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REVIEW ARTICLE

SYSTEMATIC REVIEW ON TWO INDIAN MEDICINAL PLANTS: *Ocimum canum* AND *Platycladus orientalis*

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ABSTRACT:

From the base, *Ocimum canum* spreads out, displaying open leaves and angled stems. Chefs widely cultivate the plant for its strong, aromatic flavor. The main bioactive substances found in *P. orientalis* leaves are tannins, polysaccharides, and flavonoids. *P. orientalis* leaves were the subject of pharmacological investigations that showed a variety of biological effects, including those that were anti-inflammatory, antibacterial, antioxidant, and hair growth-promoting. In this article, systematic review on two Indian medicinal plants: *Ocimum canum* and *Platycladus orientalis* has been discussed.

KEYWORDS: *Ocimum canum*, *Platycladus orientalis*, Medicinal Plants.

INTRODUCTION:

Ocimum is a member of the Lamiaceae genus. Collectively referred to as basil, it is a rich and varied source of fragrant essential oil. These essential oils serve as medicinal agents due to their antibacterial, antiemetic, antidiabetic, antifertility, antiasthmatic, anti-stress, and anticancer properties. People specifically use *O. canum* to cure a variety of illnesses, lower blood sugar, and alleviate headaches, joint pain, fever, colds, and parasitic infestations.

The evergreen tree *Platycladus orientalis* (L.) Franco is a member of the Cupressaceae family's genus *Platycladus* Spach. It spreads widely across the planet. Since ancient times, *P. orientalis* leaves—the dried needles of *P. orientalis* (L.) Franco—have been a common ingredient in medicinal products.

REVIEW OF LITERATURE:

Mittepalli, V. (2024). In the present study, *Platycladus orientalis* leaf extract (PO) was used as a reducing agent with stabilizing ability to synthesize PdNPs in a more environmentally friendly manner. The characterization of nanoparticles involved the use of transmission electronic microscopy (TEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), UV-Vis spectroscopy, and dynamic light scattering (DLS). TEM and XRD analysis were used to determine the structural and morphological investigations, while UV-Vis and FTIR research were used to further establish the presence of optical, physical, and chemical properties. Spherical nanoparticles (NPs) with an average size of 8 ± 3 nm were visible in the TEM pictures. Pd⁺² may be reduced to Pd⁰ thanks to the phytochemicals included in the leaf extract, which also served as a stabilizing agent. Later studies looked into how well PdNPs could break down dyes such as crystal violet (CV), methyl orange (MO), and rhodamine B (RhB). This environmentally friendly process of producing tiny, spherical PdNPs was effective in reducing organic dyes. [1]

Daihao Yin et al. (2024). For old trees to be effectively protected and managed for health, it is imperative to evaluate their current state of health. In order to quickly analyze the health status of elderly trees, we used an unmanned aerial vehicle (UAV) fitted with multispectral cameras in this

investigation. Based on the portions of the trees that are above ground, all trees were categorized into three classes based on their health status: healthy, declining, and severely declining trees. To determine their state of health, two conventional machine learning algorithms—random forest (RF) and support vector machines (SVM)—were used. Selected factors were included in both algorithms, along with extra variables (canopy area and aspect). The findings showed that adding these extra variables increased the models' overall accuracy by 8.3% to 13.9%, with kappa values ranging from 0.166 to 0.233. The best option for evaluating the health of old trees is the A-RF model (RF with aspect and canopy area variables), which showed the highest overall accuracy (75%) and kappa (0.571) among the models examined. All things considered, this study offers a fresh and economical method for evaluating the health of elderly trees. [2]

Li, Xiao et al. (2023). The leaves of *Platycladus orientalis* are a rich source of polysaccharides and flavonoids, which have numerous nutritional and therapeutic uses. The purpose of this study was to look at how *P. orientalis* leaf extract (PLE) affected the raccoon dogs' growth performance, fur quality, serum parameters, and gut flora. After being randomly assigned to four groups, sixty healthy male black raccoon dogs, who were 85 (± 5) days old, were fed a baseline diet supplemented with 0, 0.25, 0.50, and 1.00 g/kg PLE for 125 days (groups P0, P1, P2, and P3, respectively). As compared to group P0, the raccoon dogs in group P1 showed a lower feed/gain ratio ($p < 0.05$) and an increase in average daily gain and underfur length. Still, group P2's heart index was much lower than group P0's ($p < 0.05$), and group P3's kidney index and serum alanine aminotransferase activity were higher than those of groups P2 and P0 ($p < 0.05$), which suggests that higher doses of PLE might have bad effects. Significantly, supplementing with PLE through meals resulted in lower serum glucose concentrations ($p < 0.05$), which could have consequences for diabetes control. Additionally, using high-throughput sequencing, the study investigated the effects of nutritional supplementation with 0.25 g/kg PLE on the intestinal microbiota of the raccoon dogs. The results showed big changes in the make-up of the microbial community. For example, the amount of *Prevotella copri* significantly decreased after 0.25 g/kg PLE was given ($p < 0.05$). In conclusion, adding 0.25 g/kg PLE to the diet of raccoon dogs can enhance their growth potential and have a favorable effect on their gut flora. However, we should use higher dosages with caution as they may negatively impact several factors. As a result, PLE is a promising feed supplement for fur animal production. [3]

Himanshu Rajpurohit et al. (2022). *Platycladus orientalis* (L.) Franco, a traditional Chinese medication and food additive, belongs to the Cupressaceae family and primarily treats rheumatism, gout, diarrhea, and chronic tracheitis. Various extracts of *Platycladus orientalis* treat a wide range of illnesses. Historically, people have used it to treat a wide range of illnesses such as whooping cough, tinea mannum, acute vaginal hemorrhage, flu, bacillary dysentery, hypertension, insomnia, skin whitening, and lymphoid tuberculosis. Chinese traditional medicine uses the leaves of *Platycladus orientalis* (Linnaeus) Franco (LPO) to treat a variety of conditions, including asthma, bronchiectasis, coughs, and excessive mucus secretion. Chinese traditional medicine has used *Platycladus orientalis*, a plant with anti-inflammatory qualities, to treat inflammation. Chinese traditional medicine also uses it to treat inflammatory airway illnesses. Traditional Chinese medicine has used *Platycladus orientalis* (L.) Franco to promote hair development. Nonetheless, the active phytoconstituents, or key chemicals in it, are what stimulate hair growth. Because polyphenols are present, *Platycladus orientalis* leaves have both anti-inflammatory and antioxidant properties. [4]

Reham S. Darwish et al. (2021). This research examined the *in vitro* anti-inflammatory potential of the extracts from the oriental Thuja (*Platycladus orientalis* L. Franco) cones and leaves as well as the seasonal dynamics of the flavonoids present in these tissues. Utilizing untargeted HPTLC profiling, the significant chemical markers of the investigated extracts were identified. Then, over the span of three seasonal cycles, the effect of seasonality on the composition of these metabolites was evaluated. For the newly found chemical markers of oriental Thuja, such as hyperoside, quercetrin, isoscutellarein-7-O-xyloside, cupressuflavone, hinokiflavone, sotetsuflavone, and isoscutellarein-8-methyl ether, a quantitative HPTLC method was created and validated. Summer and winter had the greatest levels of flavonoids because leaves were more abundant than cones during those seasons. Although the cones mainly gathered biflavones, flavone glycosides are a significant class of flavones that have been found in leaves. The findings demonstrated that seasonal variation had a smaller impact on flavonoid buildup in cones than it did on flavonoid accumulation in leaves. The levels of INF- in the summer leaves were significantly lower than those obtained with piroxicam, indicating a powerful anti-inflammatory capability. (180 1.47 pg mL⁻¹). The level of INF- decreased to 80.7 1.25 ng mL⁻¹. Flavonoids glycosides, quercetrin,

hyperoside, and isoscutellarein-7-O-xyloside were the biomarkers that added the most to the decline in pro-inflammatory mediators in LPS-stimulated WBCs, according to OPLS (orthogonal projection to latent structures) models. The results of the research can be used to determine the best organs and seasons of the year to gather and acquire specific biomarkers in high concentrations, ensuring the efficacy of the resulting extracts. [5]

According to T. Liao et al. (2021). *Platycladus orientalis* is a species of preference for reforestation and beautification in northern China because it is a native tree species with a high ability for adaptation. But it mainly produces male cones and hardly any female cones. Additional breeding attempts are also banned because it's still unclear how it reproduces. In order to completely understand the reproductive biology traits and fertilization mechanism of *P. orientalis*, the present study carefully examined the process of micro and macro-sporogenesis in male and female cones from bud initiation to fertilization, and seed development. Each developmental step, such as bud initiation, microsporogenesis, megasporogenesis, and cone and seed development, had a specific point in time that was pinpointed. During maturation, the abortive phenomenon was seen in both male and female cones. Additionally, this research demonstrated that the microspore mother cells were dormant during the winter meiotic stage and that the growth of the male gametophyte began after hibernation. The growth of the secretory type of tapetum follows a typical pattern. The best period to administer therapy to consciously cause the change of male and female cones was from late June to mid-July. A theoretical basis for *P. orientalis* hybridization, breeding, improved seed yield and quality, and artificially caused male and female cone change was established by this finding. [6]

Niranjan Sutar et al. (2020). The primary goal of this study was to evaluate the anticonvulsant effectiveness of *Platycladus orientalis* leaves in albino rats. Research into this beneficial natural origin has a bright future because it is still unclear what makes *P. orientalis* unique and helpful. Thuja has been used for a very long time to cure a variety of illnesses, including bronchial catarrh, enuresis, cystitis, psoriasis, epilepsy, ulcers, uterine carcinomas, amenorrhea, rheumatism, asthma, skin infections, mumps, bacterial dysentery, arthritic pains, and early blindness. This research was done to find out if *P. orientalis* ethanol leaf extract had any anticonvulsant effects on rodents. Using the maximum electroshock seizure (MES) test and the pentylenetetrazole (PTZ)-induced seizure test, the anticonvulsant efficacy of an ethanolic extract of the leaves of *Platycladus*

orientalis (100 mg/kg, 200 mg/kg, and 400 mg/kg) was evaluated in rats. In the MES test, the leaf extract from *Platycladus orientalis* significantly ($p = 0.01$) and dose-dependently decreased the hind leg tonic extension. Additionally, the extract significantly ($p = 0.01$) delayed the onset of seizures in the PTZ model and reduced the length of clonic convulsions in a dose-dependent way. [7]

Zhou Q et al. (2019). *Oriental Platycladus* Linn. (Cupressaceae) has a tens of thousands-year lifetime. Ancient trees are extremely valuable in terms of study, trade, and culture. Research on the senescence of old plants is still in its infancy. A tree's main and most delicate structure are its leaves. The Mausoleum of the Yellow Emperor in Shaanxi Province, China, is home to the largest planted pure forest in the world. Research on the morphology, anatomy, and ultrastructure of one-year leaves of an ancient *P. orientalis* (ancient tree >2,000 years) was conducted there (Healthy, sub-healthy, and senescent). The structure of a tree's leaves changes considerably as it ages, according to observations. The chloroplast, mitochondria, vacuole, and cell wall of mesophyll cells were the most significant indicators of cellular ultrastructure during tree senescence. The leaf ultrastructure of ancient trees provided ample evidence for the visual assessment of their level of senescence made from above-ground tree sections. By understanding the connections between leaf structure and tree senescence, decision-makers can plan the preservation of old plants more quickly and effectively. Before the entire tree irrevocably recedes, by using timely rejuvenation methods. [8]

Emad Mohamed Abdallah and Eman Ramadan Elsharkawy (2019). It claimed that the antibacterial activity of *Platycladus orientalis* fruits against *Staphylococcus saprophyticus* was examined in the Arar area of Saudi Arabia. A microorganism linked to severe cystitis and urinary tract infections (UTI) in young, female people. The presence of bioactive compounds like cupressene, podocarpa-8,11,13-triene, kauran-16-ol, kerruginol, glycoside compounds like cymaridin, and periplocymarin, which were discovered using GC-MS analysis, may be the cause of the plant product's antibacterial potency. The disc diffusion test revealed a 16.0-1.0 mm zone of inhibition, and the relative percentage inhibition (RPI) of the *Platycladus orientalis* extract was 66.6% greater than that of chloramphenicol. The extract showed significant antibacterial action against *Staphylococcus saprophyticus*. The MBC value was 50 mg/ml, and the MIC value was 12.5 mg/ml. The extract has high bacteriostatic activity, as indicated by the MBC/MIC ratio of 4, which is 4. Therefore,

Staphylococcus saprophyticus, which has been linked to UTI illnesses, may be treated with antibacterial drugs made from the fruits of *Platyclusus orientalis*. [9]

M.T. Selvi et al. (2015). The *Ocimum canum* reported 36 distinct parts. The essential oil was created from plants and the camphor was the main component (39.77%). The extracted oil's in vitro antioxidant activity was found to have amount-dependent free radical scavenging activity against DPPH (IC₅₀: 523.55 0.001 g/mL) and hydroxyl radicals (491.12 0.002 g/mL). Calculations were made for the deoxyribose degradation inhibition (168.50 0.003 g/mL) and metal chelating (781.38 0.001 g/mL) activities. Comparing oil's antioxidant activity to positive controls like ascorbic acid and BHT revealed that it was less prevalent. (12.49 0.002 and 30.14 0.005, respectively). DNA breakage and significant cytotoxicity (IC₅₀ value of 60 g/mL) were present in breast cancer cells. (MCF-7). [10]

P.A. Ntonga et al. (2014). The sensitivity of *Plasmodium falciparum* and mature *Anopheles funestus* larvae to the essential oils of three Cameroonian plants—*Ocimum basilicum*, *Ocimum canum*, and *Cymbopogon citratus*—was investigated. The three main ingredients in vitamin C are geraniol, 1,8-cineole, and linalool. According to studies using gas chromatography and gas chromatography-mass spectrometry, basilicum and basilicum, respectively, have the fragrance of *C. Citratus* stems are especially effective in combating *An. niger*, according to the World Health Organization's recommended larvicidal test method for *Funestus* larvae (LC₅₀ values of 35.5 ppm and 34.6 ppm, respectively, for larval stages III and IV after 6 h of exposure). Furthermore, C. The strongest anti-P was found in citratus oil. 4.2 0.5 lg/mL was the IC₅₀ for falciparum activity in comparison to *O. oxymoron* and *Canum* (20.6 3.4 lg/mL). The radioisotopic technique was used to evaluate the in vitro anti-plasmodial activity of basilicum (21 4.6 lg/mL). Potential applications for these essential oils include the creation of natural biocides to eliminate malaria vector larvae and the discovery of natural goods with anti-malarial properties. [11]

Adjou et al. (2012). The aflatoxin production of *Aspergillus flavus* and *Aspergillus parasiticus*, which were isolated from peanut, in connection to the essential oils made from fresh *Ocimum canum* leaves. Calculations were made to determine the oil's minimum inhibitory concentration (MIC) and minimal fungicidal concentration (MFC). It was found that the essential oil's potent fungicidal properties significantly reduced the formation of aflatoxin. 30 components, or approximately 95.2% of the oil, were identified using GC/MS analysis. The three main molecular

elements that make up *O. terpinene-4-ol* (41.18%), linalol (14.7%), and α -terpinène (6.9%) make up *Canum* essential oil. Monoterpene hydrocarbons made up the majority of the fragrant extract's ingredients. *O.* based on its ability to be antifungal and antiaflatoxin. As a preventative measure against fungal and aflatoxin contamination in storage devices, canola essential oil may be suggested. The study also encourages the use of *O. canum* plants, which are used in traditional medicine to treat a variety of ailments. As a result, this plant's leaves have the potential to yield useful medications. [12]

CONCLUSION:

The various plant parts are an important medicinal herb with a wide range of ethnomedical treatments; they are primarily used to treat baldness, excessive phlegm, flu, malnutrition, cough, and rheumatoid arthritis, according to all available recent scientific research on the two studied plants. The plant's anti-inflammatory, antioxidant, antibacterial, and hair-growth-promoting properties were assessed in a pharmacological investigation. Though not enough research has been done, plants are also utilized to cure blood heat and bleeding conditions. To sum up, this assessment of the herb's traditional usage, phytochemistry, and pharmacology has yielded preliminary data for future research and commercial applications. Based on a review of numerous studies, it can be said that this substance has strong anti-microbial, antiviral, insecticidal, antioxidant, and anti-cancer properties. It also effectively combats a variety of health issues, including bacterial, fungal, and microbial infections. To assess the plants under study's overall beneficial and effective application for human wellbeing, researchers need to devote more time to them.

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