



# A VITAL ROLE OF AQUEOUS EXTRACT OF THE PLANT *EUGENIA CARYOPHYLLATA* (CLOVE) IN TREATED *TRICHOMONAS TENAX* INFECTION FOR PATIENTS ATTENDED DENTAL CLINICS, KUFA UNIVERSITY

Shaimaa A. Shlash<sup>1</sup> and Hussein A. Kadhum<sup>2</sup>

<sup>1</sup>Pharmacy College, Kufa University, Iraq.

<sup>2</sup>Department of Microbiology, Dentistry College, Al-kafeel University, Iraq.

## Abstract

The current study aims determined incident of *Trichomonas tenax* infection for people by oral diseases compare to healthy people and extent of the connection with operators of sex, age, habitation and educated level using macroscopic and microscopic routes and the vital role of hot aqueous extract *Eugenia caryophyllata* buds to treatment of this parasite infection come dental clinics/Kufa University in Al-Najaf governorate.

This study was carried out dental clinics, Kufa University from July, 2017 to May, 2018. Where included the disclosure of the incident to 100 patients with *T. tenax* in mouth of people depending on sex, age, habitation and educated level, diabetes and take insulin and non-take insulin also role of the aqueous extract of hot buds *E. caryophyllata* on patients in inhibition for this parasite where take four groups including treated three groups with concentrations 100, 200 and 300 mg / ml respectively of body weight used as Gargling by mouth while fourth group was left with positive control (non-treated). The experiment continued for 10 days at dose is 5 ml daily for all studied groups. Incident of *T. tenax* parasite in people mouth to 100 patients, The total number of the infected 74% where appeared depending on age group 38-47 and rate was 93.75%, proportion of males was 32% while of females was 42%, depending on habitation was 84.4% while educated level was 90.6% while depending on taking insulin while patients who are non taking insulin males and females reached 35% and 25% respectively, total incidence rate was parasitic 76.92%.

Showed results that hot buds aqueous extract of *E. caryophyllata* predestined on patients in inhibition of the parasite where used four groups were showed the total proportion of healing was 51.38% appeared highest healing rate reached 100% with concentration 300mg/ml gave significantly ( $p < 0.05$ ) compared with control groups (non-treated). This study find that giving the hot aqueous extract of *E. caryophyllata* buds as a gargle with concentration 300mg/kg led to parasite killing and complete recovery without side effects of both sexes.

**Key word:** *Eugenia caryophyllata*, *Trichomonas tenax*, Gargling, Clove, Healing.

## Introduction

*Trichomonas tenax* is one Trichomonadidae family members, an anaerobic commensal of human oral cavity which lives in mouth of the patients with poor oral hygiene and advanced periodontal diseases (Abulqumsaan *et al.*, 2010) Live in tarter between the teeth gingival margin concerning the gum and tonsillar crypts (Paniker, 2002). Transmission through saliva droplet spray, kissing and water drink (Junior *et al.*, 2011). These parasites were correlated with age and sex of the host is protozoa found

in human oral cavity from seen in swabs taken from dental pockets on the surface of periodontium (Chomicz *et al.*, 2002). Studies show that people with diabetes are more likely to get periodontitis than people without diabetes (Dhinahar and Lakshmi, 2011). In Iraq there is study which showed a prevalence of periodontitis 8.4% with *T. tenax* by direct smear, remarked World Health Organization has indeed recognized medicinal plants as best source for obtaining a variety of synthetic drugs (Santos *et al.*, 1995). Cloves are aromatic dried flower

\*Author for correspondence: E-mail : shaima.shlash@uoKufa.edu.iq, husseinalikadhum@alkafeel.edu.iq

buds of a tree (*Syzygium aromaticum* or *Eugenia caryophyllus*) belonging to Lamiaceae family, mainly used several parts of the plant such as leaves and buds in cooking, food processing, pharmacy and cosmetics (Asadbeigi *et al.*, 2014). Clove is natural antimicrobial, antiviral, anti-fungal agent, parasitic infestations and toothaches (Thomas and Montvale, 2004). In Iraq a major therapeutic role where using clove in different local plants to treat patients biological and pharmacological properties (Al-Saimary *et al.*, 2007). The aqueous extract of clove causes inhibit both acute and chronic inflammation- dental caries and pyorrhea (Yadav, 2013). Showed inhibit the growth of *Trypanosoma cruzi* parasite which causes Chaga's disease to successfully inhibit *T. cruzi*, with 50% of cells inhibited at 57.5 micrograms/ml (Santoro, 2007). The current study aims to determine the incidence of *T. tenax* infection in people with oral diseases compared to healthy people by using the macroscopic and microscopic methods and the vital role of the hot aqueous extract of *E. caryophyllus* buds in the treatment for patients attended dental clinics/Kufa University in Al-Najaf governorate.

## Materials and methods

This study was carried out for period from beginning of July 2017 to May 2018. These study included 100 individuals 74 patients 42 female and 32 male, their age ranged from 18-77 years old with periodontitis patients who attended to dentistry clinics / Kufa University and 26 healthy controls, Laboratory examination included Macroscopical examination where watching white layer covering the surface of the teeth, observation of tooth decay, color and texture of the gums and presence of yellow layer in the supporting tissue (tar-tar) (Carranza, 2002). Microscopically examination either by Direct smear method by taking a sample from the mouth of the patient and then placed directly on the slide and examine by the microscope under the small and large forces and used phase contrast microscope which makes easy to see movement of the parasite, which is characteristic of

this parasite Mallat *et al.*, 2004), Or by Wet preparation method the sample taken from the mouth of the patient and moistened with saliva and placed on clean slide without adding as distilled water to maintain the cellular structure of the parasite then put cover slide and examined under (400x), established as pear-shaped flagellated trophozoite about 5-13 $\mu$  long with circular movement and each sample stained with Giemsa staining Bafghi *et al.*, 2009) *E. caryophyllus* buds were obtained from local markets, washed well with water, dried then grinded and diagnosed in

the science collage / Kufa University, hot aqueous extract of clove blossoms was prepared by taking 10gm of plant powder after mill by an electric mill and then placed in glass beaker capacity 500mL, add 200 ml of boiled distilled water and leave to cool with continuous stirring. The solution is then filtered through layers of gauze and then filter paper. The leaky is then taken to be dried by an electric oven at a temperature (45-50°C) collected and keep in a clean and dark glass bottle and put in the refrigerator to a degree (4°C) until used. Prepare the stock solution where 1gm of extract and solvent in 10ml of distilled water, so have a concentrated solution 100gm/ml and attended the following concentrations 50%,75% and 100% (Fazza, 2011). Effect of hot buds aqueous extract in patients,72 infected randomly divided into 4 groups each group contain 18 patients oral cavity as Gargling.

The patients in group 1 (infected parasite) which not treated give saline as positive controls, The patients in group 2 (treated parasite) with *E. caryophyllata* buds aqueous extract orally (100 mg / ml) from body weight as gargling for 10 consecutive days with dose 15 ml once a day, The patients in group 3 (treated parasite) for the same extract orally (200 mg / ml) from body weight as gargling for 10 consecutive days with dose 15 ml once a day and group 4 (treated parasite) for the same extract orally 300 mg / ml from body weight as gargling for 10 days with dose 15 ml once a day.

The statistical analysis was performed using ANOVA ( $p < 0.05$ ) for study the correlation between parasites of oral disease among different age and sex.

## Results & Discussion

*T. tenax* presence in the oral cavity sign of low interest

**Table 1:** *Trichomonas tenax* Infection to infected and uninfected patients with Oral diseases.

Health status of patients	Examined No.	No. of Infected	(%)
Infected patients	72	57	79.2%
Uninfected patients	28	17	60.7%
Total	100	74	74%

**Table 2:** *Trichomonas tenax* Infection according to Sex

Age (years)	Male			Female			
	Examined No.	No. of Infected	%	No. of Infected	%	Total No. of infection	%
18-27	18	5	27.8	6	33.3	11	61.11
28-37	20	7	35	8	40	15	75
38-47	32	12	37.5	18	56.25	30	93.75
48-57	12	4	33.3	5	41.7	9	75
58-67	10	3	30	2	20	5	50
68-77	8	1	12.5	3	37.5	4	50
Total	100	32	32%	42	42%	74	74%

**Table 3:** *Trichomonas tenax* Infection according to Habitation

Countryside				City			
Age (years)	Examined No.	No. of Infection	%	No. of Infection	%	Total No. of infection	%
18-27	18	7	38.9	5	27.8	12	66.7
28-37	20	9	45	7	35	16	80
38-47	32	16	50	11	34.4	27	84.4
48-57	12	5	41.7	4	33.3	9	75
58-67	10	4	40	2	20	6	60
68-77	8	3	37.5	1	12.5	4	50
Total	100	44	44%	30	30%	74	74%

hygiene but the excessive increase in cleanliness has a negative impact in many diseases for immunity because of the inefficiency of the immune system and not being exposed to such parasite. As in table 1.

The study indicated total number *T. tenax* infection was 100 distributed between 42 female and 32 male infections where ages were from 18-77 years, was highest rate of infection in the age group 38-47 and rate was 93.75%.

These study showed the infection with *T.*

**Table 4:** *Trichomonas tenax* parasites Infection according to educated level

Age (years)	Examined No.	good		intermediate		low		Total No. of infection	%
		No. of infection	%	No. of infection	%	No. of infection	%		
18-27	18	1	5.6	3	16.7	6	33.3	10	55.6
28-37	20	2	10	4	20	8	40	14	70
38-47	32	8	25	10	31.2	11	34.4	29	90.6
48-57	12	2	16.7	2	16.7	5	41.7	9	75
58-67	10	1	10	2	20	4	40	7	70
68-77	8	1	12.5	1	12.5	3	30	5	62.5
Total	100	15	15%	22	22%	37	37%	74	74%

**Table 4:** *Trichomonas tenax* according to Diabetic infection among take and non take insulin patients both male and female

Diabetic patients	Male			Female			
	Examined No.	No. of Infected	%	No. of Infected	%	Total No. of infection	%
Take insulin	32	15	46.8	9	28.12	27	84.37
Non take insulin	20	7	35	5	25	13	65
Total	52	22	42.30	14	26.92	40	76.92

*tenax* tend to increase in females and this result coordinated with (Porochere *et al.*, 2002) confirms that females are more probable than males where proportion of males formed 32% while proportion of females 42% only. The physiological and immunological status of females may play a large role in increasing proportion. The results of the statistical differences were significant, confirmed the existence of positive relationship between sex and infection with this parasite. As in table 2.

**Table 6:** Number of patient healing with increase buds aqueous extract of *E. caryophyllata* after using doses 15 ml once daily during 10 days.

Group of patient	No. of patient	Extract concentration	No. of patient healing (%)	Healing
1	18	+veControl	0	0
2	18	100 mg/ml	6	20
3	18	200 mg/ml	13	60
4	18	300 mg/ml	18	100
Total	72		37	51.38

in oral hygiene, dental care and gum disease where can be transmitted by kissing, flying spray and drinking utensils (Onyido *et al.*, 2011) Showed that incidence of *T. tenax* infection has reached 100 in infected and uninfected patients and rate was 74%, This study was identical with (Al-Buquerque *et al.*, 2011) hygiene factor including the oral infection of this parasite is increased by lack of

Infections number with this parasite in countryside and city was 44, 30 respectively where ages 18-77 years was highest rate of infection in the age group 38-47, rate was 84.4% and recorded the highest rate infection in patients living in countryside 44% compared to the city 30%. May be due to the lack of awareness of the importance of oral hygiene and dental care and gums in the countryside as well as frequent exposure to pollutants such as smoking, alcohol and contaminated foods thus providing an conducive environment to oral diseases and parasites while people with old age, most of their teeth are damaged and most of them do not have teeth or take a lot of drugs as a result of other diseases may effect these drugs in parasites and prevent infection (Gharavi *et al.*, 2006) As in table 3.

Infections number with this parasite in cultural level

in low, intermediated and good was 37, 22 and 15 respectively and highest rate of infection in the age group 38-47, rate was 90.6%. This may be due to neglect of this behavioral habits and lack of interest in personal hygiene as well as the use of the same tools from one person to another this consistent with his findings (Obaid, 2008) As in table 4.

Showed *T. tenax* infection rate for both male and female was 46.8%, 28.12% respectively, taking insulin while non-taking insulin males and females reached was 35%, 25% respectively, overall infection rate 76.92%. Significant differences between taking insulin and non-insulin users sex differences, This study agrees with (Lalla and Ambrosio, 2001). *T. tenax* infection in diabetic, an increase in accident of oral parasites in diabetic patients with five times the incidence of healthy people. May be Hyperglycemia lead to be Advanced Glycation Endproducts (AGEs) in turn stimulates monocytes and endothelial cell to produce inflammatory mediators and gathered in plasma and tissues for patients with diabetes leads to the enrichment of gum tissue by vascular permeability breaks the fibrinogen fibers which increases the exposure of these patients to the infection of many types: fungi, bacteria and parasites As in table 5.

*E. caryophyllata* used in treated various disease, including intestinal parasites, migraine headaches, cold and application directly to the gum or skin to alleviate dental pain and reduce inflammation of the mouth and throat places because of some important components: Flavonoids, Phenolic acids, Alkaloids, Tannins and contain rich minerals such as: iron, calcium, phosphorus, sodium, potassium and vitamin C and vitamin A (Nassar *et al.*, 2007).

The results showed that total proportion was 51.38% appeared highest healing rate reached 100% with concentration 300 mg / ml of the aqueous extract and lowest healing was 20% with concentration 100 mg / ml, the best concentration of healing is 300mg / ml with doses 15 ml in tenth day without side effects comparison with control group results showed that patients remained intact and none of them were cured and clinical symptoms including gum swelling. As in table 6.

This may be due to the presence phenolic compound interfere the energy generation mechanism by uncoupling the oxidative phosphorylation and interfere with the glycoprotein of the cell surface of parasite and cause death or because of the existence alkaloids which act as an antioxidant capable of reducing the nitrate generation which can interfere in local homeostasis is important for developed of parasite, These results are matched with

(Shemi and Alda, 2017).

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