

observed in the first and second year of life in infants with IUGR.

But at the same time, when studied NPD of infants with IUGR 16 (39%) who began attending infant schools at the age of 2, in 4 (25%) children determined inhibition in the acquisition of new skills of speech and motor functions. From which it was concluded that such a regression may have been related to the difficulties of adapting to a new social environment, which can be considered as a failure to provide an adequate response of immature structures of central nervous system.

Thus, from the above it can be concluded that:

1. Inhibition in NPD in hypotrophic babies most pronounced in the first year of life.
2. In infants with IUGR in 2 and 3 year of life are revealed backlog in motor and speech development.
3. Low birth-weight babies require much attention and individual approach, for the first three years of life, not only to maintain their physical health, but also to create favourable circumstances for their full-grown mental and physical development.

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**CREATION OF INNOVATIONAL  
PRODUCTION ON THE BASIS  
OF SCIENTIFIC DEVELOPMENT  
OF THE COMPOUNDING AND MODERN  
TECHNOLOGIES**

Zakutnova V.I., Zakutnov O.I.

*Astrakhan state university, Astrakhan,  
e-mail: zakutnov-oleg@mail.ru*

With the purpose of creation of innovational production family Parmeliaceae (Parmeliaceae) which is one of conducting families of the Bottom Volga region, including 16 kinds of lichens is investigated. By scientists of the Astrakhan state university at support «the State Fund of assistance to development of small forms of the enterprises in scientific and technical sphere of Moscow» it is received two kinds of new production: fitotea «Parmelin» and «Immunodelirijushchie sugar candies» with use of lichen *Parmelia wandering* (*Xanthoparmelia camtschadalis*) which is brought in the official pharmacopoeia of the Russian Federation as a herb. At research methods were used: definition of non-polluting routes, creation of modelling sites territories of gathering of raw material, studying of criteria of parameters of a condition of lichens as indicators, calculation of bioresources, biochemical researches.

For creation of innovational production gathering the lichens growing in the Bottom Volga region is carried out. At studying lichenoflora have paid attention to family Parmeliaceae (*Parmeliaceae*) which is one of conducting families of the Bottom Volga region.

In use of lichens in national medicine it is possible to plan a number of stages, since an extreme antiquity. They were used for the medical purpose by ancient Egyptians 200 years prior to AD. In XVIII c. and in first half XIX c. lichens are used in medicine on more scientific basis, then even bring in official pharmacopoeias of the different countries. According to the literary data gathering of lichens were carried out by V.P. Savichev in Leningrad region for development and creation of antitubercular preparation «Binan» [11, 12].

In 1940–1950 years in Shvetsary, Finland, USA, Japan, Spain, Italy and in Soviet Union – were studied antimicrobial properties of lichens.

In 1952 by German scientists was received antibiotic preparation from lichens – «Evozin-2», or parmicin which apply to treatment of the open form of a tuberculosis easy the person. In 1954 the Spanish scientists have received the new medical preparation consisting of lichens – usnimicin for treatment of skin diseases [5].

In Russia in a department of Laboratory lichenologiya of and of a briologiya Botanical institute V.L. Komarova of the Russian Academy of Science carries out biochemical researches of lichens, practical recommendations and techniques of reception usninovy acids and specific substances are given. The St.-Petersburg state chemical and pharmaceutical academy has created preparation «Islacet» for preventive maintenance and treatments of a tuberculosis in conditions of Far North. The Novosibirsk institute of organic chemistry of N.N. Vorozhtsov of the Russian Academy of Science (NIOCH-RAS) – created a way of receiving usninovy acid.

**Materials and methods of researches.** Special researches of lichens of family Parmeliaceae were carried out within the framework of research developmental works (FRDW) on revealing places of growth. Gathering and initial processing of a material in field conditions carried out on traditional in lichenologiya to a technique in which basis the anatomo-morphological method and application of reactants lays [9].

With the purpose of definition of non-polluting routes of the Bottom Volga region areas of growth of lichens of family *Parmeliaceae* were investigated;

- the buffer zone – soils (the bulk of population of lichens of family Parmeliaceae grows on alluvial cespitose saturated, alluvial meadow saturated, alluvial cespitose and carbonate, brown semidesertic soils) [10] is studied;

- cartographical modeling of studied sites of growth of lichens of Parmeliaceae family with the indication of the area of a covering and with entering of data is carried out to information system – the Database (Db) for further zoning (allocation of zones for environmentally friendly territories for collecting raw materials) [1, 2, 7];

For definition of natural stocks of family Parmeliaceae have made calculation of bioresources by standard geobotanical techniques.

During work the laboratory method of research of raw material was used:

- realization of laboratory researches of raw material (humidity, organic and mineral substances);
- development of technology of modes of processing of raw material: drying, a various degree of a grinding, temperature modes;
- dry combustion of the dehydrated and dried samples;
- extraction, determination of parameters of the received extracts;
- selection of a compounding of pre-production models with various flavouring qualities and definition of physical and chemical parameters of the received samples of finished goods;
- development of specifications on finished goods, certification and the declaration.

Results of research and their discussion. Researches lichenoflores the Bottom Volga region have shown necessity of development of the «know-how» of innovational production from local natural raw material.

In connection with uniqueness of vegetative raw material (powder *Parmelia wandering* – *Xanthoparmelia camtschadalis*), containing vegetative iodine, on modern manufacturing techniques of production is processed so, that in a result is opened the parmeliya cellulose, and useful yodoorganichesky connections become bioaccessible, that allows

to use vegetative iodine as a component for release iodated production of various purpose, and also as independent foodstuff.

Lichens of family *Parmeliaceae* are chosen us for research still because from ancient times are known as the richest source of useful organic and mineral substances (N, P, K, Ca, I). Besides in lichens there are organic acids, enzymes and antibiotics [6, 8].

For research of non-polluting routes of gathering of raw material of family *Parmeliaceae* by us criteria – parameters of a condition of lichens as indicators of an ecological condition of territory, according to the standard table for geobotanical researches are developed. For maintenance of reasonable wildlife management (gathering of lichens without infringement of integrity of all population), the information on a condition of kinds – indicators is. At gathering raw material have studied the processes determining seen changes of the indicator (the sizes, color, quantity tallomes on unit of the area). Kinds – indicators are easily accessible to supervision. For this purpose have made a bookmark of modelling sites in areas of gathering of lichens and mapping places of gathering, with the indication of the area of a covering for Database (DB) [13].

Biochemical researches of raw material of lichens of family *Parmeliaceae* are submitted in the Table.

Biochemical researches of lichens

The name of areas of the Bottom Volga region of gathering of samples	Moisture	Nitrogen	Phosphorus	Kalium	Calcium	Iodine	Protein	Fat	Ashes
Percenton absolutely dry substance									
1. Volodarsky area	9,8	0,46	0,42	0,16	0,03	0,05	2,88	10,11	7,44
2. Kamyzyaksky area	6,3	0,37	0,10	0,15	0,07	0,04	2,31	9,69	6,97
3. Ikryaninsky area	5,3	0,41	0,40	0,13	0,06	1,0	2,56	17,01	6,66
4. Chernoyarsky area	7,4	0,44	0,10	0,12	0,02	1,05	2,75	10,72	7,03
5. Krasnoyarsk area Baire hillocks	7,1	0,43	0,09	0,14	0,02	0,4	2,69	10,24	6,84
6. Enotayevsky area	7,9	0,41	0,20	0,11	0,03	1,05	2,56	10,97	7,01
7. Bogdinsko-Baskunchaksky reserve B.Bogdo's mountains	7,4	0,44	0,10	0,12	0,02	1,06	2,70	10,78	7,04

Biochemical researches have shown, that lichens contain various mineral substances, including vegetative iodine. And in Ikryaninsky, Chernoyarsky, Enotaevskom areas and vicinities of mountain Big Bogdo's Bogdinsko-Baskunchakskogo reserve of iodine on absolutely dry substance contains from 1% up to 1,06%. Production received from family *Parmeliaceae*, containing the vegetative iodine, convenient and effective means for completion of insufficient receipt of iodine with food.

After the carried out biochemical researches on the basis of the balanced composition pre-pro-

duction models: Fitotea «Parmelin» and «Immunodelirujushchie sugar candies» were created.

For industrial production of production design and budget and allowing documentation was developed and received.

Into composition Fitotea «Parmelin» also enter: a glycyrrhiza root, camomile flowers and calendulas, the leaves of mint having immunodelirujushchi effect.

Fitotea «Parmelin» it is recommended at bronchites, diseases of a gastroenteric path, at the ENT SPECIALIST diseases of the top and bottom

respiratory ways and for completion of a lack of iodine in an organism. Supplements a composition green tea which has expressed antiseptic and bactericidal an effect that makes a drink especially useful to a gastroenteric path. Green teas in composition with medicinal herbs not only interfere with adjournment of fats and zhiropodobny substances (lipids) on walls of vessels, but also destroy already available fatty deposits, having powerful antisclerous effect.

«Immunodelirujushchie sugar candies» also are created on the basis of an extract of lichens of family *Parmeliaceae*. Create good effect at the ENT SPECIALIST diseases of the top and bottom respiratory ways.

Both products are patented and received:

– The patent for the invention № 2366199 «FITOTEA PARMELIN», is registered in the State register of inventions of the Russian Federation September, 10, 2009 [3].

– The patent for the invention № 2402226 «IMMUNODELIRUJUSHCHIE SUGAR CANDIES», is registered in the State register of inventions of the Russian Federation October, 27, 2010 [4].

Innovational products are awarded with Diplomas VIII and XII Moscow International interior of innovations and investments. Moscow, the All-Russia Exhibition Centre, 2008 and 2012. The diploma of VI specialized exhibition «Education – investments in success – 2011».

Novelty of development of «know-how» Fitotea «Parmelin» and «Immunodelirujushchie sugar candies» on the basis of vegetative, regional raw material of families of the *Parmeliyevy* (*Parmeliaceae*) is, that such production never was created in the Astrakhan area earlier and there are no analogues on creation of this production on the basis of lichens in Russia.

Now the caramel production technology with immunomodelling properties on the basis of vegetable raw materials of family of *Parmeliyevy* (*Parmeliaceae*) is developed.

New FRDW are necessary to develop the modern competitive goods on the basis of unique natural raw material.

#### References

1. Zakutnova V.I. Lichen in ecological monitoring the Astrakhan region / V.I. Zakutnova // the Bulletin of the Orenburg state university // Orenburg. – 2004. – № 4. – P. 100–107.
2. Zakutnova V.I. Monitoring of lichens of delta of Volga. The monography / V.I. Zakutnova, T.A. Pilipenko // Publishing house AIF. – Astrakhan, 2004. – 115 p.
3. Zakutnova V.I., Zakutnov O.I. Fitotea Parmelin // the Patent of the Russian Federation for the invention N 2366199 from 10.09.2009.
4. Zakutnova V.I., Zakutnov O.I. Immunodelirujushchie sugar candies // the Patent of the Russian Federation for the invention № 2402226 from 27.10.2010.
5. Zakutnova V.I. Lichen of Checheno-Ingushetiya and their economic value / V.I. Zakutnova, L.S. Musina // the printing House of a name of I.N.Zabolotnogo. Grozne. 1986. – P. 4–6.
6. Litvinov M.A. Experimental studying antibiotic properties of the lichens growing in the USSR / M.A. Litvinov, K.A. Rassadina // Botan. mag. – 1958. – Vol. XIII. – № 4.
7. Martin J.L. Lihenoindikatsionnoye mapping of pollution of atmospheric air // the International school on lichenoidindication. – Tallinn, 1984. – P. 15–34.
8. Moiseeva E.N. Biochemical of property of lichens practical value // An academy of sciences of the USSR. M., 1961. 82 p.
9. The Determinant of lichens of the USSR. L, 1974. Vol. 4.
10. Pilipenko V.N. Ecolog of biosystems: problems of studying, indication and forecasting / V.N. Pilipenko, A.V. Fedotova, L.V. Jakovleva, S.N. Perevalov // Ground. Astrakhan: the printing House «Nova». – 2007. – 32 p.
11. Savich V.P. Lichen, their use in medicine and reception of a new antibiotic binan // The collection. New antibiotic binan, or sodium salt of usninovy acid. – M.-L., 1957. – P. 7–29.
12. Cerbelaud R. Lichens aromatiques Evernia et Sticta. La parfumerie moderne. – 1928. – № 5. – P. 3–17.
13. Zakutnova V.I. Influence of heavy metals on lichens / V.I. Zakutnova, T.A. Pilipenko // the Bulletin of the Orenburg state university. – Orenburg, 2004. – № 12. – P. 112–116.

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