Evaluation of Hemolytic and Anti-Hemolytic Activity of the Aerial Parts of Sonchus Oleraceus Extracts

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ABSTRACT
Plants have been used as alternative remedy for the treatment of various ailments since ancient times. The present study aimed to evaluate some of the biological activities of the plant Sonchus oleraceus in vitro including the hemolytic and antihemolytic effect. Hydromethanolic 80% and aqueous extracts of the aerial parts of plant were prepared using ultrasound-assisted extraction. Phytochemical analysis, hemolytic and anti-hemolytic activity of both extracts of Sonchus oleraceus were assessed. Phytochemical screening revealed the presence of tannins, carbohydrates, flavonoids, saponins, and phenolic compounds in both extracts. Hemolytic activity assessment has been conducted, using spectrophotometric method.

KEYWORDS: Sonchus Oleraceus; Hemolytic activity; Erythrocytes membrane; Membrane-stabilizing property; Antihemolytic; Antioxidant.

Introduction
Since the beginning of human civilization, medicinal plants have been used for its therapeutic value. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have hence been isolated from natural sources (Shwetha et al., 2016). According to the World Health Organization (WHO) estimate, more than 80% of the population of the developing countries rely on conventional plants for initial health care. Only in Asia, medicinal plants has a big impact on economy and primary health care. There are approximately 6,500 species used for curative purpose in Asia (Asif et al., 2014). However, use of herbal drugs in the developed world continue to rise because they are rich source of novel drugs and their bioactive principles form the basis in medicine, nutraceuticals, pharmaceutical intermediates and lead compounds in synthetic drugs (Hossain et al., 2014). These compounds are known as secondary plant metabolites and have biological properties such as antioxidant activity, antimicrobial effect, stimulation of the immune system, decrease of platelet aggregation and modulation of hormone metabolism and anticancer property (Saxena et al., 2013). Herbal products are often perceived as safe because they are “natural”(Mannan et al., 2015). However, because of the numerous side effects of the synthetic drugs, the value of medicinal plants is being rediscovered as some of them have proved to be as effective as synthetic medicines with fewer or no side effects and contraindications (saxena et al., 2013). Despite this fact inherent toxicity of some of their constituents should not be underestimated, and even nontoxic herbs can have side effects if inappropriately dosed (Colegate and Molyneux, 2008).

It has been reported that many plants used as food or in traditional medicine have mutagenic, cytotoxic and genotoxic effects (Lohith et al., 2013). Many plants contain chemical substances that might have a hemolytic or anti-hemolytic effect on human erythrocytes (Manthey et al., 2001). Plant extracts can positively affect the red cell membrane (Freitas et al., 2008) and many plants have serious adverse effects, which include induction of hemolytic anemia (Zohra and Fawzia, 2014). Therefore, research on medicinal plants is one of the leading areas of research globally (Shailesh et al., 2011), and it is of utmost importance that efficacy and toxicity risks or potential hemolytic activity of medicinal plants are evaluated (Zohra and Fawzia, 2014). Hemolysis assay is an extremely sensitive method for cytotoxic studies with wide range of phytochemicals effects (Lohith et al., 2013). Hemolysis is due to red blood cells destruction which resulted from lysis of membrane lipid bilayer, by which hemoglobin and other internal cell components are