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Studies on the Pharmacological Effects of Saraca Indica Leaf Extract on the Nerves of Mice

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Abstract: ***People in India think that the Ashoka tree, also called the Saraca indica tree, is one of the holiest plants. Ayurvedic doctors have used the properties of the Saraca indica plant for a long time to treat pain, promote a healthy complexion, help with digestion and absorption, stop thirst, get rid of all infectious agents, treat blood diseases and inflammation, and calm the central nervous system. The goal of this study was to find out if different extracts of Saraca indica leaves have any CNS-depressing effects. In earlier research, it was thought that Saraca indica might have a depressant effect on the central nervous system. This led to the current study. Because of their different levels of polarity, petroleum ether, chloroform, methanol, and water were used in this order to get the leaves of Saraca indica. The depressant effect of pentobarbitone on the central nervous system (CNS) was measured by timing how long it took for the drug to make the subject fall asleep and by tracking how much the subject moved with an actophotometer. At a dose of 400 mg/kg, an extract of Saraca indica leaves that was made with methanol showed the most helpful effects. Significantly (P 0.01), this dose both slowed down the time it took for pentobarbitone to cause sleep and made it last longer. When the extract was given, the amount of movement decreased by 67.33 percent. The effect of extracts in water, chloroform, and petroleum ether on the CNS was different depending on the dose. Even so, neither animal showed any clear signs of the CNS being slowed down by the petroleum ether extract. Based on what was found, some Saraca indica leaf extracts may make the CNS feel down.***

Keywords: Saraca indica, Pentobarbitone, Locomotor activity, Methanolic extract, diseases and inflammation

I. INTRODUCTION

Saraca indica L. is in the family Leguminosae. Its common name, Asoka, is often used to talk about it. It can grow up to 9 meters tall and has many branches that hang down and spread out. The orange or red flowers smell good, and the leaves have 4–6 pairs of oblong-lanceolate leaflets and are 15–25 cm long. The bark of the bush is a dark brown to almost black color. Ashok, The saraca indica plant is one of the most common and important native medicines in India. The bitter bark of this plant has been used for a long time to treat a wide range of health problems, such as blood poisoning symptoms like nausea and vomiting, biliousness, colic, piles, ulcers, fractures, menorrhagia, metropathy, dyspepsia, visceromegaly, and even visceral hypertrophy. Children with vitiated pitta, syphilis, hyperdipsia, inflammation, diarrhea, hemorrhoids, or scabies are helped by the flowers. The leaves help ease the pain of a stomachache. The flowers of Saraca indica are used as a uterine tonic, an antidiabetic, and an antisyphilitic. The stem bark is used as a uterine sedative, an astringent, an antileucorrheic, and an antibilious. The whole plant is needed for the CNS depressant effect for the same reason that the plant's aerial parts are needed for the CNS active, hypothermic, CNS depressive, and diuretic effects. Chemical tests on the flower showed that it had -sitosterol, flavonoids, flavone glycosides, anthocyanins, and fixed oil. Chemical tests show that the bark has many different compounds, such as catechols, sterols, tannins, flavonoids, glycosides, leucopelargonidin, and leucocyanidin. The seeds and pods have oleic, linoleic, palmitic, and leucocyanidin. The leaves and stems have quercetin, quercetin-3-O—Lrhamnoside, kaempferol 3-O—Lrhamnoside, amyrin, ceryl alcohol, and beta-sitosterol. The plant has properties that help fight cancer, heal ulcers, kill germs and bacteria, and act as an antioxidant. The plant can also help with oxytocin and diabetes. The rise of modern science and technology has made it impossible to deny that the quality of life has gotten better. But stress in modern life is to blame for the sharp rise in the number of people with many types of mental illness.

Anxiety, depression, schizophrenia, epilepsy, and parkinsonism are just some of the neuropsychiatric and neurological conditions for which the current medications are either ineffective, have serious side effects, or cause dangerous drug-drug and drug-food interactions. Benzodiazepines and other psychoneural medicines are often used to treat anxiety, depression, epilepsy, and insomnia, but they have a number of bad side effects. Since the beginning of time, people have used plants as medicine. Eighty percent of the people in the world take medicines made from plants.

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Herbal treatments have been used for hundreds of years, and for good reason: they are easier on the body than traditional medicine while still being very effective. Because of these results and the fact that it was said that Saraca indica was a CNS-depressant, a number of studies were done to find out if the plant's leaves were CNS-depressant.

II. METERIALS AND METHODS

A. Animals

Both male and female albino mice that weighed between 18 and 25 grams were used in the tests. The animals were kept in a place where the temperature was "25±2°C," the humidity was "55±5%," and there was a "12-hour light-dark cycle." They also had food and water available all the time. As the law requires, the Institutional Animal Ethical Committee has given the go-ahead for all of the planned animal treatments.

B. Process of Preparing Extracts

The Saraca indica leaves were washed well and dried in the shade. Then, a dry grinder was used to turn the leaves into a coarse powder. The leaves were ground into a powder and filtered through No. 40. They were then put in an airtight container and kept at 25 degrees Celsius for future research. We used a Soxhlet apparatus and solvents with increasing polarity, such as petroleum ether (60–80°C), chloroform, methanol, and water, to get 1.2 kg of powdered plant material. Between each stage, the temperature changed.

After letting the marc dry each time, different solvents were used to get rid of it. The extract was evaporated until it was completely dry, and then the solvent was distilled in a rotating vacuum evaporator to make it stronger. Based on the weight of the dried plant material, the yield was found to be 7.99%, 1.46, 12.15%, and 12.90%, respectively.

C. Investigation of Phytochemicals in the Preliminary Stage

Solvents like petroleum ether (PSI), chloroform (CSI), methanol (MSI), and water were used to do qualitative chemical analysis on different leaf extracts in order to find a wide range of phytoconstituents (WSI). Plants have many different types of phytoconstituents, such as sterols, glycosides, saponins, carbohydrates, alkaloids, flavonoids, tannins, proteins, and triterpenoids. The investigation was done in the correct way.

Standard methods were used to test the phytochemicals of the extracts.

D. Evaluation of the Acute Toxicity

OECD-423 standards were used to do toxicology studies on acute toxicity through the mouth. The mice had nothing to eat or drink all night. After 14 days, we checked on the groups that had been given chloroform, methanol, or water extracts by mouth at a dose of 5 mg/kg body weight. We found that each group had a significantly different death rate. If the animals lived through the first treatment, they were given more doses of 50, 300, and 2,000 mg/kg. We watched the animals for three days to see if they showed any signs of being poisoned, such as strange behavior, a change in how they walked, convulsions, and eventually death.

E. Pentobarbitone Testing is used to Determine When a Patient will fall Asleep

Followed what Sivaraman and Muralidaran said about how CNS depressants work. Randomly, mice of both sexes were put into three groups: test, standard, and control. In each group, there are six mice. In Group I, which was the control, 10 ml/kg of normal saline was given through an IV. In Group II, which was the standard, 1 mg/kg of chlorpromazine hydrochloride was injected into the muscle 15 minutes before 40 mg/kg of pentobarbitone was given. Groups 3–8 were given CSI (200 and 400 mg/kg), MSI (200 and 400 mg/kg), and WSI (200 and 400 mg/kg) as treatments. After 30 minutes, a 40 mg/kg injection of pentobarbitone was given through the muscle. Metrics were used to figure out when everyone in the group was sleeping and for how long. The start of action was marked by the loss of the righting reflex in three different trials, and the length of sleep was measured by how long it took to get the reflex back.

F. Actophotometer Measurements of Locomotor Activity

Researchers used an actophotometer to measure how each Saraca indica extract affected the way mice moved to find out how well each one slowed down brain activity. In total, there were eight different groups of six albino mice each. After putting each mouse in the actophotometer chamber by itself for 10 minutes, the baseline activity score was found. Group II got the standard treatment, chlorpromazine, through an IV, while group I got a sugar pill (0.5% sod CMC).

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CESI (200 and 400 mg/kg), MESI (200 and 400 mg/kg), or WESI (200 and 400 mg/kg) were given to mice in groups III–VIII. After 30 minutes, their activity was measured with an actophotometer. In the past, the same amount of CESI, MESI, and WESI was given to all of the animals in Groups III–8. The relative drop in activity was worked out using the following steps: Where Wa and Wb are the average activity scores before and after taking the medicine, respectively, (1-Wa/Wb) x 100 gives the percentage of activity decrease. Also, the average decline in activity across all groups was figured out.

III. CONCLUSION

This study shows that the saraca indica leaf has effects that slow down the central nervous system (CNS). Several Saraca indica leaf extracts were found to make the effects of pentobarbital last longer (sleeping time) and make the effects of phenobarbitone start sooner (sleep latency), compared to the control group (P 0.01). The investigation's results showed that this is true. It was thought that a sedative effect would show up as less movement, while an alerting effect would show up as more movement. The fact that this happened shows that Saraca indica leaf extracts have a depressant effect on the CNS.

Gamma-aminobutyric acid, or GABA, is the main neurotransmitter in the brain and nervous system that slows down nerve signals. Saraca indica extracts may work by either directly activating GABA receptors or by increasing GABAergic inhibition in the central nervous system (CNS), which slows the firing rate of important brain neurons. There is a good chance that the effects of Saraca extracts are similar to those of GABAA-based medicines that treat anxiety, relax muscles, and put people to sleep.

Several studies have shown that flavonoids, saponins, and tannins found in plants could be used to treat CNS problems. Researchers have found that both neuroactive steroids and phytoconstituents bind to GABAA receptors in the brain. This led to the conclusion, as explained in the source material, that their possible effects are similar to those of drugs like benzodiazepines. Phytochemical testing showed that the extract contained alkaloids, flavonoids, saponins, and tannins. This suggests that these phytoconstituents may be to blame for the extract's potential to slow down the central nervous system (CNS). Because of this, it's important to learn more about this building. It's important to find the most important factor and explain how it works. From this, we can say that the Saraca indica leaf has properties that slow down the central nervous system. More research is needed to figure out the exact nature of the active ingredients and how they work to do what they do.

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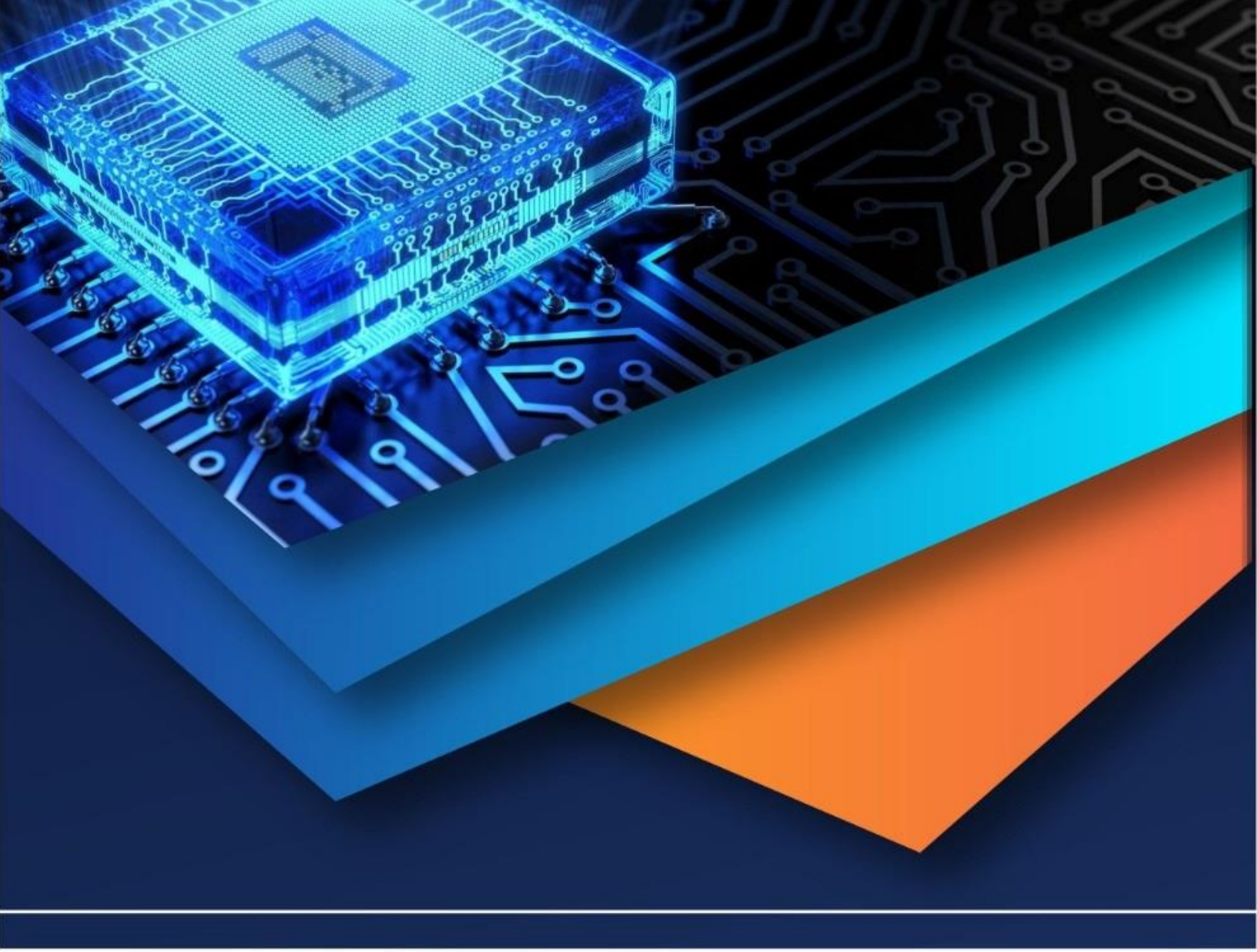

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