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Study of the Chemical Properties of Black Seed and the Bioactive Substance in its Content - Thymoquinone Antioxidant

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Abstract:
Thymoquinone is a bioactive compound found in the seeds of the plant Nigella sativa, commonly known as black cumin. In the last few decades, thymoquinone has gained much attention in the field of cancer due to its potential therapeutic effects. This article aims to review the current state of knowledge regarding the properties of thymoquinone and its potential therapeutic applications. The article reviews the current scientific literature on celandine seeds, thymoquinone and its biological activity.

Keywords: Black seed, thymoquinone, seed oil, Nigella Sativa

Introduction

Recently, interest in non-traditional oilseeds has increased. Oil plants are important sources of oils of nutritional, industrial and pharmaceutical importance. Among the various oil seeds, black cumin is of particular interest because it has important antioxidant properties. Black sedana, which is well-known all over the world and loved by many people, is a medicinal plant that relieves many ailments. It is called by many names - Roman calliandra, nigella, seed, kaindji, etc. Its seeds have a pleasant bitter taste, so they are added to many dishes.

It contains fatty acids, essential oils, vitamins, phonetic compounds, alkaloids, saponins, sterols, minerals, amino acids, proteins and carbohydrates. Calcium and magnesium dominate among mineral components [3].

Sedana has many healing properties. Its composition contains features such as fighting against the harmful effects on the body and strengthening health. Black sedana is used in the prevention and treatment of many diseases due to its comprehensive effect [7].

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The oil obtained from this seed is often consumed in capsule form. However, some people use the oil extensively externally, that is, to rejuvenate and nourish the skin of the face and body. In particular, the mixture of honey and oil can be used as a remedy for burns, skin infections, and joint pain [5].

Thymoquinone is a naturally occurring bioactive compound found in black cumin seeds, commonly known as black cumin. That's why we focused on producing it with black seed and sunflower seed oils to study it in depth. In the last few decades, scientific studies have shown that thymoquinone has a wide range of pharmacological properties, including anti-inflammatory, antioxidant and anti-cancer effects [2].

Thymoquinone is a member of the quinone family and has the chemical formula $C_{10}H_{12}O_2$. Thymoquinone is a yellow crystalline substance with a characteristic odour and taste. The chemical structure of thymoquinone consists of a quinone ring with radicals 2 and 5 containing two methyl groups and radical 6 being an isopropyl group. The structure of the quinone ring is responsible for its antioxidant and redox properties. Thymoquinone is obtained by various methods, in particular, using cold pressing, steam distillation and Soxhlet extraction method from the seeds of the black cedar plant [4].

Thymoquinone is soluble in organic solvents such as ethanol, methanol, and chloroform, but insoluble in water. Its melting point is 45-46 ℃ and its boiling point is 243 ℃. Thymoquinone is a highly reactive molecule due to the presence of two adjacent xenon rings [1].

In general, there are different ways to extract oil from black sesame seeds without losing thymoquinone. During the research, we will choose the most optimal way after considering the advantages and disadvantages of these methods. We increase the productivity of oil extraction from black seed seeds.

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Conclusions

The main focus of this research was on the potential therapeutic effect of black seed oil and thymoquinone contained in it. Current scientific literature on thymoquinone and its biological activity was reviewed in the thesis. The presence of active proteins and lipid-soluble elements in black seed seeds was studied. Recently, this seed has become an important topic for research around the world. But a lot of research needs to be done to find out the new properties and effects of this versatile phytotherapeutic seed and it needs to be used in various trials to prove its effectiveness.

References

1. Agarwal R., Kharya MD., Shrivastava R. (2013) Antiinflammatory effects of Nigella Sativa oil on paw edema in albino rats. Annals of biological Research, 117-120
2. approby.com
3. Е.В. Феськова., О.С. Игнатовец., И.М.Савич. Определение компонентново состава семян чернушки посевной (Nigella Sativa). 2018. БГГУ-2, 167-170
4. Elsevier.com
5. Mohamed Fawzy Ramadan. “Nutritional value, functional properties and nutraceutical applications of black cumin”. International Journal of food Science and Technology 2007, 42
6. publons.com
7. qalampir.uz
8. Quality of oil extracted by cold press from Nigella Sativa seeds incorporated with rosemary extracts and pretreated by mi