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Research Article

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EFFECT OF *Solanum nigrum* ON PROTEIN CONTENT OF LIVER AND KIDNEY OF ALBINO RATS

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ABSTRACT

Solanum nigrum (family: Solanacae) commonly called Black nightshade, grows as a weed, found in the dry parts of India and other parts of the world. It has a medicinal usage and has been used as a traditional folk medicine for treating various ailments such as pain, fever and liver disorders.[1,2] Generally, black nightshade is very rich in nutritive values, which are capable of supplying minerals , vitamins, hormones and proteins.[3] This herb elaborates a wide variety of medicinal properties such as anticancer[4], antioxidant[5], neuroprotective[6], cytoprotective[7], antimicrobial[8], antinociceptive and antipyretic properties[9]. It has been claimed that *Solanum nigrum* particular are an excellent remedy for liver disorders.[10]

Present investigation is therefore designed to determine the effect of crude ethanolic extract of *S. nigrum* on protein content of liver and kidney after daily administration of dose at the level of 250mg/kg b. w. for three, five and seven days respectively. It was noticed that the chronic administration for longer duration leads to significant increase in protein contents of kidney and liver.

Keywords: *Solanum nigrum*, liver, kidney, protein content.

INTRODUCTION

Solanum nigrum is one of the medicinal herbs which belong to family "*solanacae*". It has been used traditionally to treat various ailments such as pain, inflammation and fever. It is locally known as "Makoi". Its leaves, stems and roots are used as a poultice or to treat leucoderma and wounds while extracts of this plant are claimed to possess anti-inflammatory, antispasmodics, vasodilator and hepatoprotective effects. The fruits of *S.nigrum* have been reported to play an adjuvant role in the hepatoprotective property. Inhibition of lipid peroxidation and free radical scavenging activity has been suggested as a possible mechanism of action.[11] Although there is lot of disagreement over whether the leaves or fruits of *S. nigrum* are poisonous or not it is believed that the toxic effects vary considerably according to the pat or cultivar of the plant being used or grown. The unripe fruit of *S. nigrum* contain the highest concentration of toxin particularly *Solanine*.[12]

The liver is central metabolizing organ, so it is more susceptible to metabolism dependent injury. Kidney is also the most important organ of our body. It plays a major role in secretion and excretions. Therefore the present study deals with the effect of *S.nigrum* on the protection content of liver and kidney of albino rat.

MATERIALS AND METHODS

Plant Material

The whole plant of *Solanum nigrum* was collected from the Bundelkhand region. It was shed dried and powdered in an electric grinder. The powdered plant material was extracted in a soxhlet extractor and evaporated to dryness yielding a semi solid mass (9.8% w/w). After this extracts were dried in desiccators.

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Animals

Sprague Dawley albino rats weighing 150-200 g were purchased from the National Defense Research Laboratory Gwalior. The animals were fed with commercial diet(Amrut, Feeds, Pranav Agro Industries LTD, Sangli) and water *ad-libitium* and maintained under hygienic standard laboratories condition; temperature maintained at 24-28˚C and relative humidity at 60-70%. The study was permitted by the Institutional animal ethical committee with Reg. No 716/02/9/CPCSEA, Institute of Basic Science, Bundelkhand University, Jhansi, India.

Dose preparation

Oral administration of dose containing 250mg/kg b.wt. of *S. nigrum* extract was given to experimental animals.

Preparation of Liver and Kidney Homogenate

The rats were sacrificed under light anesthesia (ether inhalation) at the end of 7 days of treatment. The Liver and Kidney were quickly removed, washed with cold water and weighed. They were then freed of fat and then homogenized in hypotoxic solution (8% $NaHCo_3$ solution). This homogenate was used to determine the protein contents in various samples (method of Lowry *et al* [13]).

Experimental Protocol

Animals were divided into two groups each having 5 rats. Group I rats received normal standard diets and vehicle only. Group II is experimental. Those rats received 2 ml and 4 ml of dose (250 mg/kg b.wt.) for 3days, 5 days and 7days chronically.

Statistical Analysis

Results of biochemical estimations are reported as mean ± S.E. if six animals in each group. The data were subjected to one way ANOVA followed by Tukey's multiple comparison tests. PL 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Table **1** show the effect of *S. nigrum* on the protein contents in liver when 2 ml and 4 ml dose was administered daily for 3 days, 5 days and 7 days. Its administration significantly increased the protein contents in Liver at both the doses even when administered for 3 days. When the period of treatment was increased from 3 days to 7 days, there was a successive increase in the proteins contents. A dose of 4 ml was relatively more patent.

Table 1. Effect of daily administration of *S. nigrum* on protein content in Liver of adult rats. Protien content is expressed in mg/100mg of concerned tissue

Drug	Duration after treatment (in days)		
	3	5	7
Control	18.6±0.94	18.8±0.96	19.0±0.94
2ml	19.6±0.95	20.5±0.80	21.2±0.86
4ml	22.0±0.84	22.8±0.67	23.1±0.83

Table **2** shows the effect of *S. nigrum* on the protein contents in kidney. The administration of *S. nigrum* at 2 ml dose for 3 days did not provoke change but 4 ml dose increased protein contents significantly when administered daily for 3 days. When these doses were administered daily for 5 days and 7 days the protein contents were gradually increased.

Table 2. Effect of daily administration of *S. nigrum* on protein content in Kidney of adult rats. Protien content is expressed in mg/100mg of concerned tissue.

Drug	Duration after treatment (in days)		
	3	5	7
Control	13.2±0.66	13.5±0.63	13.1±0.64
2ml	13.4±0.65	14.0±0.52	15.2±0.60
4ml	15.8±0.62	16.4±0.56	19.2±0.41

In the present study the ethanolic extract of *S. nigrum* was found to report the effect on the protein contents of liver and kidney of albino rat. In this chronic toxicity study, the *S. nigrum* treated groups did not show any significant changes in the protein content at 3, 5 and 7 days as compared to control group. Proteins are complex macromolecules with exquisite specificity. Omale James *et.al.*[14] have investigated that the crude protein composition is either in the matured leaves of *Cissus mautistriatta* than the young leaves and roots. The importance of proteins cannot be over emphasized. Structurally and functionally they are the most diverse and dynamic molecules and play key roles in nearly all biological process. The presence of protein in this plant sample could justify its use in the management of Kwashiorkor a protein deficiency disease.

Jitendra Vaghasiya *et. al.*[15] has also studied the polyherbal (*Tomarix gallica*, *Capparis spinosa*, *Cichorium intybus*. *Solanum nigrum*, *T. arjuna* and *A. millefolium*) these medicinal herbs alone or in companion can influence in restoration of the cellular functions and structural integrity of liver. A number of reports are also available about the increase in the protein contents due to administration of herbal drugs and extracts. [16-17]

The present findings suggest that *S. nigrum* is not toxic since no marked changes in protein contents were observed. Thus at normal therapeutic doses *S. nigrum* is considered to be safe for the treatment in liver and kidney problem.

CONCLUSION

Effect of crude ethanolic extract of *S. nigrum* on protein content of liver and kidney was examined after daily administration of dose at the level of 250mg/kg b. wt. for three, five and seven days. There was a successive increase in the protein content. Presence of protein in this plant sample could justify the increase in protein content of liver & kidney and its potential in the management of protein deficiency disease like Kwashiorkor.

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