

ADAPTOGENIC ACTIVITY OF HYDROALCOHOLIC EXTRACT OF TRIPHALA IN ALBINO RATS

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ABSTRACT

The present study was designed to perform the adaptogenic activity of hydroalcoholic extract of Triphala fruit (HAETF) part. The adaptogenic activity was evaluated by administering acute and chronic dose of HAETF in albino rats. The rats were randomly divided into five groups. Group one was not subjected to stress and were kept as normal control, group two was subjected to stress and were kept as stress control and other groups were treated with different dose of HAETF i.e. 100, 200 and 400 mg/kg p.o. and the adaptogenic activity was studied on acute swim endurance stress model and chronic swim endurance stress model for acute and chronic study respectively. In

acute stress models, VMA level of the stress control rat was $21.42 \pm 1.49 \mu\text{g/ml}$ and the normal control showed a VMA level of $3.92 \pm 1.39 \mu\text{g/ml}$ which was statistically significant ($p < 0.01$). The rats treated with 400mg/kg of HAETF showed VMA level $6.26 \pm 1.33 \mu\text{g/ml}$ which showed no significant difference as compared to normal control. In chronic stress model rats were divided into three groups i.e. normal control, stress control and test group administered with 400mg/kg of HAETF and stress was applied by force swimming endurance test for eight days. On 8th day SGOT and brain MDA level was estimated. In case of stress control plasma SGOT and brain MDA level was significantly ($p < 0.001$) increased. After treatment with HAETF at a dose of 400mg/kg all the parameters were reduced to normal. From this study it was concluded that, HAETF shows a significant adaptogenic activity in albino rats.

KEYWORD: VMA, plasma SGOT, brain MDA, force swim endurance stress model.

INTRODUCTION

Adaptogens are substances that produce a non-specific defensive response to stress to help organisms to adapt to unfavourable stressful conditions, which could be physical, chemical, biological or mental condition and have a normalizing influence on the body. All adaptogens display effects that help to regulate the neuroendocrine and the immune systems, provide a defense against stress. Adaptogens reduce stress-induced damage, thus presenting stress-protective effects such as anti-fatigue, anti-infectious, anti-depressant. Adaptogens exhibit stimulating effects, both after single and multiple administration, leading to increased working capacity & mental performance against a background of fatigue and stress. The mechanism of action or anti-stress action of the adaptogens can be grouped into 3 heads based on the system and function it affects, i.e. stress protective activity of adaptogens through endocrinology, CNS stimulatory effects and effect on fatigue and cognitive functions.

Stress can be described as the experiences that are challenging emotionally and physiologically. Selye defined stress as the non-specific response of the body to any demand. Stress is defined as a state in which homeostasis is actually perceived and re-established by a complex behavioural and physiological adaptive responses of the organism. There are four main types of stress, i.e. eustress (good stress), distress (negative stress), hyperstress, hypostress.

Present study is performed by using hydroalcoholic extract of triphala fruit part. Triphala (=three fruits) is a traditional ayurvedic herbal rasayana churna formulation consisting of equal parts of the dried fruits of three following myrobalans, in the ratio (1:1:1) taken without seed: Amalaki (*Phyllanthus emblica*), Haritaki (*Terminalia chebula*), Bibhitaki (*Terminalia bellirica*). The active constituents of Triphala are tannin, gallic acid, chebulagic acid, ellagic acid, phenol and glycosides.

AIM AND OBJECTIVE

Aim

The aim of my project work is to evaluate the adaptogenic activity of Triphala using swim endurance as an acute and a chronic stress model and to gather sufficient biochemical evidence supporting the fact.

Objective

- Collection of the dried fruits of the 3 constituent plants of the herbal formulation.
- Extraction of the coarsely ground mixture of the dried fruits in the ratio of 1:1:1 with 70% hydroalcohol (70 : 30, methanol : water v/v)
- Carrying out the detailed pharmacological studies on the prepared herbal formulation for their adaptogenic or anti-stress activity using both acute and chronic stress model.
- Investigation of the effect of the herbal formulation on the various biochemical parameters establishing adaptogenic activity.

METHOD AND MATERIAL**Acute stress study: (Forced swimming endurance test).**

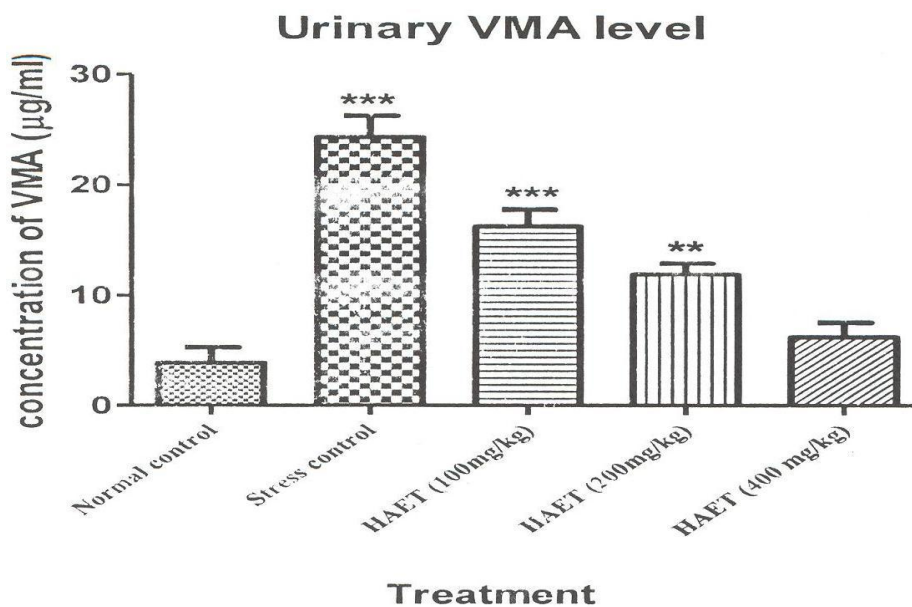
The rats were randomly divided into five groups. Group one was not subjected to stress and were kept as normal control, group two was subjected to stress and were kept as stress control and other groups were treated with different dose of HAETF i.e. 100, 200 and 400 mg/kg p.o. for 7 days. On 8th day the rats were subjected to forced swimming stress by keeping them in propylene cylinder, filled with water to a height of 25cm. The rats were made to swim individually for a session of 2hours to induce stressed condition. Then the animals were placed individually inside metabolic cages for duration of 24 hours for urine collection for the estimation of VMA.

Chronic stress study: (Forced swim endurance test).

Rats were divided into three group i.e. normal control, stress control and test group administered with 400mg/kg of HAETF and stress was applied by force swimming endurance test for eight days. On 8th day SGOT and brain MDA level was estimated.

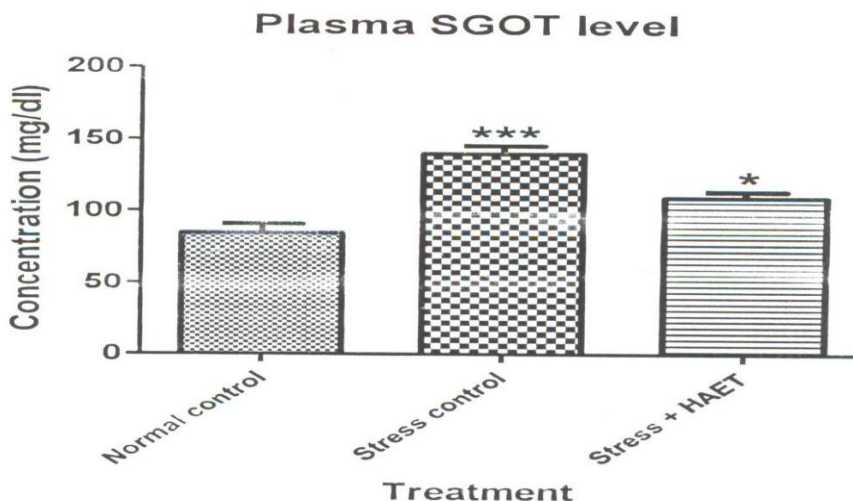
RESULT AND DISCUSSION**Effect of HAET on urinary VMA level**

GROUP	TREATMENT	MEAN ± SEM
Normal control	Vehicle (1% gum acacia)	3.92 ± 1.39
Stress control	Vehicle (1% gum acacia)	21.42 ± 1.49
Test 1	HAET (100mg/kg)	16.25 ± 1.53
Test 2	HAET (200mg/kg)	11.875 ± 1.02
Test 3	HAET (400mg/kg)	6.25 ± 1.33



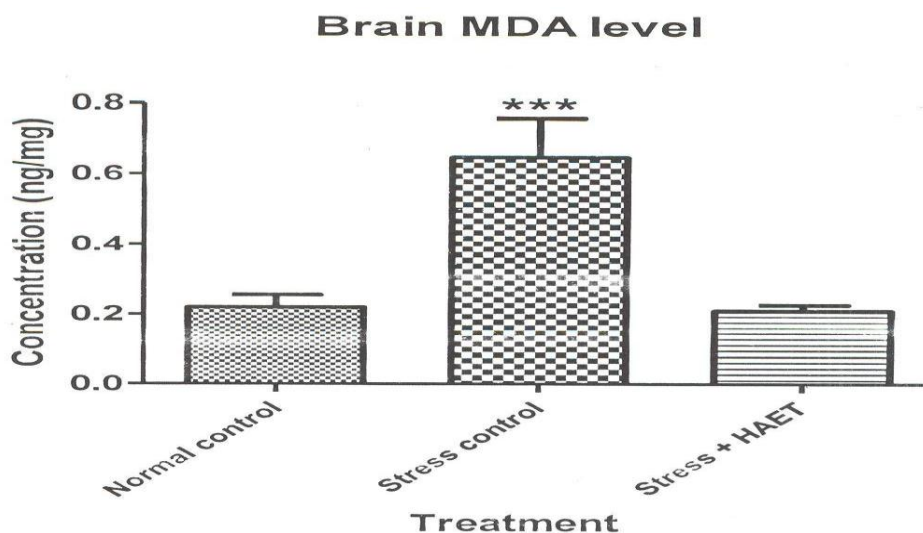
Effect of HAET on plasma SGOT level

GROUP	TREATMENT	MEAN ± SEM
Negative control	Vehicle (1% gum acacia)	85.34 ± 6.05
Positive control	Vehicle (1% gum acacia)	139.77 ± 5.41
Test group	HAET (400mg/kg)	110 ± 4.28



Effect of HAET on brain MDA level

GROUP	TREATMENT	MEAN ± SEM
Negative control	Vehicle (1% gum acacia)	0.22 ± 0.06
Positive control	Vehicle (1% gum acacia)	0.64 ± 0.18
Test group	HAET (400mg/kg)	0.21 ± 0.006



CONCLUSION

The above results confirm the adaptogenic activity of Triphala on rats. Out of the three evaluated doses of Triphala 400mg/kg showed the best adaptogenic activity.

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