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PINEAPPLE LEAF USED IN POLYHERBAL BANDAGE

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ABSTRACT

Development of pineapple leaf fiber (PALF)-based polymer composites has gain interests due to sustainable and environmental benefits when compared with synthetic-based non-degradable fibers. However, the hydrophilic PALF has poor interfacial bonding with the thermosetting and thermoplastic polymers which are hydrophobic. Moreover, this hydrophilic nature of PLAF leads to more moisture absorption rate, which results in degradation of overall properties. This issue can be addressed by modifying the surface of the fibers. Therefore, a comprehensive understanding of the effect of fiber surface modification on various properties and adhesion with polymers is a key for improving the performance of the PALF and its composites

KEYWORDS : *Pineapple leaf fiber Soil cover – component of pineapple leaves-mechanism of bandage-advantage and disadvantage of bandage*

INTRODUCTION

There is a great deal of potential for large-scale pineapple production in north eastern India. The extraction of pineapple leaf fibre is opening up a market for both commercial and small-scale producers. Numerous other possibilities, such as different fibres that may come from the pineapple, are being researched. [1]The pineapple is an unidentified fruit that is native to tropical regions. An emerging industry that can be used for market opportunities is valuable dietary fibre. The fruit's fibre is a beneficial addition to a wide variety of foods. The fruit's microcrystalline cellulose, which is used in the other area, is visible.*The correspondence's author pharm fibre prosperity in addition to its strong foundation in the north eastern and Assamese regions. Thailand, the Philippines, Costa Rica, China, and India are the world's fastest-growing nations, along with Brazil[2]. The largest region available for pineapple crop cultivation on a productivity scale is Assam. India leads the world in this crop's production, which leads to additional opportunities for fibre production. Nearly 90–95% of the product is organic, and the area generates over 40% of the nation's pineapple[3]. The creation of fibres and textiles with an emphasis on the green environment is a result of rising consumption and living standards .aceutical sectors. Gaining knowledge from creative projects that utilise leaves and stems Concerns about sustainable development have recently sparked initiatives to decrease waste output and increase the efficiency of raw resource use. The use of agricultural waste as a substitute fibre source has been emphasised in this context. By reusing these wastes, the amount of garbage produced will be significantly reduced, which will lessen their impact on the environment[4]. In addition, the agricultural economy will become more diversified as a result of the repurposing of those byproducts for the production of value-added products. One of the most well-known tropical fruits that is grown extensively worldwide is the pineapple. For economic development, pineapple leaves—the plant's main underutilised portion—need international attention. Following the harvest of fruit, the leaves are burned or broken down for disposal. This occurred as a result of farmers' and local communities' misunderstanding of the existence of commercial uses of the antiquated technology used for this purpose. pineapple leaves. A thorough investigation is required to determine the potential of these useful agricultural wastes since plantation yield improvement will result from the in-situ decomposition and burrowing of the leaves [5]. Numerous researchers have conducted studies on different facets of pineapple leaf fibres (PALF). A number of writers have examined the physical, mechanical, and chemical characteristics of PALF from different pineapple species [6, 7]. Additionally, not much investigation has been done on the surface. effects of treatments on the tensile characteristics of PALF [8, 9].

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Drugs

Pineapple leaves themselves are not typically associated with any recreational or psychoactive drug use. However, there are some aspects of pineapple leaves and their potential uses in medicine or alternative health practices that are worth mentioning.



Medicinal Use of Pineapple Leaves

Pineapple leaves contain various bioactive compounds, including bromelain (a mixture of enzymes), antioxidants, and other phytochemicals. These compounds have been studied for various potential health benefits, including:

1]Anti-inflammatory effects: Bromelain has been researched for its ability to reduce inflammation, which could help with conditions like arthritis or sports injuries.[10]

2]Digestive aid: Bromelain may also assist in digestion by breaking down proteins and improving the absorption of nutrients.[11]

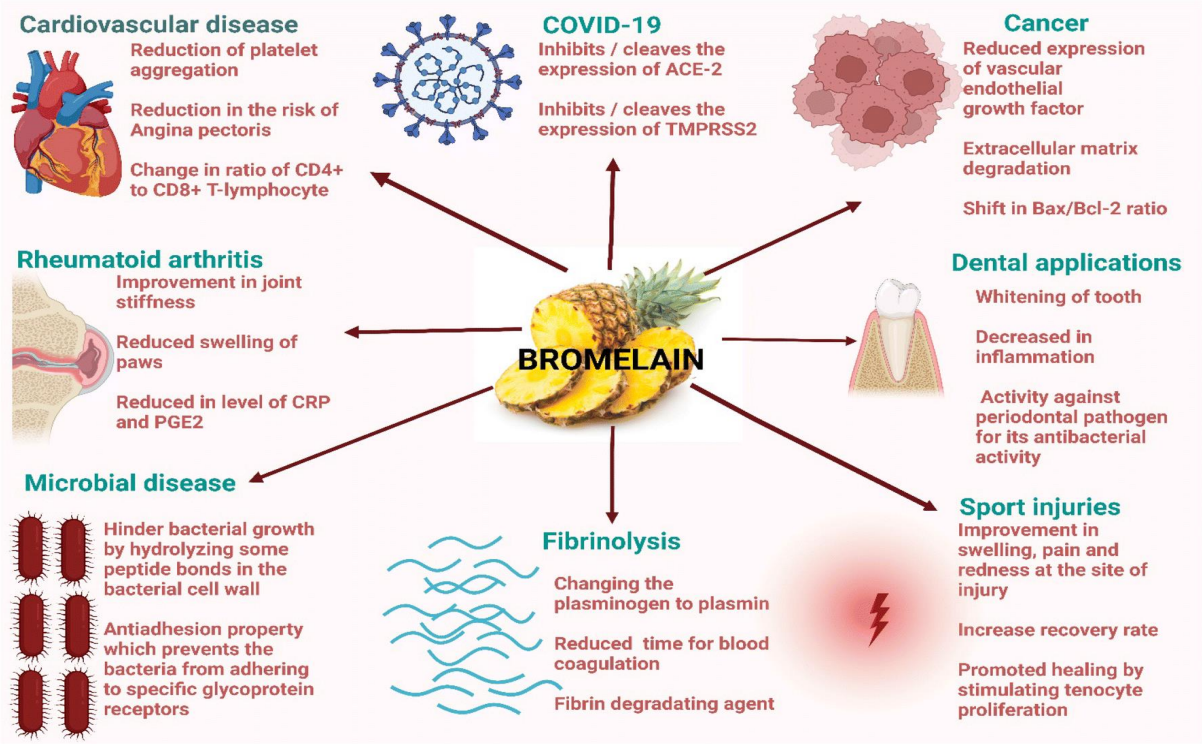
3]Antioxidant properties: Pineapple leaves contain antioxidants that may help combat oxidative stress and support general health[12]

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Key Components of Pineapple Leaves

Bromelain:

Bromelain is a mixture of enzymes found in pineapple, particularly in the stem and leaves. It has various health benefits, including anti-inflammatory, digestive, and potential anticancer properties.[13'14]



Fibers: The leaves are rich in cellulose and lignin, making them suitable for extraction into fibers that can be used in textiles, including Piñatex, a sustainable alternative to leather.[15]



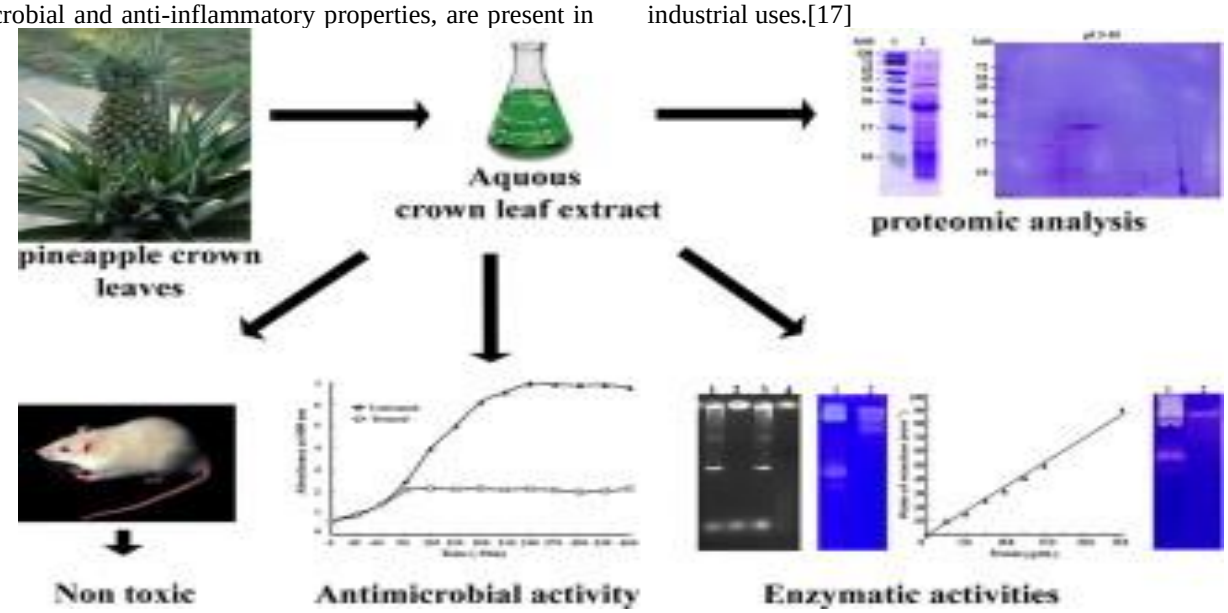
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Flavonoids and Antioxidants

Pineapple leaves contain various antioxidants like flavonoids, which have anti-inflammatory and disease-fighting properties. These antioxidants can be extracted for use in dietary supplements or cosmetics. [16]



Phenolic Compounds: These compounds, which have antimicrobial and anti-inflammatory properties, are present in pineapple leaves and are of interest for various health and industrial uses.[17]



Key Mechanisms of Bandage

- *Hemostasis (controlling bleeding)* through pressure.
- *Protection* from infection by creating a sterile barrier.
- *Moist wound healing* by maintaining a balanced moisture level.
- *Immobilization* to stabilize injured areas and reduce further damage.
- *Absorption* of exudate to prevent excess fluid build-up.
- *Comfort and pain reduction* through cushioning and reducing exposure to irritants.

Advantages of Bandages

1. *Protection of Wounds:*
   - Bandages help protect a wound or injury from dirt, bacteria, and external contaminants, reducing the risk of infection.
2. *Support and Immobilization:*
   - For sprains, strains, or fractures, bandages can help immobilize the injured area, providing support and minimizing movement to allow proper healing.
3. *Control of Bleeding:*
   - Bandages, especially when used with pressure, can help control bleeding by applying gentle pressure to the wound, promoting clotting and reducing blood flow to the injured area.
4. *Pain Reduction:*
   - By stabilizing the injured part of the body, bandages can reduce the amount of movement and therefore help alleviate pain, especially in cases of sprains or strains.
5. *Absorption of Exudate:*
   - Bandages, particularly those with absorbent pads, can absorb wound exudates (fluids that leak from the wound), keeping the wound clean and preventing maceration of surrounding skin.
6. *Compression:*

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- Elastic bandages, such as an ACE bandage, are commonly used to apply compression to reduce swelling, promote circulation, and speed up the healing process in conditions like sprains, strains, or edema.

7. *Aesthetic Coverage:*
   - Bandages help cover up visible wounds, burns, or abrasions, which can also be important for psychological reasons, especially in visible or socially sensitive areas like the face or hands.
8. *Easy Application:*
   - Bandages are relatively simple to use and apply, making them a practical and immediate solution for basic wound care, especially in emergency situations.[18]

Disadvantages of Bandages

1. *Improper Application Can Cause Harm:*
   - If a bandage is applied too tightly, it can restrict blood flow, leading to further tissue damage, swelling, or even the development of more serious complications like ischemia. Conversely, if applied too loosely, it may fail to provide the necessary support, causing the injury to worsen.
2. *Skin Irritation:*
   - Prolonged use of bandages, especially those with adhesive, can lead to skin irritation, allergic reactions, or rashes. People with sensitive skin are particularly vulnerable to such issues.
3. *Infection Risk (If Not Changed Properly):*
   - If bandages are not changed regularly, they can become a breeding ground for bacteria, leading to infection. It is essential to change bandages according to the wound's condition and the advice of healthcare professionals.
4. *Discomfort or Restriction:*
   - Some bandages, especially thick ones or those used for immobilization, can cause discomfort or restrict the range of motion, making it difficult for the person to move freely.
5. *False Sense of Security:*
   - A bandage can sometimes give the false impression that a wound or injury is fully healed or protected, leading individuals to neglect proper medical care or rehabilitation. Over-reliance on bandages can delay proper healing.
6. *Difficulty in Monitoring Wound Healing:*
   - While bandages provide protection, they can sometimes obscure the wound, making it harder for both the patient and healthcare provider to monitor for signs of infection or other complications.
7. *Expensive or Specialized Types:*
   - Some bandages, especially advanced ones like hydrocolloid or antimicrobial dressings, can be costly. Additionally, specialty bandages may not be readily available in all situations or may require medical supervision to apply correctly.
8. *Potential for Compression Injury:*
   - For injuries requiring compression (such as using an elastic bandage for a sprained ankle), if the compression is too tight or not applied correctly, it can cause further injury, such as nerve damage or blood circulation problems.[19]

CONCLUSION

In conclusion, The future of bandages lies in a perfect fusion of material innovation, smart technology, and personalized healthcare. As these developments unfold, bandages will not just be passive wound coverings but active, dynamic agents in promoting healing, preventing infection, and monitoring health. This progression will not only improve the quality of wound care but could also have significant impacts on healthcare efficiency, environmental sustainability, and patient outcomes. The next generation of bandages will undoubtedly play a crucial role in the transformation of modern medicine and wound care.

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