



Research Article

Botany

A STUDY ON PHYTOCHEMICAL ANALYSIS AND *IN VITRO* ANTI-ARTHRITICS
ACTIVITY OF *Ipomoea obscura* LEAVES

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ABSTRACT

The bioactive components of *Ipomoea obscura* leaves have been evaluated. The chemical compositions of many bioactive compounds were responsible for therapeutic applications. The phytochemical screening and *in vitro* anti-arthritis activity of *Ipomoea obscura* leaves extract. The qualitative analysis of ethanolic and aqueous extract of *Ipomoea obscura* leaves showed that the presence of tannin, saponins, flavonoids, terpenoids, polyphenol, glycoside and coumarins. Steroids, triterpenoids and anthraquinone were absent in aqueous extract only. Significant amount of flavonoids (10.00 ± 0.24 mg/gm) and total phenol (189.00 ± 1.12 mg/gm) were present in *Ipomoea obscura* leaves were observed. The potential *in vitro* anti-arthritis activity of the *Ipomoea obscura* extracts was confirmed by protein denaturation methods.

Keywords: *Ipomoea obscura*, qualitative, quantitative and anti-arthritis.

INTRODUCTION

Herbal medicines are used for the treatment of various ailments from ancient times and it is not an exaggeration to say that the use of the herbal drugs is as old as mankind (Tandon and Gupta, 2004). Phytochemicals are chemical compounds produced by plants, generally to help them thrive or thwart competitors, predators, or pathogens. The ayurvedic system of medicine is purely of Indian origin and development more than 2400 remedies have been known in Indian medical flora (Vispute and Khopade, 2011). The extracts of roots, bark, and leaves are commonly used to treat gastroenteritis, vomiting, diarrhoea, dysentery, wounds, ulcers, toothache, coughs, sore throat, inflamed gums, and a number of other conditions (Lapik *et al.*, 2005). Rheumatoid arthritis (RA) is considered the most common

chronic inflammatory autoimmune disease, occurring in 1 to 2% of the worldwide population (Firestein *et al.*, 2005). The epidemiological ratio of arthritis in female and male is 3:1 and the prevalence is 1% of the world population. Common signs and symptoms of rheumatoid arthritis include pain and swelling of joints, warmth or redness over the affected joints, morning stiffness lasting longer than 30 minutes along with fatigue, weakness, weight loss, and low-grade fever (Lee and Weinblatt, 2001; Klarenbeek *et al.*, 2010). Plant produces phytochemicals to protect itself but recent research demonstrates that many phytochemicals can protect humans against diseases. Keeping in view, the present study was to investigate phytochemicals and *in vitro* anti-arthritis activity of *Ipomoea obscura* leaves.

MATERIALS AND METHODS

Collection of plant materials

The *Ipomoea obscura* were collected from Kelakavatagkurichiy, Ariyalur district, Tamil Nadu, India during March 2022. The collected leaves were washed several times with distilled water to remove the traces of impurities from the leaves. Then examined carefully, old infected and fungus damaged portion of the leaves were removed. Healthy leaves were dried in room temperature and grind using grinder mixture. The powder was stored for further analysis

Preparation of plant extract

1 gram of the powder of *Ipomoea obscura* leaves were transferred in to different conical flask (250ml). The conical flask containing 50ml of different ethanol and water. The conical flask containing *Ipomoea obscura* leaves were shaken well for 30 minutes by free hand. After 24 hrs, the extracts were filtered using Whatman filter paper No.1 and filtrate is used for further analysis.

Phytochemical screening

Chemical tests were carried out on the extract using standard procedures to identify the constituents as described by Sofowara (1993), Trease and Evans (1989) and Harborne (1973 and 1984). Total phenols estimated by the

method of Edeoga *et al.*, (2005). Flavonoid determine by the method of Bohm and Kocipai-Abyazan (1994). Alkaloid determine by the method of Harbone (1973). Tannin determined by Van-Burden and Robinson (1981) method.

In vitro Antiarthritics activity

In vitro anti-arthritics activity was carried out by egg albumin and bovine serum albumin (protein) denaturation methods (Sangita Chandra *et al.* 2012).

RESULTS AND DISCUSSION

Qualitative phytochemical analysis

The qualitative phytochemical screening of the leaves of *Ipomoea obscura* study was carried out on the *Ipomoea obscura* leaves extract revealed the presence of medicinally active constituents. The phytochemical characters investigated and summarized in Table 1. The presence of tannin, saponins, alkaloids, flavonoids, terpenoids, polyphenol, glycoside and coumarins while steroids, anthroquinone and triterpenoids were absent in ethanol and aqueous extract.

Quantitative phytochemical analysis

Table 2 shows total of flavonoids (10.00±0.24 mg/gm), total phenol (189.00±1.12 mg/gm), alkaloids (30.23±3.11) and Tannin (18.02±2.03) were present in *Ipomoea obscura* leaves.

Table 1: Qualitative phytochemical analysis of *Ipomoea obscura* leaves extract

S. No	Phytochemicals	Aqueous extract	Ethanol extract
1	Alkaloids	++	+
2	Antroquinone	-	-
3	Coumarins	+	+
4	Flavonoids	+	+
5	Glycosides	+	+
6	Polyphenol	++	++
7	Saponin	++	++
8	Steroids	-	-
9	Tannin	++	++
10	Terpenoids	+	+
11	Triterpenoids	-	-

(+) Presence, (++) High concentrations and (-) Absences

Table 2: Quantitative estimation of *Ipomoea obscura* leaves

S. No	Phytochemicals	Results (mg/gm)
1	Alkaloids	30.02±3.11
2	Flavonoids	10.00±0.24
3	Tannin	18.02±2.03
4	Total phenol	189.00±1.12

Values are expressed as mean ± SD for triplicates

Plants are a great concern for drug discovery exploration and a major source of our modern medicine. About 25% of modern medicines are derived from a plant source and merely 5-15% of plants have been investigated for their medicinal use (Gurnani *et al.*, 2014). Nowadays, natural plants, herbal medicines, phytomedicines, and functional foods are extensively studied by scientists all over the world which resulted with the lucrative therapeutic potentials such as antidiabetic (Chen *et al.*, 2018). The phytochemicals and use of

phytochemicals is increasing more because of the harmful side effects of the synthetic compounds (Vikram *et al.*, 2014).

In vitro anti-arthritic activity

The alcoholic extract of *Ipomoea obscura* leaves confirmed the anti-arthritic activity through protein denaturation method using Egg albumin and Bovine Serum albumin. The highest activity in 87.65±0.82 and 89.23±1.38 % for 500µg/ml were observed in Egg albumin and Bovine Serum albumin (Figure 1 and 2).

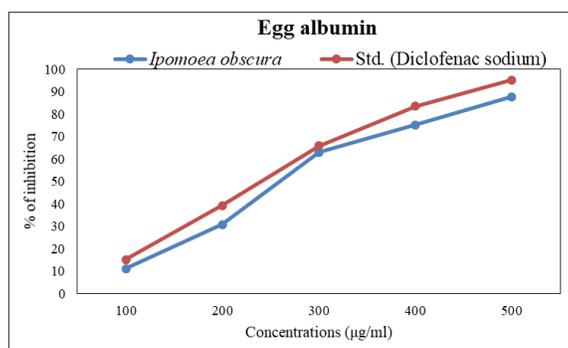


Figure 1: In vitro anti-arthritic activity of *Ipomoea obscura* leaves (Egg albumin)

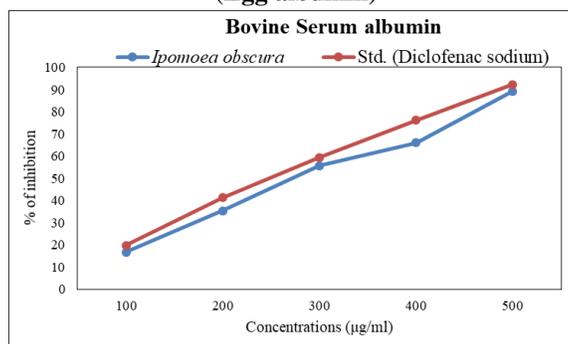


Figure 2: In vitro anti-arthritic activity of *Ipomoea obscura* leaves (Bovine Serum albumin)

Divya Singh *et al* (2013) examined anti-arthritic Activity of seed extract of *Pongamia pinnata* (L.) Pierre by *in vitro* model. Susmitha Sudevan *et al.*, (2015) investigation exposed that the extracts of *Acmella Oleracea* have potent phytochemical and anti-arthritic activity which explains its use in traditional system of medicines. Hence, in the present study the protein denaturation bioassay was selected for *in vitro* assessment of anti-arthritic property *Ipomoea obscura* leaves. Denaturation of tissue proteins is one of the well-documented causes of

inflammatory and arthritic diseases (Grant *et al.*, 1970).

CONCLUSION

The *Ipomoea obscura* leaves has rich source of phytochemicals and possess potential anti-arthritic activity. The results of the study concluded that *Ipomoea obscura* leaves may be used for the treatment of arthritics. The potential *in vitro* anti-arthritic activity of the *Ipomoea obscura* extracts was confirmed by egg albumin and bovine serum albumin (protein) denaturation methods.

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