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The Protective Role of Black Seeds (*Nigella sativa*) on the Tissues of Liver and Kidney in Female Rabbits Treated with Green Lean Body Capsule

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Abstruct:

The seeds of *Nigella sativa* (Ranunculaceae herbaceous plant), commonly known as black seed or black cumin, are used as herbal medicine all over the world for the treatment and prevention of a number of disease and conditions like asthma, diarrhea and dyslipidaemia. The present study was carried out to investigate the effects of *Nigella sativa* in protection of the liver and kidney tissues against pathological changes caused by green lean body capsule in female rabbits. Fifteen female rabbits were involved in this study and were divided randomly into three groups (5 rabbits in each group) and treated as following daily for 30 days: control group drenched with 1ml normal saline orally; T1 group: drenched with (4.2mg/kg) of green lean body capsule orally; T2 group: drenched with green lean body capsule (4.2mg/kg) in addition to black seed (28mg/kg) orally. The (T1) group which received green lean body capsule only revealed approximately dominant destruction of liver and kidney tissues. While, group (T2) which received green lean body capsule in addition to black seeds revealed very mild destruction as compared with T1. On conclusion it seems likely that black seeds provided an excellent protection to liver and kidney tissues against oxidative stress of green lean body capsule.

Keywords: *Nigella sativa*, Black Seeds, Rabbit, Kidney, Liver and Green Lean Body Capsule.

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1. Introduction:

The use of plants as medicines dates from the earliest years of man's evolution [1]. Medicinal plants serve as therapeutic alternatives, safer choices, or in some cases, as the only effective treatment [2,3]. People in different cultures and places have used particular plants for to treat certain medical problems [4]. A larger number of these plants and their extract have shown beneficial therapeutic effects, including anti-oxidant, antiinflammatory, anti-cancer, anti-microbial, and immunomodulatory effects [5,6]. Among the promising medicinal plants, *Nigella sativa*, a dicotyledonous of the Ranunculaceae family, is an amazing herb with a rich historical and religious background [7]. Nigella sativa is found in southern Europe, northern Africa, and Asia Minor. It is a bushy, self-branching plant with white or pale to dark blue flowers. *Nigella sativa* reproduces with itself and forms a fruit capsule which consists of many white trigonal seeds. Once the fruit capsule has matured, it opens up and the seeds contained within are exposed to the air, becoming black in color [8]. The seeds of *Nigella sativa* are the source of the active ingredients of this plant. It is the black seed referred to by the prophet Mohammed as having healing powers [7]. Black seed is also identified as the curative black cumin in the Holy Bible and is described as the Melanthion of Hippocrates and Discroides and as the Gith of Pliny [9].

Historically, it has been recorded that Nigella sativa seeds were prescribed by ancient Egyptian and Greek physician to treat headache, nasal congestion, toothache and intestinal worms, diuretic and to increase milk production [7,10]. The seeds of N. sativa, known as black seed, black cumin have long been used in the middle and far east as a traditional medicine for a wide range of illnesses including bronchial asthma, headache, dysentery, infections, obesity, back pain, hypertension and gastrointestinal problems [8,11]. Its use in skin condition as eczema has also been recognized worldwide [7]. Four dolabellane-type diterpene alkaloids have been isolated from the seeds of N. sativa [12,13]. High performance chromatographyic analysis of N. sativa oil showed many compounds like thymoquinone, dithymquinone, thymohydroquinone and thymol [14]. Nigella sativa seeds contain other ingredients, including nutritional components such as carbohydrates, fats, vitamins, mineral elements, and proteins, including eight of the nine essential amino acids [14-18]. Monosaccharides in the form of glucose, rhamnose, xylose, and arabinose are also found. Nigella sativa seeds are rich in the unsaturated (linoleic and oleic acid) and essential fatty acids [14,15]. The major phospholipid classes are phosphatidylcholine, phosphatidylethanolamine, phosphatidyl-serine, and phosphatitdylinisitol [14,15,18] . The seeds contain carotene, calcium, iron, and potassium [15]. In addition to the previous nutritional values, the Nigella sativa has a wide margin of safety [20]. In the light of the above findings this work was conducted to monitor the protective effect of black seeds provided to kidney and liver tissues against oxidative stress of green lean body capsule.

2. Material and methods:

2.1 Animals: fifteen adult female rabbits (local breed), weighted about 1250-1500gm, Rats were kept under suitable environment condition and maintained in temperature and humidity control with 12 h light/dark cycle daily and housed in cages, the food was given as pellets of freshly prepared ration, all

rabbits were allowed to free access of drinking water and basal diet. The animals were kept for seven days for adaptation before beginning the experiment.

2.2 Plant materials: seed of *Nigella sativa* were purchased from local market. The seeds were grinded with a grinder to get a powder and dissolved in normal saline (freshly prepared) and then extracted with Soxlet extractor. The aqueous extract of *Nigella sativa* is administrated orally to rabbit using animal feeding intubation needles.

2.3 Experimental design: rabbits were divided into following group (5 rabbits for each group).

1. Control group received (1ml) normal saline orally for 30 days.

2. Treated groups: (T1) drenched orally with green lean body capsule (4.2mg/kg) daily for 30 days, (T2) drenched orally with black seed (28mg/kg) in addition to green lean body capsule (4.2mg/kg) daily for 30 days.

2.4 Tissue sampling: At the end of the experiment period, animals of each group were sacrificed to study the histopathology of kidney and liver. The kidney and liver were excised and preserved in 10% neutral formalin Buffer solution till the preparation of histological section. Tissue was embedded in paraffin and several tissue sections of kidney and liver were stained with Hematoxylin-Eosin stain [19].

3. Results and Discussion:

Kidney section of control group demonstrates normal structure of nephrone (figure: 1). The picture of T1 group (figure: 2) illustrated acute cellular vacuolar degeneration in the laying epithelial cell of renal tubules, while the kidney's tissues of T2 group (figure: 3) showed no clear lesion appearance except slightly cloudy swelling of laying cell of renal tubules.

On the other hand, the picture of Liver's hematoxyline eosin stained section of control rabbit (figure: 4) demonstrated normal liver portal area, central vein and sinusoids. Furthermore, picture of section from T1 group (figure: 5) illustrated aggregation of inflammatory cells around blood vessels with large area of fatty change characterized by round clear sharp space in the cytoplasm of hepatocytes also dilated and congested sinusoids with mononuclear cells and neutrophils in the lumen beside vacuolar hepatocytes, whereas the picture of liver section of T2 (figure: 6) showed a slight spaces of fatty change with less number of mononuclear cells neutrophils in the lumen and seems approximately like the liver of control group.

In fact many potent antioxidants have actually been isolated from some natural herbs. Thus, it is hypothesized that the beneficial effect of black seed and other herbs are most likely perhaps due to their protection against cellular damage caused by oxidative stress [3]. The antioxidant properties of isolated black seed component have appreciable free radical scavenging properties [4]. Cells exposed to oxidative stress undergo extensive cellular damage due to oxy-radical induced DNA breakage, lipid

oxidation and extensive protein damage [5]. In present study, we supposed that *N. sativa* provided the protection to the cells membrane against oxidative stress of green lean body capsule probably due to the antioxidant components of it, in addition to its more potent component thymoquinone which may potentiate glucose-6-phosphate dehydrogenase (enzyme rate limiting enzyme of pentose phosphate pathway) and finally convert in active intracellular antioxidant glutathione to active form [20]. According to the results we recommendation is to use black seed in combination to green lean body capsule**.**

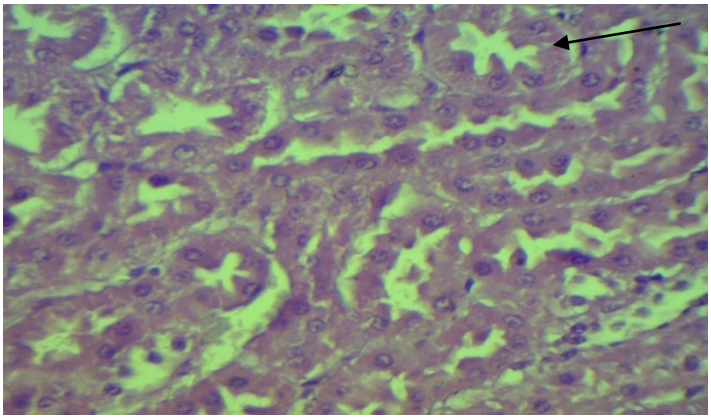

Figure (1): Histological section of kidney of female rabbit of control group, showed normal renal structure (H & E X 400).

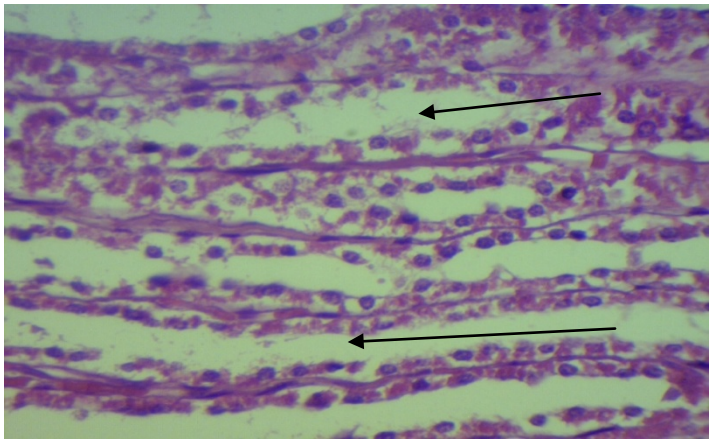

Figure (2): Histological section of kidney of female rabbit of T1 group, showed acute cellular vacuolar degeneration in the laying epithelial cell of renal tubules (⟶) (H & E X 400).

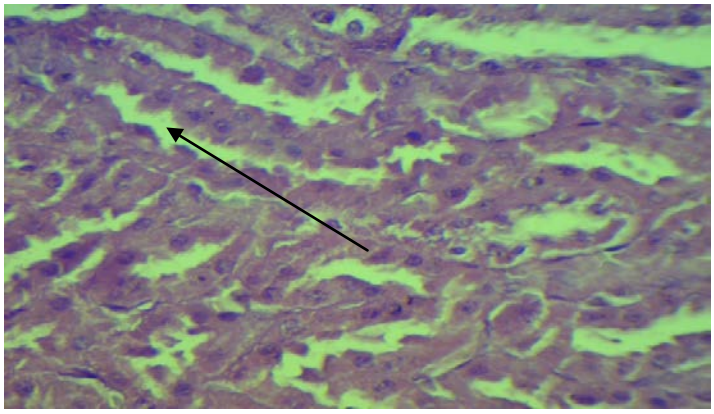

Figure (3): Histological section of kidney of female rabbit of T2 group showed no clear lesion appearance except slightly cloudy swelling of laying cell of renal tubules (⟶) (H & E X 400).

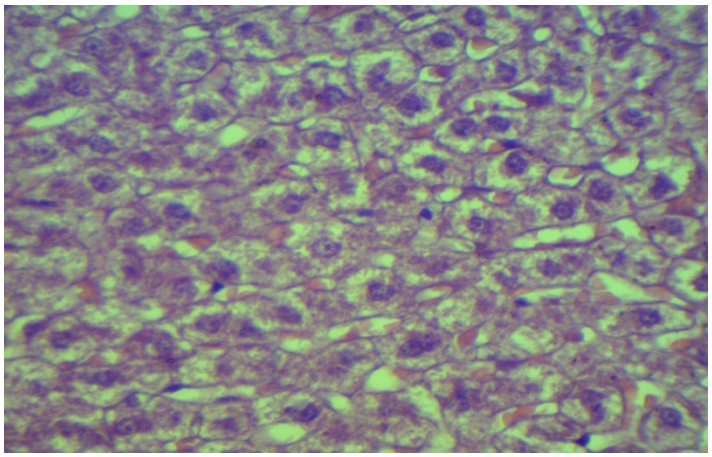

Figure (4): Histological section of liver of female rabbit of control rabbit demonstrated normal hepatic structure (⟶) (H & E X 400).

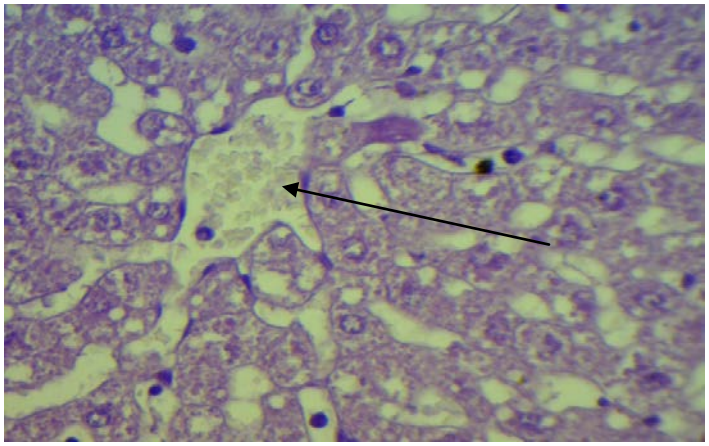

Figure (5): Histological section of liver of female rabbit of T1 group illustrated aggregation of inflammatory cells around blood vessels with large area of fatty change characterized by round clear sharp space in the cytoplasm of hepatocytes also dilated and congested sinusoids with mononuclear cells and neutrophils in the lumen beside vacuolar hepatocytes (⟶) (H & E X 400).

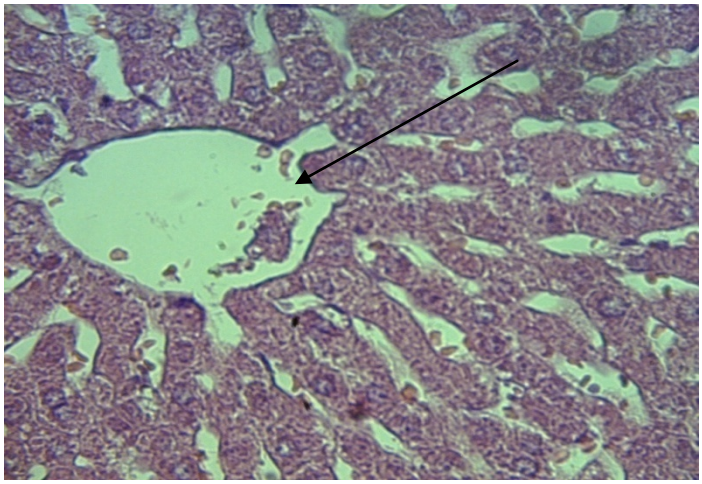

Figure (6): Histological section of liver of female rabbit of T2 showed a slight spaces of fatty change with less number of mononuclear cells neutrophils in the lumen and seems approximately like the liver of control group (⟶) (H & E X 400).

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