PHARMACOLOGICAL ACTIVITY OF BAY LEAVE

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ABSTRACT

Laurus nobilis is also referred to as the lovely bay leaf, the real Roman or Turkish laurel, among other names used in commerce. a little evergreen tree of the Lauraceae family. Sesquiterpene lactones such as 10-epigazaniolide, Gazaniolide, spirafolide, costunolide, Reynosin, santamarine, flavonoid glycosides, and others have been found to be present in its chemical makeup. a fragrant material Wound-healing, neuroprotective, antioxidant, anticonvulsant, antiulcerogenic, antimutagenic, antiviral, anticholinergic, antibacterial, and antifungal actions have all been documented for it. A few pharmacological and phytochemical characteristics of Laurus nobilis were discovered in this review, which the researcher might employ in further research.

KEYWORDS

Neuroprotective Activity, Wound Healing Activity, Antioxidant Activity, Antiulcerogenic Activity, Antiviral Activity, Antibacterial Activity

INTRODUCTION

Laurus nobilis is also referred to by the trade names aromatic bay leaf and real, roman, or Turkish laurel. a little evergreen tree belonging to the Lauraceae family. It is a sturdy, many-branched tree that reaches a height of around 10 metres and has smooth bark. [1,2] It has alternate leaves that are narrowly oblong-lanceolate. These small, four-lobed blossoms have 2-4 staminodes in the female and 8–12 stamens in the male. Ripe fruit is oval, 10-15 mm in diameter, and black. [3] These pleasant and aromatic southern European native plants also produce camphor, fixed oil, and volatile oil. [4] The plant Laurus nobilis is used to make cosmetics, medications, and culinary items. Dried leaves and essential oils are widely used in the food sector to season meat, fish, and soups. Due to its antibacterial and insecticidal qualities, bay is used in the food industry as a food preservative. Fruits contain both fixed and volatile oils, which are mainly utilised to make soap. [5]

TAXONOMICAL CLASSIFICATION

Kingdom: Plantae

Division: Magnolids

Order: Laurales

Family: Lauraceae

Genus: Laurus

Species: Laurus nobilis

Rheumatism, dermatitis, and digestive problems like epigastric bloating, slow digestion, eructation, and flatulence have all been treated with it historically. [6] The aqueous extract is used in traditional Turkish medicine as a diuretic, anti-rheumatic, hemorrhoidal, and stomachache treatment. [7]

PHYTOCHEMISTRY

Terpenoids

Sesquiterpene lactones were discovered in Laurus nobilis, including 10-epigazaniolide, Gazaniolide, spirafolide, costunolide, Reynosin, and santamarine.[8] 5a,9-dimethyl-3-methylene-3,3a,4,5,5a,6,7,8-octahydro-1-oxacyclopenta[c] was also discovered. Among other sesquiterpene lactones, Azulen-2-one, 3-chlorodehydrocostuslactone, dehydrocostuslactone, artremorin, and Lauroxepin The substances 11,13-dehydrosantonin, [9,10] 5a,9-dimethyl-3-methylene, 3a, 4, 5,5a,6,7,8, and octahydro-1-oxacyclopenta[c] Deacetyl laurenobiolide and azulen-2-one (3-chlorodehydrocostuslactone [14]). [11] The trypanocidal terpenoid zaluzanin D, also known as 1,15-dihydroxy-5H,7H-eudesma-3,11(8)-dien-12,6-olide and 5H,7H-eudesman-4,6,11,12-tetraol. [12] Two steroisomeric monoterpine alcohols, Cis and trans-thuj-2-en4-ol, were found in the essential oil of Laurus nobilis. [13]

Glycosides

Four non-polar flavonoids were found in the leaves of Laurus nobilis. Kaempferol-3-O—L-(2",4"-pcoumaroyl)-rhamnoside, kaempferol-3-O—L-(3",4"-di-E-p-coumaroyl)-rhamnoside, and a recently discovered chemical, kaempferol-3-O—L- (2",4"-di-Z-p-coumaroyl) -rhamnos In the methanolic extract of leaves from L. nobilis L., five new megastigmane glucosides, designated laurosides A–E, and a new phenolic glucoside were discovered. [14,15] Kaempferol-3-rhamnopyranoside and kaempferol-3, 7-di-rhamnopyranoside were found in an aqueous ethanolic extract of Laurus nobilis. [16]

Anthocyanin

The primary anthocyanins were determined to be cyanidin 3-O-glucoside and cyanidin 3-O-rutinoside. Two minor anthocyanins, 3-O-glucoside and 3-O-rutinoside, were additionally discovered. [17]

Oil Essential

The essential components of the oil were identified. 1,8-cineole, p-cymene, terpinene-4-ol, terpinyl acetate, and linalool acetate are some of its components. [18] A number of other compounds were found to be present, including (E)-cymene, (L)-longipinene, cadinene, (T)-terpinyl acetate, (B)-bulnesene, [19] (T)-terpinene-4-ol (4.25%), and (S)-sabinene. Linalool and myrcenol, which are acyclic monoterpenes, were less common, although cumin aldehyde, dimethylstyrene, eugenol, methyl eugenol, and carvacrol were found. [20]

HISTORY/ ORIGIN

The origin of the bay leaf is probably in South Asia and the rest of the world.

DEMOGRAPHY/LOCATION

Bay leaf can be grown under a variety of ecological and climatic conditions. The optimum and perfect conditions for rapid, luxuriant development are wet, sandy soil with a lot of water or some moist atmospheric conditions close to the ocean beach (Patrakar et al., 2012). Soil with a pH range of 4.5-8.2, damp sandy soil, and partial sun shadow are all ideal. The leaves may also burn in hotter climates. Bay grows fluffy yellow-white blooms and black berries in hotter regions. Under 28°F and over an extended period of time, the bay will die (Kemp et al., 1983). There are a number of countries where bay is a widespread plant, including India, Pakistan, other Southeast Asian countries, some Pacific islands, Australia, the Mediterranean and Southern European coasts, Greece, Portugal, France, Turkey, Mexico, Southern United States, and the Canary Islands. [21]

NEUROPROTECTIVE ACTIVITY

On the subject of dopamine-induced intracellular reactive oxygen species (ROS) formation and apoptosis, the effects of the n-hexane fraction from Laurus nobilis leaves on human neuroblastoma SH-SY5Y cells were examined. Hexane fraction had an IC50 of 3.0 g/ml while dehydrocostus lactone and costunolide had IC50s of 7.3 M and 3.6 M, respectively, for inducing apoptosis in response to DA. A positive control was

apomorphine (APO, IC50=18.1 M). The hexane fraction significantly decreased ROS production in DA-induced SH-SY5Y cells, as did these essential compounds. A mouse 6-hydroxydopamine (6-OHDA) model of Parkinson's disease was used to test the potential neuroprotective effects of hexane fraction in vivo. 6-OHDA was injected into the substantia nigras of young adult rats, and TH-positive neurons were counted using an immunological histochemical method. Additionally, hexane fraction showed neuroprotective characteristics by drastically suppressing 6-OHDA-induced TH-positive cell loss in the substantia nigra and reducing DA-induced -synuclein (SYN) formation in SH-SY5Y cells. [22]

WOUND HEALING ACTIVITY

The effectiveness of Laurus nobilis and Allamanda's aqueous extracts to treat wounds was assessed and compared using rats. Excision and incision wound models were used to evaluate the wound healing process. Wound healing was assessed using the following metrics: the pace of wound closure, the duration of epithelialization, the tensile strength, the weights of the granulation tissue, the content of hydroxyproline, and the histology of the granulation tissue. In rats given Laurus nobilis, the hydroxyproline concentration, weight of the granulation tissue, and wound contraction rate were all moderately high (P .05). The mice treated with Laurus nobilis had less collagen and more inflammatory cells in their granulation tissue than the mice treated with Allamanda cathartica, according to a histological examination. [23]

ANTIOXIDANTS ACTIVITY

We looked at the aqueous and ethanol extracts of Laurus nobilis for their antioxidant properties. Both extracts were evaluated for their antioxidant activity, reducing power, free radical scavenging, superoxide anion radical scavenging, hydrogen peroxide scavenging, and metal chelating abilities in order to determine their overall antioxidant capacity. In a linoleic acid emulsion, both extracts significantly increased antioxidant activity overall. Concentrations of 20, 40, and 60 g/ ml for water and ethanol extracts showed 84.9, 95.7, 96.8 and 94.2, 97.7, and 98.6% and 94.2, 97.7, and 98.6% inhibition of lipid peroxidation of linoleic acid emulsion, respectively. Contrarily, traditional antioxidants butylated hydroxyianisole (BHA), butylated hydroxytoluene (BHT), and -tocopherol at concentrations of 60 g/ml in 96.6, 99.1, and 76.9%, respectively, prevented lipid peroxidation in a linoleic acid emulsion. Additionally, both extracts demonstrated considerable reducing power, DPPH free radical scavenging, superoxide anion radical scavenging, hydrogen peroxide scavenging, and metal chelating activities at doses of 20, 40, and 60 g/ml. Gallic acid equivalents were used to determine the total amount of phenolic components in each extract. [24]

ANTIULCEROGENIC ACTIVITY

In order to test Laurus nobilis seeds for their ability to prevent stomach ulcers, rats that had been ethanol-induced stomach ulcers in an experiment were employed. The outcomes demonstrated the antiulcerogenic activity of the oily component of these seeds as well as the 20 and 40 percent aqueous extracts. [25]

ANTIMUTAGENIC ACTIVITY

By using chromatography, the antimutagen, 3-kaempferyl p-coumarate, was extracted from a bay leaf extract made with ethylacetate. The yield from 100 g of bay was 20 mg and the amount required to totally stop the mutagenicity of 20 mg of Trp-P-2 was 1.9 g. This value is comparable to flavones and flavonols, two powerful antimutagens. The antimutagenicity was due to the desmutagenic action, which stopped Trp-P-2 from metabolically activating into its final carcinogenic form. The kaempferyl moiety made the activity possible. [26]

ANTIVIRAL ACTIVITY

Essential oils of Laurus nobilis were tested for their inhibitory potency against SARS-CoV and HSV-1 reproduction in vitro by visually evaluating the virus-induced cytopathogenic impact post-infection. Laurus nobilis oil has shown activity against SARS-CoV with a selectivity index (SI) of 4.16 and an IC (50) value of 120 g/ml. This oil's main ingredients, alpha-pinene, beta-ocimene, 1, 8-cineole, and were responsible for most of its unique qualities. [27]

ANTICHOLINERGIC ACTIVITY

We looked at the acetyl cholinesterase (AChE) enzyme activity of the ethanolic extract, decoction, and essential oil of Laurus nobilis. It was discovered that the essential oil fraction has a greater than 50% potential to inhibit AChE. In the ethanolic fraction, it also showed a potent 64% (1 mg ml1) inhibition of AChE. [28]

ANTIBACTERIAL ACTIVITY

The essential oil, seed oil, and methanolic extract of seed oil from Laurus nobilis were tested for their in vitro antibacterial properties. When compared to essential oil and seed oil, the methanolic extract of seed oil shown greater antibacterial activity. [29]

CONCLUSION

The goal of this inquiry is to determine Laurus nobilis's and its constituent parts' medicinal potential. We can infer the following from this research: The findings covered in the review article will be helpful to researchers looking for new Laurus nobilis drugs. The isolated compounds will be considered in next clinical trials.

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