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A REVIEW ON CINNAMON BARK FORMULATION AND EVALUATION HAVING A WOUND HEALING PROPERTIES

Samuvel Raj A., Gopi S., Ragul G., Hardha B.* and Senthil Kumar M.*

Sree Abirami College of Pharmacy, Coimbatore-21.

***Corresponding Author: Hardha B.**
Sree Abirami College of Pharmacy, Coimbatore-21.

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ABSTRACT
By using capillary GC and GCIMS, the cinnamon bark, leaf, root, and fruit were examined for their essential oils. Six and y-cadinene (36.0%), cadinol (7.7%), and 8-caryophyllene (5.6%) were the main components of cinnamon fruit oil. About Sesquiterpenes made up 84% of the cinnamon fruit oil, but other cinnamon elements did not. included fewer than 9% of the chemicals in this category. The phenyl propanoids main components of cinnamon bark, leaf, and root oils, whereas monoterpenes were found in root oil as the predominant components (95%). Powdered Cinnamomum zeylanicum (cinnamon bark) was treated with subcritical water in a semi-continuous system at 150 and 200°C with a constant flow rate of 3 mL/min and pressure of 6 MPa. Major flavouring substances such cinnamaldehyde, cinnamic acid, cinnamyl alcohol, and coumarin were recovered with lower recoveries than when methanol was used, indicating that these substances may have degraded during the subcritical water treatment. The subcritical water treatment produced the acids vanillic, caffeic, ferulic, p-coumaric, and protocatechuic. In terms of the quantity of components and recovery, subcritical water extraction was superior to methanol (50% v/v) extraction to produce these acids, especially at 200°C. In comparison to methanol extraction, subcritical water treatment at 200°C produced a greater total phenolic content and DPPH radical scavenging activity.

KEYWORDS: cinnamaldehyde, cinnamic acid, cinnamyl alcohol, and coumarin.

INTRODUCTION
The use of medicinal plants is crucial for maintaining the health of both people and entire societies. Some chemical components in plants have therapeutic relevance because they have definite physiological effects on people. Alkaloids, tannins, flavonoids, and phenolic compounds are the most significant of these bioactive plant components. Numerous native medicinal plants are also used as food and spice plants. For therapeutic purposes, they occasionally added to foods intended for expectant moms and nursing mothers. Additionally, herbal therapy has been used to cure illnesses and infections since the dawn of humankind. The World Health Organisation is in favour of using traditional medicines as long as they have been shown to be secure and effective. Many people in developing nations live in abject poverty, and some of them suffer and pass away due to a lack of access to safe drinking water and medicine.

Therefore, it is essential to consider using medicinal plants as an alternative to conventional medications while delivering primary healthcare. More specifically, herbal remedies have drawn a lot of interest as sources of lead compounds since they are seen to be time-tested, generally safe for human use, and environmentally acceptable. Additionally, they are inexpensive, accessible, and reasonable. Many medicinal plants are said to aid in wound healing in the conventional medical system. Even though very few of these plant treatments have been studied for their mechanisms of action, toxicity, or efficacy, many have been utilised for centuries.

The skin is the body's largest organ in term of surface. It is a crucial component that products inside tissue against physical harm, microbial infection, UV light, and extremely low and high temperature. This makes if extremely prone to harm which would have a substantial effect on both individual patient and the healthcare industry.

The rational use of medications requires a grasp of how they work. According to Ayurveda, this is described in terms of the pharmacodynamic properties of the medications, such as Rasa (taste), Guna (properties), Veerya (potency), and Vipaka (biotransformation). Although there has been a lot of research on medicinal plants recently, it is still unclear how these plants actually work from the perspective of traditional Ayurvedic teachings. The same is true for plants that can

cure wounds. The entire analysis of medicinal plants (Vrana-Shodhana [wound cleaning] and Vrana-Ropana [wound healing]) listed in the Sushruta Samhita together with pharmacodynamics and their mode of action is not available. Published literature is available for wound-healing plants. According to reports, plant chemicals such tannins, flavonoids, and ster.

Due to their strong antioxidant properties, plants and their extracts have been studied in recent scientific research worldwide. It was discovered that many of these extracts had therapeutic effects on various disorders. The generic name for the cinnamon plant is Cinnamomum vernum. One of the first herbs used in traditional medicine, cinnamon is used to flavour meals like cakes and snacks. Antibacterial and antifungal activities are present in cinnamon. Additionally, it is used to heal wounds and treat diarrhoea and motion sickness. Reported that cinnamon helps persons.

Since pesticide use in agriculture has risen, particular roles for seriousols, polyphenols, saponin, and triterpenoids have emerged. due to astringent, antibacterial, antioxidant, free-radical scavenging, and improvement in vascularity in wound healing. Wound healing can be aided by herbal therapies. The precise methods by which medicinal herbs promote wound healing have not yet been identified.2-5 Cinnamomum verum, a popular spice from the Lauraceae family that is used in food and medicine, is made from the inner bark of trees in the genus Cinnamomum. The antioxidant, anti-inflammatory, and antibacterial effects of cinnamon essential oil are well established. Analgesic and wound-healing properties have been observed in its alcoholic extract.

The use of cinnamon as a spice and seasoning has a long history. Common cinnamon, also known as "true cinnamon" or Ceylon cinnamon (Cinnamon verum, C. zeylanicum), and cassia cinnamon (C. aromaticum), often known as Chinese cinnamon, are the two forms of cinnamon most frequently consumed (Jellin 2006a,b). Both common and cassia cinnamon have traditionally been considered to be generally safe to consume; but, in more recent years, concerns have been raised about the amount of coumarin present in cassia cinnamon. The liver and kidneys are moderately toxic to coumarin, despite its medicinal importance as a precursor to various anticoagulants, with an 50 of 275 mg/kg (Lungarini et al. 2008).

Cinnamon may be regarded as safe when ingested in amounts used for food preparation, according to evidence obtained from clinical trials, with the exception of one case report published by Westra et al. (1998) United states food and drug administration (USFDA 2006).

As a result, in the current study, an effort has been made to compile pertinent data on medicinal plants that treat wounds using cinnamon bark. As a result, cinnamon bark is the source of essential cinnamon oil. Cinnamon oil has anti-inflammatory and antibacterial qualities that may hasten the healing of wounds.

VARIOUS FORMULATION OF CINNAMON BARK

1. Cinnamon oil
2. Cinnamon gel
3. Cinnamon patches
4. Cinnamon lip balm

EVALUATION OF CINNAMON LIP BALM

A homogenous combination known as the base was created by combining 45g of oil, 24g of candelilla wax, and 45g of cupvacu butter in a water bath at 100°C. Once the mixture is uniform, add up to 18g of cinnamon leaf powder. Pour the mixture into a lip balm mould tube and use a universal indicator to check the liquid's pH. Allow the liquid to remain at room temperature for 48 hours until it has fully solidified to stabilise the lip balm. Making lip balms involves weighing out 45 g of coconut oil, 24 g of candelilla wax, and 45 g of cupuaçu butter. These ingredients are then added to a water bath set to 100 °C to create a homogeneous mixture that is then given the designated basis. Six different types of lip balms with various compositions were created with the goal of analysing the impact of cinnamon oleoresin/essential oil and vitamin E to the base. 18 g of base were used in each of the variations. Four vitamin E capsules were added to each sample of the balms that contained the vitamin. In each variant, 5 drops of the oleoresin or essential oil were added to the balms. All of the prepared samples were kept in an acrylic container that was correctly labelled in accordance with the terminology and composition as follows:

• Base is Control 1;
• Alternative 2: base plus vitamin E;
• Control 3a: base plus oleoresin of cinnamon;
• Control 3b: base with essential oil of cinnamon;

Sample 1 has a base, cinnamon oleoresin, and vitamin E.

• Sample 2: base plus cinnamon essential oil and vitamin E.

Balm Stability Tests: Two stability tests on the produced balms were conducted, the the AST and EST (Extended Stability Tests), respectively. The 15-minute AST EST lasts 90 days, while days. For this, stress was put on the test formulations. factors that could hasten the appearance of potential instability symptoms include 2012 (ANVISA). the following environments were used to store the study's sample storage: temperatures:

• Oven: 40 °C;
• A refrigerator: 5°C at T;
• Freezer: -5°C;
• 24-hour cycles at 45°C

EVALUATION OF CINNAMON OIL

Tween 80 and water were used to create a nanoemulsion of cinnamon oil (extracted from Cinnamomum

zeylanicum). In the formulation of nanoemulsions, variables like surfactant concentration, oil-surfactant mixing ratio, and emulsification time were optimised. The amount of surfactant present was shown to be directly related to stability and inversely related to droplet size. Droplet diameter decreased as emulsification time increased. After sonication for 30 minutes, a stable formulation of cinnamon oil (CF3) with droplet diameter of 65 nm was created.

By using hydrodistillation to extract the essential oils, the essential oils from the samples of cinnamon bark produced clear yellow wax oils with yields ranging from 0.72 to 3.08% (Fig. 1a). Our research showed that the three species of Cinnamomum have significantly different cinnamon oil compositions. C. loureirii had the largest oil yield (3.08%), and C. verum ha Twenty patients (18F/2M) with mild-to-moderate facial acne were treated for eight weeks with topical cinnamon gel in this open-label, assessor-blind, and uncontrolled clinical research. At the baseline, fourth, and eighth weeks, the results of the acne lesion count, red fluorescence parameters, and skin biophysical profile were assessed. Any negative medication reactions occurred throughout the trial were noted for safety assessment. The number of overall (47%, p=0.000), inflammatory (42%, p=0.026), and non-inflammatory (48%, p=0.002) lesions significantly decreased two months after using cinnamon gel. Additionally, there was a notable reduction in the size of the red fluorescence patches (p 0.05). Erythema (61.31+/-68.25), sebum (31.05+/-36.15), hydration (10.05+/-10.16), and pH (0.63+/-0.75) were all significantly lower in skin biophysical measurements than controls. Some patients reported having brief, moderate symptomsd the lowest yield (1.14%). Variations were seen in the oil output from the seven C. cassia samples.

EVALUATION OF CINNAMON GEL

A 0.5% (w/w) gel was made based on the outcomes of the repeated open application test (ROAT). These steps were used to create each 100 g cinnamon gel:

1 g of Carbomer 940 was soaked in the water phase for wetting, 10 g of propylene glycol and 64.37 g of ethanol were added to 0.5 g of cinnamon essential oil, and then all of the ingredients were combined and stirred by a stirrer (IKA, Germany) at 400 rpm for two minutes. Then, to create a gel, a few drops of triethanolamine were added to the solution. Aluminium tubes weighing 15 g were filled with the formulation.

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EVALUATION OF CINNAMON PATCHES

a) A digital image of the patch. A 0.5 cm scale bar is used.
b) using Micro-CT to recreate the patch in 3D. A 1 mm scale bar is used.
c) An optical micrograph of the first array of tiny suction cups. 500-m scale bars are used.
d) An optical micrograph of the interface with suction cups in place. There is a partially magnified image in the lower right corner. 500-m scale bars are used.
e) The patch's photothermal response curves at various NIR power densities.
f) The patch's photo thermal cycling curve. The NIR is on during this time period, as indicated by the red area.
g) The mucus temperature-modulus curve. The storage modulus and loss modulus are denoted by G' and G"" respectively. Digital images that have been inserted show mucus in its gel and sol phases.
h) The PNIPAm-DN shrinkage rate (M/M0)-temperature curve. The initial mass is M0, and the mass at a particular temperature is M0. Digital images showed the PNIPAm-DN prior to and following contraction.
i) The suction cups' cycle of contraction and relaxation. 500-m scale bars are used.
j) The suction-cup's contraction rate (/0) in various states, where 0 is the initial diameter and is the diameter in a particular state.
k) The patch's regulated medication release curve under NIR and without it. It was done with the model medication FITC-BSA. The presence of NIR during this time is indicated by the red area. The data for (e), (h), (j), and (k) are displayed as mean SD, n=3.

Patch Thickness: A screw gauge was used to measure the patch's thickness at five different spots on the film, and the resulting mean value was calculated.18

Weight Uniformity: Segments of transdermal film with a 2 cm radius and a 4 cm diameter were removed. Five different films' masses were measured, and the variations in weight were computed.19

3. Folding Endurance: A 2 cm radius by 4 cm diameter transdermal film was repeatedly cut and folded at the same spot until it burst. The folding endurance rating was derived from the number of folds that occurred at the same location without breaking.20

4. Percentage Moisture Content: Each of the prepared patches was weighed and then put into a desiccator filled with anhydrous calcium chloride. It was then left at room temperature for 24 hours. The patches were weighed again after this period, and the Using a formula, the percentage moisture content was calculated.21
5. Percentage Moisture Uptake: Weighed patches underwent a 24-hour period of exposure. within a desiccator with a saturated potassium chloride at room temperature. solution to keep the relative humidity at 84%. Afterward, the patches were reweighed, and a formula was used to determine the % moisture uptake.22
6. Drug Content: A portion of the movie was dissolved in phosphate buffer. solution. The transdermal patch's disintegration was aided by stirring, and then the The remedy was poured into a volumetric flask. The absorbance of the solution was measured, making it possible to ascertain the drug content.23

PHARMACOLOGICAL ACTIVITY

Antibacterial activity

The antibacterial activity of various species of Cinnamomum essential oils and crude extracts against a variety of pathogenic microorganisms has been the subject of numerous studies. The antibacterial potential of many essential oils, acetone extracts from several spices, and C. tamala against Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Bacillus cereus, Bacillus subtilis, and Staphylococcus aureus was examined by Singh et al. The investigation showed that, in comparison to the acetone extract, the essential oils demonstrated excellent efficacy against the examined organisms. Similarly, Kapoor et al. studied the antibacterial activity of the essential oil and oleoresins of C. tamala against bacteria and fungi, and they found that both the oil and the oleoresins demonstrated efficient antimicrobial action against the tested species.

The antibacterial properties of C. tamala extract and essential oil were also examined by Mishra et al. They came to the conclusion that the oil had the strongest antibacterial effects against Klebsiella pneumoniae and Pseudomonas aeruginosa. 50 traditional medicinal herbs, including C. tamala from Pakistan, were tested for their bactericidal effects against seven clinical isolates by Zaidi et al., with particular attention paid to Helicobacter pylori, the causative agent of gastrointestinal illnesses. The outcomes showed that C. tamala had significant anti-Helicobacter pylori activity (>500 g/ml). The antimicrobial activity of C. tamala extracts was assessed by Jayasree and Dasarathan against four pathogenic organisms, and they reported that butanol extract displayed inhibitory activity against all of the tested species and noteworthy positive results in comparison to other solvent extract.

The crude extract of C. tamala was examined for potential antibacterial activity by Goyal et al. They discovered that all the extracts (ethanol, methanol, and ethyl acetate) showed varying degrees of inhibition zones against the various bacterial species they were tested against, with the exception of hexane extract, which was completely inactive. In 2012, Pandey et al. looked at the fungicidal activity of C. tamala against five pathogenic and food-spoiled fungi, as well as the antioxidant activity of seven extracts from the leaf.anti-oxidant function. The antioxidant activity of C. tamala has previously been assessed using several techniques. Using the Soxhlet apparatus, some writers assessed the activity of extracts from nine plants chosen from the families Euphorbiaceae, Lauraceae, Malvaceae, and Balsaminaceae. The solvents used were petroleum ether, chloroform, ethyl acetate, and methanol/n-butanol in increasing polarity.

The highest antiradical (96.8%) and phosphomolybdate activity was demonstrated by the methanolic extracts of C. zeylanicum and C. tamala, whereas the highest lipid per-oxidation (FTC) activity was demonstrated by the ethyl acetate extract of R. communis (793.3%). IC50 value of C. tamala chloroform extract (2.2 g/ml). These findings imply that polyphenols play a major role in the antioxidant activity that these extracts exhibit. In addition to significantly lowering peroxidation products, such as thiobarbituric acid reactive compounds, C. tamala's antioxidant activity was also assessed in steptozotacin-induced diabetic mice.

Quantification of the phenols, ascorbate, and carotenoids in the leaves demonstrated that this study's C. tamala leaves contained significant levels of antioxidants. The anti-diabetic and antioxiadtive properties of C. tamala, a common ingredient in cooking, have been proven in artificially created diabetic circumstances. Previous research indicates that some writers are trying to determine the antioxidant capabilities of various common spices. Allium sativum, Coriandrum sativum, C. tamala, and other methanolic crude extracts were examined for their capacity to scavenge free radicals using ascorbic acid as the reference antioxidant. The ability of the extracts under investigation to serve as donors of H atoms or electrons in the transition of the DPPH radical into its reduced form was examined using the DPPH assay.

The essential oils' and acetone extracts' DPPH radical-scavenging power increased linearly with concentration. According to certain studies, all acetone extracts had much higher levels of radical scavenging activity than the commercial antioxidant BHA (81.2–94.9%), which was proven by several authors. They concluded that the volatile oil's antioxidant activity may be the result of a synergistic interaction between the chemical constituents of the essential oil or acetone extract. Due to rising market demand, many spice plants are currently being examined. In rats given streptozotacin, authors showed a 50% improvement in the antioxidant activity of C. tamala ethanolic extract.

The biochemical and physiological indicators related to the metabolism of carbohydrates, proteins, and lipids revealed a considerable beneficial change. By using the peroxide, p-anisidine, thiobabituric acid, and total carbonyl methods against mustard oil, the antioxidant activity of essential oils and oleoresins was assessed. Because essential oils contain phenolic components like eugenol and spathulenol, they demonstrated that they have better antioxidant activity than ethanol oleoresins. It was discovered that the sample containing volatile oil and oleoresins was considerably (p0.05) more effective than the control.

Antidiabetic activity

The effects of a single oral dose of 250 mg/kg body weight of a 95% ethanolic extract of C. tamala leaves on blood glucose levels in normal fasting, fed, glucose-loaded, and streptozotocin-induced diabetic male albino rats were studied. Authors provided evidence of the considerable drop in blood glucose levels seen in diabetic, fed, and fasting rats. In the rats that had been given glucose, the extract likewise dramatically reduced the peak value. It is possible that the extract has an insulin secretogogue effect that promotes the peripheral utilisation of glucose and also increases the muscle glycogen store in fed models, leading to a hypoglycemic response. This is supported by the marked degranulation in pancreatic -cells of extract-treated rats and the corresponding lowering of blood glucose. Although cinnamon plays a lively role as a spice, it also has important antibacterial, antifungal, and antioxidant properties thanks to its essential oils and other ingredients. As an anti-inflammatory, antitermite, insecticidal, antimycotic, and anticancer agent7, it has also been employed. Nearly 20 years ago, research on cinnamon as a possible DM treatment was initiated. This small review's objective is to give a succinct overview of cinnamon's anti-diabetic properties.

CINNAMON AS AN AGENT ANTI-DIABETIC

Based on research by Zare et al., it has been established that taking 500 mg of cinnamon twice daily can improve a patient's lipid profile, glycemic index, and anthropometric measurements in people with type 2 diabetes. Patients with a higher BMI (BMI 27) experience these advantages significantly more.15. According to Shahibet al, administering 1 g of cinnamon12 weeks of powder use lowers fasting blood With uncontrolled type 2 diabetes, glucose levels and glycosylated haemoglobin people with diabetes as well as raising serum glucose levels However, superoxide dismutase and glutathione lower serum levels. malondialdehyde level, demonstrating the positive impact of adding cinnamon as an antioxidant and anti-diabetic traditional methods for poorly managed type 2 diabetes diabetes16

Antigenotoxic Activity

According to certain writers, C. tamala is a medicinally significant plant, and chromium trioxide has been linked to specific biological effects on the respiratory system and disorders like cancer. It has cytotoxic and genotoxic effects by inducing oxidative stress and causing the stable Cr-DNA adducts to form. Using the Allium cepa root chromosomal aberration assay against CrO3, the antigenotoxic effects of Indian spices Syzygium aromaticum (L.) Merr and Perry and C. tamala were assessed in the current study. Three types of therapy were applied to the roots. Roots were initially treated with various concentrations of methanol extract of Syzygium aromaticum (MSA) and C. tamala (MCT) (0.1%, 0.50%, and 1%) before the pre-treatment, according to this study's author.

MCT extract and MSA for two hours. In a simultaneous treatment, different concentrations of MSA and MCT extract (0.1%, 0.50%, and 1%) are applied to the root tips at the same time for 2 hours. Roots were given an 8 ppm CrO3 treatment as a positive control. The incidence of chromosomal abnormalities decreased in a dose-dependent manner as a result of the impacts of pre-, post-, and simultaneous administration of MSA and MCT extracts.

Peripheral blood cells were subjected to cotreatment with H2O2 and tested products to assess the antigenotoxic potential of Biochaga and dihydroquercetin. According to our findings, Biochaga and dihydroquercetin considerably reduce the proportion of cells with H2O2-induced DNA damage across the board for all concentrations examined. Intriguingly, in both cotreatments (Biochaga and dihydroquercetin), the concentration of 250 g/mL showed the most pronounced reduction of DNA damage compared to control. It should be noted that both products' 500 g/mL concentrations showed a comparable amount of attenuation of DNA-damaged cells compared to their most prominent 250 g/mL concentration (Figure 2). In the following step, the cells were exposed to a mixture of Biochaga and dihydroquercetin at concentrations of 250 and 500 g/mL, respectively.

Anti-inflammatory activity

A number of in vivo and in vitro screening techniques revealed that the aqueous extract of C. tamala leaves at doses of 100, 200, and 400 mg/kg had an anti-inflammatory effect. Carrageenan-induced paw edoema in rats and acetic acid-induced vascular permeability in mice were used to assess the acute inflammation. Red blood cells (RBCs) treated to a hypotonic solution in triplicate were used to test the extract's in vitro anti-inflammatory efficacy (concentrations 0.2–1.0 mg/ml). The plant extract effectively and dose-dependently reduced the vascular permeability caused by acetic acid in mice and suppressed the edoema caused by carrageenan in rats. When compared to Indomethacin, the extract demonstrated considerable membrane-stabilizing property in a concentration-dependent manner up to 1 mg/ml in vitro models.

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Individual compounds were tested for their anti-inflammatory activity in the same way as the extracts using two different cell lines, RAW 264.7 and J774A.1 macrophages, as previously described21. This was done in order to determine which of the constituents was responsible for the anti-inflammatory activity of the extracts. With the exception of coumarin, all substances showed significant anti-inflammatory effect as shown by the suppression of LPS+IFN-induced NO and TNF-production. The most potent compounds were E-cinnamaldehyde and o-methoxycinnamaldehyde, which exhibited IC50 values for NO with RAW 264.7 cells of 55 ± 9 µM (7.5 ± 1.2 µg/mL) and 35 ± 9 µM (5.7 ± 1.5 µg/mL), respectively; and IC50 values for TNF-α of 63 ± 9µM (8.6 ± 1.2 µg/mL) and 78 ± 16 µM (12.6 ± 2.6 µg/mL), respectively.

Similar outcomes were made using the cell line J774A.1. Again, o- and E-cinnamaldehyde were the most powerful substances. Methoxycinnamaldehyde's IC50 values for NO were 51 2 M (6.9 0.3 g/mL) and 38 2 M (6.2 IC50 values for TNF- are 51 5 M (6.9 0.7 g/mL) and 79 7 M (12.8 1.1 g/mL), respectively.

EVALUATION OF CINNAMON

The bactericidal effectiveness of the created nanoemulsion against Bacillus cereus was assessed. After being exposed to nanoemulsion, B. cereus cells were found to be killed in a time- and concentration-dependent manner. Significant bacterial population reduction was seen even at higher CF3 dilution levels. Quantifying the release of UV absorbing substances revealed a change in the membrane permeability of the interacting samples. Bacterial staining with acridine orange/ethidium bromide confirmed the above findings of altered membrane permeability and validated the kinetics of killing data. In nanoemulsion-treated cells, the peak associated with the vibration of acyl chains of lipid at 2852 cm1 was displaced to 2854 cm1, suggesting that membrane phospholipids have been deformed, as shown by the removal of the peak corresponding to phosphate vibration at 1078 cm1 and 536 cm1.

Cell lysis was seen as a result of membrane deformation in SEM images. According to these findings, cinnamon oil nanoemulsion may be used to preserve foods that have undergone minimum processing.

The term "phytochemical screening" is another name for this method. In this procedure, plant samples such as leaves, stems, roots, or bark that are the reservoir of secondary metabolites are processed into aqueous and organic extracts. The presence of secondary metabolites such as alkaloids, terpenes, and flavonoids is next examined in the plant extracts. For each class of substances to be examined, standard tests are listed in the literature.

Following this, the presence and nature of the mixture's components are often examined using a straightforward separation technique like thin-layer chromatography (TLC). In TLC, the extracts are put into a glass dish covered in silica gel or another adsorbent and stored in a chromatographic chamber with an appropriate flowing solvent. The essential components of this method are a mobile phase and a stationary phase, where the compounds are divided according to their polarity.

After the plate has been removed from the chromatographic chamber, a developing solvent may occasionally be used to identify the compounds. In developing nations, this strategy has historically been employed and is still being used. This method allows for the early detection of known metabolites in the extracts and is therefore economically practical because the isolation of pure bioactive components is a time-consuming and laborious operation. The tests are straightforward to carry out, but they are not appropriate for the effective separation of metabolites. They also have limited selectivity and sensitivity of detection, making it challenging to find even minute amounts of components in the sample.

Introduction about phytochemical test for cinnamon bark:

Chemicals

Benzaldehyde (1), 4-hydroxybenzaldehyde (2), cinnamaldehyde (3), benzenepropanal (4), (E)-cinnamic acid (6), cinnamyl alcohol (7), methyl cinnamate (9), cinnamyl acetate.

Antifungal activity of cinnamaldehyde and its congeners

According to our earlier research (Wang et al., 2005a; Cheng et al., 2006), cinnamaldehyde (3) is the most potent antifungal component found in Cinnamomum osmophloeum leaf essential oils. 15 compounds with chemical structures comparable to cinnamaldehyde were chosen for this study in order to evaluate the structure-activity connections of cinnamaldehyde. These substances include benzaldehyde, 4-hydroxybenzaldehyde, benzenepropanal, -methyl cinnamaldehyde, (E)-cinnamic acid, and cinnamyl.

A large class of naturally occurring chemical compounds known as alkaloids have one or more nitrogen atoms (in some cases amino or amido) in their structures. These nitrogen atoms are what make these molecules alkaline. Typically, these nitrogen atoms are arranged in a ring structure.

Identification Tests

1) ALKALOIDS

The alkaloidal reagents easily precipitate the ergot alkaloids. However, Mayer's reagent, which is thought to be the most accurate test for Iodine in KI, also produces an immediate precipitate when used with extremely diluted ergot alkaloids.

The Keller Test A few milligrammes of solid FeCl should be added to a solution of the alkaloid in glacial acetic acid before adding 1-2 ml of concentrated sulphuric acid down the tube's edge. At the intersection of the two layers, a vivid blue coloration is achieved.

Fluorescence test: The salts of ergot alkaloids exhibit a unique blue fluorescence in aqueous solution.

Van Urk Test: When an ergot alkaloid-containing solution is combined with Van Urk Reagent, a distinctive reaction results. Deep blue concentration.

2) CINNAMALDEHYDE

Cinnamaldehyde was separated using a separating funnel, recognised using Tollen's test, and then detected on TLC plates in comparison to a positive control substance, standard cinnamaldehyde. The purity and authenticity of cinnamaldehyde were further confirmed using FTIR spectrometry and HPLC analysis.

3) FLAVANOIDS

Flavonoids are known to have antioxidant effects and have been demonstrated to suppress the initiation, development, and advancement of tumours. They have also been linked to a decreased risk of coronary heart disease. According to this study, flavonoids are present in significant amounts in Barteria nigritiana, Moringa oleifera, Cordia millenii, Afrormosia laxiflora, and Sacoglottis gabonensis. Other biological activities that flavonoid has in addition to its antioxidant qualities include defence against platelet aggregation, bacteria, hepatotoxins, viruses, tumours, ulcers, free radicals, inflammation, and allergies.

4) PHENOLS: Humans and plants both contain phenols as antioxidants. This study included some softwoods that could be used for their saponin content, including Sacoglottis gabonensis, Pentaclethra macrophylla, Moringa oleifera, and Anogeissus leiocarpus. Haslam draws attention to the growing interest in the possibility of treating diseases with no more complicated measures than increasing dietary intake of minerals with antioxidant qualities, such as vitamin E, vitamin C, -carotene, and carotenoids, as well as plant phenolics like tannins and flavonoids.

5) GLYCOSIDES

The acetal derivatives of monosaccharides and alcohol produced as a result of an acid catalyst are known as glycosides. Glycosides are resistant to alkaline oxidants like Tollen's reagent, but aqueous acid hydrolyzes them back to their alcohol and sugar constituents.

CONCLUSION

A difficult clinical issue, wound healing is a biological process. Reduced risk factors that impede wound healing and improved healing are two of the key goals of wound treatment. Wound healing has been proven to benefit from a number of medicinal herbs. This review article's goal is to inform readers of the ethanopharmacological applications, phytoconstituents, and their mechanisms of action that contribute to wound healing.

Herbal treatments have found to be both economical and efficient, particularly when utilised in conjunction with bacterial activity, wound healing, and lowering oxidative stress in animals. The molecular mechanisms of recently identified therapeutic plants with the ability to repair wounds were revealed during this evaluation.

It is also clear from the current study that it has considerable therapeutic value in treating bacterial infections, oxidative stress, diabetes, inflammation, wound healing, cancer, anxiety, and depression, among other medical conditions. According to ethnomedical research, cinnamon may be used as an effective chemopreventive for cervical cancer. It may also be used to treat bronchitis, cardiac disorders, cephalalgia, diarrhoea, uropathy, fever, arthritis, and coughing.

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