the oil containing in it.

Conclusion. 1. If you combine the average value of the oil content of the fruit along the rivers Hovd (Altantsugts, Bugat, Nogoonnuur sums), Tsagaan (Tsengel sum), Bulgan (Bulgan sum): in dry weight in september, 21.5 ± 0.8%, in december and january 29.4 ± 1.0, the fluctuation is (16.9-30.0%) and (18.7-34.6%) in these months, in wet weight 3.77 ± 0.3% and 4.56 ± 0.5%, the variation is (1.9-5.3%) and (2.8-5.7%). When frostbite, the oil of the fruit increased slightly, this is due to accumulation on warm autumn days. The quantitative value of the oil content of the fruit of the natural sea buckthorn in Bayan-Ulgii as a subspecies of the Mongolika (ssp.mongolica Rousi) is equatable if you compare long-term studies of Mongolian and Russian researchers.

2. New trends in the increase in oil content from 2.8% to 5% were found at altitudes of 1641, 1643, 1705, 1935, 1986m. In Mongolia, the highest point (1986m) sea buckthorn growth in the Tsagaan River.

3. In the rivers where research was conducted, the content of sea buckthorn seed oil is 11.4% (9.4-14.0%). In the Tsagaan river, the weight of 1000 fruits was greater (14.0g), and the oil content was less (11.0%), also in the Nariin river the weight was less (11.4g), and the oil content was higher (14.0%).

4. In the rivers of Tsagaan, Bulgan large fruits with better oil content were observed.

5. This is the first preliminary result and I assume in the future, for various purposes, the oil content will be repeated. On the other hand, it is important to consider a comparative study of the biologically active substances contained in the oil of sea buckthorn seeds and fruits, growing in the highlands of Bayan-Ulgii, which are of great importance for medicinal drugs and therapeutic properties.

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ДҮНИЕЖҮЗІНІҢ САЯСИ КАРТАСЫНДАҒЫ ШИЛЕНІСТІ АЙМАҚТАР ЖӘНЕ ҚАЗАҚСТАННЫҢ ГЕОСАЯСИ МҮДДЕСІ

Аңдатпа

Мақалада геокикілжіңнің теориялық негіздері, кезеңдері мен деңгейін сондай-ақ жіктелуі қарастырылады. Әлемнің әртүрлі аймақтарындағы қақтығыстарға қатысты негізгі теориялық және практикалық аспектілер зерттеледі. Атап айтқанда, аймақтық шиеленістердің негізгі экономикалық, саяси-идеологиялық, және әлеуметтік себептерін талқылап елдер ішіндегі және арасындағы қақтығысты талқылайды.

Мақаланың бөлімі бойынша түрлі қақтығыстарға талдау жүргізу, нақтырақ айтқанда - қақтығыстардың өңірлері, аумақтық ерекшеліктерін, қақтығыстың түрлі себеп- салдарын әртүрлі ушыққан аймақтардың мәртебесін және қақтығыстардың негізгі нүктелерін зерделейді. Мсыалы Ресей-Украина, Орталық Азияда, Балқанда, Таяу Шығыста, Африкада және Еуропа мен Американың кей жерлерінде орын алған шиленістер талқыланады.

Геокикілжіңдердің саны жыл өткен сайын артып отыр. Оның жалпы мемлекет және аймақ үшін келтіретін зардабы ауыр. Ол мемлекеттік қауіпсіздікке, саяси тұрақтылыққа кері әсере етеді. Әсіресе Қазақстан секілді жас, тәуелсіз елдер үшін аймақтағы саяси тұрақтылықтың маңызы зор. Сол үшін әлемдегі және аймақтағы, тіпті ел ішіндегі түрлі геокикілжіңдерді, қақтығыстарды ғылыми түрде зерттеудің және одан лайықты қорытынды шығарудың тиімділігі жоғары болады.

Осындай ауқымды тақырыпты зерттеу барысында сан түрлі әдістерді қолдануға тура келеді. Мәселен, тарихи-географиялық, мұрағаттық, баяндау, статистикалық және салыстыра