

Abstract

Nigella sativa, commonly known as black seed, is an annual flowering plant belonging to the family Ranunculaceae, and it is a native of Southern Europe, North Africa, and Southwest Asia. Black seed was traditionally used as a preservative in mummification in the ancient Egyptian civilization, and it has a long history of use as medicine in the Indian traditional medicine system. *Nigella sativa* has extensively been used, namely as-diuretic, antihypertensive, antidiabetic, anticancer, immune-modulatory, and antimicrobial. The objective of this work is to understand the traditional and modern uses of *Nigella sativa* through a literature review of the botany, chemical composition, and biological activity of this plant.

Introduction

Nigella sativa, known as black seed or black cumin, is an annual flowering plant belonging to Ranunculaceae's botanical family (Figure 1). *N. sativa* is native to South and Southwest Asia. It is cultivated and used in different parts of the world, such as the Mediterranean countries, Southern Europe, and North Africa. Based on historical records, this plant was known as far back as 1400 years ago. It has been considered an herbal medicine for several diseases since then; additionally, in Islamic medicine, it has been named a cure for all diseases except death.



Figure 1. *Nigella sativa*

Botanical Description



Figure 2. Flower fruits and seeds of *N. sativa*

Nigella sativa is an erect, branched herb that bears alternate leaves, terminal white flowers, and capsule-like fruits. The flowers are usually white, pink, yellow, pale purple, green- to blue-colored flowers with 5-10 petals. The fruit is a large and inflated capsule composed of 3-7 united follicles, each containing numerous black trigonal seeds, which attain lengths ranging from 2.5-3.5 mm and widths from 1.5-2 mm (Figure 2).

Chemistry Composition

The most medicinally valued part of *Nigella* are the seeds, commonly known as Panacea (in old Latin means "cure-all"), and thymoquinone (TQ) (30%-48%), p-cymene (7%-15%), carvacrol (6%-12%) are considered the most important active compounds (Figure 3).

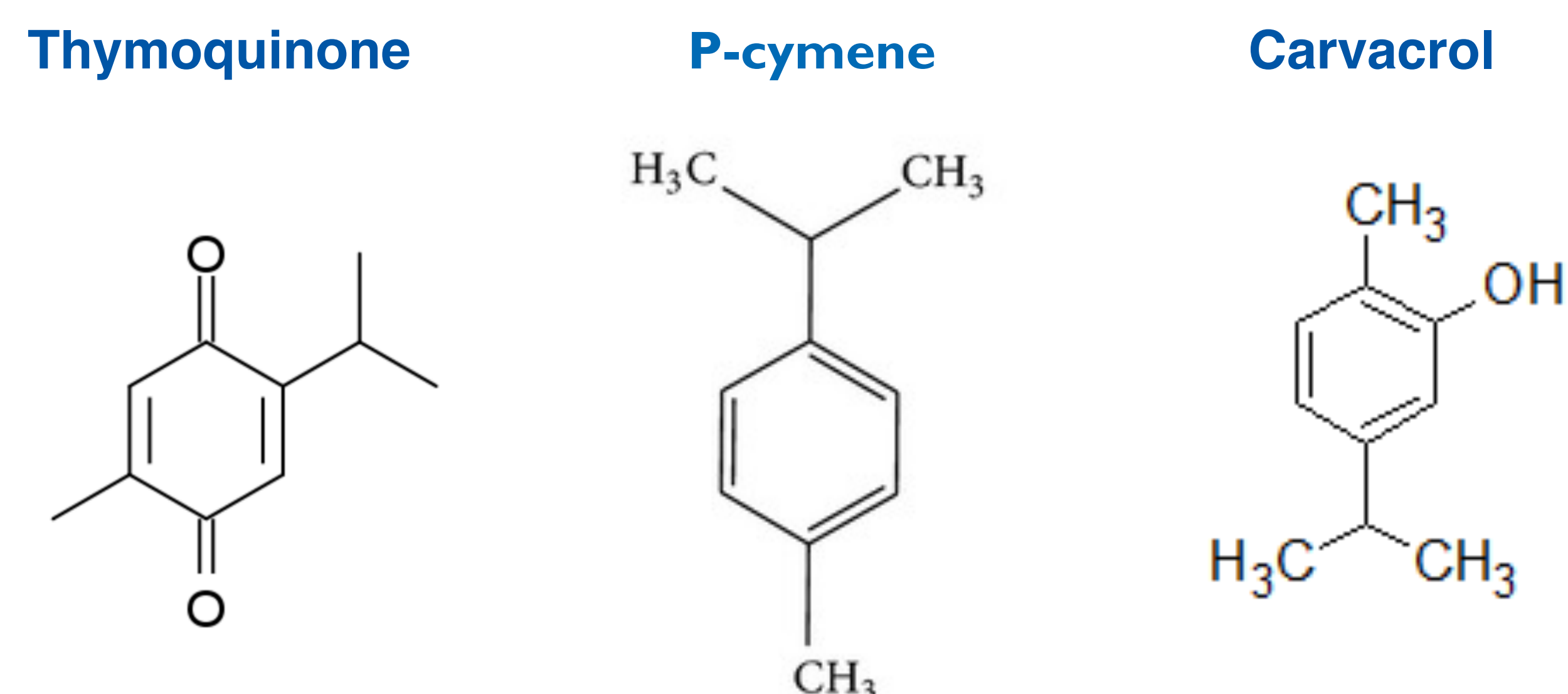


Figure 3. Chemical structures of the main components of *N. sativa* seeds

Moreover, *N. sativa* seeds also contain α -hederin, a water-soluble pentacyclic triterpene, and saponin, a potential anticancer agent. Black seeds also contain some other compounds like 4-terpineol, t-anethol, α -pinene, and thymol, and essential ingredients including oils, essential fatty acids, vitamins (Cu, P, Zn, and Fe), carbohydrates, minerals, proteins, and essential amino acids. This rich consistency of components enables *N. sativa* to have different effects as antibacterial, antiviral, antifungal, wound healing, etc.

Traditional Uses

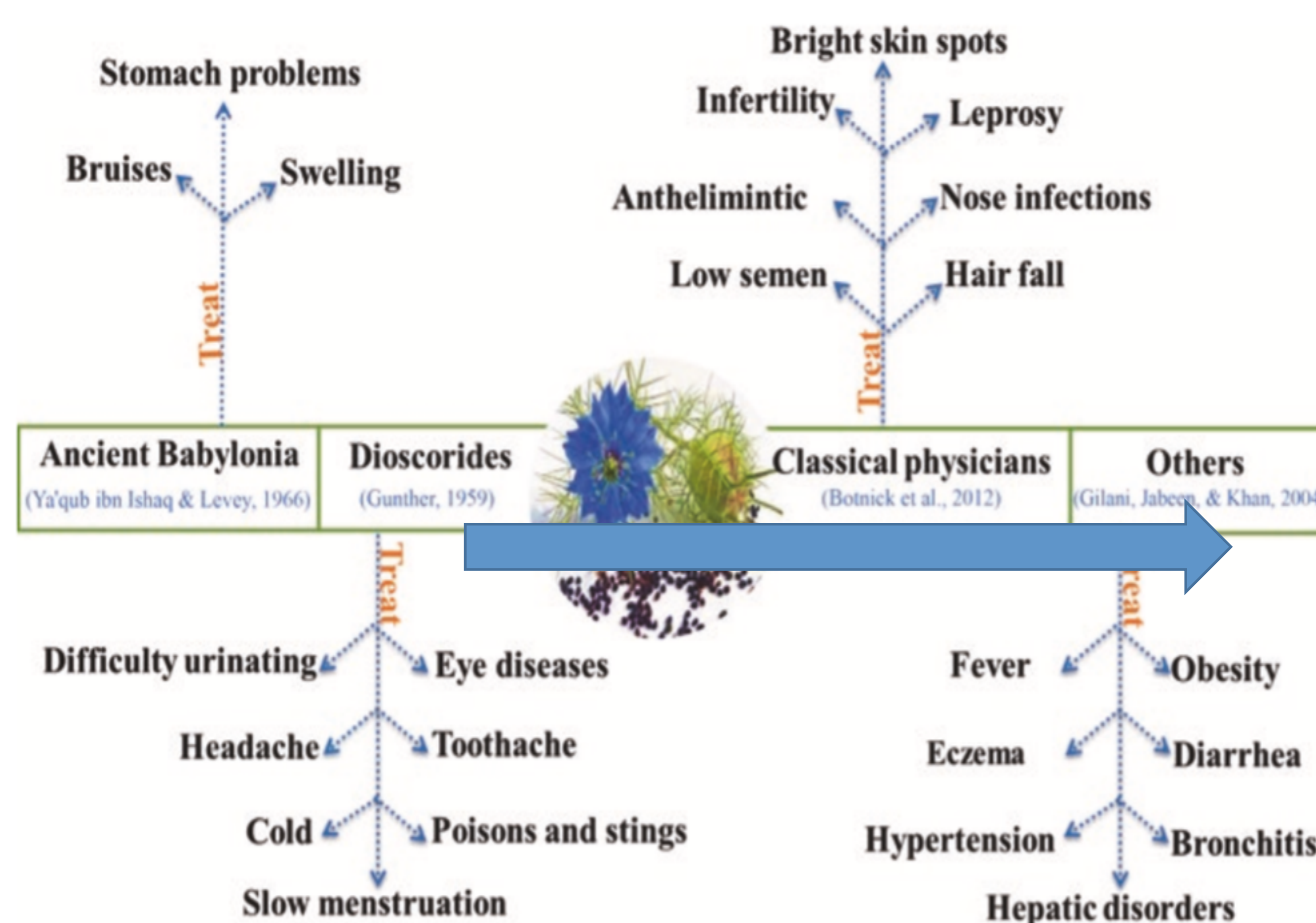


Figure 4. Traditional Uses of *N. sativa* in different cultures

Nigella sativa has been used for different purposes from different cultures (Figure 4). Its traditional uses are recognized by different religions (Islamic books and Holy Bible) as well, and throughout history by the ancient Egyptians, Romans and Greeks. Black seeds and its oil play an important role in food as well as in medicine of historical Indian and Saudi Arabian civilizations.

The seeds have been extensively used in south Asian and Middle Eastern cuisines as spices for preparing meals due to pungent, bitter taste and aroma, and for adding flavor in curries, vegetables, and pulses, as well as in bread and pickles. The Indians seemed to have figured out *N. sativa*'s medicinal properties long before anyone else and used it for Unani and Ayurveda. The active constituents of black seeds have been known to cure respiratory problems like bronchitis, asthma, and other inflammatory diseases.

N. sativa's therapeutic potential makes it a consequential substance possessing a wide spectrum of activities like anticancer, anti-microbial, anti-inflammatory, gastroprotective, hepatoprotective, spasmolytic, bronchodilator and anti-diarrheal. It can be used as a liver tonic and parasitic infections could be relieved. Conventionally, black seeds and its oil are broadly used for diabetes, fever, hypertension, bronchitis, gastrointestinal disturbances, soreness and skin problems.

Conclusion

The use of herbal products as complementary medicine have gained immense worldwide popularity nowadays. Many drugs are derived directly from plants whereas the others are chemically modified natural products. The biological activity of *N. sativa* seeds could be associated to its main chemical components, particularly thymoquinone, p-cymene, carvacrol and α -hederin. As *N. sativa* possess remarkable in-vitro and in-vivo biological activities and it is found to be relatively safe, adding seed of *Nigella sativa* to our diet could provide multiple health benefits.

Acknowledgements

I would like to express my special thanks of appreciation to my mentor Dr. Koroch, who helped me in every step throughout the project. This project was also supported by the CUNY Research Scholars Program (CRSP) at the Borough of Manhattan Community College and S-STEM program.

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