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A REVIEW ARTICLE ON VELDT GRAPE AGAINST FUSARIUM

K. VAISHNAVI

DEPARTMENT OF MSC.MICROBIOLOGY

SIDDHARTHA WOMENS DEGREE AND PG COLLEGE

KUKATPALLY, HYDERABAD

ABSTRACT

Cissus quadrangularis, a member of the Vitaceae family, is a traditional medicinal plant used to treat several illnesses, including bone repair and inflammation. Its phytochemical composition has been described in various research with in vitro support as antioxidants, antibacterials, and antifungals against specific microbial species. Although it shown mild antifungal effects against Penicillium spp., Trichoderma viride, and Candida albicans, there is no scientific proof of its effectiveness against Fusarium species. Therefore, this gap is essentially filled by using Veldt grapes as a medicinal or biocontrol agent against Fusarium infection. This study highlights the gaps and limitations in the existing literature.

INTRODUCTION

In the continuous search for natural antibacterial and antifungal medicines, medicinal plants have been utilized since ancient times. Cissus quadrangularis, often known as Veldt grape, is one such plant that is thought to have therapeutic qualities. Growing abundantly in many tropical nations, this creeper has long been used to cure bone ailments, fractures, inflammation, and other general health issues. It is primarily recognized through Indian Ayurveda. (ijpbr.in)[1].

Growing interest in plant-derived chemicals as an alternate source makes sense given growing concerns about chemical antifungals. Therefore, it makes sense to wonder if C. quadrangularis includes any substances that are effective against pathogenic fungus, possibly even serious soil-borne infections like Fusarium. This review evaluates the current body of scientific literature to determine whether such use can be justified.

REVIEW OF LITERATURE

The abundance of secondary metabolites in C. quadrangularis is confirmed by a number of pharmacognostic research and reviews. Flavonoids, phenolic components, tannins, sterols (including β-sitosterol), triterpenoids, and other bioactive substances are all present. These substances provide possible activities that have been demonstrated by various assessments: In conventional medicine, antioxidants have potential anti-inflammatory, anti-ulcer, bone-healing, and general therapeutic uses. (ijpbr.in)[1].

For instance, one study showed that C stem and root extracts have potent antioxidant and free-radical scavenging properties. quadrangularis in the system in vitro. An additional in vivo investigation revealed that a specific C. In a rat model, quadrangularis slowed the progression of osteoarthritis. As a result, it may be used to treat diseases of the joints and cartilage. Consequently, C. Regarding human health and illness, quadrangularis's therapeutic and medicinal potential is rather well documented.

Studies on Antifungals and Antimicrobials

Additionally, researchers have looked at C. quadrangularis for its strong phytochemical content and antibacterial, including antifungal, action.
Antimicrobial activity against a range of bacteria, including Gram-positive ones like Bacillus subtilis and Staphylococcus aureus, was found in early studies on C. quadrangularis extracted using various solvents (ethyl acetate, methanol, aqueous, etc.) (PubMed +2)[2].

Certain C. quadrangularis extracts were found to have antifungal properties that inhibited the growth of fungi such as Aspergillus flavus, Geotrichum candidum, Penicillium spp., and Candida albicans (PMC)[3].

A more recent comprehensive examination of C. Among other examples of antifungal activity, quadrangularis reports that acetone extract inhibited Aspergillus flavus, water extract inhibited several Penicillium species, and n-butanol stem extract inhibited Geotrichum candidum. (PMC)[3].

A 2023 experimental investigation found that methanolic stem extract suppressed fungal strains, particularly Candida albicans and Trichoderma viride, in in vitro agar diffusion tests.

Consequently, there is solid evidence that C. Quadrangularis can exhibit antifungal effects under laboratory (in vitro) conditions, but only against particular fungi (yeasts, molds, and saprophytes), not plant-pathogenic Fusarium (as far as published literature demonstrates).
Limitations and Results from the Literature

Several notable disadvantages emerge in spite of these antifungal discoveries:

Limited range of tested fungi: Yeasts or common molds (e.g., Candida, Aspergillus, Trichoderma, Geotrichum, Penicillium) made up the bulk of the fungal species analyzed in the cited studies. None of those reports specifically tested for Fusarium species (PMC)[3].

Plant-pathogenic fungi have not been studied: peer-reviewed study investigating whether C. In vitro or in vivo (soil, plants, host crops), quadrangularis extracts can suppress or control pathogenic Fusarium species like Fusarium oxysporum and Fusarium solani. A thorough analysis of the literature does not provide such evidence.
In vitro vs. in vivo gap: Antifungal activity has only been demonstrated by in vitro broth-dilution or agar-diffusion testing. There is no evidence of efficacy in complex biological or environmental contexts (such soil or plant root systems), which are usually more challenging.

Variability with extraction method and solvent: The degree of antimicrobial/antifungal activity is greatly influenced by the extraction method and solvent (methanol, ethyl acetate, acetone, n-butanol, etc.). This unpredictability complicates any generalization to practical applications. (PMC)[3].

Lack of pathogenic-challenge or mechanistic research: It seems that no published study has looked at C. quadrangularis in the context of disease challenge (i.e., introducing Fusarium to a plant and then using Cissus

extract to treat or prevent infection), which is a requirement for claiming the potential for biocontrol or disease control.

DISCUSSION

Given the aforementioned data and constraints, what conclusions may be drawn about Cissus quadrangularis's potential as an antifungal agent, specifically against Fusarium?

The C. Quadrangularis does show broad-spectrum antimicrobial capability under closely watched laboratory circumstances, including antifungal efficacy against particular opportunistic or non-pathogenic fungi (molds, yeasts). This encourages the development of novel medications (such as topical medications and natural antifungal creams) and supports its traditional medical uses.
However, the lack of knowledge on plant-pathogenic fungus, especially Fusarium, is a critical gap. Without concrete proof, the claim that C prevents Fusarium growth, spore germination, or disease progression is not supported by science. Quadrangularis is effective "against Fusarium."

It would be important to demonstrate that C. quadrangularis extracts continue to function efficiently in soil, in a range of environmental settings, and on living plants—conditions that are significantly more complex than agar plates—for practical uses (such as crop protection or agriculture). There is no published information regarding these studies.
Because of chemical diversity and extraction challenges, even if a specific extract shows antifungal efficacy in one study, standardization would be required to reliably duplicate that effect. Its effectiveness, stability, bioavailability, and safety in field situations are still unknown.

There are more reputable ways to control Fusarium. Current research focuses on soil management, crop rotation, fungicides, beneficial bacteria (biocontrol agents), resistant cultivars, and other integrated disease management measures for soil-borne diseases like Fusarium rather than extracts from unrelated medicinal plants.
Thus, C. Although quadrangularis appears to be promising for human health, there is simply no evidence that it can fend off Fusarium fungus. As of yet, no one has demonstrated that it is effective.

CONCLUSION

The Veldt grape, Cissus quadrangularis, continues to be used as a therapeutic plant. Its complex mixture of phytochemicals is supported by numerous studies, which also demonstrate its antibacterial, anti-inflammatory, and antioxidant properties. In laboratory experiments, it even has some antifungal activity. However, there is currently no evidence that it can treat or prevent Fusarium species.

Anyone claiming that Veldt grape inhibits Fusarium in soil or crops is speculating because there is no solid proof. If you want to address plant issues caused by Fusarium, go to C. Right now, quadrangularis just doesn't make sense. It is not supported by science.

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