

SCREENING OF *ABELMOSCHUS ESCULENTUS* FRUITS FOR ITS
ANALGESIC ACTIVITY

Biren N. Shah*¹ A. K. Seth², K.M. Maheshwari¹ and R.V. Desai¹

¹ Dept. of Pharmacognosy, Vidyabharti Trust College of Pharmacy, UmraKh, Gujarat, India.

² Sumandeep Vidyapeeth University, Vadodara, Gujarat, India.

* For Correspondence

Mr. Biren N. Shah

birenpharma@yahoo.co.in

Mob: +919978262799

Summary

The present study was taken to give the scientific validation of folklore medicinal use of *Abelmoschus esculentus*. The analgesic activity of methanolic and aqueous extract of fruit of *Abelmoschus esculentus* was evaluated using tail immersion method in rats. The rats were evaluated for the pain threshold at different interval of time up to 180 minutes. The methanolic extract and aqueous extract shows significant activity at 180 min (5.82 ± 0.012) and (5.78 ± 0.012) respectively. The results support the traditional use of this plant in some painful and inflammatory conditions.

Key words: *Abelmoschus esculentus*, Analgesic, Tail immersion method.

Introduction

Abelmoschus esculentus L. (or *Hibiscus esculentus* or Okra) – Malvaceae is used for a long time as an edible vegetable in many countries, and commonly eaten in India and Vietnam because of its nourishing components. Traditionally, it is believed that the plant is useful in the treatment of pain and inflammatory disorders, constipation and retention of urine. On the other hand, a number of previous studies have reported that *Abelmoschus sp.* possessed hypoglycemic effect¹. However, there is a little study regarding its analgesic effect.

Known for about 2000 years,² Okra (*Abelmoschus esculentus* L.) Monech, Malvaceae, (formerly *Hibiscus esculentus* Linn.) is currently being grown in all regions of the Old World with a tropical or mediterranean climate. It is the seed pods that are used most frequently: they are consumed as a fresh vegetable especially in Africa (gombo) and India (bhindi). It is an edible hibiscus which has a variety of traditional uses and was shown to possess various pharmacological activities. The fruit of the okra plant,

Abelmoschus esculentus is used as a mucilaginous food additive against gastric irritative and inflammatory diseases,³ antioxidant,⁴ anti-ulcerogenic⁵. The roots are very rich in mucilage, having a strongly demulcent action, plasma replacement, an infusion of the roots is used in the treatment of syphilis, the seeds are antispasmodic, cordial and stimulant.

The purpose of the present study was, therefore, to evaluate the analgesic effect of the *Abelmoschus esculentus* fruit extract using tail immersion method of pain in rats. The extract was also studied for its acute toxicity effects and preliminary phytochemical screening.

Materials And Methods

Collection of Plant material:

The fruits of *Abelmoschus esculentus* were purchased from the local area of Bardoli, India and were authenticated by the botanist. The voucher specimen was kept in the college museum.

Extraction of Fruits:

The shade dried fruits of *Abelmoschus esculentus* were reduced to fine powder (# 40 size mesh) and around 200 gm of powder was subjected to successive hot continuous extraction (soxhlet) with methanol. Finally the drug was macerated with chloroform water. After the effective extraction, the solvents were distilled off, the extract was then concentrated on water bath and the extract obtained with each solvent will be preserved.

Animal selection:

Albino rats of either sex weighing 150 to 200 g were selected for the experiment. They were employed for assessing analgesic activity. Rats were divided into four groups, each group having six animals. The bedding material of the cages was changed every day.

Materials:

Extract used

- a) Methanol extract of *Abelmoschus esculentus*
- b) Aqueous extract of *Abelmoschus esculentus*
- c) Standard: Pentazocin. (FORTWIN ,Ranbaxy, India)

Dose selection:

- a) Methanol extract of *Abelmoschus esculentus* (250 mg/kg b.wt)
- b) Aqueous extract of *Abelmoschus esculentus* (250 mg/kg b.wt)
- c) Control: 5 ml/kg of 5% gum acacia. (p.o.)
- d) Standard: Pentazocin 5 mg/kg body weight (i.p.)

Method:

The analgesic responses of the given samples of extracts were evaluated using the Tail immersion method⁶ using analgesiometer.

In this method the rats were divided into four groups (each group containing six animals). The first group was served as control and received 5% acacia solution only (5ml/kg bd wt, orally.), second group of animals was served as standard and administered standard drug Pentazocin (5 mg/kg bd wt., i.p.). The animals of remaining groups were treated with different extracts. The analgesic responses of the fruit extracts were evaluated using the tail immersion method. In this procedure the albino rats were weighed and marked. They are placed into individual restraining cages leaving the tail hanging out freely. The animals are allowed to adapt to the cages for 30 min before testing. The lowest 5 cm portion of the tail is marked. This part of the tail is immersed in a cup of freshly filled water of exactly 55 °C. Within a few seconds the rat reacts by withdrawing the tail. The standard, test and control doses were injected to the animals and the reaction time was noted at 0, 30, 60, 90, 120 and 180 minutes.

All data were expressed as Mean \pm SEM and analyzed statistically by using Dunnett's *t*-test. A difference was considered significant at P value less than 0.05.

Result and Discussion

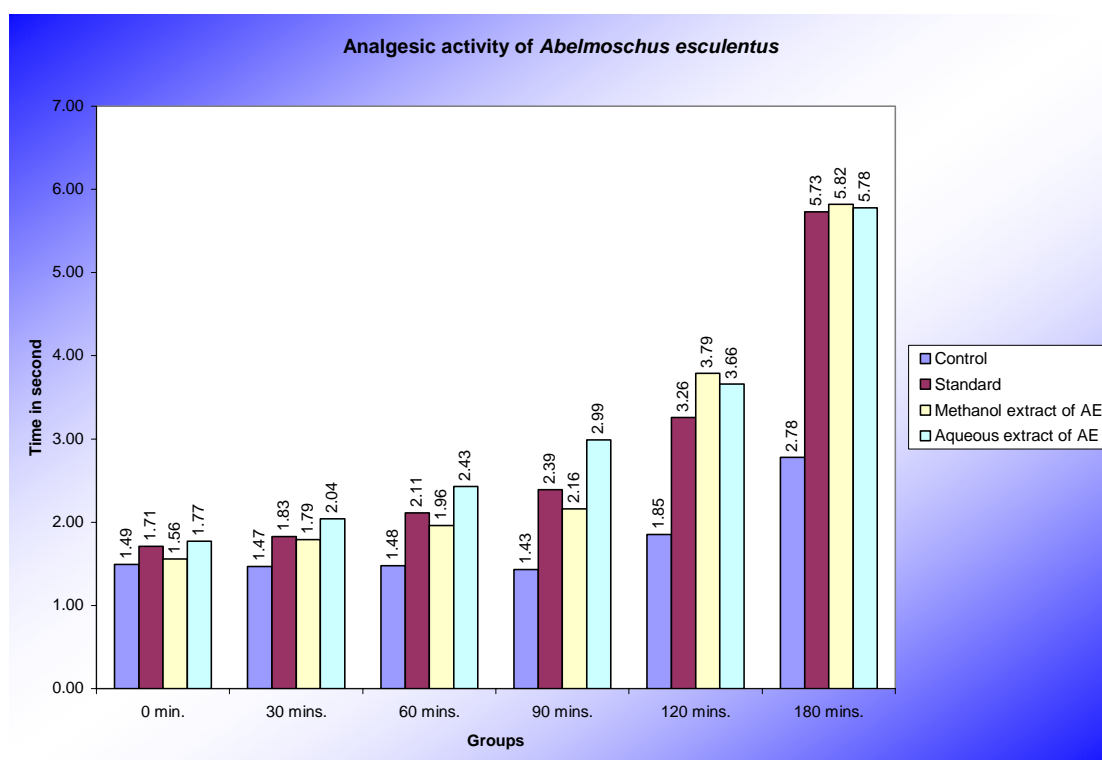
The results have been shown in Table No.1 and Figure No.1.

This present study was carried out to assess the validity of the folkloric use of this plant in the management of pain threshold. Both *in-vivo* and *in-vitro* methods are available for the evaluation of analgesic agents but among the *in-vivo* methods tail immersion method is believed to be one of the most reliable and also the most widely used.

From the results obtained it is concluded that methanolic extract of *Abelmoschus esculentus* shows moderate activity while aqueous extract of *Abelmoschus esculentus* shows significant activity after 90 min. While at 180 min both aqueous extract and methanolic extract of *Abelmoschus esculentus* shows significant analgesic activity. Still it is a preliminary study it requires the molecular level study to find out the responsible chemical constituent for the analgesic effect.

Table No.1 Analgesic activity of various extracts of *Abelmoschus esculentus*.

SL. NO.	GROUP	0 min.	30 mins.	60 mins.	90 mins.	120 mins.	180 mins.
		MEAN \pm SEM					
1	Control	1.49 \pm 0.012	1.47 \pm 0.023	1.48 \pm 0.015	1.43 \pm 0.020	1.85 \pm 0.019	2.78 \pm 0.031
2	Standard	1.71 \pm 0.030	1.83 \pm 0.020	2.11 \pm 0.017	2.39 \pm 0.026	3.26 \pm 0.006	5.73 \pm 0.071
3	Methanol extract of AE	1.56 \pm 0.026	1.79 \pm 0.037	1.96 \pm 0.030	2.16 \pm 0.016	3.79 \pm 0.011	5.82 \pm 0.012
4	Aqueous extract of AE	1.77 \pm 0.020	2.04 \pm 0.016	2.43 \pm 0.010	2.99 \pm 0.011	3.66 \pm 0.016	5.78 \pm 0.012

Figure 1: Analgesic activity of *Abelmoschus esculentus*

References

1. I-Min Liu, Shorong-Shii Liou, Ting-Wei Lan, Feng-Lin Hsu, Juei-Tang Cheng Myricetin as the active principle of *Abelmoschus moschatus* to lower plasma glucose in streptozotocin-induced diabetic rats. *Planta Med.* 2005: 71 (7), 617-621.
2. Ames, J. M. and MacLeod G. Volatile components in okra seed coat. *Phytochem.* 1990: 29(4), 1201.
3. Lengsfeld C, Titgemeyer F, Faller G, Hensel A. *Krankenhausstrasse*; 2004: 8-10.
4. Ansari NM, Houlihan L, Hussain B, Pieroni A, Antioxidant activity of five vegetables traditionally consumed by South-Asian migrants in Bradford, Yorkshire, UK. *Phytother. Res.* 2005: 19(10), 907-11.
5. Gurbuz I, Ustun O, Yesilada E, Sezik O, Kutsal O. Antiulcerogenic activity of some plants used as folk remedy in Turkey. *J. Ethnopharmacol.* 2003: 88(1), 93-97.
6. Chandrashekar KS, Satyanarayana D, Joshi AB. Analgesic activity of *Leucas lavandulaefolia* Rees. *Indian Drugs.* 2002: 2, 78-80.