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Original Article

Preliminary Phytochemical Investigation of *Hypnea valentiae* with Antigluconegenesis Activity in Goat Eye

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ABSTRACT

ROS is known to the main spark off the pathogenesis of cataract. In the Red seaweed the protein content along with Carotenoids are highly having the anti-oxidant activity to nullify the Oxidative stress. Along this ward, the Selected Red Seaweed where macerated in different solvent system. From that, the phytochemical parameters, were investigated. However, it showed that the Aqueous extract of *Hypnea valentiae* posse the protein, Carbohydrate, tannin and cartotenoids. The indexed extract pointed with the antigluconesgenesis effect in the isolated goat eye. The results suggest that the *Hypnea valentiae* extract under investigation can delay the diffusion onset and/or prevent the progression of cataract. In this, anti-cataract potential may be attributed to the presence of high protein and carotenoids. Photographic evaluation, further, confirmed the observation.

Key words: Hypnea valentiae, Aqueous extract, Anti gluconeogenesis, Goat eye.

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INTRODUCTION

Seaweeds plays a major important role in marine ecosystem.[1] Red algae are significant as primary producers, which are economically important as providers of food and gels.[2] Rhodophytes contain chlorophyll a which is masked by phycobilin pigments bound to proteins.[3,4] The chloroplasts in red algae resemble Cyanobacteria both biochemically and structurally. Food reserves are stored outside of the chloroplasts as Floridean starch.[5] Of the approximately 6000 species, most red algae are marine; only a few occur in freshwater.

MATERIALS & METHODS

Extraction

The selected algae specimens for the proposed study were collected from, Madurai mandapam region, Tamil nadu The whole plant of *Hypnea valentiae* were shade dried and coarsely powdered. About 500 gm of the powdered materials were extracted separately by cold maceration procedure successively with solvents of increasing polarity (Hexane, Chloroform, Ethyl acetate, Ethanol, Methanol and Aqeous). The solvent was filtered and distilled off. Final traces of solvent was removed under vacuum. The yield was noted and its percentage was calculated. The result is given in Table 1.

Phytochemical test[6,7]

The preliminary phytochemical screening various extracts were carried out for the identification of various phytoconstituents. The results are tabulated in Table 2.

Pharmacological screening

In- vitro cataract activity[8]

Fresh goat eyeballs were obtained from a local slaughterhouse within two hours after killing of the animals and the lenses were isolated. They are preserved and carried to the laboratory at 0-4°C. The isolated lens were incubated in artificial aqueous humor at 37°C and pH 7.8 for 72 h. Glucose at a concentration of 55 mM was used to induce cataract. A total of 42 goat lenses were used and divided into seven experimental groups consisting of 6 in each group.

Group I: Artificial aqueous humor alone (Normal control)

Group II: Glucose 55 mM alone (Negative control)

Group III: Glucose 55 mM + Vitamin E (100 µg/ml, Positive control)

Group IV-A: Glucose 55 mM + HV (100 µg/ml)

Group V-B: Glucose 55 mM + HV (200 µg/ml)

At the end of the experiment, the lenses were removed from the medium and rolled on filter paper to remove medium, adhering non lens tissue, and vitreous humor.

Examination of lens opacity

Lenses were placed on a wired mesh with posterior surface touching the mesh, and the pattern of mesh (number of hexagons clearly visible through the lens) was observed through the lens as a measure of lens opacity.

Preparation of lens homogenate

After incubation, lenses were homogenized with 10 volumes of 0.1 M potassium phosphate buffer,

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Table 1: Percentage yield of *Hypnea valentiae*.

Drug	Extract	Colour	Percentage Yield (w/w)
Hypnea valentiae (Whole Plant)	Hexane	Light red	0.61
	Chloroform	Light red colour	0.58
	Ethyl Acetate	Reddish brown colour	8.12
	Methanol	Deep red colour	5.82
	Ethanol	Redish Brown colour	7.91
	Aqueous	Deep Reddish colour	14.64

Table 2: Phytochemical investigation of *Hypnea valentiae*.

S.no	Chemical Test	Extracts					
		Hexane	Chloroform	Ethyl Acetate	Ethanolic Extract	Methanolic Extract	Aqueous Extract
1.	Alkaloids	-	-	-	-	-	-
2.	Glycosides	-	-	-	-	+	+
3.	Carbohydrate	-	-	-	-	+	+
4.	Protein	-	-	-	-	+	+
5.	Amino acid	-	-	-	-	-	+
6.	Saponin	+	+	-	-	-	-
7.	Flavonoid	-	-	-	-	+	+
8.	Phenolic Compound	-	-	-	-	-	+
9.	Tannin	-	-	-	-	-	+
10.	Terpenoids	-	-	-	-	-	-
11.	Oils and fats	+	+	-	-	-	-
12.	Steroids	+	+	-	-	-	-

+ Present, - Absent

Table 3: Effect of aqueous extract of *Hypnea valentiae* on lens protein and enzymatic anti-oxidant in control and experimental group.

Biochemical Parameter	Group –I (Control)	Group –II (Normal)	Group –III (Stand)	Group –IV (Test 100 µg)	Group – V (Test 250 µg)
Total Protein(mg)	198.2 ± 0.2	158.01 ± 0.9	165.2 ± 2.3	183.18 ± 3.1*	178.1 ± 1.2**
Catalase(kU/I)	8.8 ± 0.1	4.7 ± 0.3	7.2 ± 0.3	5.9 ± 0.7*	6.8 ± 0.2**

Values are expressed as mean ± SEM; n=5 in each group; $P < 0.01$ when compared to normal control; $P < 0.01$, $P < 0.05$ when compared using oneway ANOVA with post-hoc Dunnett's test using glucose 55 mM group as control.

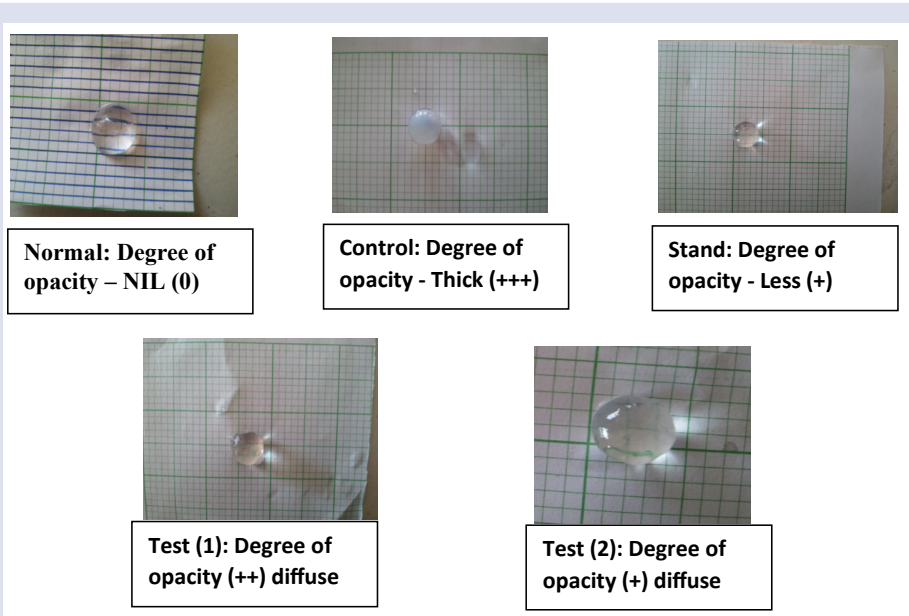

Figure 1: Anti cataractogenesis activity of aqueous extract of *Hypnea valentiae*.

pH 7.0. The homogenate was centrifuged at 10,000 g for 1 h and the supernatant was used for estimation of biochemical parameters.

After 72 h of incubation in glucose 55 mM, lens becomes completely opaque. normal control (Figure 1a). Incubation of lenses with HV 100 µg / 200µg (Test 1 and 2), at the concentrations used, seem to retard the progression of lens opacification, compared with lenses incubated in glucose 55 mM (negative control, Figure 1b). The effect of vitamin E, the positive control groups is showing considerable retardation in the progression of lens opacification (std Figure) which is near normalcy when compared to negative control.

DISCUSSION AND CONCLUSION

A fall in the protein level noted in Aqueous extract of *Hypnea valentiae* with the support of Catalase (Ku/I). The Hypnea implementation, produce significantly of $P < 0.01$ and restored the normal catalase enzyme also reported in the normal lens. A significant restoration activity indicate that, the Aqueous extract showed Antigluconegenesis activity. The Hypnea valentiae reduced the incidence of selenite cataract.[9,10] A significant delay in the deposition and the onset and progression of galactose cataract was observed.[11,12] Based on the results, the aqueous extract of Hypnea valentiae protects against experimental cataract development by virtue of its antioxidant and protein, and it may be useful for the therapy against cataracts.

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