IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, December 2025
Impact Factor: 7.67

Indian-Origined Medicinal Plants with Neuropharmacological Properties

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Abstract: *The scientific study of how medications affect the central nervous system is known as neuropharmacology. Its main emphasis is on the effects of drugs of addiction as well as treatments for neurological and mental conditions. Applying knowledge of medications and their modes of action to create safer, more efficient therapies, and ultimately preventative and curative strategies for a variety of disorders of the nervous system, is the aim of neuropharmacology. Numerous medications are used in conventional medicine to treat different central nervous system problems, and many of these medications are now being investigated scientifically to determine their effects on the central nervous system. Numerous investigations have been conducted in an attempt to discover structures with activity at the central nervous system in order to develop alternative treatments for disorders of the neurological forum. Nevertheless, the majority of screenings are often carried out haphazardly rather than methodically...*

Keywords: Neuropharmacology, Phytochemicals, Ayurveda, Cognition, Botanicals

I. INTRODUCTION

The most often utilized class of pharmacological medicines are still those that operate on the central nervous system, which were among the first to be identified by early humans. Many plants have been found to have activities against CNS disorders, making them very helpful remedies for reducing human suffering [1]. The CNS acting drugs are invaluable therapeutic because they can produce specific physiological and psychological effects from the vast array of material medica of the indigenous system. Numerous investigations in the 19th century marked the beginning of the search for novel compounds that have therapeutic effects and operate on the central nervous system. Actually, natural resources, particularly plants, were the basis for the first medications used to treat pathologic diseases of the central nervous system [2]. The current study focuses on several medicinal plants that have neuropharmacological or central nervous system effects in animals.

ADIANTUM CAPILLUS VENERIS LINN. (ADIANTACEAE)

Antitussive, astringent, demulcent, depurative, emetic, laxative, stimulant, sudorific, tonic, and used to treat skin conditions are the properties of the fresh or dried leaf fronds. When compared to a control group in the PTZ-induced convulsion model, the ethanolic extract of Adiantum capillus veneris (L) at a dose of 400 mg/kg body weight demonstrated anticonvulsant activity by significantly delaying the onset of seizures and shortening their duration. It also decreased the time for different seizure phases in the MES-induced seizures test. Analgesic activity of the extract was shown by a significant increase in the initiation of paw licking to heat stimuli in Eddy's hot plate technique and an increase in response latency to tail withdrawal in the tail immersion test [3].

ANACYCLUS PYRETHRUM (ASTERACEAE)

It has long been utilized as a nervous system tonic. Anacyclus pyrethrum roots are said to have aphrodisiac, immunostimulating, anabolic, and anti-inflammatory properties. According to behavioral tests and sedative, muscle relaxant, anxiolytic, no-tropic, and antidepressant action in rats, the ethanolic extract of roots (50 mg, 100 mg, and 200 mg/kg body weight) has potential neuropharmacological and antidepressant activity [4].

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ARGEMONE MEXICANA (PAPAVERACEAE)

It is known that the papaveraceae family has CNS depressing properties. Methanolic and ethyl acetate extract (100 mg, 200 mg, and 400 mg/kg body weight) administered orally resulted in a significant reduction in the animals' motor activity and fall off time on a rotating rod. Additionally, the extract had a sedative effect by intensifying the phenobarbitone-induced sleeping time in Swiss albino mice, as well as effects on muscle relaxant activity, locomotor activity, and the phenobarbitone sodium sleep model [5].

ARGYREIA SPECIOSA SWEET (CONVOLVULACEAE)

It is often referred to as "elephant creeper." The roots are used to treat rheumatism, gonorrhea, chronic ulcers, and nervous system disorders. They are also said to be bitter, aphrodisiac, and tonic. In a pentobarbital-induced sleep study in rats, the hydroalcoholic extract of Argyreia speciosa Sweet roots (100 mg, 200 mg, and 500 mg/kg, p.o.) increased pentobarbital-induced hypnosis and decreased spontaneous motor activity [6].

AVICENNIA OFFICINALIS (AVICENNIACEAE)

In addition to decreasing the open field score in the open field test, the number of holes crossed from a single chamber in the hole cross test, and the head dip reactions in the hole board test, the crude methanolic extract of the leaves increased the amount of time that mice slept after being exposed to pentobarbital [7].

BALANITES ROXBURGHII PLANCH (ZYGOPHYLLACEAE)

Children with pneumonia might benefit from applying a mixture of apple pulp and goat milk to their chests. On a variety of animal models, the methanolic extract of Balanites roxburghii's pericardium impacted locomotor activity, decreased spontaneous motility, generated pro-depressant activity, relaxed skeletal muscle, considerably extended the amount of time that pentobarbital-induced sleep was induced, and decreased spatial learning. At 300 mg/kg, the extract had a more pronounced depressing effect than at 100 mg/kg [8].

BARLERIA LUPULINA (ACANTHACEAE)

It is often referred to as "Vishellakarani" in Bengali. At dosages of 100 mg, 200 mg, and 300 mg/kg, the methanolic extract of Barleria lupulina's aerial parts demonstrated a dose-dependent decrease in general behavioral patterns, including spontaneous activity, alertness, awareness, pain reaction, and touch sensitivity. It was discovered that the methanolic extract significantly decreased the conditioned avoidance response, muscle relaxant activity, motor coordination, and exploratory behavioral profile (Y-maze and head dip tests). Additionally, the extract increases the amount of time that phenol barbitone sodium induces sleep [9].

BIXA ORELLANA L. (BIXACEAE)

We call it the anode plant. The leaves and roots may be infused to treat fever, jaundice, diarrhea, and epilepsy. In the pentobarbitone-induced hypnosis test, the methanolic extract of Bixa Orellana L. Leaves at doses of 125 mg, 250 mg, and 500 mg/kg body weight statistically decreased the time it took for sleep to start at 500 mg/kg dose and (dose-dependently) increased the amount of time that people slept overall at 250 mg and 500 mg/kg dose. In the open-field and hole-cross tests, a statistically significant reduction in locomotor activity was seen at all dosages. The extract improved the test animals' average survival time in the strychnine-induced anticonvulsant test (statistically significant at 250 mg and 500 mg/kg) [10].

BRYOPHYLLUM PINNATUM (LAM.) (CRASSULACEAE)

It was discovered that the aqueous leaf extract of Bryophyllum pinnatum significantly reduced exploratory activity in a dose-dependent manner at dosages of 50 mg, 100 mg, and 200 mg/kg. It also demonstrated a strong sedative effect by potentiating pentobarbitone-induced sleep duration and significantly reducing gross behavior. It postponed the start of convulsions (seizures) caused by strychnine and picrotoxin, respectively, with picrotoxin having a far greater protective effect than strychnine [11].

CAESALPINIA PULCHERRIMA (L.) (FABACEAE)

It is used to treat skin conditions, asthma, tumors, fever, and ulcers. The neuropharmacological properties of Caesalpinia pulcherrima bark crude methanolic extract were assessed. In addition to decreasing the open field score in the open field test, the number of holes crossed from a single chamber in the hole cross test, and the head dip reactions in the hole board test, the bark extract increased the amount of time that mice slept after being exposed to pentobarbital [12].

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CALOTROPIS GIGANTEA R.BR. (ASCLEPIADACEAE)

In addition to treating sprains, anxiety, epilepsy, and mental illnesses, the plant is used as an analgesic for toothaches and earaches. Albino rats were given oral doses of 250 mg and 500 mg/kg bodyweight of an alcoholic extract of peeled Calotropis gigantea R.Br. roots to test for central nervous system activity. The extract was shown to have significant anticonvulsant activity in PTZ-induced convulsions, intensity activity in the elevated plus maze paradigm, reduced locomotor activity, and enhanced the sleep effect of pentobarbitone [13].

CAMELLIA SINENSIS (THEACEAE)

Green tea, or Camellia sinensis, has long been used to treat coronary artery disease, peripheral vascular disease, angina pectoris, and asthma. The entire board test, Y maze test, social interaction test, and foot shock induced aggressiveness test were used to evaluate the neuropharmacological investigation of camellia sinensis's anxiolytic efficacy. The aqueous extract was administered at two dosages of 200 mg/kg and 400 mg/kg. According to the study's findings, camellia sinensis has a variety of effects on the central nervous system, including anxiolytic action [14].

CISSUS QUADRANGULARIS LINN (VITACEAE)

The most popular element in alternative medicine, Hadjoda, is used to treat piles, anorexia, indigestion, chronic ulcers, asthma, otorrhea, wounds, and to speed up the healing process of fractures. Through the use of spontaneous motor activity, exploratory behavior, Rota-rod performance, and the potentiation of pentobarbitone sleeping duration in mice, the effects of extracts on the central nervous system were investigated. The extract (50 mg, 100 mg, and 200 mg/kg i.p.) resulted in a longer duration of pentobarbitone-induced sleep and a decrease in spontaneous motor activity, exploratory behavior, and motor coordination [15].

CLITORIA TERNATEA LINN (FABACEAE)

It is often referred to as "butterfly pea." Leprosy, inflammation, leucoderma, bronchitis, asthma, pulmonary TB, dementia, hemicrania, burning sensation, and fever may all benefit from the roots. It was established what range of effects the methanolic extract of Clitoria ternatea had on the central nervous system at dosages of 100 mg, 200 mg, and 400 mg/kg body weight. It was discovered that the extract had no depressive, anticonvulsant, tropic, anxiolytic, or anti-stress properties [16].

COUROUPITA GUIANENSIS AUBL. (LECYTHIDACEAE)

The effects of 100 mg, 250 mg, and 500 mg/kg of the methanolic extract of Couroupita guianensis on spontaneous motor activity, Rota-rod performance, and phenobarbital sleeping duration in mice were investigated. The extract had no impact on motor coordination, but it significantly decreased spontaneous motor activity and the duration and start of pentobarbitone-induced hypnosis in a dose-dependent manner [17].

ECLIPTA ALBA (LINN.) (ASTERACEAE)

In addition to its hepato-protective, hair-growth-promoting, and anti-aging qualities, it has also been described as a nervine tonic. Sedative, muscle-relaxant, anxiolytic, no-tropic, and anti-stress properties of the plant's aqueous and hydroalcoholic extracts were assessed. While the hydrolyzed fraction was given at a dosage of 30 mg/kg, p.o., the aqueous and hydro-alcoholic extracts were given at doses of 150 mg and 300 mg/kg, p.o. The results showed that the aqueous extract (300 mg/kg, p.o.) and its hydrolyzed fraction (30 mg/kg, p.o.) had no-tropical activity [18].

FUMARIA INDICA LINN. (FUMARIACEAE)

It is often referred to as geometry. It has historically been used as a cholagogue, blood purifier, diaphoretic, diuretic, laxative, stomachic, sedative, tonic, and antidyspeptic. The CNS effects of the extract at 100 mg, 200 mg, and 400 mg/kg doses (p. o.) were assessed using behavioral models such as pentobarbital-induced sleeping time, locomotor activity, effect on muscle grip performance of mice, maximal electroshock seizures in rats, and pentylenetetrazole-induced convulsions in mice. Rats treated with Fumaria indicia Linn extract demonstrated a considerable reduction in the beginning of sleeping time and a large and dose-dependent increase in pentobarbital-induced sleeping duration. The extract from Fumaria indicia Linn has shown a significant reduction in locomotor activity. In the Rota-rod test, mice did not exhibit any muscle relaxant effects from the Fumaria indicia Linn extract. Significant anticonvulsant action was shown by the Fumaria indicia Linn extract in rats with MES and mice with PTZ-induced convulsions, respectively [19].

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HEDYCHIUM CORONARIUM KOEN (ZINGIBERACEAE)

Type 2 diabetes may be treated using the plant's rhizome. It is also used as a tonic, febrifuge, excitant, and anti-rheumatic. The extract's neuropharmacological effects were examined in mice using the Hole-cross and Open field tests at dosages of 100 mg, 200 mg, and 400 mg/kg body weight. In the investigated animal models, the extract showed dose-dependent inhibition of exploratory behavior and motor activity [20].

JATROPHA GOSSYPIFOLIA LINN. (EUPHORBIACEAE)

It is often referred to as "bellyache bush" in English. Hole cross, entire board, and elevated plus maze tests were used to assess the neuropharmacological activities of methanolic extract at 200 mg and 400 mg/kg body weight. In a whole cross test, the extract at both dosages had a significant sedative effect. The extract exhibited extremely significant anxiolytic action at lower dosages in the entire board test, while same activity was shown at greater levels in the EPM test [21].

LEPTADENIA RETICULATE (ASCLEPIADACEAE)

The so-called "jivanti" is said to have the power to bestow vitality and health. In traditional medicine, it is widely recognized for its stimulating, restorative, and tonic properties. At dosages of 250 mg, 500 mg, and 1000 mg/kg body weight, the antiepileptic and neuropharmacological properties of the methanolic extract of Leptadenia reticulate were assessed. It was discovered that the methanolic extract was significant against Pentylenetetrazol and maximal electro shock. The extract significantly reduced locomotor activity, increased phenobarbitone-induced sleep duration, and had no discernible impact on motor coordination, but it had no discernible effect on catalepsy caused by haloperidol [22].

LUCAS LONGIFOLIA BENTH. (LAMIACEAE)

It is often referred to as "Barumbi or Dudhani." Methanol, chloroform, and crude petroleum ether extracts of the aerial portions of Lucas longifolia have been tested for their ability to depress the central nervous system at doses of 100, 200, and 400 mg/kg intraperitoneally. At larger dosages than petroleum ether extract, the methanolic extract dramatically lowers spontaneous motor activity. Additionally, there was a reduction in the fall off time (motor coordination). Because of the methanolic extract's sedative properties, a potentiation of pentobarbitone-induced sleep was seen [23].

LIPPIA NODIFLORA(VERBANACEAE)

Known by most as Poduthalai, it has long been used as a diuretic, anodyne, and antibacterial. In mice, it has been shown that Lippia nodiflora ethanolic extract at 250 mg and 500 mg/kg p.o. and its chloroform extract at a higher dosage of 500 mg/kg had anxiolytic, anticonvulsant, and central inhibitory (sedative) effects [24].

MIKANIA SCANDENS (L.) WILD. (ASTERACEAE)

In English, it's called climbing hemp weed. In traditional medicine, aqueous leaf extracts of this plant have been administered to the damaged region of the body to cure wounds and bruises, and they have also been used to treat stomach ulcers. The hydroalcoholic extract of Mikania scandens aerial parts (at 250 mg and 500 mg/kg body weight intraperitoneally) was tested for neuropharmacological effects. Its depressing impact on the central nervous system was shown by the study's findings, which showed strong and dose-dependent central anti-nociceptive, locomotor, and depressant, muscle relaxant, and sedative potentiating effects [25].

MIMUSOPS ELENGI (SAPOTACEAE)

It is often referred to as Bakul (Bengali). The bark of Mimusops elengi has been used for a number of medicinal purposes, including astringent, stomachic, anthelmintic, catatonic, and alexipharmic. Whole cross and open field tests were used to assess the extract's central nervous system depressant action at dosages of 100 mg, 200 mg, and 400 mg/kg body weight. In whole cross and open area tests, the extract dramatically reduced the mice's motor activity and exploratory behavior, respectively [26].

NIGELLA SATIVA L. (RANUNCULACEAE)

The Nigella sativa L. seed. anti-tumor, bactericidal, anti-chested, anti-nematode, anti-inflammatory, analgesic, anti-diabetic, anti-ulcerogenic, diuretic, lactogogue, and vermifuge properties. It is also used to treat asthma. At a dosage of 100 mg/kg body weight, the aqueous and methanol extracts of Nigella sativa seed changed the overall patterns of behavior, significantly decreased spontaneous motility, decreased normal body temperature, and significantly reduced pain in response to pressure and hotplate tests. All of the aforementioned results point to both extracts having a CNS-depressant effect [27].

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PASSIFLORA INCARNATA LINN (PASSIFLORACEAE)

The whole plant, either fresh or dried, has been used as a natural remedy to alleviate sleeplessness and anxious anxiety. Animal models were used to assess the anxiolytic (using the Forced Swimming assess) and antioxidant properties of a methanolic extract of the aerial portions of Passiflora incarnata Linn at dosages of 100 mg and 200 mg/kg body weight. In all tested dosages, the findings demonstrated a considerable anxiolytic effect equivalent to that of diazepam [28].

PEPEROMIA PELLUCIDA (L.) (PIPERACEAE)

Luchi Pata is its local name. The leaves are used to cure convulsions, fever, eczema, headaches, and stomachaches. Mice were given ethanolic extract of Peperomia pellucida leaves in petroleum ether and ethyl acetate soluble fractions at doses of 50 mg and 200 mg/kg intraperitoneally. The effects of these fractions on the length of diazepam-induced sleep, nikethamide-induced toxicity, light-dark test, and force swimming test were assessed. These fractions were administered to prolong the duration of diazepam-induced sleep. High dosages of nikethamide kill mice, however administering these fractions postpones the period at which nikethamide kills animals. These fractions had diazepam-like effects in the force swimming test and the light-dark test. These findings imply that the depressant effects of Peperomia pellucida leaves are dosage dependant for both groups [29].

PISTIA STRATIOTES L. (ARACEAE)

Water lettuce or water cabbage are other names for it. Leaves are used to heal wounds, boils, syphilitic eruptions, ringworm infections of the scalp, and skin diseases. The hole cross test, open field test, beam walking test, and thiopental sodium induced sedation test were used to assess the CNS activity in mice at dosages of 850 mg/kg. It dramatically reduced the mice's locomotor activity. When tested on mice using the hot plate, tail immersion, and acetic acid-induced writhing test, the extract demonstrated strong anti-nociceptive action [30].

PORTULACA OLERACEA L. (PORTULACACEAE)

It is used as a vermifuge, diuretic, antiseptic, antiscorbutic, antispasmodic, and to treat urinary tract and mouth ulcers. When administered intraperitoneally at doses of 200 mg and 400 mg/kg body weight, the extract significantly decreased the locomotor activity of mice, the anti-nociceptive activity of rats using the Tail flick method, the onset time of convulsions caused by pentylenetetrazole in mice, and the muscle relaxant activity in both in-vivo (grip strength) and in-vitro (rat hemi diaphragm) experiments [31].

PORTULACA QUADRIFIDA LINN.(PORTULACACEAE)

It helps with ulcers, inflammations, coughing, asthma, and urine discharges. At dosages of 400 mg and 800 mg/kg (i.p.), the effects of an ethanolic extract of Portulaca quadrifida Linn. on the central and peripheral nervous systems were investigated utilizing spontaneous motor activity, anti-nociceptive activity, in vivo muscle relaxant activity, and anticonvulsant activity. Significant decreases in spontaneous motor activity, anti-nociceptive activity, and recovery time from electrical shock-induced convulsions were seen in the extract. It was determined that the extracts' impact on grip strength was not statistically significant [32].

RUTA CHALEPENSIS (RUTACEAE)

Experimental models demonstrated a delay in the onset of seizures, a dose-dependent suppression in the tonic phase and mortality caused by pentylenetetrazole, an extension of the duration of sodium pentobarbital-induced hypnosis, a significant attenuation of the anxiety response, and a decrease in the licking and shaking behavior in a formalin-induced nociception test when the ethanol extract of Ruta chalepensis aerial parts was administered systemically at doses (i.e. 10–1000 mg/kg body weight). Ruta chalepensis may have a depressive impact on the central nervous system, as shown by its sedative-hypnotic potentiation, anxiolytic, anticonvulsant, and antinociceptive actions [33].

SOLANUM NIGRUM L (SOLANACEAE)

"Herba mora" is the common name for the plant Solanum nigrum L. The neuropharmacological effects of fruit ethanol extract at dosages of 51 mg, 127.5 mg, and 255 mg/kg body weight were investigated in experimental animals. Pentobarbital-induced sleep duration was considerably increased by an intraperitoneal injection of the extract, which also changed the general behavior pattern, decreased the exploratory behavior pattern, inhibited aggressive behavior, altered locomotor activity, and decreased spontaneous motility. There was no sedation or motor incoordination seen in the fruit ethanol extract [34].

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STRYCHNOS NUX-VOMICA LINN. (LOGANIACEAE)

It is mostly used to treat gastro-hepatic tract problems. Strychnos Nux-vomica seeds were processed traditionally using aloe and ginger juices, fried in cow ghee, and boiled in cow milk to examine the effects of detoxifying. These samples' ethanolic extracts were tested for morphine-induced catalepsy, diazepam-assisted protection, PTZ-induced convulsions, pentobarbitone-induced hypnosis, and spontaneous motor activity. Every sample suppressed catalepsy and decreased SMA. The seeds that were turned into milk had the lowest strychnine level, the most hypnotic potency, and a noticeable reduction of PTZ-induced convulsions [35].

THUJA OCCIDENTALIS (L.) (CAPRESSACEAE)

Psoriasis, uterine cancers, amenorrhea, rheumatism, enuresis, cystitis, and bronchial catarrh have all been treated with it. The anxiolytic, anticonvulsant, and motor coordination effects of oral administration of 100 mg, 200 mg, and 400 mg/kg dosages of Thuja occidentalis Linn aqueous extract were assessed in rats and mice. The extract reduces the frequency of convulsions in seizures brought on by pentylene-tetrazole in a dose-dependent manner. The extract's CNS depressive action is shown by significant motor incoordination and an increase in immobility duration in the Rota road test and Tail suspension test, respectively [36].

TRAPA BISPINOSA (TRAPACEAE)

The fruits are used to treat leprosy, urine discharges, fractures, sore throats, bronchitis, anemia, intestinal astringency, aphrodisiac, and anti-inflammatory conditions. Motor coordination, spontaneous locomotor activity, object identification, transfer latency, anxiolytic and analgesic action, sodium nitrite-induced respiratory arrest, hypoxic stress, and other neuropharmacological properties of the hydroalcoholic extract of Trapa bispinosa were assessed. It was discovered that the extract (250 mg and 500 mg/kg) increased the discriminating index in the object recognition test and decreased the time needed to occupy the center platform (transfer latency) in the elevated plus maze, suggesting no-tropic action. The hot plate analgesic activity of Trapa bispinosa extract (250 mg and 500 mg/kg) demonstrated a significant increase in response time. Additionally, it demonstrated a significant decrease in both the delay to death and spontaneous locomotor activity in respiratory arrest caused by sodium nitrite [37].

TRIGONELLA FOENUM-GRAECUM LINN. (FABACEAE)

It is often referred to as fenugreek. Numerous properties, including anticancer, antibacterial, aphrodisiac, astringent, demulcent, emollient, expectorant, anthelmintic, wound healing, and gastroprotective actions, are present in the crude extract. Methanolic extract was neuropharmacologically screened in mice at dosages of 100 mg, 200 mg, and 400 mg/kg body weight using whole cross and open field tests. Significant dose-dependent inhibition of motor activity and exploratory behavior was shown by the extracts [38].

VISCUM ALBUM L. (LORANTHACEAE)

Another name for it is mistletoe. It has been used to stimulate the immune system, treat neurological problems as a sedative or to treat epilepsy, and prevent cardiovascular illnesses like hypertension and atherosclerosis as well as a variety of bone and joint conditions including periarthritis, spondylitis, and arthritis. At 50 mg and 150 mg/kg body weight, the aqueous leaf extract of Viscum album L. decreased the locomotor activity in the actophotometer and extended the duration of pentobarbital-induced sleep. Furthermore, the extract lessened convulsions brought on by isoniazid, pentylenetetrazole, and maximal electroshock. The extract increased the HAL-induced cataleptic score and reduced the stereotyped behavior brought on by apomorphine, indicating that it has anti-dopaminergic properties [39].

WEDELIA CALENDULACEA LESS (ASTERACEA)

Pentobarbital-induced sleep duration, pentylenetetrazole and strychnine-induced seizures, spontaneous motor activity, exploratory behavior, and rota-rod performance (motor coordination) were used to screen for the neuropharmacological properties of the methanolic and aqueous extract of Wedelia calendulacea stem. The pentobarbital-induced slumber period was significantly prolonged by the methanolic extract (20 mg and 50 mg/kg i.p.) and the aqueous extract (200 mg and 500 mg/kg i.p.), which also decreased the SMA and exploratory behavior. The extract delayed the beginning of the seizure activity phases, but it did not shield animals from strychnine and pentylenetetrazole-induced death. Additionally, the motor coordination test was unaffected. These findings imply that the extract included a neuropharmacologically active substance that could have sedative properties [40].

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XYLOCARPUS MOLUCCENSIS LAMK. M. ROEM. (MELIACEAE)

It is often referred to as "Possur." The bark has long been used to treat diarrhea, dysentery, and other stomach issues. It also acts as an astringent and febrifuge. The effects of methanolic extracts of Xylocarpus moluccensis barks and pneumatophores at dosages of 250 mg and 500 mg/kg b. wt. on the central nervous system were evaluated in mice using the pentobarbitone-induced sleeping period, open field, hole cross, hole-board, and evasions tests. These extracts reduced locomotor and exploratory activity in the whole cross, head-dip, and evasion tests, as well as the start and duration of pentobarbitone-induced hypnosis in a dose-dependent manner. These findings imply that extracts of bark and pneumatophores both have CNS depressive properties [41].

II. CONCLUSION

Herbs, spices, and meals made from plants provide an infinite supply of compounds that may be used to enhance human health. Nonetheless, hundreds or thousands of secondary bioactive metabolites may be found in a single plant. Plants' evolutionary progress was influenced by their chemical variety, which favored their ability to adapt to a changing environment. According to this perspective, it is improper and untimely to attribute the health benefits of a plant food or medicinal herb to a single molecule or class of components. It's probable that many phytochemicals have additive and synergistic effects in vivo, which increases (or decreases/inhibits) their activities [42]. Since the beginning of time, people have used plants to treat illnesses and provide respite from them. They used to be the most significant suppliers of medications for humans. However, this traditional therapeutic approach started to lose its significance in the late 1940s as synthetic treatments progressively took its place. The insights learned over millennia were dismissed as "unscientific."

On the other side, scientists' quest for novel compounds with medicinal qualities was aided by this ancient usage of plants. It is believed that plants are the direct or indirect source of around 25% of contemporary medications. Here are a few instances pertaining to the CNS: Among them include reserpine, opioids, cannabis, caffeine, and ephedrine.

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IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, December 2025
Impact Factor: 7.67

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