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The Antibacterial Effect of *Fig* (Leaves Extract and Latex) on *Enterococcus faecalis* as Intracanal Medicament. (An in vitro study)

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الخلاصة

الهدف: استهدفت الدراسة الحالية أجراء التقييم المختبري لتأثير المستخلص الكحولي لأوراق التين في تراكيز مختلفة والمحلول المستحلب للتين ضد المكورات المعوية وكذلك تقييم أفضل تركيز مؤثر لمستخلص أوراق التين والمحلول المستحلب للتين ضد المكورات المعوية الموجودة في القنوات العاجية عند استخداماهما كدواء لقناة الجذر. **المواد وطرائق العمل:** استخدمت طريقة التخافيف الدقيقة في الوسط السائل في تقييم التأثير المضاد للجرثومة لمحاليل أوراق التين بتراكيز(0,1%، 0,3% ، 0,6%، 1,25%، 2,5%، 5%) والمحلول المستحلب للتين. تم اختيار مائة وعشرون سن بشري مقلوع ذو قناة جذر واحدة. كل سن قطع من منطقة اتصال التاج بالجذر ثم تم توسيع قناة الجذر بعد ذلك قطع الثلث العلوي من السن. جميع الأسنان عقمت ثم لوثت بالمكورات المعوية ووضعت بالحاضنة. العينات قسمت عشوائيا إلى ثلاثة مجاميع. قناة الجذر تم مداوتها مع 5% مستخلص أوراق التين والمحلول المستحلب للتين وفورمكريزول وبعد ذلك حضنت لمدة يوم واحد للمجموعة الأولى ولثلاثة أيام للمجموعة الثانية وسبعة أيام للمجموعة الثالثة. ثم تم ازالة الدواء وحك من عاج قناة الجذر 10ملغم حيث تم وضعه في قنينة محكمة تحتوي على سائل قلب الدماغ حيث تم زرعه على وسط اكار الدم وتم عد المكورات الجرثومية التي نمت. **النتائج:** اوضحت النتائج ان 5% مستخلص اوراق التين والمحلول المستحلب للتين لها قابلية فعالة لقتل المكورات المعوية بعد فترة سبعة ايام وان تاثيرها افضل من فورمكريزول. **الاستنتاجات:** من خلال هذه الدراسة تم استنتاج انه من الممكن استخدام 5% مستخلص اوراق التين والمحلول المستحلب كدواء لقناة جذرالاسنان

ABSTRACT

Aims: This study perfoemed were to evaluate the effectiveness of ethanolic extract of leaves (EEL) at different concentrations and latex (LX) of *Ficus carica* against *Enterococcus faecalis*, and to evaluate the most effective concentration of EEL and LX against *Enterococcus faecalis* in dentinal tubules when used as intracanal medicament. **Materials and Methods:**The different concentrations of EEL (5%,2.5%,1.25%,0.6%,0.3%,0.1%) and LX against *Enterococcus faecalis* was evaluated by broth microdilution method using spectrophotometer. One hundred and twenty freshly extracted single canal humen teeth were chosen. They were section at cementoenamal junction, instrumented, sectioned apical one third, and then sterilized. They are then contaminated with *Enterococcus faecalis* solution and incubated. These samples divided into three groups randomly. Root canals filled with 5% EEL, LX, and formocrsol and maintained for one day for group one, for three days for group two, and seven days for group three. The medicaments removed from the canal and dentin chips was obtained from the canal and weight 10 mg that will be diluted in brain heart infusion broth, and cultured on blood agar then the number of colonies recovery were estimated. **Results:** this study obtained that 5% EEL had best effect than other concentrations but its effect less than LX but significantly not different. Result also obtained that 5% EEL and LX capable after seven day to eliminate the Enterococcus faecalis from Infected dentinal tubule, while formocresol can not**. Conclusions:** The EEL at 5% and LX had sufficient antibacterial effect against Enterococcus faecalis in the infected dentinal tubules when they are used as intracanal medicaments.

Key words: Fig, intracanal medicament, leaves, latex, antibacterial, Enterococcus faecalis.

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INTRODUCTION

Microorganisms and their by products are the main cause of pathological changes in the dental pulp and periradicular tissues and therefore the success of endodontic treatment depends on elimination of bacteria and their substrate from the root canal [1,2]. This is normally accomplished by mechanical instrumentation, supported by various irrigating solutions, and antibacterial intra canal medicament between appointments [3,4].

Many reports showed that *Enterococcus faecalis* is a common isolate from infected root canals. It is well recognized as a pathogen associated with persistant apic-

al periodontitis in endodontically treated teeth and highly prevalent in failed root filled teeth [1-7].

The need for medication with antibacterial action is required to maximize the disinfection, especially in those cases where an infection is resistant to regular the treatment and the therapy cannot be successfully completed due to the presence of pain or continuing exudates [2,3]. A variety of subastances have been tested and used for intracanal medicament, no one had been found to eliminate *Enterococcus faecalis* completely from infected root canals [8].

The use of plants and their preparation to treat infections were known since time immemorial and they were possibly the only methods available. Interest in plants with antimicrobial properties has revived because of the current problems associated with the use of other antimicrobial agents [9].

The common *Fig* (*Ficus carica*, family Moraceae) is a blessed tree, Allah the Almighty has sworn by it in Quran to draw our attention to their great benefits to humans. It has been employed as an important food crop for thousand years, it contains copious milky sap which called latex. The latex and extract from leaves of *Fig* are much employed in folk medicine and have several pharmacological properties in traditional medicine and the benefits have generally been ascribed to its antibacterial effect [10].

The purpose of this study was to evaluate the efficacy of leaves extract (at different concentrations) and latex of *Ficus carica* against *Enterococcus faecalis*, and then study the most effective concentration of leaves extract and latex of *Ficus carica* for there ability to eliminate of *Enterococcus faecalis* in dentinal tubules when used as intracanal medicament.

MATERIALS AND METHODS

Ethanolic Extract of ***Ficus carica Leaves*** (EEL)**:** Five hundred grams of *Ficus carica* leaves were cleaned and washed, then ground to the powder with commercially available food blender (S.S/ GLASSCO), and then 120ml of 60% ethanol were added to 40g of powder in a sterile well capped flask, left for 3 days at room temperature and then filtered through several layers of gauze. The resultant mixture was agained pass through No.1 filter paper to get rid-off the gross remnants of mixture. The resultant extract was then dried at very low temperature and high vacuum in the lyophilizer machine (EDWARDS/ Moduly/ England) and stored in sterile screw capped vials in the refrigerator until needed for the use and then freshly prepared in distilled water immediately before use at a concentration of 5% (50 mg/ml), 2.5% (25 mg/ml), 1.25% (12.5 mg/ml), 0.6% (6 mg/ml), 0.3% (3 mg/ml), and 0.1% (1mg/ml) [11].

Accumelation of Latex (LX):

A milky white liquid bleeds out of the stems when they are cut, this fluid called the fig latex. It is collected at its peak of activity in early morning. The latex was obtained by sucking at the site of cutting stems with dispossible syringe (about 10 ml), and then stored on the sterile screw capped vial to be used in the same day of collection and then discarded because of coagulation of latex occur after 12 hrs of its removal from the tree [12,13].

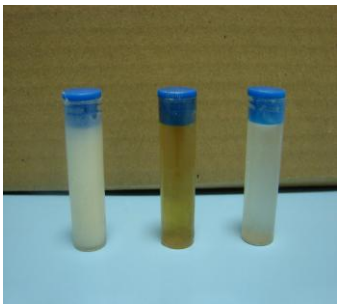
*Turbidity Test***:**

The microbiological study was done in the Microbiology unit, Department of Dental Basic Sciences, College of Dentistry, University of Mosul. The antibacterial effect of formocresol (Vevey (Suisse)) and EEL and LX of *Ficus carica* used in this study was determined through using a broth microdilution method. The test microorganism was used in this study to include *Enterococcus faecalis*. This microorganism was isolated and identified from clinical samples at the Microbiology Labrotory of College of Dentistry, Mosul University. In this study, series of sterile screw capped vials that contain an equal amount of brain heart infusion broth (Oxiod/England) about 4ml were prepared. The examined solutions were EEL at concentrations of (5%, 2.5%, 1.25%, 0.6%, 0.3%,0.1%) and LX of *Ficus carica*, formocresol, and normal saline. At least three replicates of each treatment were inoculated as well as the untreated microorganism culture.The turbidity (bacterial growth) of each vial was measured using spectrophotometer (CEIL CE 1021/ Eng-

land) at 590 nm W.L. So, in this method there was a control positive vial, control negative vial and treatment vial. A control negative vial represents a turbidity which is caused by examined solution itself, while control positive vial represents a turbidity caused by microorganisms' growth. In order to determine the exact antibacterial effect of each examined solution, the turbidity of examined solution itself must be excluded [11].

Preparation of (EEL and LX) Pastes:

In order to obtained maximal efficacy of the medicaments prepared from *Ficus carica* (EEL and LX) against *Enterococcus faecalis*, pastes were prepared. The pastes were performed by mixing 10ml of 5% EEL solution (because it shows the best antibacterial effect among used centrations of EEL by turbidity test) with 0.2g of orabase, also, 10ml of LX was mixed with 0.2g orabase, and 10ml of distilled water mixed with 0.2gm orabase, as shown in Figure (1). They are used at the same day of preparation and then discarded [14].



Prepared Pastes

Prepared Specimen

Figure (1) Prepared Pastes of *Ficus carica* (Leaves Extract and Latex) and Orabase; and Prepared Specimen. 1=paste of latex. 2=paste of leaves extract. 3=paste of orabase

Assessment of Antibacterial Efficacy of *Ficus carica* (LX and 5% EEL) Against *Enterococcus Faecalis* in Dentinal Tubules:

One hundred twenty freshly humen teeth with single canal extracted for different reasons obtained from Department of Surgery, College of Dentistry, University of Mosul and private clinics were used for this study. The crowns were removed at the cemento-enamel junction using carbide disc in a straight hand piece under water cooling. The root canals of the teeth were instrumented with k-type endodontic files (Union Broach Co., Long Island City, N.Y., USA) up to size 70. Irrigation with distilled water was performed during enlarging procedure. The apical one-third of the canal section in same manner as mentioned before. Root specimens with a length 9mm were prepared as shown in Figure (1). In the coronal and apical sections of the root specimens, small cavitiy was prepared to 2.5 mm in diameter and 1.5 mm in the depth in order to leave some space for composite (Vivadent/ Liechtenstein) and temporary filling (glass ionomer cement (Medicem/Germany)). Apical cavities closed by means of composite resin to prevent bacterial leakage. Finally, the root canals irrigated with 5 ml 3% hydrogen peroxide, 5 ml 5.25% NaOCl and 1 ml 17% EDTA which was left in place for 5 min to remove the smear layer. The canals were then given a final flush with 5 ml of 5.25% NaOCl. The root specimens were then sterilized by autoclave for 30 min at 121^0C. Each tooth was transferred to brain heart infusion (BHI) broth, and incubated for 24 hrs at 37^0C as a test for sterility. These teeth were transferred to 2 ml sterile physiologic saline (SPS) (Physio-Delta/Syria) in individual tubes for washing out BHI and to avoid dehydration and contamination; they were then incubated for 24 hrs at 37^0C. Following incubation in SPS, each tooth was removed from SPS and root canals were carefully dried with sterile paper points under aseptic conditions. The root specimens glued upright in

Petri dishes using a quick setting steel epoxy resin (Eaglestar/USA), were then infected with a standard volume of 10 µl (10^8cfu) of *Enterococcus faecalis* suspension and incubatd at 37^0C for 24 hrs. The specimens were removed from Petri dishes and root canals were irrigated with 5 ml of SPS, dried with sterile absorbent paper points. After this stage, the specimens were divided randomly into three groups of 40 samples for each group: one day group, three day group, and seven day group, for evaluation of the antibacterial efficacy of each root canal medicament as time dependent [2,3,8,15,16].

*One day group***:** Ten teeth were filled compeletly with 5% EEL paste and 10 teeth filled with LX paste by injecting the material with a syringe. Another ten teeth were medicated with formocresol (positive control) by placing a tiny cotton pledget in the orifices of the canals, the cotton pledgets were moistened with solution and excess liquid pressed on to cotton rolls. Five teeth filled with orabase, the five unmedicated teeth were kept as (negative control). The medicaments were left in the canal as dressing for one day by sealing the orifice with temporary filling material. The medicated and unmedicated teeth were stored in SPS for 24 hrs at 37^0C. After medication the cotton pledgets and the paste of EEL, LX, and orabase were removed from the canals. The pastes were removed from the root canals using SPS and mechanical stirring with sterile files. Subsequently, root canals were dried with sterile absorbents paper points. The dentin chips were obtained with a special penetration drill of post (CO213/208, Dentsply, Suiss/France) from the canal walls were collected on to separated sterile Petri dishes and weighed 10 mg. The dentine chips of the teeth were diluted in 5 ml BHI, 10 µl of this pippeted out and poured on to blood agar plates. This was streaked using sterile cotton swab to spread the suspension evenly throughout the agar plate. They were incubated for 24 hrs at 37^0C and colony forming unit were enumerated [2,3,8,15,16].

*Three days group***:** The teeth were medicated in the same manner as previously described. The medicated and unmedicated teeth were stored in SPS for three day at 37^0C. Dentin chips were taken and weight 10 mg, and the number of bacteria recovery were estimated in same manner as mentioned before [2,3,8,15,16].

*Seven day groups***:** The same procedure will be repeated as mentioned before but the only different was that the medicated and unmedicatd teeth were stored in SPS and incubated for seven day at 37^0C [2,3,8,15,16].

RESULTS

Turbidity Test:

In this study, the analysis of variance at level ($p<0.01$) was performed. The mean absorbance values in (nm) of the replicates were measured and compared with control group by Duncan's New Multiple Range Test. This was shown in Table (1).

Table (1): Duncan's New Multiple Range Test for Antibacterial Effect of *Ficus carica* (Leaves Extract and Latex) and Formocresol Against *Enterococcus faecalis*.

Examined Solutions	**Absorbance Mean (nm)± SD**	**Duncan's Grouping***
Control +ve *Enterococcus faecalis*	0.92±0.03	E
Normal saline	0.91±0.03	E
Formocresol	0.05±0.02	A
**** Fc Latex**	0.03±0.01	A
Fc Leaves 5%	0.05±0.01	A
Fc Leaves 2.5%	0.28±0.06	B
Fc Leaves 1.25%	0.44±0.10	C
Fc Leaves 0.6%	0.49±0.12	C
Fc Leaves 0.3%	0.78±0.08	D
Fc Leaves 0.1%	0.82±0.09	D

*= The different letters mean significant difference exists. **=*Ficus carica*.

The results determined that LX and all concentrations of EEL of *Ficus carica* and formocresol had antibacterial effect significantly different from control group, however, normal saline failed to show any significant effect.

EEL of *Ficus carica*, the best antibacterial effect was noticed at 5% concentration which showed a highly significant difference from other concentrations, 2.5% had antibacterial effect significantly higher than that of other concentrations. 1.25% had antibacterial effect nearly similar to 0.6%, and 0.3% had antibacterial effect significantly not different from 0.1%. 1.25% and 0.6% had antibacterial effect higher than 0.3% and 0.1% which was significantly different from them.

Results also revealed that LX had a highest antibacterial effect which was significantly not different from 5% EEL and formocresol. However, 5% EEL had no significant different from formocresol.

Assessment of Antibacterial Efficacy of *Ficus carica* (LX and 5% EEL) Against *Enterococcus Faecalis* in Dentinal Tubules:

Bacterial counts were taken as follow: after one day , after three day, and after seven day of incubation. The mean and standard deviation for bacterial counts at different groups were calculated.

The analysis of variance (Appendices XIX and XX) at level of significance (0.05 and 0.01) was performed. Through utilizing one way analysis of variance, Result revealed that bacterial counts at each time interval for unmedicate specimens significantly not different from the specimens that medicate with orabase. This indicate that orabase used in this study had no antibacterial effect.

Comparing the results at different time interval for each medicament used, it was found that the mean bacterial counts for *Ficus carica* (LX and 5% EEL) and formocresol after one day less than that of the unmedicate specimens which was statisticaly significant ($p<0.05$). Result revealed that the mean bacterial counts for *Ficus carica* (LX and 5% EEL) and formocresol after three day less than that of one day which was also, statisticaly significant ($p<0.05$). Result also found that bacterial counts for *Ficus carica* (LX and 5% EEL) and formocresol after seven day less than that of three day, but satistically had no significant different ($p>0.05$), in which LX show negative growth of bacteria in all specimens, EEL obtain negative result in 8 specimens and positive growth in 2 specimens, and formocresol show positive result in all specimens. For unmedicate specimens and specimens medicate with orabase the mean bacterial counts after three day greater than one day, and after seven day greater than three day which were significantly different ($p<0.05$). This was shown in Tables (2 and 3).

Table (2): Comparison for the Antibacterialal Effect of *Ficus carica* (5% Leaves Extract and Latex) and Formocresol Against *Enterococcus faecalis* at different time intervals.

Groups	**Mean (nm)± SD**		
	Time Intervals		
	One day	**Three day**	**Seven day**
Unmedicate	109.20±14.60 **A**	148.00±25.71 **B**	195.00±8.12 **C**
Orabase	110.00±13.32 **A**	146.80±28.85 **B**	197.40±13.97 **C**
Formocresol	84.60±34.38 **B**	14.70±2.75 **A**	8.00±5.41 **A**
Fc Latex*	36.00±33.76 **B**	1.00±0.94 **A**	0.00±0.00 **A**
Fc LE 5%**	66.60±37.86 **B**	5.90±2.60**A**	2.00±0.41 **A**

The different letters horizontally mean significant difference exist.
*=Ficus carica Latex. **=Ficus carica Leaves Extract.

Table (3): Comparison between the Antibacterialal Effect of *Ficus carica* (5% Leaves Extract and Latex) and Formocresol Against *Enterococcus faecalis* at different time intervals.

Groups	Mean (nm)± SD Time Intervals		
	One day	**Three day**	**Seven day**
Unmedicate	109.20±14.60 **C**	148.00±25.71 **B**	195.00±8.12 **C**
Orabase	110.00±13.32 **C**	146.80±28.85 **B**	197.40±13.97 **C**
Formocresol	84.60±34.38 **B**	14.70±2.75 **A**	8.00±5.41 **B**
Fc Latex*	36.00±33.76 **A**	1.00±0.94 **A**	0.00±0.00 **A**
Fc LE 5%**	66.60±37.86 **A**	5.90±2.60 **A**	2.00±0.41 **A**

The different letters vertically mean significant difference exist.
*=*Ficus carica* Latex. **=*Ficus carica* Leaves Extract.

Comparing the results among medicaments used at each time interval. For one day group, it was found that the mean bacterial counts after one day for *Ficus carica* (LX and 5% EEL) significantlly not different ($p>0.05$), but mean bacterial counts of *Ficus carica* (LX and 5% EEL) significantly different ($p<0.05$) from formocresol after one day. However, result found that bacterial counts for *Ficus carica* (LX and 5% EEL) and formocresol significantly different from unmedicate specimens. In three day group, result determined that the mean bacterial counts after three day for *Ficus carica* (LX and 5% EEL) and formocresol significantlly there were no different ($p>0.05$) among them. But, mean bacterial counts of *Ficus carica* (LX and 5% EEL) and formocresol had significant different ($p<0.05$) from unmedicate specimens. In seven day group, Result also estimated that the mean bacterial counts after seven day for *Ficus carica* (LX and 5% EEL) significantlly not different ($p>0.05$), but mean bacterial counts of *Ficus carica* (LX and 5% EEL) significantly different ($p<0.05$) from formocresol after seven day. However, result found that bacterial counts for *Ficus carica* (LX and 5% EEL) and formocresol significantly different ($p<0.05$) from unmedicate specimens. This was shown in Table (2) and Figure (2).

Figures (3 and 4) demonstrated the recovery bacteria from infected root canal after one, three, and seven day application of *Ficus carica* (LX and 5% EEL).

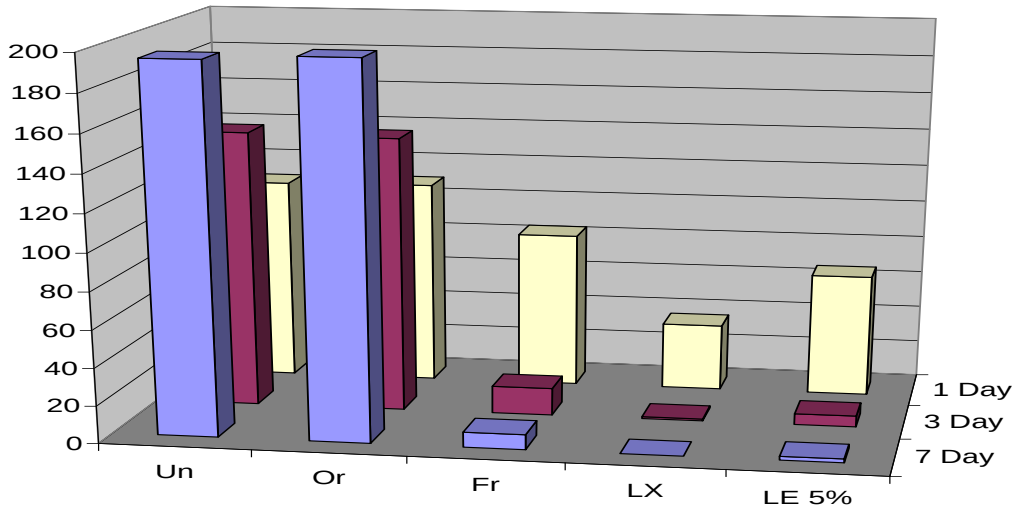
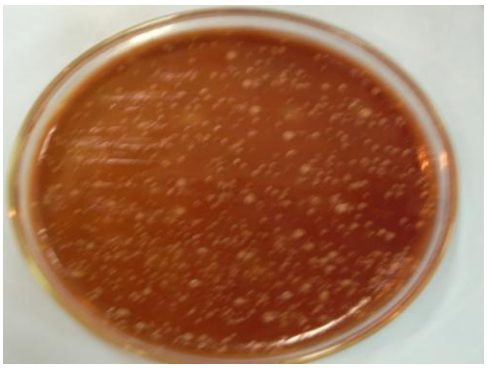
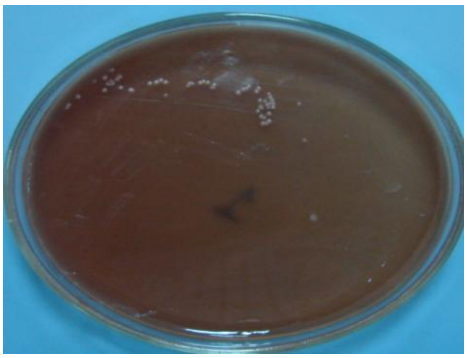


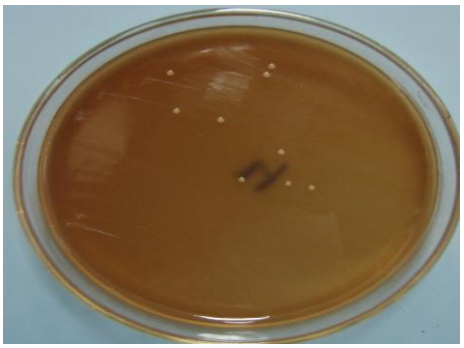
Figure (2): Bacterial counts after one, three, and seven day for *Ficus carica* (Latex and 5% leaves extract), formocresol, unmedicate specimens, and orabase. Or=orabase. Un=Unmedicate. Fr=Formocresol. LE= leaves extract. LX=latex.



Unmdicate

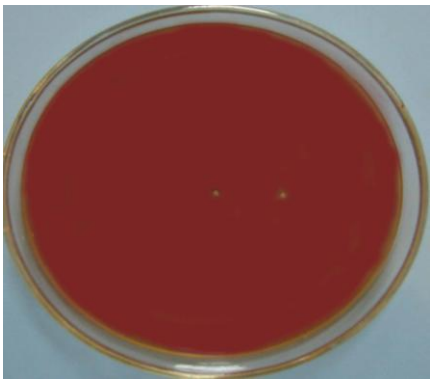


LX1

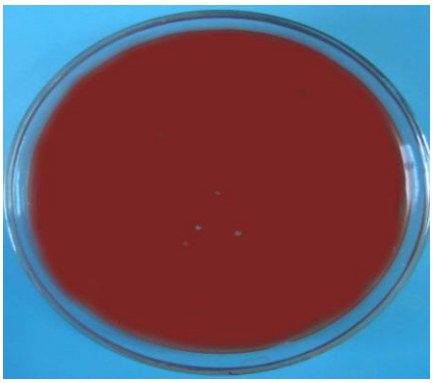


LE1

Figure (3) Bacterial Counts After One Day Application of Pastes of Latex and 5% Leaves Extract of *Ficus carica*; and for Unmedicate Specimen. LX1=bacterial counts after one day application of latex. LE1 =bacterial counts after one day application of leaves extract.

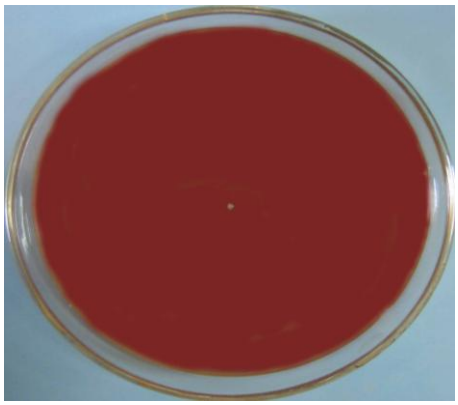


LX2



LE2

LX3



LE3

Figure (4): Bacterial Counts After three and seven Day Application of Pastes of Latex and 5% Leaves Extract of *Ficus carica*. LX2=bacterial counts after three day application of latex. LE 2=bacterial counts after three day application of leaves extract. LX3=bacterial counts after seven day application of latex. LE 3=bacterial counts after seven day application of leaves extract.

DISCUSSION

The main goal of successful root canal therapy is to eliminate microorganisms from root canals and to prevent subsequent reinfection [1,2,3]. It can be argued that certain resistant bacteria residing deep within the dentinal tubules can be the prime cause for lack of healing and endodontic failures. Use of improved intracanal medicaments seem to be warranted in the treatment of persistant apical periodontitis and re-treatment cases where a change in the type of root canal flora expected. Judicious use of proper kind of medicament will definitely ensure a higher rate of success [2,3,5,17].

Recently, there has been an increased interest in antimicrobial agents from medicinal plants which have been used in folk medicine. One approach that has been used for the discovery of antimicrobial agents from higher plants based on the evaluation of medicinal plant extracts that are well known in local medicine [9,18]. In study for safety and toxicity of *Ficus carica* (leaves and latex) in animal mice, it was found that 120 mg/Kg of LX and 160mg/Kg of EEL when given via oral route to mice will not cause animals mortality during seven days of post treatment [22].

The pharmacological effects of *Ficus carica* (leaves and latex) support its used in folk medicine. Several studies confirmed there value in folk medicine such as antitumer, the ability to mediate body metabolisms, mediating hyperglycemia, hyperlipidemia and cholesterol levels, enhancining oxidation resistance, the ability to mediate immunity, activating coagulation, antibacterial, antifungal, antiviral, anti-inflammatory, antiparasite, antiulcer, antiwarts, and had the ability to treat digestive disorder, headaches, calcification in kidney and liver. In addition, *Ficus carica* has been used to treat many medical conditions such as cough, flu, asthma, abscess, constipation, gingivitis, gout, convultion and arithrits [9-14, 19,20,21].

Chemical analysis of *Ficus carica* (leaves and latex) proved that they contains the following compounds: Carbohydrate, monosaccarides, protein, potassium, calcium, maganesium, phosphorus, iron, copper, zink, sulpher, sodium, and chlorine. They also contain many vitamins, enzymes, acids, disinfectants, phytochemical benzaldehyde, astringents agents, antioxidants, laxative, beta-carotene, flavonoids, and polyphenols (about 12 phenolic compounds) [22]. The antibacterial and antiviral effect of Ficus carica related primarly to it's high contains of carbohydrates, flavonoids, benzaldehyde, and poly phenols [22,23].

Enterococcus faecalis, which is an opportunistic, facultative anaerobic, was chosen as a test organism in this study because, it is well recognized as a pathogen associated with persistant apical periodontitis in endodontically treated teeth and is highly prevalent in failed root filled teeth. It is non fastidious and easy to culture. It has been used successfully in previous studies. It has been previously shown to infect dentinal tubules rapidly and persist within it as a mono infection for up to 10 days without any nutrition. It has been clearly shown to be resistant to many antimicrobial agents, and also this microorganism constitue a problem with treatment because it is difficult to eliminate [1,3,4,7].

Several studies demonstrated that *Enterococcus faecalis* present a high resistance to the most frequently used intracanal medicaments which includes formocresol, camphorated monochlorophenol (CMCP), calcium hydroxide, calcium hydroxide with (CMCP), and iodine potassium [2,5,8]. Therefore, this study was performed in order to evaluate the ability of EEL and LX of *Ficus carica* to eliminate *Enterococcus faecalis* from dentinal tubules when they are used as intracanal medicaments.

In this study, broth microdilution method was used to determine the most effective concentration of EEL at (5%, 2.5%, 1.25%,0.6%,0.3%,0.1%) and LX against *Enterococcus faecalis*. The best antibacterial effect was noticed at 5% concentration of EEL which had significant different from other concentrations and significantly not different from LX and formocresol. This finding indicate that the antibacterial action of EEL is a concentration dependent. The antibacterial effect of EEL and LX of *Ficus carica* related primarly to it's high contains of carbohydrates, flavo-

noids, benzaldehyde, and poly phenols [22,23].

In this study, the antibacterial effect of pastes made from 5% EEL and LX against *Enterococcus faecalis* in dentinal tubule of prepaerd root canal model when they are used as intracanal medicaments were also evaluated and compared with formocresol. The preparation of pastes in order to produce a maximal antibacterial effect by allowing direct diffusability of active ingredients into dentinal tubules. LX produce the best antibacterial effect, it will give a negative growth of *Enterococcus faecalis* after seven day in all samples, 5% EEL will produce a negative growth of bacteria for 8 samples and positive growth for 2 samples, while formocresol will produce positive growth in all samples, this indicated that LX and EEX had antibacterial effect remaine for one week so, they are capable to efficiently eliminate bacteria which may survive after biomechanical instrumentation. The LX exhibited highest antibacterial effect than that of 5% EEL, may be related that it contain polyphenols, benzaldehyde, and flavonoids greater than that of EEL [22,23].

Many studies evaluated the antibacterial effect of *Ficus carica*, its ethanolic extract of leaves and latex against gram positive and gram negative bacteria, and fonnd that they had a strong antibacterial effect [22,23,24]. Other studies showed that a minimium inhibitory concentration of ethanolic extract of leaves of *Ficus carica* against *Streptococcus pyogens*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, and *Klebsiella pneumoniae* was noticed at 5% concentration [11,18,25].

CONCLUSIONS

1. The best antibacterial effect of EEL was noticed at 5% concentration and into the LX.
2. This study showed that LX and 5% EEL of *Ficus carica* are suggestible as intracanal dressing between two appointments. However, further investigations made in vivo are necessary for better understanding the efficiency of these materials as intracanal medicaments to study on other microorganisms.
3. the antibacterial effect of LX and 5% EEL of Ficus carica are continue up to seven days which were significantly different from formocresol.

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