

Nigella Sativa Seeds: Folklore Treatment in Modern Day Medicine

The seeds of *Nigella sativa* (family: Ranunculaceae), commonly known as Black Seed, Black Cumin, or “*Habbatul Barakah*”, have long been used in folk medicine in the Arabian Gulf region, Far East Asia, and Europe. The Prophet Mohammad had described the healing powers of the Black Seeds against a variety of diseases. According to common Islamic and Arabic belief, Habbatul Barakah is a remedy for all ailments (universal healer). Black Seed is also mentioned as the curative “*black cumin*” in the Holy Bible and is described as *Melanthion* by Hippocrates and Dioscorides and as *Gith* by Pliny.^[1]

In the traditional system of medicine practised in the Arabian Gulf region, Black Seed is recommended for a wide range of ailments, including fever, cough, bronchitis, asthma, chronic headache, migraine, dizziness, chest congestion, dysmenorrhea, obesity, diabetes, paralysis, hemiplegia, back pain, infection, inflammation, rheumatism, hypertension, and gastrointestinal problems such as dyspepsia, flatulence, dysentery, and diarrhea. It has been used as a stimulant, diuretic, emmenagogue, lactagogue, anthelmintic, and carminative.^[2] Black Seed has also been used externally where it is applied directly to abscesses, nasal ulcers, orchitis, eczema, and swollen joints.

Many of the folk medicinal claims of Black Seed use have been scientifically tested. Over 150 studies have been conducted over the last five decades to investigate chemical and pharmacological properties of Black Seeds. Phytochemical studies of Black Seed showed the presence of >100 constituents. Many of these compounds have not been chemically identified nor have they been pharmacologically tested. A combination of fatty acids, volatile oils, and trace elements are believed to contribute to the pharmacological activity of Black Seeds.

The results of extensive pharmacological studies justify the broad, traditional therapeutic value of Black Seeds. These studies found Black Seed to have analgesic,^[3] antilipemic,^[4,5] postcoital contraceptive,^[6] diuretic and antihypertensive,^[7] bronchodilator and calcium antagonist,^[8] histamine release inhibitor,^[9] hepatoprotective,^[10] anthelmintic,^[11] antifungal,^[12] antimicrobial (against a wide range of organisms),^[13] anticancer,^[1] and antiinflammatory activities.^[14]

In this issue of the *Saudi Journal of Gastroenterology*, Al-Mofleh *et al.*^[15] have confirmed the gastric antisecretory and antiulcer activity of Black Seed in a well-conceived,

nicely designed, and perfectly executed experimental study. The “Introduction” section provides the most recent and intricate details of the pathogenesis of gastric ulcers and describes the crucial targets of effective antiulcer drugs. The authors also describe the rationale for studying Black Seeds for its gastroprotective effects. The methodology clearly describes the preparation of Black Seed suspension and the timing and doses of the test substance used in this study. The experimental models used in this study for gastric antisecretory and antiulcer activities are well recognized and reproducible. Assessment of lesion by a blinded investigator further confirms that investigators have ruled out any bias or error in the results. The selection of biochemical parameters to determine the etiopathology of ulcer disease and the mechanisms of drug-induced gastroprotection further strengthens the findings of the study.

It is quite interesting to note that an aqueous suspension of Black Seed provides a highly significant and dose-dependent protection of gastric mucosa against a variety of necrotizing agents. Histopathological studies show complete absence of congestion, hemorrhage, inflammation, and necrosis in Black Seed-treated animals.

Although the etiology of ulcer is unknown in most cases, it is known that a breach of the “mucosal barrier” leads to ulceration. It is generally accepted that gastric ulcers result from an imbalance between aggressive and defensive factors, i.e., the mucosal defense mechanism and the offending chemicals (endogenous and exogenous) and/or infectious agents.^[16]

In this study, the volume and acidity of gastric secretion, which are considered the major aggressive factors for gastric mucosal injury, were reduced by more than fourfold by the Black Seed suspension. The digestive effect of the accumulated gastric juice is believed to be responsible for producing ulcers in pylorus-ligated rats. In addition to gastric secretion changes, gastric mucosal microcirculation plays an important role in the formation of gastric ulcers.^[17] Prostaglandins (PGs) play a significant role in cell proliferation, mucosal microcirculation as well as in gastric secretion. PGs are produced from arachidonic acid released from phospholipids of biological membranes by the action of phospholipases. Phospholipids are metabolized into PGs and leukotrienes (LTs) via the cyclooxygenase and lipoxygenase pathways, respectively. PGs exert their cytoprotective effect at various levels, including the luminal cavity, epithelium, and subepithelial levels. Particularly, PGE₂ increases the

mucosal blood flow, promotes mucus secretion, and increases bicarbonate secretion, while PGI₂ suppresses gastric acid secretion. On the other hand, an increase in LTs enhances the radical production and exacerbates damage to the gastric mucosa. Black Seed and its ingredient (thymoquinone) have been shown to modulate PGs and LTs production.^[18] Besides attenuating the aggressive factor (acid secretion), this study also showed that Black Seed suspension significantly enhanced the secretion of gastric mucus, which is considered a major natural mucosal defense against noxious stimuli. Thus, Black Seed suspension provides reinforcement to the mucosal barriers by exerting significant gastroprotective activity.

Furthermore, the suspension of Black Seed was found to significantly attenuate ethanol-induced depletion of nonprotein sulfhydryl (NP-SH) content of gastric mucosa. NP-SH content plays an important role in cellular protective mechanisms against a number of cytotoxic and necrotizing agents. The gastric mucosa contains a surprisingly high concentration of NP-SH. Agents that cause depletion of gastric mucosal NP-SH may lead to gastric erosion and ulcers; whereas, the drugs that preserve gastric NP-SH levels, protect gastric mucosa against stress and chemically induced gastric ulcers.^[19]

In conclusion, the valuable finding of Al-Mofleh *et al.* further provides a scientific confirmation of gastric antisecretory and antiulcer property of Black Seed.

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