

Assessment of Fig (*Ficus carica* L) Latex from Male and Female Trees as a Natural Therapy for Common Warts

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ABSTRACT

This study aimed to assess and compare the therapeutic effectiveness of fresh latex derived from male and female *Ficus carica* L trees as a natural treatment for common warts. Fresh latex was collected from immature green fruits of male and female trees and applied topically to 62 warts in 28 patients, three times weekly. Clinical responses were documented over a four-week period. Both types of latex produced measurable therapeutic effects, characterized by progressive shrinking, drying, and detachment of warts. Male latex demonstrated significantly faster action: initial flaking occurred by day 3, with complete resolution observed in most lesions within 12–21 days. Female latex required longer treatment times, with full regression occurring between 15 and 30 days. The superior efficacy of male latex may reflect differences in biochemical composition, including higher or more active concentrations of proteolytic enzymes (e.g., ficin), organic acids, phenolics, triterpenoids, and antioxidant-related proteins such as chitinase and peroxidase. These compounds may synergistically produce antiviral, keratolytic, and cytotoxic effects on human papillomavirus (HPV)-infected keratinocytes. No severe adverse reactions were reported, and only mild discomfort occurred in sensitive areas. This study provides the first comparative evidence supporting fig latex, particularly from male tree, as a simple, inexpensive, and natural therapeutic option for common warts.

تقييم عصارة شجرة التين (*Ficus carica* L) المستخلصة من الأشجار المذكرة والمؤنثة كعلاج طبيعي للآليل الشائعة

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المصطلح	الكلمات المفتاحية
هدفت هذه الدراسة إلى تقييم ومقارنة الفعالية العلاجية للعصارة اللبينية المستخلصة من أشجار التين <i>Ficus carica</i> L الذكورية والأنثوية بوصفه علاجاً طبيعياً للآليل الشائعة. جُمع اللاتكس الطازج من الثمار الخضراء غير الناضجة للأشجار الذكورية والأنثوية، وطُبّق موضعياً على 62 ثؤلولاً لدى 28 مريضاً، بمعدل ثلاث مرات أسبوعياً. ووُثِّقت الاستجابات السريرية على مدى أربعة أسابيع. أظهر كلا النوعين من العصارة اللبينية تأثيرات علاجية واضحة، تمثلت في الانكماش التدريجي للآليل وجفافها وانفصالها. وأظهرت للعصارة اللبينية الأشجار الذكورية فعالية أسرع بصورة ملحوظة: إذ بدأ التقشر في اليوم الثالث، مع حدوث زوال كامل لمعظم الآفات خلال 12–21 يوماً. في المقابل، تطلب العصارة اللبينية لأشجار الأنثوية فترة علاج أطول، حيث حدث التراجع الكامل للآليل خلال 15–30 يوماً. وقد تُعزى الفعالية الأعلى للعصارة اللبينية من النبات المذكر إلى الاختلافات في تركيبه الكيميائي الحيوي، بما في ذلك ارتفاع تركيز أو زيادة نشاط الإنزيمات المحللة للبروتين، مثل الفيسين (<i>ficin</i>)، والأحماض العضوية، والمركبات الفينولية، والتريتربينويدات، والبروتينات المرتبطة بمضادات الأكسدة، مثل الكيتيناز (<i>chitinase</i>) والبيروكسيداز (<i>peroxidase</i>) وقد تعمل هذه المركبات بصورة تآزرية لإحداث تأثيرات مضادة للفيروسات، ومحللة للكيراتين، وسامة للخلايا الكيراتينية المصابة بفيروس الورم الحليمي البشري (HPV). ولم تُسجَل أي تفاعلات ضارة شديدة، واقتصرت حدوث الأعراض الجانبية على انزعاج خفيف في المناطق الحساسة. وتقدم هذه الدراسة أول دليل مقارن يدعم استخدام عصارة التين، ولا سيما المستخرجة من الأشجار المذكرة، كخيار علاجي طبيعي وبسيط وغير مكلف للآليل الشائعة.	عصارة التين الآليل الشائعة العلاج الطبيعي فيروس الورم الحليمي البشري (HPV)

Introduction

Medicinal plants have long served as the foundation of primary healthcare systems across many cultures, particularly in regions where traditional knowledge is transmitted orally from generation to generation [1,2]. With the expansion of

modern healthcare services, including hospitals and clinical facilities, reliance on traditional remedies has diminished in some communities [3]. Nevertheless, medicinal plants remain a vital therapeutic resource in many parts of the world, with various plant organs, including leaves, roots, bark, fruits,

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seeds, flowers, and latex used for the management of diverse ailments [4,5]. Latex-producing plants represent an important yet relatively underexplored group within medicinal botany. Despite their substantial agricultural and economic importance, limited attention has been directed toward understanding their physiological, biochemical, and pharmacological properties. Much of the earlier research has focused on broad plant groups characterized by latex production rather than investigating latex-producing species in relation to specific diseases or therapeutic applications. Plant latex is recognized as a complex biological secretion functioning in defense against herbivores, pathogens, and mechanical injury [6,7]. Increasing evidence indicates that latex exhibits antimicrobial, antifungal, antiviral, antitumor, and cytotoxic properties, highlighting its potential as a natural therapeutic agent [6]. Several latex-producing species are traditionally used in developing countries for treating infectious and inflammatory conditions, including *Ficus carica* (Moraceae), *Calotropis procera* (Asclepiadaceae), *Lactuca taraxacifolia* (Asteraceae), *Euphorbia heterophylla* (Euphorbiaceae), and *Papaver somniferum* (Papaveraceae). These species have been used to treat ailments such as abscesses, diarrhea, dysentery, anemia, malaria, hemorrhoids, respiratory disorders, and skin infections. Among these plants, the common fig (*F. carica*) occupies a significant medicinal and nutritional position. The tree is widely cultivated for its edible fruits in temperate and Mediterranean regions, and its latex an exudate from leaves, stems, and unripe fruits is traditionally used to treat skin infections, digestive disorders, and inflammatory conditions [8]. The latex of *F. carica* is a rich and complex mixture of bioactive constituents. Its primary therapeutic activity is attributed to proteolytic enzymes, specifically ficin, a cysteine protease known for its protein-degrading and keratolytic properties. In addition to ficin, fig latex contains: Phenolic compounds (e.g., catechins, ferulic acid, chlorogenic acid), Organic acids (malic, citric, oxalic acids), Terpenoids and triterpenes (e.g., lupeol, β -sitosterol), Lipids and fatty acids, Polysaccharides and glycoproteins, and Latex-specific defense proteins, including peroxidases and chitinases. These components collectively suggest that fig latex may exert antiviral and keratolytic actions capable of degrading infected epidermal tissues, making it a potential natural treatment for viral skin lesions such as warts [9].

Common warts (*Verruca vulgaris*) are benign hyperkeratotic skin lesions caused by infection with human papillomavirus (HPV) [9,10]. Clinically, warts are classified into four major types: common, plantar, flat, and genital warts ([9,11,12]. Despite the availability of more than 40 therapeutic approaches, including cryotherapy, surgical removal, laser therapy, topical keratolytics, immunotherapy, and antiviral agents' warts frequently recur within weeks of treatment [13,14]. Many of these treatments are expensive, painful, or inaccessible in resource-limited settings, underscoring the need for safe, affordable, and effective plant-based alternatives. Although fig latex is traditionally used in various cultures for wart removal, scientific studies evaluating its efficacy particularly in relation to latex from male and female fig trees are scarce. Considering the known biochemical differences between male and female fig trees, comparative evaluation may reveal important distinctions in therapeutic potency [15]. The present study aims to assess and compare the effectiveness of latex from male and female *F. carica* trees as a natural treatment for common warts

(*Verruca vulgaris*). This study seeks to provide scientific evidence supporting traditional practices and to explore the potential development of a simple, low-cost phytotherapeutic alternative for managing HPV-induced skin lesions.

Methodology

Latex Collection: Fresh latex was collected from male and female *F. carica* (var. *Brown*) trees growing in the mountainous region of Gharyan City, Libya. Latex was obtained by gently detaching immature green fruits from both male and female trees during mid-June 2025, coinciding with the peak period of latex production. Because the latex occurs in very small quantities, each drop exuded from the fruit surface was carefully aspirated using a sterile syringe and transferred into sterile 1.5 mL microtubes. Samples were either used immediately or stored at 4°C until analysis and application (Fig. 1). Care was taken to avoid contamination and to ensure equal handling of latex samples from both tree types.

Study Participants: A total of 30 volunteers clinically diagnosed with common warts (*Verruca vulgaris*) were recruited for this study. Participants ranged in age from 32 to 55 years. Prior to enrollment, all individuals completed a questionnaire regarding previous exposure to fig (*Ficus carica* L.) latex and any history of allergic or hypersensitivity reactions. To assess latex tolerance, a preliminary skin sensitivity test was performed by applying a small quantity of freshly collected fig latex to the forearm of each participant. Individuals who exhibited signs of irritation, hypersensitivity, or any allergic response were excluded from the study (Fig. 1). Of the 30 enrolled participants, 24 individuals presented with two or more warts, yielding a total of 60 lesions. To minimize inter-individual variation and allow direct comparison of treatment efficacy, the warts of each participant were equally allocated into two treatment groups:

Group A (n = 30 warts): Treated with latex obtained from male fig trees.

Group B (n = 30 warts): Treated with latex obtained from female fig trees.

The remaining six participants each presented with a single wart (total = 6 warts). These lesions were assigned as follows:

Group C (n = 3 warts): Treated with male fig tree latex.

Group D (n = 3 warts): Treated with female fig tree latex.

This study design enabled a balanced evaluation of the therapeutic efficacy of latex derived from male and female fig trees while reducing potential confounding effects associated with individual patient variability.

Treatment Procedure: Fresh fig latex was applied three times per week directly onto the surface of each wart. Each application was performed using a sterile wooden applicator or cotton-tipped stick. Treatment continued until the wart completely regressed or detached. At each visit, patients were examined for redness or swelling, irritation or allergic reaction, and any unusual more.

Results

One patient was lost to follow-up, and other one had uncomfortable feelings of latex treatment, after he started, apologized for continuing treatment.

After the rest patients (28) completed the study course (total of warts = 62), the result showed that Fig tree latex had a beneficial effect in the treatment of the warts. Shrink warts began at the end of the first week of the treatment of the fig tree latex (Fig2). Slight pain did occur during latex treatment of sensitive area such as armpit. Patients who treated by fresh

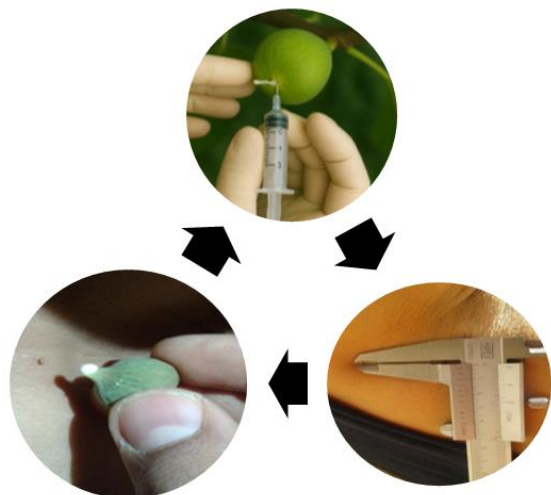


Figure 1: Shows the warts treatment Procedure with fig tree latex.

latex from female fig took longer than those treated with male latex. Where ~30 days for female latex, while patients' complete resolution of the male fig tree latex-treated warts was observed after 2 weeks (table 1).

Table 1: The data on the experimental groups receiving fig latex treatment

Group	No of disappeared warts each week			
	Week 1	Week2	Week3	Week4
A (male fig trees)	10	10	8	0
B (female fig trees)	4	4	12	8
C (male fig trees)	3	0	0	0
D (female fig trees)	0	0	2	1

In group A, 3 days after treating with male fig tree latex 10 flaking and shrinking of the warts were completely dropped off. The rest of the warts except 8 disappeared by day 12 and the remaining wart also dropped off by day 21. However, in group B and D, after applying a treated by fresh latex from female fig tree, 4 flaking and shrinking of the warts were detected at first week. four of warts were dropped off at the second week. At day 21, fourteen warts were removed, only eight warts were remaining on the skins, which disappeared by day 28. In group C three of the warts were dropped off spontaneously by days 20, 25 and 30. In group D, all warts after applying a treated by fresh latex from female fig tree, were needed more than 15 days to Disappeared.

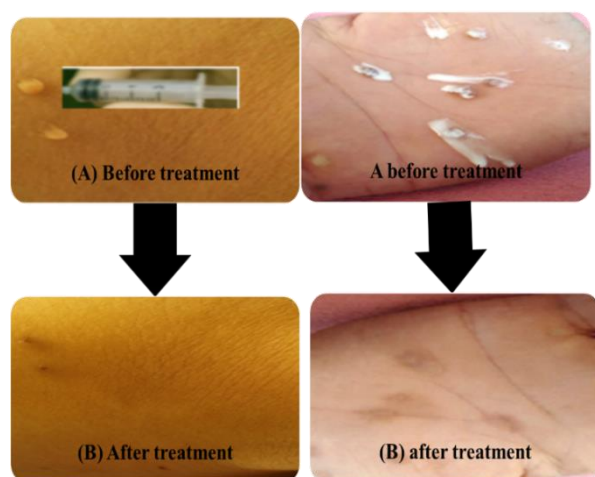


Figure 2: Representative the warts (A) before and (B) after treatment with fig tree latex

Discussion

The present study provides the first comparative evaluation of latex derived from male and female *Ficus carica* trees as a natural therapeutic agent for common warts (*Verruca vulgaris*). Although *Ficus* latex has been used traditionally in several cultures for wart removal, scientific literature describing its clinical effectiveness, particularly regarding the influence of plant sex is extremely limited [13 - 16]. The findings of this study contribute new evidence to the growing field of plant-based antiviral and dermatologic therapies.

Results demonstrated that both male and female fig latex exhibited measurable therapeutic activity, leading to progressive shrinking, drying, and ultimately the detachment of treated warts. However, male latex produced a significantly faster response. In Group A, initial flaking and regression were observed as early as day 3, and most warts resolved completely within 12 days, with the remaining lesions disappearing by day 21. By contrast, female latex (Groups B and D) required 15–30 days for complete resolution, indicating a slower but still effective therapeutic action. The faster response observed with male latex may be due to differences in the concentration or activity of ficin and/or other bioactive components between male and female trees [17].

The superior performance of male latex may be explained by differences in biochemical composition. Previous researchs has shown that *F. carica* latex contains a diverse mixture of biologically active constituents, including proteolytic enzymes (e.g., ficin), organic acids, triterpenoids, phenolic compounds, sterols, sugars, amino acids, minerals, chitinase, peroxidases, and trypsin inhibitors [14,15,16]. These compounds contribute to antiviral, keratolytic, antimicrobial, and pro-inflammatory activities properties essential for disrupting HPV-infected keratinocytes and promoting wart detachment [18]. The proteolytic enzyme ficin has been widely studied for its keratin-dissolving capability, which likely accelerates the degradation of hyperkeratotic wart tissue [19]. Additionally, antioxidant-related enzymes such as peroxidase and chitinase play roles in plant defense and may contribute to local oxidative stress on viral tissue, enhancing therapeutic potency. Variations in enzyme concentration or metabolic activity between male and female trees could underlie the difference in clinical response observed in this study [19]. Plant latex in general is considered part of a complex defensive system, protecting tissues from herbivores, insects, and microbial pathogens [7]. Its demonstrated ability to inhibit bacterial, fungal, viral, and tumor cell lines supports its potential as a topical bioactive agent [6,4,20]. The results of this investigation align with earlier reports describing the therapeutic effects of latex from *Calotropis procera*, *Euphorbia* species, and other latex-producing plants traditionally used for wart treatment [21,22,23,24]. Collectively, the findings indicate that fresh fig latex, especially from male trees may serve as a simple, inexpensive, and natural option for wart therapy. No severe adverse reactions were noted, although mild discomfort occurred in sensitive regions such as the axilla. Further research is needed to quantify differences in chemical composition between male and female latex, establish optimal dosing protocols, and explore potential antiviral mechanisms against HPV [17].

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