Stabilizing Activity of *Hypericum perforatum* on Erythrocyte Membrane in Female Rat Blood Samples

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***Abstract*—**The aim of this study was to determine the membrane stabilizing effect of hydroalcoholic extract of *Hypericum perforatum* on female rat RBC membrane. Female Wistar rats blood samples were divided to control group and groups exposed to 6 and 75 mg/kg/body weight of hydroalcoholic *Hypericum perforatum* extract. In each group 5 blood samples of 5 female rats were examined. Membrane stabilizing activity of each blood sample was calculated and the data were analyzed using ANOVA. Membrane stabilizing activity of 6 mg/kg of extract was significantly higher compared to control group ($P<0.001$); however, membrane stabilizing activity of 75 mg/kg of extract did not significantly differ from control group . Appropriate dose of Hypericum perforatum can enhance RBC membrane stability.

***Keywords*—** Hypericum perforatum, Membrane Stability, RBC, Female Rat.

I. Introduction

HYPERCIUM perforatum is a yellow-flowering, stoloniferous or sarmentose, perennial herb indigenous to Europe. It has been introduced to many temperate areas of the world and grows wild in many meadows. The herb's common name comes from its traditional flowering and harvesting on St John's day, 24 June. The genus name *Hypericum* is derived from the Greek words *hyper* (above) and *eikon* (picture), in reference to the plant's traditional use in warding off evil by hanging plants over a religious icon in the house during St John's day. The species name *perforatum* refers to the presence of small oil glands in the leaves that look like windows, which can be seen when they are held against the light (Fig. I).

St John's wort is a perennial plant with extensive, creeping rhizomes. Its stems are erect, branched in the upper section, and can grow to 1 m high. It has opposing, stalkless, narrow, oblong leaves that are 12 mm long or slightly larger. The leaves are yellow-green in color, with transparent dots throughout the tissue and occasionally with a few black dots on the lower surface. Leaves exhibit obvious translucent dots when held up to the light, giving them a 'perforated' appearance, hence the plant's Latin name [1].

Fig. I. Hypericum Perforatum

The use of herbal medications and other alternative therapies is growing worldwide. Survey data clearly indicate that these agents are frequently combined with prescription and over-the-counter medications. Hypericum perforatum is one of the most commonly utilized herbal agents. In spite of growing concern and examples of herb-drug interactions, little systematic research has been published or funded in this area [2], [3], [4]. The chemical composition of St. John's wort has been well-studied. Documented pharmacological activities, including antidepressant, antiviral, and antibacterial effects, provide supporting evidence for several of the traditional uses stated for St John's wort. Many pharmacological activities appear to be attributable to hypericin and to the flavonoid constituents; hypericin is also reported to be responsible for the photosensitive reactions that have been documented for St. John's wort [5]. St. John's wort extracts are used in a therapeutic area which extends well beyond the traditional field of herbal medicine [6]. *Hypericum* as a medicinal herb has a potent anti-inflammatory property as an arachidonate 5-lipoxygenase inhibitor and COX-1 inhibitor[7].

According to anti-inflammatory property of *Hypericum perforatum* we carried out the present study to investigate the membrane stabilizing effect of hydroalcoholic extract of *Hypericum perforatum* on female rat RBC membrane**.**

II. Material And Methods

In this laboratory experimental study, female Wistar rats blood samples were divided to control group and groups exposed to 6 and 75 mg/kg/body weight of hydroalcoholic *Hypericum perforatum* extract. In each group 5 blood samples of 5 rats were examined. Membrane stabilizing

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activity of each blood sample was calculated and the data were analyzed using ANOVA.

III. Results

Membrane stabilizing activity of 6 mg/kg of extract was significantly higher compared to control group (P<0.001); however, membrane stabilizing activity of 75 mg/kg of extract did not significantly differ from control group (Fig. II)

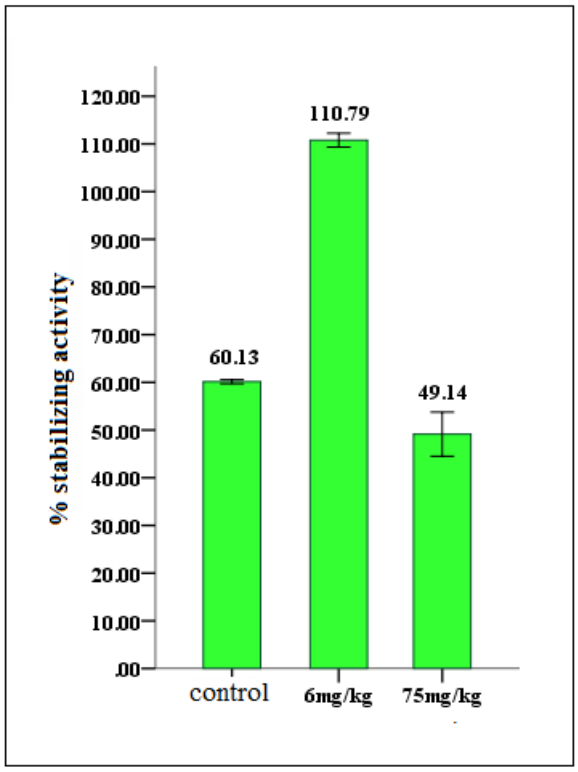

Fig II. RBC Membrane Stabilizing Activity Of *Hypericum Perforatum* Extract In Female Rats Blood Samples Exposed To 6 And 75 Mg/Kg/Body Weight Of Hydroalcoholic *Hypericum Perforatum* Extract

IV. Discussion

Our results indicated that lower dose (6 mg/kg) of *Hypericum perforatum* extract had increasing membrane stabilizing activity; however, higher dose (75 mg/kg) of *Hypericum perforatum* extract did not significantly influence RBC membrane stability in female rat blood samples.

In line with our findings the studies show that there are many anti-inflammatory plants and agents which modify inflammatory responses by accelerating the destruction or antagonising the action of the mediators of inflammatory reaction and increasing RBC membrane stability [8], [9].

In humans, the active ingredient of *Hypericum perforatum* called hyperforin is a monoamine reuptake inhibitor which also acts as an inhibitor of PTGS1, arachidonate 5-lipoxygenase, SLCO1B1 and an inducer of cMOAT. Hyperforin is also a anti-inflammatory compound with anti-angiogenic, antibiotic, and neurotrophic properties. Hyperforin also has an antagonistic effect on NMDA receptors, a type of glutamate receptor [10]-[12].

V. Conclusion

We have shown that low dose of *Hypericum perforatum* extract has stabilizing activity on RBC membrane according to which the anti-inflammatory effects of *Hypericum perforatum* is justifiable.

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