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LEMON HEALTH PROPERTIES, CONTENT AND USE OF LEMON ESSENTIAL OIL

©*Alibeili Kh.*, Institute of Dendrology Ministry of Science and Education of Azerbaijan Republic, Baku, Azerbaijan, *xeyleelibeyli@gmail.com*

©*Sadigov T.*, Ph.D., Institute of Dendrology Ministry of Science and Education of Azerbaijan Republic, Baku, Azerbaijan, *sadigovtofig@mail.ru*

ПОЛЕЗНЫЕ СВОЙСТВА ЛИМОНА, СОДЕРЖАНИЕ И ИСПОЛЬЗОВАНИЕ ЛИМОННОГО ЭФИРНОГО МАСЛА

©*Алибейли Х.*, Институт дендрологии Министерства науки и образования Азербайджанской Республики, г. Баку, Азербайджан, *xeyleelibeyli@gmail.com*
©*Садыгов Т.*, Ph.D., Институт дендрологии Министерства науки и образования Азербайджанской Республики, Баку, Азербайджан, *sadigovtofig@mail.ru*

Abstract. The presented article provides information on the chemical composition of the essential oil obtained from the fruits of the lemon tree cultivated in the Lankaran and Astara districts of Azerbaijan, which have a subtropical climate, and its application in various fields of industry. During the research, essential oil was obtained from lemon fruits and leaves collected from the southern regions of Azerbaijan by the Ginzberg hydrodistillation method in the Industrially Important Plants laboratory of the Institute of Dendrology. The component composition of the obtained essential oil was analyzed in Kristal 2000 M gas chromatography. The areas of application of lemon essential oil have been investigated: Lemon essential oil has a pleasant aroma. Citral is the component that gives the specific pleasant smell of lemon. 90% of its composition is terpene-limonene, and 3-6% is citral aldehyde. Since lemon essential oil is of high quality, it can be widely used in various fields of industry.

Аннотация. В статье представлены сведения о химическом составе эфирного масла, полученного из плодов лимонного дерева, возделываемого в Ленкоранском и Астаринском районах Азербайджана, имеющих субтропический климат, и его применении в различных областях промышленности. В ходе исследований эфирное масло было получено из плодов и листьев лимона, собранных в южных районах Азербайджана методом гидродистилляции Гинзберга в лаборатории промышленно важных растений Института дендрологии. Компонентный состав полученного эфирного масла анализировали на газовой хроматографии «Кристалл» 2000 М. Исследованы области применения эфирного масла лимона: эфирное масло лимона обладает приятным ароматом. Цитраль — компонент, придающий специфический приятный запах лимона. 90% его состава составляют терпен-лимонен, а 3–6% — цитральальдегид. Поскольку эфирное масло лимона отличается высоким качеством, его можно широко использовать в различных областях промышленности.

Keywords: lemon, essential oil, cosmetology, aromatherapy.

Ключевые слова: лимон, эфирное масло, косметология, ароматерапия.



Citrus plants are successfully cultivated in Lankaran and Astara regions of Azerbaijan with a subtropical climate. The composition of citrus plants, which have high economic efficiency, is rich in many substances necessary for the body. Among the citrus plants, lemon is the most widespread and used. Lemon is a very useful plant. The leaves, flowers, and fruit peel of the lemon tree are rich in essential oils. Essential oils have a therapeutic effect on the human body. In recent years, the demand for essential oils continues to increase day by day. Essential oils are mainly used in medicine, aromatherapy, perfumery, food industry. Lemon essential oil is liquid and has a pleasant aroma. Lemon oil is mostly used in the perfumery industry. In recent years, citral aldehyde with a pleasant smell has been obtained from lemon leaves, which is used in the treatment of hypertension in the form of a 2-3% alcoholic solution.

Material and methods

The research work was carried out on the lemon (*Citrus limon* (L.) Burm. f.) plant cultivated in Lankaran and Astara regions, which have a subtropical climate in the southern region of Azerbaijan. Lemon tree leaves and fruit peels were used for the research. The rind of the lemon fruit contains up to 3-6% essential oil. In the "Industrially Important Plants" laboratory of the Institute of Dendrology, essential oil was obtained from the leaves and peels of the lemon tree by the hydrodistillation (Ginzberg) method (Figure 1). The component composition of the obtained essential oil was analyzed in "Kristal" 2000M gas chromatography. It has been found that lime essential oil contains strong chemical components such as α -pinene, camphene, β -pinene, sabinene, myrcene, α -terpinene, linalool, β -bisabolene limonene.

It is possible to remove the essential oils from the peel of lemons, a citrus plant, without distillation, by expelling the essential oil from the solution obtained by squeezing.



Figure 1. Getting the essential oil

Results and discussion

Lemon (*Citrus limon* (L.) Burm. f.) is a type of plant belonging to the Rutaceae family (Figure 2). Its homeland is ancient India. It is a 3-7 m tall, evergreen, thorny small tree with a

retractable umbel. The bark of the branches is green, thin, covered with gray cracks. The leaves are oblong-ovate, small-toothed at the tips, leathery, with a specific lemon smell. There are light-emitting glands on it. Flower buds are small. The flowers are white, fragrant, on short wingless stalks. Fruits are ellipsoid, sometimes girdle, light yellow, skin is glandular [4]. Lemon is a tree that blooms all year round. There are ripe and unripe fruits on it at the same time. The fruit has a very pleasant smell and contains many seeds. It contains vitamins B1 and B2, as well as a lot of vitamin C in its fruits and leaves. The juicy fruit of the lemon is valuable. It contains 4.14-5.87% citric acid and 2.06 and 3.78% sugar [3].



Figure 2. *Citrus limon* (L.) Burm. f.

In our country, lemon occupies a special place among fruit plants. Lemon fruits have high nutritional value and medicinal value. Lemon fruits are widely used in medicine. Lemon is a long-lived plant. There are about 200 varieties of lemons. Among them, Meyer, New Georgia, Lisbon, Villa-Franca, and Udarnik varieties are more widespread in our country. Lemon ripens mainly between September and December [2].

The lemon species is very sensitive to temperature. The plant get damaged at low temperatures. It is a light and moisture demanding plant. It has normal color and productivity in sandy type fertile soils with high water and air permeability. Lemon is propagated by seeds and vegetatively.

The peel of lemon fruits contains up to 0.6% essential oil with a pleasant smell. The essential oil contains up to 90% terpene limonene, 3-6% citral aldehyde and 1% geranyl acetate, which are considered the most valuable components of lemon oil. Lemon oil is mainly used as the most valuable flavoring agent in the perfumery industry. In addition to the essential oil, a large amount of flavonoids (citrine) and furocoumarins with P-vitamin properties have been identified in the peel of the fruits [1].

Sodium citrate is prepared from citric acid, which is used as a preservative for donor blood in blood transfusion institutes. In addition, lemon fruits are very useful for angina and avitaminosis. Dried fruit peels have appetizing properties. Lemon juice is recommended for low stomach acid, rheumatism and gout. It is widely used as a diuretic and against nausea [1].

During the research, essential oil was obtained from the peels of the leaves and fruits of the lemon plant collected from Lankaran and Astara regions in the laboratory by hydrodistillation (Ginzberg) method (Figure 3).

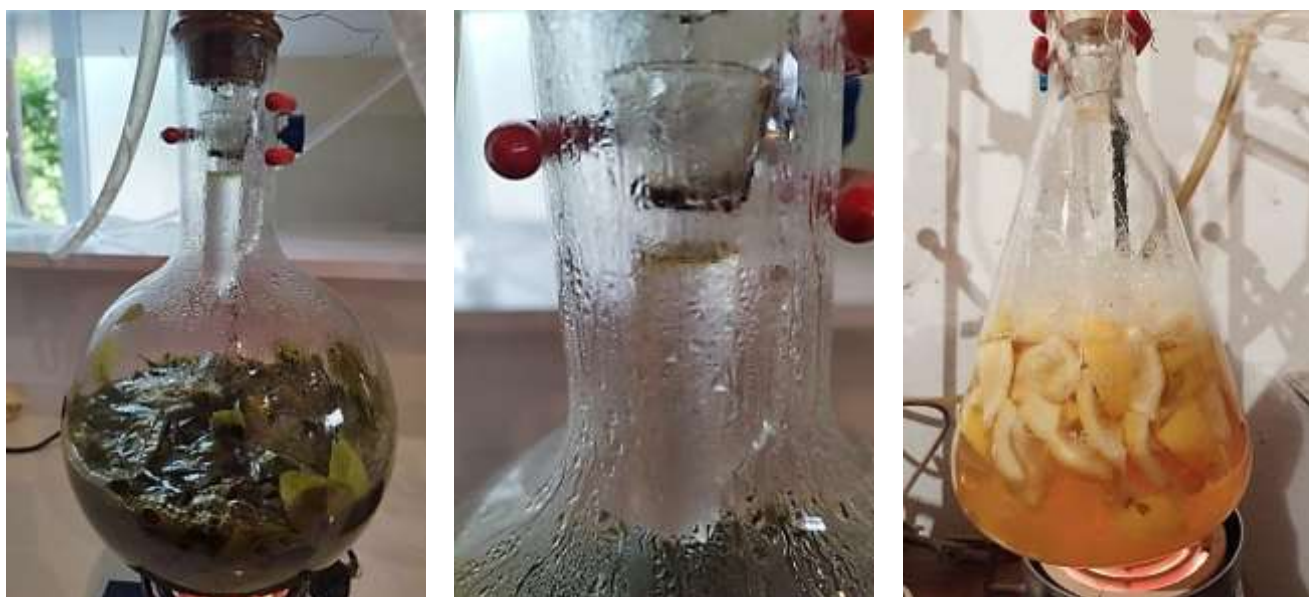


Figure 3. In the laboratory

The component composition of the obtained oil was analyzed in a "Kristal" 2000M gas chromatograph. Based on the results of the analysis, lemon essential oil contains chemicals such as α -pinene, camphene, β -pinene, sabinene, myrcene, α -terpinene, linalool, β -bisabolene linonene.

Conclusion

During the conducted scientific-research works, essential oil was obtained from both the leaves and fruit peels of the lemon plant in laboratory conditions. The component composition of the obtained essential oil was analyzed in "Kristal" 2000M gas chromatography. Studies show that the use of essential oil obtained from the peels of lemon fruits in medicine, cosmetology, aromatherapy, and food industry is of great importance.

Essential oil obtained from the peel of lemon, which is considered a very useful fruit, has an antibacterial effect. It helps protect the skin from germs and harmful external factors. The biologically active substances contained in lemon essential oil have a positive psychological effect on a person. The lemon plant, which has multifaceted importance, is suitable for wide use in various fields of industry.

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