Industrial Chemistry
ISSN: 2469-9764

Review Article Open Access

Study on Analysis of Chlorophytum Borivilianum and Asparagus Racemosus Leaves by Phytochemistry

Tom Brown*

Department of Nucleic Acid Chemistry, University of Oxford,UK

Abstract

Asparagus racemosus is a member of the Liliaceae family and is commonly referred to as Satavari. It is referred to as Sam-Roi-Rak or Rak-Sam-Sib in Thai. The plant is frequently found in tropical climates in Asia, Australia, and Africa at low elevations in shaded areas. Most of the plant is made up of steroidal saponins, like shatavarin . Antiulcer, antioxidant, immunomodulatory, antidiabetic, antidiarrhoeal, phytoestrogenic, anti-aging, and adaptogenic properties of A. racemosus root extracts (AR) have been documented. The bittersweet root of A. racemosus has emollient, cooling, nervine, constipating, galactagogic, aphrodisiac, diuretic, rejuvenating, carminative, stomachic, and antiseptic properties. It can also be used as a tonic. The root of A. racemosus has several beneficial effects that have been suggested for the treatment of nervous disorders, dyspepsia, diarrhea, tumors, and inflammation. Currently, medicinal plants are in high demand in developing nations for a variety of therapeutic applications and for the purpose of preserving one's health. Safed musli or musli is a common name for Chlorophytum borivilianum . It is a herb with lanceolate leaves that belongs to the family Asparagaceae. Its roots are beneficial to health and its leaves are eaten as vegetables. It originated in India's thick forests. Due to their potent medicinal properties, Chlorophytum borivilianum have a significant economic potential since antiquity. Saponins, alkaloids, terpenoids, carbohydrates, phenols, resins, mucilage sugars, and other components make up this group. Chlorophytum borivilianum has short, white flowers that are about 55-60 centimeters long, long, slender leaves that are 20-70 centimeters long and 2-3 centimeters wide, and a thick, fleshy rhizome .

Introduction

The English word "herb" is derived from the Latin word "herba" and the French word "herbe" . According to recent research, the term "herb" refers to any component of the plant, including its roots, stem, leaves, fruits, flowers, and so on, also non-woody plants, but the term "herb" only refers to non-woody plants in old age . Herbal plants are used as food, perfume, medicine, ornamental plants, spiritual faith, and so on due to their various medicinal properties. Humans have relied on nature for their basic needs, such as food, shelter, clothing, medicine, scent, and transportation since the beginning of time . Many researchers in developing nations are working on herbal plants because these plants have a strong effect when used for a long time in the health care system. Herbal plants play an important role in the discovery of new drugs in both developed and developing nations [1]. Herbal plants are the only ones that can treat deadly conditions like heart attacks, cancer, AIDS, and hepatitis . India is the world's largest country with a lot of biodiversity. Herbal plants have long been used as medicines in homeopathy, ayurveda, unani, and siddha.

Chlorophytum borivilianum is a rare ayurvedic herb with lanceolate leaves that is traditionally found in India's thick forests [2]. Due to its strong economic potential and a number of useful properties, including Aphrodisiac, anti-inflammatory, and adaptogenic substances utilized in diabetes, arthritis, and cancer. Chlorophytum borivilianum is also known as safed musli, but its root is known as White gold due to its color . Several active components, like polysaccharides and saponins, are abundant in the roots [3]. Chlorophytum borivilianum possesses a variety of pharmacological activities, including anxiolytic, aphrodisiac, immunomodulatory, antihelminthic, antiulcer, antistress, antitumor, antioxidant, antidiabetic, antimicrobial, and other properties Chlorophytum borivilianum is a unique natural gift for humans. The leaves of Chlorophytum borivilianum have traditionally been used for a variety of purposes, including culinary, aphrodisiac, and vegetable preparation.

Asparagus racemosus

Asparagus racemosus is a traditional plant used to treat dyspepsia, constipation, diarrhea, bronchitis, dementia, diabetes, and other conditions in India and the Himalayas. A species of asparagus known as Asparagus racemosus is native to the tropical and subtropical regions of India [4]. It is also referred to as satavar, shatavari, and so on. It is a woody climber that can reach 2 to 3 meters in height and has roots that penetrate the soil deeply. Due to its numerous medicinal applications, Asparagus racemosus is constantly in high demand . Traditional Ayurvedic medicine uses the entire Asparagus racemosus plant, including its leaves and roots . In general, Asparagus racemosus plants can be found in India, some parts of the Himalayas, Sri Lanka, Asia, Australia, and other places. Numerous pharmacological effects include: antitussive, antisecretory, gastrointestinal, antibacterial, antiprotozoal, apoptogenic, molluscicidal, antihepatotoxic, uterine, and other properties In general, I.P., B.P., Ayurveda, Siddha, and Unani all describe the therapeutic uses of Asparagus racemosus. The asparagus racemosus plant is generally insect and pest resistant . These thrive in hot conditions and well-drained black soil [5].

Materials and Method

The ethnobotanical survey and medicinal use of the plants

***Corresponding author:** Tom Brown, Department of Nucleic Acid Chemistry, University of Oxford ,UK, Tel: 16574521640; E-mail: BrownT@gmail.com

Received 02-Jan-2023, Manuscript No. ico-23-86347; **Editor assigned:** 04-Jan-2023, PreQC No. ico-23-86347 (PQ); **Reviewed:** 18-Jan-2023, QC No. ico-23-86347; **Revised:** 24-Jan-2023, Manuscript No. ico-23-86347 (R); **Published:** 31-Jan-2023, DOI: 10.4172/2469-9764.1000211

Citation: Brown T (2023) Study on Analysis of Chlorophytum Borivilianum and Asparagus Racemosus Leaves by Phytochemistry. Ind Chem, 9: 211.

were used to select them. The leaves of Chlorophytum borivilianum and Asparagus racemosus are rich in saponins, sterols-sitosterols , flavonoids, and other compounds. based on a variety of reports . The leaves of Chlorophytum borivilianum and Asparagus racemosus would serve as the test components [6].

Asparagus racemosus leaves were gathered from the campus of the University of Gopal Narayan Singh in Jamuhar, Sasaram (Bihar), and Chlorophytum borivilianum leaves were gathered from the district of Indrapuri-Rohtas Sasaram (Bihar). The Botanist at the Department of Botany, National College of Bihar, University of Patna (Bihar) performed the plant authentication. These two plants' leaves were desiccated without being dried [7].

Evaluation Physiochemically

The dried components were examined as usual to ascertain the various physicochemical parameters. Successive Plant Material Extraction Samples were broken up and 40 meshes were used to test them. Dried leaves of Asparagus racemosus and Chlorophytum borivilianum were loaded into Soxhlet machines and extracted using petroleum ether (60-62 °C), chloroform, ethanol, and water until the plant material was coarsely powdered (250 gms) [8]. Distillation was used to extract the solvent after the extraction was finished. Utilized a rotator evaporator to dry the extracts. After that, the remainder was kept in a dessicator, and a percentage yield was calculated .

Phytochemical investigation

The various leaf extracts of Asparagus racemosus and Chlorophytum borivilianum, also known as Pet. Following extraction, the ether, chloroform, ethanol, and aqueous extracts were subjected to phytochemical screening to ascertain the presence of various phytochemicals in the extracts . Phytochemical experiments were carried out on a variety of extracts that were obtained following extraction to ascertain the presence of several phytochemicals in the extracts. The research was carried out in accordance with established protocols .TLC and HPTLC analysis of extracts The HPTLC instrument was used to identify the chemical components that were found in the leaves of Chlorophytum borivilianum . The TLC profile of ethanolic and aqueous extracts of ARL was analyzed using thin layer chromatography: CBL and Asparagus racemosus (Leaves): Using the following method, Chlorophytum borivilianum (Leaves)

Morphology and physicochemical properties of AR liposomes

A negative-staining transmission electron microscope (Tecnai G2 20;) was used to examine the microscopic appearance of prepared AR liposomes. The Eindhoven, Netherlands-based Fei Company). On a 300-mesh copper grid, a drop of liposomal dispersion was briefly placed. Using filter paper, the excess liquid was removed from the grid after the liposomes had adsorbed onto it. A 2% aqueous solution of uranyl acetate was used to stain the sample that was still on the grid, and it was allowed to air dry for about 30 minutes. Before being used, the sample was stored in a desiccator.

Size of the particles Photon correlation spectroscopy (PCS) with dynamic light scattering (Zetasizer Nano ZS) was used to determine the particle sizes and size distribution. Malvern Instruments, Ltd., Malvern, United Kingdom) at 25 degrees Celsius. The samples, which were liposomal dispersions, were diluted in an isotonic phosphate buffer with a pH of 7.0 until their concentrations were low enough to prevent hydrodynamic and electrostatic interactions between vesicles but high enough to be reliable in PCS measurement-based autocorrelation functions. In addition to the polydispersity index, which indicates the size distribution of the liposomes, the measurements were carried out in triplicate and expressed as a z average [9]. After the plates have been filled, they are put in a chamber where the solvent is allowed to work until the solvent height at the point of view is about 15 cm. The plates are then taken out and marked. After that, it is left to air dry, sprayed with detecting reagent, and stored for five minutes in the oven. The Rf values are then computed .

Conclusion

The creation of an HPTLC fingerprint for ethanolic and aqueous ARL extracts: CBL and Asparagus racemosus (Leaves): The automatic Linomat IV additive and the CAMAG HPTLC (Switzerland) system are used to produce Chlorophytum borivilianum (Leaves). HPTLC is comprised of pre-assembled silica gel HPTLC aluminum plates 60 F254 (20 cm 10 cm / 10 cm 10 cm, 0.2 mm thick, 5-6 m particle size, E. Merck, Germany), and the analysis was carried out in a room that was cooled by air and kept at a temperature of 220 °C. Using automatic samples and a Hamilton syringe containing 100 ml, a 5-10 l sample solution containing 1 g/ml was used to identify a band with a diameter of 4 or 5 mm. A prepared solvent system, such as EA, is used to develop the plates: M: H2O; 7.5: 2: 4 in the CAMAG double plate development room, which was lined with filter paper and had a 30 ml cell section in front, for ethanolic and methanolic extractions, respectively. The enhanced plates are photographed after being dried in the air. For densitometry measurement and data processing, a Spectro densitometer with the planar chromatography controller software WINCATS was utilized. The measurement mode of absorbance/emission had a scan speed of 20 mm/sec. To record their UV-VIS spectrum and identify wavelengths of high wavelength, fragment dots are scanned between 200 and 800 nm. A different sample, Asparagus racemosus wild, was observed, and a densitogram was taken at a wavelength with high absorption. is widely utilized to treat a variety of diseases due to its therapeutic properties. The antioxidative potential, total phenolic content, and total flavonoid content of A. racemosus arial parts were examined in this study. A combination of effect-directed analysis and high-performance thin-layer chromatography (HPTLC) was also developed to examine A. racemosus' antioxidant properties and quantify biologically active compounds on A. racemosus chromatograms. Methanolic extract of A. racemosus had higher total phenolics (154 mg gallic acid equivalent/g), flavonoid content (497 mg quercetin/g), and IC50 (15.25 g/ml) than n-hexane, chloroform, and ethyl acetate extracts. Antioxidant activity and the presence of phytosterols, terpenoids, and polyphenolic contents were evaluated using HPTLC hyphenated with chemical derivatizations. Combining effect-directed analysis and attenuated total reflectance-Fourier transform infrared spectroscopy, hyphenated HPTLC made it possible to quickly characterize the active compound. The antioxidant activity was attributed to myricetin, quercetin, p-coumaric acid, and caffeic acid by spectral analysis of the band from attenuated total reflectance.

References

1. Brunet R, Boer D,Guillén-Gosálbez G, Jiménez L (2015) Reducing the cost, environmental impact and energy consumption of biofuel processes through heat integration. ChemEng Res Des 93:203-212.
2. Kautto J, Realff MJ, Ragauskas AJ, Kässi T (2014) Economic Analysis of an Organosolv Process for Bioethanol Production. Bio Resources 9:6041-6072.
3. Nguyen TTH, Kikuchi Y, Noda M, Hirao M (2015) A New Approach for the Design and Assessment of Bio-based Chemical Processes toward Sustainability. Ind Eng Chem Res 54: 5494-5504.
4. Rajendran K, Rajoli S, Teichert O, Taherzadeh MJ (2014) Impacts of retrofitting analysis on first generation ethanol production: process design and techno-economics. Bioprocess BiosystEng 38:389-397.

5. Rossetti I, Lasso J, Compagnoni M, Guido G De (2015) H2 Production from Bioethanol and its Use in Fuel-Cells. ChemEng Trans 43:229-234.

6. Rossetti I, Compagnoni M, Torli M (2015) Process simulation and optimisation of H2 production from ethanol steam reforming and its use in fuel cells. 1. Thermodynamic and kinetic analysis. ChemEng J.281:1024-1035.

7. Ren J, Dong L, Sun L, Goodsite ME, Tan S, et al. (2015) Life cycle cost optimization of biofuel supply chains under uncertainties based on interval linear programming. BioresourTechnol 187:6-13.

8. Mazzetto F, Simoes-Lucas G, Ortiz-Gutiérrez RA, Manca D, Bezzo F (2015) Impact on the optimal design of bioethanol supply chains by a new European Commission proposal. ChemEng Res Des 93:457-463.

9. Mazzetto F, Ortiz-Gutiérrez RA, Manca D, Bezzo F (2013) Strategic Design of Bioethanol Supply Chains Including Commodity Market Dynamics. Ind EngChem Res 52:10305-10316.