

ORIGINAL RESEARCH



UV PROTECTIVE ACTIVITY OF GLYCINE MAX SEEDS

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ABSTRACT:

The UV protective activity against hairs is new and most beneficial sector for the cosmetic industry and for self protection of hair. However most of the plant based drugs and the synthetic agents have been tested for the same and it was shown that the protection from UV damage is less but effective because there are some of the other factors like colouring of hairs and mechanical damage and sometimes the various environmental factors are also involved.

In the present study the seeds of Glycine max were selected as it contains the saponins. The aqueous extract was used for the hair samples before exposing them to the UV rays in an UV chamber.

KEYWORDS: UV protective activity, Glycine Max**Corresponding Author: Dr. Amandeep Singh****Email:** aman.arora12345@gmail.com**Mob. No:** 9456754191**Indian Research Journal of Pharmacy and Science; 15(2017)1190-1195;
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INTRODUCTION:

Glycine max (L.) Merr. , the cultivated soybean, is a summer annual herb that has never been found in the wild (Hymowitz, 1970). This domesticate is in fact extremely variable, due primarily to the development of soybean "land races" in East Asia.⁹The subgenus Soja contains, in addition to G. max and G. soja, the form known as G. gracilis, a form morphologically intermediate between the two. This is a semi-cultivated or weedy form, and is known only from Northeast China.¹²

Glycine is a genus in the bean family Fabaceae. The best known species is the soybean (Glycine max). While the majority of the species are found only in Australia, the soybean's native range is in East Asia. A few species extend from Australia to East Asia (e.g., G. tomentella and G. tabacina).

Glycine species are used as food plants by the larvae of some Lepidoptera species: The Engrailed, The Nutmeg and Turnip Moth have all been recorded on soybean (The Wealth of India, 2007).

Now day hair damage is an major problem due to faulty dietary habits and damaging UV exposure. Therefore, there is always need for the novel hair protecting that can prevent the damage to the hair without affecting the aesthetic appearance. In the present study an attempt has been made to evaluate the UV protective effect of Glycine max seeds on different hair types.¹³

MATERIAL AND METHODS

Collection and authentication

The seed material was purchased from Shri Mahadev Swayatt Sahkaarita, Dewaldhar, Bageshwar (Uttarakhand) and authenticated by Mr. K.C. Tanta (Business Head).

Preparation of aqueous extract

The seed were crushed in the grinder and converted into the fine powder and the powder was extracted 3 times with boiling water (1:10) and filtered. The extract was concentrated and partitioned once with equal volume of ethyl acetate then further partitioned with the n-butanol to the ethyl acetate layer. The n-butanol partitioned layer was evaporated and the residue was dried and it was saponins.

Selection of hair samples

The hair samples were selected as the Natural hairs and the hair samples were Black color (Virgin), Chemical color treated with the branded synthetic hair colors and the Grey hairs treated with the henna. The hair samples were coded as Black color hair (BH), Chemical color hair (CH) and the Grey hairs (GH). The hair samples were collected from the ladies of 25-40 years of age and the length of the hair samples was about 15cm long and each bunch was about 5gm of weight. The hair samples were collected from the Beauty parlor of the local market of Dehradun.



Fig.1: Hair Samples treated with SLS (10%)

The hair samples were collected and coded as BH, CH and GH and were treated with 10% SLS (sodium lauryl sulphate) solution and air dried.² Then the samples were treated with 10% extract solution. The hair samples were then divided into two sets, one set was exposed to UV and one was unexposed.

Further coding was done as hair samples exposed and unexposed.

Black Hair Unexposed (BHU), Black Hair Exposed (BHE), Chemical Hair Unexposed (CHU), Chemical Hair Exposed (CHE) and Grey Hair Unexposed (GHU), Grey Hair Exposed (GHE).



Figure No.2: Coded hair samples

Length of Study

The UV exposure period was about 100hrs under well and maintained humidity and temperature conditions. All the hair samples were given 4 intermittent treatments with 10% SLS and extract solution.

Tryptophan Estimation**Sample solution-**

60 mg of hair sample was taken in a 50ml volumetric flask. 2ml of 18N sulphuric acid solution and 1ml of p-dimethyl amino benzaldehyde reagent in 10% sulphuric acid solution and 11ml of 18N sulphuric acid was added to the flasks. The flasks were kept for 2hrs at 70°C and after 2 hour the hydrolysate was cooled for 2 minutes in a well ice bath. 2ml of 0.001M sodium nitrate solution was then added with 0.03 N sulphuric acid. The flask was then kept for the 2hr at 60°C and cooled at room temperature in ice bath for 2 min. The solution was then filtered and after 15 min. the Absorbance was measured at 585nm using Shimadzu- UV spectrophotometer.

Control solution

The control solution was the solution without the p-dimethyl amino bezaldehyde reagent was taken in a 50ml of volumetric flask. Compared the result obtained with the control solution. The tryptophan content was calculated by using calibration curves obtained from solution of pure tryptophan in 0.03N sulphuric acid. The solution was then filtered and the absorbance was measured after 15 min. at 585nm in the UV spectrophotometer. From the absorbance the tryptophan content for all hair samples was determined. The percentage tryptophan degradation was then determined by the graph.

RESULT & DISCUSSION:

The damage of hairs due to the UV radiation is of physical and chemical. The physical damage is due to the mechanical factors and leads to changes in textures and hair fall. Chemical damage is due to the photo-oxidation of amino acids and leads to degradation of the hair proteins and the amino acids.⁴

The damage of hairs by the UV radiation is different for each hair types which were taken previously and it is depend on the physiology of the hair samples. The hair samples used were Black, Grey and chemically treated hair were different in the pigment contents.¹⁶ So the protection by the protective agent also varies with the hair samples (Daud and Kulkarni, 2011).

In the present study photo-protective activity of Glycine max seed on different hair types were assessed.¹⁴ The seeds of Glycine max were purchased from Shri Mahadev Swayatt Sahkaarita, Dewaldhar, Bageshwar (Uttarakhand). The seeds were powdered to the coarse powder and subjected to maceration with water for obtaining the aqueous extract. The hair samples were collected from the local parlour of Dehradun. They were cleaned and divided into 3 separate groups for the treatment such as Black, Grey and chemical coloured. The hair samples were then treated with the extract and then exposure of 100 hrs in UV chamber. After that the tryptophan estimation was carried out with the help of standard graph.

The amino acid content stated that the hair which was untreated and exposed to UV showed higher degree of chemical changes while that the treated (Glycine max extract) offered protection.

Table 1: Tryptophan content for Black, Coloured and Grey hair treated with Glycine max extract before and after exposure

Table 1				
Types of hair	Amino acid content (gm)		% Degradation	% Degradation (Untreated samples)
	Unexposed	Exposed		
Black	0.00017	0.00015	29.235	47.558
Chemically treated	0.00031	0.00036	30.129	17.568
Grey	0.00022	0.00038	27.727	25.931

CONCLUSION: The degradation was shown minimum in Black hair-BHE (29.235) and maximum in Chemical coloured hair-CHE (30.129). So it was shown that better protection by the Glycine max extract in different hair types and

it is by the saponin content of the particular. The protection shown in Chemical coloured hair was minimum and tryptophan degradation was maximum.

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