

Evaluation of Laxative Activity of *Alstonia scholaris*

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ABSTRACT

Alstonia scholaris Linn. is traditionally used to treat constipation. The present study was carried to investigate laxative activity of aqueous extract of *A. scholaris* on albino Wistar rats. Rats were divided in to 4 groups of 6 animals each, first group as control, second group served as standard (Senna-30 mg/kg), while group 3 and 4 were treated with aqueous extract of *A. scholaris* at doses of 100 and 200 mg/kg body weight (p.o.), respectively. The laxative activity was determined based on the weight of feces matter. The aqueous extract of the plant produced significant ($p<0.01$) laxative activity at both doses. The results showed that the aqueous extract of *A. scholaris* has a significant laxative activity and supports its traditional use in herbal medicine.

Keywords: *Alstonia scholaris*, Laxative Activity, Senna.

1. INTRODUCTION

Constipation is a highly prevalent, often chronic, gastrointestinal disorder that affects adults^{1,2}. The treatment with classic drugs did not cut, in one hand, with the inadequate relief of bloating and other symptoms, and with the lack of efficacy in relieving constipation. So far, half of patients were not satisfied with the effect of laxatives on improving quality of life³. Plants have long been a very important source of drugs against several diseases including constipation.

Alstonia scholaris Linn. (Apocynaceae), popularly known as the "Saptaparni", is used traditionally as laxative, astringent, thermogenic, antipyretic, antimalarial, antileprotic, anti-eczema, anthelmintic, cardioprotective and used for the treatment of bronchitis^{4,5}. *A. scholaris* is generally reported to possess antipyretic, anti-inflammatory, anticancer, antidiabetic, antianxiety, immunomodulator and hepatoprotective properties⁶.

There seems to be no report on the laxative activity of *A. scholaris*, so the present study was planned to examine the laxative activity of the aqueous extract of *A. scholaris*.

Material and Methods

Collection of Plant Material and Extraction

The *A. scholaris* bark procured from local market and was authenticated by B.K. Venkatesh, Botanist, First Grade College, Chickballapur, Karnataka (India) and herbarium specimen was prepared and stored in college museum with SKVCP No. 18. The collected bark was coarsely powdered and extracted with water by using soxhlet apparatus and the extract obtained was vacuum dried. The obtained aqueous extract of *A. scholaris* was screened for the presence of various phytoconstituents like flavonoids, saponins, glycosides, terpenoids aminoacids, alkaloids, carbohydrates, phenolic compounds and proteins as described by Kokate⁷.

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Animals

Wistar rats, weighing 150-200 g, of either sex were acclimatized to the experimental room at temperature 23 ± 2 °C, controlled humidity conditions (50-55%) and 12 h light and 12 h dark cycle. They were caged with a maximum of two animals in polypropylene cage and were fed with standard food pellets (Kamadenu Enterprises, Bangalore) and water *ad libitum*.

Laxative Activity

The laxative activity was performed according to Capasso *et al*⁸. Rats of either sex were fasted for 12 h before the experiment, but with water provided *ad libitum*. The animals were divided into 4 groups of six animals each. The first group of animals, serving as control, received normal saline (25 ml/kg); the second group serving as reference, received aqueous extract of

Senna (30 mg/kg) while third and fourth groups received the aqueous extract of *A. scholaris* at doses of 100 and 200 mg/kg, respectively. Immediately after administration of dose, the animals were isolated and housed separately in polypropylene cages suitable for collection of feces. After 8 h of drug administration the feces were collected and weighed. Thereafter, food and water were given to all animals and fecal outputs were again weighed after a period of 16h.

Statistical Analysis

The Data were expressed as mean \pm SEM. The differences were compared using one-way ANOVA followed by Dennett's test using PRISM software (version 4). The results were considered significant when $p < 0.05$.

Table 1. Laxative activity of aqueous extract of *Alstonia scholaris* in rats

Treatment	Dose (mg/kg, p.o)	Fecal output (g)	
		8h	8-16 h
Control	-	0.61 \pm 0.06	1.24 \pm 0.08
Senna	30	1.97 \pm 0.05**	3.4 \pm 0.17**
<i>Alstonia scholaris</i>	100	1.2 05 \pm 0.02**	2.76 \pm 0.14**
	200	1.75 \pm .0.04**	8.95 \pm 0.31**

Values are expressed as mean \pm S.E.M (n = 6); ** p < 0.01 compared to control group

RESULTS AND DISCUSSION

In this study, the different doses of the aqueous extract of *A. scholaris* showed dose dependant increase in fecal output of rats when compared to the control group (Table 1). The effects of *A. scholaris* at doses of 100, 200 mg/kg (p.o.) increased significantly ($p < 0.01$) and in a dose dependent manner. The fecal output of rats was compared to control group at 8th and 16th hour. The results showed that oral administration of leaves aqueous extract of *A. scholaris* produced significant and dose dependant increase in fecal output of rats.

The presence of phytoconstituents like alkaloids,

terpenoids, steroids, carbohydrates, flavonoids, phenolic compounds, tannins and alkaloids⁹ have been previously found to be responsible for laxative activities in plants. In the present study, phytochemical screening of the aqueous extract of *A. scholaris* revealed the presence of glycosides, alkaloids, tannins, flavonoids, steroids, and terpenoids. These constituents may be responsible for the laxative activity of *A. scholaris*.

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تقييم نشاط *Alstonia laxative Scholaris*

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ملخص

يستخدم *Alstonia scholaris* Linn تقليدياً لعلاج الإمساك. وقد أجريت هذه الدراسة إلى التحقق من أثره الملين باستخدام المستخلص المائي لـ *A. scholaris* على فئران ويستار البيضاء. تم تقسيم الفئران إلى 4 مجموعات من 6 الحيوانات لكل منها، المجموعة الأولى هي مجموعة السيطرة، المجموعة الثانية مجموعة معيارية باستخدام مستخلص نبات السينا (سينا-30 ملغ / كلغ)، في حين أن مجموعة 3 و4 عولجوا بالمستخلص المائي *A. scholaris* بجرعات من 100 و200 ملغم / كغم من وزن الجسم على التوالي. تم تحديد النشاط الملين على أساس وزن البراز. المستخلص المائي سببا لنشاط الملين في كل الجرعات ($p < 0.01$). وأظهرت النتائج أن المستخلص المائي للـ *A. scholaris* لديه النشاط ملين كبيرة وتدعم استخدامه التقليدي في الأدوية العشبية.

الكلمات الدالة: تقييم نشاط، نبات السينا.