

Cell Membrane Stabilizing Activity of *Hypericum perforatum*

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Abstract— Studies show that *Hypericum perforatum* extract has considerable antioxidant effects. The aim of this study was to determine the membrane stabilizing effect of hydroalcoholic extract of *Hypericum perforatum* on male rat RBC membrane.

In this laboratory experimental study, male Wistar rats blood samples were divided to control group and groups exposed to 2, 6, 25 and 50mg/kg/body weight of hydroalcoholic *Hypericum perforatum* extract. In each group 5 blood samples of 5 rats were examined. Membrane stabilizing activity of each blood sample was calculated and the data were analyzed using ANOVA. Membrane stabilizing activity of the extract was significantly lower in male rats exposed to *Hypericum perforatum* extract compared to control group. Our results indicated that hydroalcoholic *Hypericum perforatum* extract has anti-stabilizing activity on RBC membrane stability in male rats which may result in RBC hydrolysis.

Keywords—Hypericum perforatum, Membrane stabilizing activity, RBC, Rat.

I. INTRODUCTION

HYPERICUM perforatum L (Hypericaceae), popularly called St. John's wort, is an herbaceous perennial plant belonging to the family Clusiaceae especially grown in Iran, India, China, Turkey, and some other countries. *Hypericum perforatum* extract contains flavonoids, phenolic acids, quercetin and quercetin-3, which demonstrated a free radical scavenging activity [1],[2]. The essential and active ingredients of this herb include hypericin and heperforin [3],[4]. Many studies show that *Hypericum perforatum* could relieve mild to moderate forms of depression [5]. Furthermore, antioxidant [6], urinary system relaxant effects [7] and inhibition of calcium crystallization in the urinary system have been reported [8]. Herbal medicine has also employed lipophilic extracts from *Hypericum perforatum* as a topical remedy for wounds, abrasions, burns, and muscle pain [9]. On the other hand, the effective use of some herbal extracts on blood system has been reported [10]. The reports coming from studies conducted to elucidate the effects of *hypericum perforatum*

extract on blood system function are still conflicting, so, the present study was carried out to show the effects of *hypericum perforatum* extract on male rats RBC membrane stability.

II. MATERIAL AND METHODS

A. Animals

Adult male Wistar rats weighting 200 ± 30 g were purchased and raised in our colony from an original stock of Pasteur institute (Tehran, Iran). The temperature was at 23 ± 2 °C and animals kept under a schedule of 12h light: 12h darkness with free access to water and standard laboratory chow.

B. Protocol of Study

Male Wistar rats were randomly divided in to control group (normal saline receiving) and groups exposed to 2, 6, 25 and 50mg/kg/body weight of hydroalcoholic *Hypericum perforatum* (Figure 1) extract of 10 in each group. For immobilizing the animals, a standard restrainer was used. After 8 days blood samples were collected using cardiac puncture method. Membrane stabilizing activity of each blood sample was calculated.

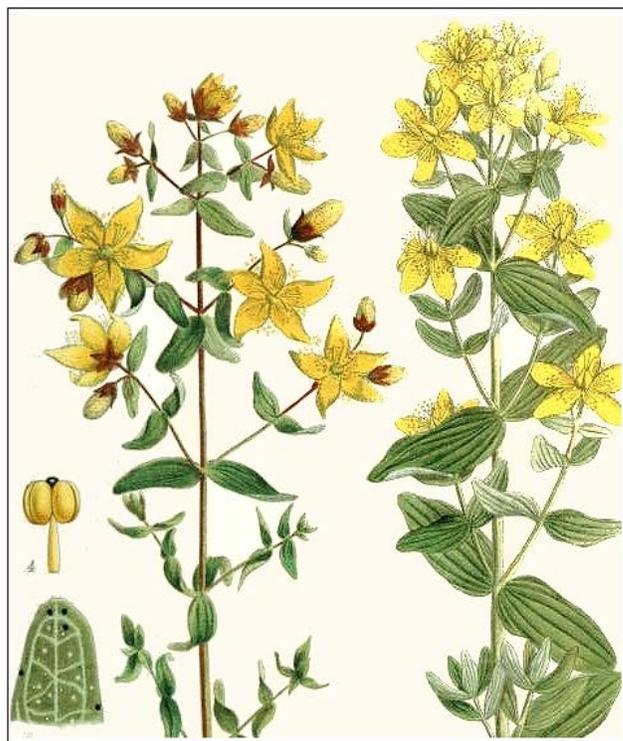


Fig. 1 *Hypericum perforatum*

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C. Statistical Analysis

All values are presented as mean±SD. Statistical significance was evaluated by one-way analysis of variance (ANOVA) using SPSS 19. Significance was measured using Game-s Howell significant for the exact P values and significant differences are noted in the results. Differences with P<0.05 were considered significant.

III. RESULTS

Membrane stabilizing activity of the extract was significantly lower in male rats compared to control group (Fig. 1).

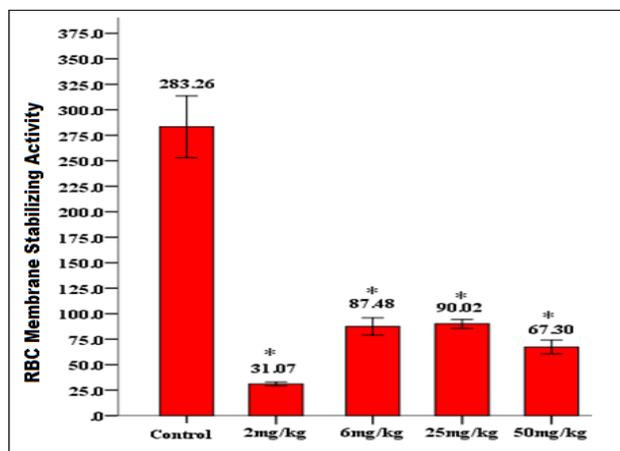


Fig 1. RBC membrane stabilizing activity of *Portulaca oleracea* grain extract in male rats. * indicates significant difference (P<0.001) compared to control group.

IV. DISCUSSION

Our results indicated that hydroalcoholic *Hypericum perforatum* extract has anti-stabilizing activity on RBC membrane stability in male rats. There are reports indicating that hypericum to be comparable to active controls, such as amitriptyline [11], imipramine [12]-[14] and fluoxetine [15] and superior to placebo [13]. In contrast to our findings, *Hypericum perforatum* ethanol extracts have also been shown to have anti-viral and anti-inflammatory activities [16],[17]. Antioxidants are caused by internal and external sources can protect red blood cell membranes against free radicals and cause stability to the membrane [19]. On the other hand, studies show that flavonoids compounds found in plants, with regard to the protection of SH groups of membrane proteins in red blood cells, can be effective in the red blood cell membrane stability [20],[21]. Despite existing of antioxidants and flavonoids, *Hypericum perforatum* did not show stabilizing activity on RBC membrane in male rats in our study. This is a conflicting issue should be more studied in future studies.

V. CONCLUSION

We have shown that hydroalcoholic *Hypericum perforatum* extract has anti-stabilizing activity on RBC membrane stability in male rats; according to which, may have inflammatory effects in male.

ACKNOWLEDGMENT

This research has been done with the support of Islamic Azad University, Hamedan Branch, Hamedan, Iran. We appreciate all who helped us to exert the present study.

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