

EVALUATION OF ANTIPYRETIC ACTIVITY OF *CAESALPINIA CRISTA LINN.* SEED EXTRACTS ON WISTAR RATS

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ABSTRACT

Antipyretic activity of ethanolic and aqueous seeds extract of *Caesalpinia Crista Linn.* belonging to the family caesalpiniaceae/fabaceae were evaluated in wistar rats.¹ The experimental model for Antipyretic activity used was Brewer's yeast induced pyrexia method. The drug paracetamol was used as standard drug. Ethanolic and aqueous seeds extracts of *Caesalpinia Crista Linn.* were given orally. It is observed that ethanolic seeds extract of *Caesalpinia Crista Linn.* have good antipyretic activity as compare to aqueous seeds extract of *Caesalpinia Crista Linn.*²

Keywords – *Caesalpinia crista linn.*, seed, Antipyretic Activity.

INTRODUCTION

The plant *Caesalpinia Crista Linn.* belongs to family caesal piniaceae/fabaceae, seeds are the rich source of alkaloids, flavonoids glycosides, saponins amino acid, proteins, carbohydrate, tannins, triterpenoids^{8,9,10}, fatty acids like palmitic acid, stearic acid, oleic acid, a non-crystalline bitter glycoside bonducin. It also contain phytosterins, caesalpins, bonducellin, citrullin, lupeol, alpha and beta amyirin^{3,4}. The mineral elements of this plant seeds are used as anti-helminthic, antipyretic, anti-inflammatory, anti-malarial.^{5,6} It has been reported to have analgesic, antioxidant, antibacterial, anti-asthmatic, anti-tumor, immuno-modulatory and hepato-protective properties.⁷ Traditional use of seeds were considered as leprosy, convulsions, antipyretic, pneumonia, malaria, and skin diseases etc.¹¹ The present work is an effort to show that the seeds of *Caesalpinia Crista Linn.* has antipyretic activity.

MATERIALS AND METHODS

The drug was collected from Local area of Bareilly (U.P.) firstly clean the extra material was present in the seeds, after that seeds will dry under shade for 20 to 25 days. Plant seeds were authenticated by department of Plant Science, M.J.P. Rohilkhand University, Bareilly (U.P.). The dried seeds will converted in the course powder with the help of mechanical support. About 300 gm drug powder take and then ethanolic extract was prepared by soxhletion method.

The aqueous extract was prepared by the maceration process. The extracts were concentrated until dryness under reduce pressure, controlled temperature (40-50°C) and filter with filter paper.

The animals used for the study were male wistar rats (150-200 gm). Animals were housed under standard environment conditions at room temperature ($25 \pm 2^{\circ}\text{C}$) and light dark (12 :12h). The animals were divided in four groups, each group have six wister rats. Pyrexia was induced in rats by subcutaneous injection of a 20% w/v brewer's yeast suspension of dried yeast in 0.9% saline at the dose of 10 ml/kg (1 ml/100 gm). The animals were kept on fasting for 16 hrs before experiment but allowed to free access to the water. All the drugs were given as freshly prepared aqueous suspension in 0.9% saline.

The treatment was given as –

Group-I – It was treated with 10 ml/kg, i. P of Brewer's yeast + saline.

Group-II – It was treated with 200 mg/kg, P.O of Brewer's yeast + ethanolic extract of *C. Crista*.

Group-III - It was treated with 200 mg/kg, P.O of Brewer's yeast + aqueous extract of *C. Crista*.

Group-IV – It was treated with 200 mg/kg, P.O of Brewer's yeast + standard drug paracetamol.

The rectal temperature of all animals was recorded at 1 hour intervals after administration of different extracts *Caesalpinia Crista Linn.* and standard drug.

All results were expressed as mean \pm SEM. Data was analyzed by using one-way ANOVA.

RESULTS

DAY-1

1. Standard vs. Test 1st, Test 2nd and Control

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Test T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* (Linn.) of dose 200 mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for 21 hour and control group consist of six animals, in each group treated with normal saline of dose 1 ml/kg for 21 hour. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals recorded by the thermometer and noted down it.

Table 1: Standard Vs T 1st, T 2nd and control group

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------------------|--------------------------------------|----------------------------------|------------------|------------------|------------------|
| 1. | Standard group | 36.59 \pm 0.13 | 38.40 \pm 0.15 | 37.42 \pm 0.12 | 37.15 \pm 0.07 | 36.40 \pm 0.07 |
| 2. | Test 1 st group | 36.50 \pm 0.11 | 38.41 \pm 0.89 | 37.91 \pm 0.04 | 37.33 \pm 0.14 | 36.77 \pm 0.06 |
| 3. | Test 2 nd group | 36.62 \pm 0.05 | 38.28 \pm 0.10 | 37.68 \pm 0.08 | 37.43 \pm 0.10 | 36.58 \pm 0.13 |
| 4. | Control group | 36.57 \pm 0.19 | 38.14 \pm 0.03 | 38.24 \pm 0.04 | 38.30 \pm 0.03 | 38.51 \pm 0.09 |

2. Standard vs. Control

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Control group consist of six animals, each group treated with normal saline of dose 1ml/kg for 21 hour. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals was recorded by the thermometer and noted down.

Table 2: Standard vs. Control

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Standard group | 36.59±0.13 | 38.40±0.15 | 37.42±0.12 | 37.15±0.07 | 36.40±0.07 |
| 2. | Control group | 36.57±0.19 | 38.14±0.03 | 38.24±0.04 | 38.30±0.03 | 38.51±0.09 |

3. Standard vs. Test 1st and Test 2nd

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Test T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* Linn. of dose 200mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for four days. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals was recorded by thermometer and noted down.

Table 3: Standard vs T 1st and T 2nd group

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Standard group | 36.59±0.13 | 38.40±0.15 | 37.42±0.12 | 37.15±0.07 | 36.40±0.07 |
| 2. | Test 1 st group | 36.50±0.11 | 38.41±0.89 | 37.91±0.04 | 37.33±0.14 | 36.77±0.06 |
| 3. | Test 2 nd group | 36.62±0.05 | 38.28±0.10 | 37.68±0.08 | 37.43±0.10 | 36.58±0.13 |

4. Control vs. Test 1st and test 2nd

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Test T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* Linn. of dose 200mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for 21 hour. After treatment its

antipyretic effects was evaluated during the time session of 21 hour. The temperature of the animals recorded by the thermometer and noted down it.

Table 4: Control Vs T 1st and T 2nd group

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Control group | 36.57±0.19 | 38.14±0.03 | 38.24±0.04 | 38.30±0.03 | 38.51±0.09 |
| 2. | Test 1 st group | 36.50±0.11 | 38.41±0.89 | 37.91±0.04 | 37.33±0.14 | 36.77±0.06 |
| 3. | Test 2 nd group | 36.62±0.05 | 38.28±0.10 | 37.68±0.08 | 37.43±0.10 | 36.58±0.13 |

DAY 2

1. Standard vs. Test 1, Test 2 and Control

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour, Teat T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* (Linn.) of dose 200mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for 21 hour and control group consist of six animals, in each group treated with normal saline of dose 1ml/kg for 21 hour. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals recorded by the thermometer and noted down.

Table 5: Standard Vs T 1st and T 2nd and control group

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Standard group | 36.45±0.09 | 38.28±0.09 | 37.75±0.08 | 37.31±0.05 | 36.43±0.04 |

| | | | | | | |
|----|-------------------------------|------------|------------|------------|------------|------------|
| 2. | Test 1 st group | 36.78±0.10 | 38.40±0.06 | 37.93±0.03 | 37.68±0.03 | 36.53±0.01 |
| 3. | Test 2 nd group | 36.81±0.09 | 38.32±0.04 | 37.82±0.04 | 37.29±0.09 | 36.53±0.14 |
| 4. | Control group | 36.56±0.11 | 38.31±0.05 | 38.32±0.07 | 38.47±0.05 | 38.54±0.04 |

2. Standard vs. Control

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Control group consist of six animals, each group treated with normal saline of dose 1ml/kg for 21 hour. After treatment, antipyretic effect was evaluated using thermometer during the time session of 21 hours. The temperature of the animals was recorded by the thermometer and noted down.

Table 6: Standard vs control

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Standard group | 36.45±0.09 | 38.28±0.09 | 37.75±0.08 | 37.31±0.05 | 36.43±0.04 |
| 2. | Control group | 36.56±0.11 | 38.31±0.05 | 38.32±0.07 | 38.47±0.05 | 38.54±0.04 |

3. Standard vs. Test 1 and Test 2

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Test T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* Linn. of dose 200mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for four days. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals recorded by the thermometer and noted down.

Table 7: Standard vs T 1st and T 2nd

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Standard group | 36.45±0.09 | 38.28±0.09 | 37.75±0.08 | 37.31±0.05 | 36.43±0.04 |
| 2. | Test 1 st group | 36.78±0.10 | 38.40±0.06 | 37.93±0.03 | 37.68±0.03 | 36.53±0.01 |
| 3. | Test 2 nd group | 36.81±0.09 | 38.32±0.04 | 37.82±0.04 | 37.29±0.09 | 36.53±0.14 |

4. Control vs. Test 1 and Test 2

Each values represent mean \pm SEM (n=6), compared to standard group by Thermometer during the time session of 21 hour. Test T1 and T2 group consist of six animals, each group treated with *Caesalpinia crista* Linn. of dose 200mg/kg (aqueous extract) and 200mg/kg (ethanolic extract) respectively for 21 hour. After treatment by using Thermometer to evaluate its anti pyretic effects during the time session of 21 hour. The temperature of the animals recorded by the thermometer and noted down.

Table 8: Control Vs T 1st and T 2nd

| S. No. | Treatment | Initial Temp. before Br's yeast Inj. | Temperature after 18 hrs (0 Hr.) | 1 Hr. | 2 Hr. | 3 Hr. |
|--------|----------------------------|--------------------------------------|----------------------------------|------------|------------|------------|
| 1. | Control group | 36.56±0.11 | 38.31±0.05 | 38.32±0.07 | 38.47±0.05 | 38.54±0.04 |
| 2. | Test 1 st group | 36.78±0.10 | 38.40±0.06 | 37.93±0.03 | 37.68±0.03 | 36.53±0.01 |
| 3. | Test 2 nd group | 36.81±0.09 | 38.32±0.04 | 37.82±0.04 | 37.29±0.09 | 36.53±0.14 |

DISCUSSION

Antipyretics are drugs which reduce hyperthermic body temperature. The regulation of body temperature requires a delicate balance between the production and loss of heat and regulates the set point at which body temperature is maintained. In the fever set point is elevated and drugs like paracetamol (PCM) do not influence body temperature when it is elevated by factors such as exercise or increase in ambient temperature.¹²

In general non steroidal Anti-inflammatory drugs (NSAIDs) produce their antipyretic action, through inhibition of prostaglandin synthesis within the hypothalamus.

The medicinal plants are nature's gift to human being to help them pursue a disease-free healthy life. The plants have been used as drugs by human since thousand years ago. The antipyretic action of *Caesalpinia crista* Linn. may be inhibition of prostaglandin synthesis. The *Caesalpinia crista* Linn. belongs to family Caesalpinaceae. The *Caesalpinia crista* Linn. is a plant with wide range of chemical constituents which exerted many pharmacological effects. There is a great promise for development of novel drugs from *Caesalpinia crista* Linn. to treat many human diseases as a result of its effectiveness and safety.

CONCLUSION

Fever is one of the oldest clinical indicators of disease in the mammalian host as well as one of the most common reasons for medical consultation. The ethanolic and aqueous seed extracts of *Caesalpinia crista* Linn. showed antipyretic activity but the maximum antipyretic activity was given by the standard drug paracetamol.

- Aqueous extract of *Caesalpinia crista* Linn. 200mg/kg showed mild antipyretic effect when compared to ethanolic extract test group.
- The ethanolic extract of *Caesalpinia crista* Linn. 200mg/kg showed good antipyretic activity as compared to control and aqueous test group.
- The standard drug paracetamol (PCM) 200mg/kg showed good antipyretic activity as compared to other groups.

No toxic effects of the ethanolic and aqueous extracts were observed on the body of Wistar rats.

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