JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205

Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

MOMORDICA CHARANTIA L. (INDIAN POMEGRANATE) CHEMICAL COMPOSITION, BENEFICIAL PROPERTIES AND METHODS OF USE

Yarmukhammedov Jasur Mansurovich
Teacher, Bukhara state university
Sadullayeva Jasmina Sherali kizi
Student, Bukhara state university

Abstract. The roots of Momordica charantia contain triterpene saponins, which are used to treat rheumatism. Current research suggests that some of the compounds found in the fruit may be used to treat hepatitis and HIV due to their antibacterial activity.
Keywords: Indian pomegranate improves hematopoiesis, increases immunity, antibacterial and antiviral, insulin, phytoncides, improves the cardiovascular system.
Introduction. Momordica charantia is a plant widely distributed in tropical regions, rich in vitamins, minerals and bioactive substances, and in recent years, interest has been growing in the warm climatic regions of Uzbekistan. In the conditions of the Bukhara region, the cultivation of momordica needs to be studied experimentally, since the climate, soil and agrotechnical conditions are different. “Momordica” (Indian pomegranate) is a common and popular vegetable in tropical Asia. It is a single-stemmed vine-like plant that grows up to 4 m in length. The stem is pentagonal in shape, with simple longitudinal veins. The leaves are flattened and have a kidney-shaped and rounded shape with divided leaflets. The length of the leaves is 1-7 cm, the size of the leaf plate is 3-12 cm. They are arranged alternately. The flowers are unisexual, located one by one in the leaf axils.[1] The fruits are initially green, turning bright yellow or orange when ripe; the surface is rough and bumpy. The shape of the fruit resembles a dwarf melon, and some people even have an elongated pumpkin. When ripe, they are initially slightly yellowish, gradually becoming more saturated in color, acquiring an orange hue. The peel of the momordica resembles a chestnut, all of which is covered with numerous small and prickly pimples[2]. Ripe fruits split into several parts, revealing their dark red pericarp. Momordica seeds have an amazing beauty Brown color and original designs in the Indian style. To taste, the fruits resemble dates and a little melon[3].
LITERATURE REVIEW. Large-scale clinical trials have shown that extracts from the fruit of M. charantia significantly reduce glucose in patients with type 2 diabetes[4]. For example, a 2019 meta-analysis of 12 studies found that taking M. charantia supplements improved glycemic control, but this effect was less than that of standard drugs such as metformin. However, its low incidence of side effects makes it attractive as a natural therapy.[5] There are also promising results in oncology: in vitro and in vivo studies have shown that plant extracts can inhibit the growth of breast, colon, prostate, and other cancer cells or induce apoptosis (cell death) (Weng and Chen, 2011)[6].
The effect of Momordica charantia fruit juice on the distribution and number of gastric striatum in streptozotocin (STZ)-induced diabetic rats was investigated using immunohistochemical methods. The results showed that there was a significant increase (Student's t-test, $P<0.004$) in the treated animals compared with untreated diabetic rats, but their number was much lower than that obtained for normal rats. There was a significant increase ($P<0.006$) in the STZ-diabetic rats compared with non-diabetic rats. This increase was not due to M. charantia

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

treatment. The number of cells in M. charantia-treated rats did not change significantly compared with untreated diabetic rats. Our results show that oral feeding of M. charantia fruit juice allows for the recovery of partially destroyed rat cells in STZ-diabetic rats or, alternatively, in rats.[7]

OBJECT AND METHOD OF THE RESEARCH. The generally accepted methods were Borisova, Beydeman I.N. Panomarev, Zaitsev G.N. Yarash, Terekhin, etc. and state standards.

• Analysis of biologically active substances. Charantin concentration: The average charantin content in the fruits of the control group was 1.2 mg/g, while in group 2 this figure reached 1.6 mg/g, and in group 3 it reached 1.9 mg/g. This is a statistically significant difference ($p < 0.05$), confirming that biotechnological methods (in particular, biostimulants) enhance the synthesis of secondary metabolites by activating the anti-stress mechanisms of plants.[8]

• Polypeptide-p concentration: A similar trend was observed in the amount of polypeptide-p. In the control group, its average content was 0.8 mg/g, while in group 2 it reached 1.1 mg/g, and in group 3 it reached 1.4 mg/g. It is proved that the content of this medicinal component is increased, especially by improving the soil composition and protecting the plant from stress.

• **Tropical conditions:** India, Indonesia, South America, the Philippines, some species have also been cultivated in Crimea. “Momordica” contains:

• 1) Protein, Carbohydrates and fats.
• 2) Amino acids
• 3) Alkaloids
• 4) Vitamins A, B, E, C, and F, PP
• 5) Mineral salts, calcium and phosphorus
• 6) Phenols, oils, resins, saponins
• 7) Folic and nicotinic acid
• 8) Fat rich in farotine - in the bark
• 10) triterpene - in the root

The fruits are bitter, rich in vitamins and iron, and are harvested unripe, soaked in salt water for several hours to remove their bitterness, and then stewed and fried or boiled.[9] Young fruits are preserved in marinades. The plant's juice is poisonous in its raw form and is used as a medicine for arthritis, rheumatism, asthma, some skin diseases, diabetes, and as a medicine for children. In unripe fruits, the seeds are removed before culinary use, but in ripe fruits, the seeds are sweet and edible. The pulp of the "Momordica" is clear and juicy, resembling the pulp of cucumbers, green vegetables, peppers, and is usually eaten when the fruit is green. The fruit can also be eaten when it turns yellow and ripens, but it becomes bitter. The pulp of the unripe fruits is light green, dense, juicy, and very bitter. The color of the ripe seeds is reddish-brown.[10]

Usage: It is advisable to use young leaves and green fruits, only the seeds of ripe fruits can be eaten. The fruits are also used to make wine, jam, liqueur. Due to the large amount of essential oils, they are used as an aromatic spice used in various dishes, confectionery and baking. With the exception of people with an individual allergic reaction, momordica should be used with great caution: Red berries are an additional source of potassium, zinc, selenium, silicon, vitamins B, E, A, C, folate and pantothenic acid. “Momordica” Indian pomegranate is able to increase the level of beta-enzymes in the pancreas. As a result, the function of insulin production is normalized, which has a beneficial effect on the concentration of sugar in the

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

blood. Regular consumption of fruits stops the growth of prostate, liver tumors, the development of sarcoma, melanoma. Researchers have proven the anti-leukemia activity of substances contained in momordica.[11] The pulp juice has antibacterial and antiviral effects. Enjoying the bright taste of the fruit, you can help your body overcome various infections and inflammatory processes. The fact is that momordica is a source of phytoncides. Elements that kill viruses and bacteria. “Momordica” Indian pomegranate stimulates the immune system. This helps to remove toxins and toxins. Its fruits are useful for improving vision. Vitamin E contained in the fruit helps to renew cells.[12] Tocopherols have an antioxidant effect. Substances bind free radicals and inactivate them. Due to folic acid, the hematopoiesis process improves. The fruits contain substances that reduce the level of cholesterol in the blood. Therefore, momordica is used to treat pathologies of the heart and blood vessels. It is customary to eat momordica pulp. But in traditional medicine recipes, you can use all its parts, including the peel, seeds and even “biting” leaves. They contain a general complex of vitamins and minerals that are very beneficial for the human body. The seeds, which contain a large amount of essential oils, are used as an aromatic seasoning for various dishes, confectionery and baking.[13]

CONCLUSION: In the future, the volume of Momordica charantia L. cultivation in Uzbekistan may increase and it may become an export-oriented product. Currently, the global market for medicinal plants is projected to reach $247 billion by 2030, up from $146 billion in 2023. In order to take a worthy place in this market, countries like Uzbekistan need to adapt medicinal plants to local conditions and produce high-quality and standard products. This study will create a scientific basis for the cultivation of this plant in the Bukhara region, opening up new opportunities in the pharmaceutical and agricultural sectors of the country. There are many medicinal plants such as momordica in terms of chemical composition and pharmaceutical industry, and there are many methods of use.

REFERENCES

1. A.Bekmuradova Qarshi muhandislik iqtisodiyot instituti talabasi N.X.Qobilova OOMT kafedrasi dotsenti

2. ↑ Basch E., Gabardi S., Ulbricht C. Bitter melon (Momordica charantia): a review of efficacy and safety (англ.) // American Journal of Health-System Pharmacy : journal. — 2003. — Vol. 60, no. 4. — P. 356—359.

3. Grover, J. K., & Yadav, S. P. (2004). Pharmacological actions and potential uses of Momordica charantia: a review. *Journal of ethnopharmacology*, *93*(1), 123-132.

4. Thiruvengadam M, Praveen N, Maria John KM, Yang Y-S, Kim S-H, Chung I-M. Establishment of Momordica charantia hairy root cultures for the production of phenolic compounds and determination of their biological activities. Plant Cell Tiss Organ Cult. 2014;118(3):545-57.

5. Samadov, B. S. (2022). ANATOMICAL STRUCTURE OF THE MEDICINAL PLANT MOMORDICA CHARANTIA L. Thematics Journal of Botany, 6(1).

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

6. Юлдошов, Л. (2024). AGROBIOTECHNOLOGY OF CULTIVATION RICINUS COMMUNIS L. IN THE CONDITIONS OF THE BUKHARA. *ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz)*, *50*(50).

7. Baxtiyorovna, X. L. (2024). DORIVOR O'SIMLIKLARNING TABIATDA VA INSON HAYOTIDAGI O'RNI. *INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024*, *3*(28), 1-6.

8. Mansurovich, Y. J. (2025). DORIVOR CALENDULA OFFICINALIS L. O'SIMLIGINING BUXORO VILOYAT SHAROITIDA YETISHTRISH TEXNOLOGIYASI HAMDA DORIVORLIK XUSUSIYATLARI. *SCIENTIFIC ASPECTS AND TRENDS IN THE FIELD OF SCIENTIFIC RESEARCH*, *3*(29), 354-358.

9. Mansurovich, Y. J. (2024). EFIR MOYI, FLOVONOID VA SAPONIN SAQLOVCHI DORIVOR O'SIMLIKLARNING XALQ XO'JALIGIDAGI AHAMIYATI. *INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024*, *3*(33), 109-112.

10. Yarmuhammedov, J. M., Norova, S. S., & Dilmurotova, A. (2024). BIR YILLIK DORIVOR O'SIMLIKLARNING KIMYOVIY TARKIBI VA ISHLATILISHI. *INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024*, *3*(33), 18-22.

11. Mansurovich, Y. J., Tolibovich, Y. L., & Ganjiyevich, J. T. (2025). MEDICINAL PROPERTIES OF MOMORDICA CHARANTIA L. JOURNAL OF INTERNATIONAL SCIENTIFIC RESEARCH, 2(5), 179-183.

12. Yarmuhammedov, J. M., Norova, S. S., & Dilmurotova, A. (2024). BIR YILLIK DORIVOR O'SIMLIKLARNING KIMYOVIY TARKIBI VA ISHLATILISHI. INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024, 3(33), 18-22.

13. Baxtiyorovna, X. L. (2024). DORIVOR O'SIMLIKLARNING TABIATDA VA INSON HAYOTIDAGI O'RNI. INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024, 3(28), 1-6.