International Journal of Bioassays 7.1 (2018) pp. 5464-5467

Open Access
CODEN: IJBNHY
ISSN: 2278-778X
International Journal of Bioassays

Research Article

Antibacterial effect of medicinal Rue extracts on the infectious mouth in AL – Najaf community. An *In vivo* study

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Received: 05-12-2017; **Revised**: 11-12-2017; **Accepted**: 22-12-2017
Available online: 1st January 2018

Abstract: Aim: Clinical evaluation of antibacterial and antimicrobial properties for herbal extracts plants as (rue) to have been investigated in order to suggest them as potential mouth rinse to overcome the microbial effect in the mouth of patients. **Methods:** Assessing the opposite effect of the extract of this plant (rue) on gingivitis. Using precise dilution in distilled water only without the addition of any other material of this extract a certain concentration of 20%. I've been watching influence through the state of the gum tissue surrounding the teeth clinical examination before and after use of this extract for a period of 10 days for a group of patients totaling 32 patients (25 females and 7 males), age (10-80 years). A swab was taken of the bacteria from the mouth of the patients were cultured before treatment to observe bacterial growth and swab after the treatment to note the death of bacteria. **Results**: The clinical use of direct observation of signs and symptoms after the examination. Rue have a good function on inflammation of the gums and tissues surrounding the teeth after using the vegetable extract of rue material through actual viewing and examination of periodontal pockets. Also after taking swabs and cultured them.

Keywords: Rue, Essential composition, Antimicrobial activity, Gingivitis, Periodontal pockets, MAO (Mono Amine Oxidase).

Introduction

The increased incidence of oral infectious diseases, such as types of gum disease, like untreated gingivitis (is the mildest form of periodontal disease. It causes the gums to become red, swollen, and bleed easily. There is usually little or no discomfort at this stage. Gingivitis is often caused by inadequate oral hygiene), could advance to periodontitis and eventually lead to tooth loss and other health problems. It started when the bacteria in plaque (the sticky, colorless film that constantly forms on teeth) causes the gums to become inflamed with great increased in number of bacteria that can be collected from mouth, mostly in patients have less than perfect mouth care. Recently, there has been an increased interest in antimicrobial agents from herbal remedies which have been used in popular medicine (1). Antibiotics are produced either synthetically or through microbial fermentation, plants, however, may provide additional source for antimicrobial substances. (2,3) Much of work has been performed to explain the antimicrobial effect of this plant and isolation their active ingredients (4).

Rue has been used as a medical preparation and has a variety of roles, probably because of its varied chemical composition. Rue benefits and medicinal uses antimicrobial and anti-bacterial(5,6), One of other important features of *P. harmala* alkaloids is their bactericidal activity were compared with another common antibiotics in its effectiveness against some bacterial defect, so that kill and prevent bacterial infections. The acridone alkaloids are the most potent antimicrobial compounds. The active ingredient is the extraction of contain Peganum harmala (Syrian Rue) seeds harmaline, and harmine, are very potent inhibitors of monoamine oxidase (MAO) (7), and other harmaline alkaloids, effects of the alkaloids derived from *P. harmala* seeds. It has also been used widely as an anti-fungal (8), and antiparasidal (9,10) agent in traditional medicine of some parts of the world. The aim of this study is to evaluate the antimicrobial, and antibacterial effect of medicinal plant extracted. (An in vivo study).

Material and Methods

We use 5000 gm of Peganum harmala (Syrian Rue) seeds in 25000 ml of distal water after boiling at 100°C for 30 mints and then take the extracted fluid only with concentration of 20% (11).

32 patients (25 female and 7 male)
Age for female between 10 – 80 years.
Age for male between 10 – 80 years.

The amount of extracted rue was using 330 ml for each patient for ten days. Using 10ml with its

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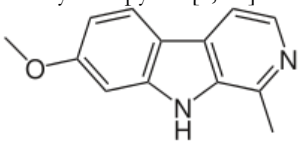
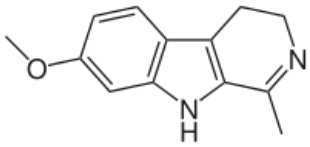
concentration 20% as mouthrines three time a day after the eating, put in mouth 1 mint and rinse with it and then remove it and not wash the mouth after that at least half hour. We take a swab for culture from every patient mouth before and after the treatment with extracted solution of rue. The culture of patients show a good results, theses cultures were showing an eruption or growth of bacteria in the media before the treatment, and then after the treatment with the suspension for ten days, there is no bacterial growth. Peganum harmala (Syrian Rue) dry seeds contain significant amounts of harmine and harmaline (respectively at the concentration of 5.6% and 4.3 %), approximately 3% and other harmaline alkaloids (Shulgin 1997; Most 1985; G&Z 1985) (12).

Chemical form of Harmine: **$C_{13}H_{12}N_2O$** 7-Methoxy-1-methyl-9*H*-pyrido[3,4-*b*] indole



Harmine is a reversible inhibitor of MAO-A(13) .

Chemical form of Harmaline: **$C_{13}H_{14}N_2O$**4,9-Dihydro-7-methoxy-1-methyl-3*H*-pyrido[3,4-*b*] indole



Harmaline is a reversible inhibitor of MAO-A.(13)

Contain natural rue seeds extracts, seeds are commonly used as a mouthrines without alcohol. Helps to protect against tooth and gum hypersensitivity due to infection. It have a bitterness taste. Swelling (inflammation) reduced in the patient's mouth by chemicals in rue which also help in decrease muscle contractions.

Even the dose of rue depends on many factors such as the general health, user's age, and another conditions, we take amount of this material to doing a good dose in order to have a better results, keep in mind that dosages can be important for natural products to give a healthy mouth. But there is not enough scientific information to determine an appropriate range of doses for rue, so I take this percentage which killed the bacteria with no effects on oral tissues.

Result

In this study, we were getting a amazing results after healing the signs and symptoms of infectious mouth as gingivitis, periodontitis, and any another infection after clinical examination and cultured that was conducted to patients after uses of extracted rue, which appear in the figures and table below.

Figure 1: The cultured of (sample no. 1) before and after treatment with extracted rue*.

Figure 2: The cultured of (sample no. 4) before and after treatment with extracted rue.

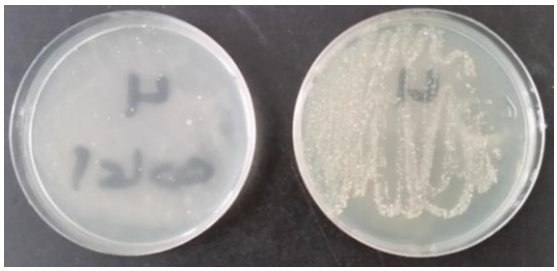


Figure 3: The cultured of (sample no. 8) before and after treatment with extracted rue

Table 1. The table explain the group of patient's signs and symptoms in this study before treatment by extracted rue.

Age (Years)	No.	Gender ♀	Gender ♂	Signs and symptoms before treatment
10 –20***	4	2	2	Increase in the gum's sensitivity and lead to a greater reaction to any irritation, including food particles and plaque. The gums may become swollen, turn red and feel tender.
21 – 30*	7	5	2	Red, swollen or tender gums or other pain in the mouth. Bleeding while brushing, flossing, or eating hard food
31 – 40	10	10		Women with this condition may experience bleeding gums, bright red and swollen gums and sores on the inside of the cheek, and strongly to irritants.
41 – 50	3	3		Red gingiva, swollen, and bleed easily, plaque can spread and grow below the gum line.

51 – 60**	4	2	2	Infections in the mouth, tobacco use may be one of the most significant risk factors in the development and progression of periodontal disease especially with male, red, swollen gums with pain.
61 – 70	2	1	1	Gums that are receding or pulling away from the teeth, causing the teeth to look longer than before. Loose or separating teeth
71 – 80	2	2		Inflammatory response and the tissues and bone that support the teeth are broken down and destroyed. Gums separate from the teeth, forming pockets (spaces between the teeth and gums) that become infected.
Total	32	25	7	

* This sign in table explain the group with age 21 – 30 years after repeated the culture swab.
** This sign in table explain the group with age 51 – 60 years after repeated the culture swab.
*** This sign in table explain the group with age 10 – 20 years after repeated the culture swab.

Discussion

The antibacterial, antimicrobial and antifungal activity of extracted rue in this project was evaluated by use it as in vivo study to treating an infectious mouth. Rue has been used for centuries as a medical preparation and has a variety of roles, probably because of its varied chemical composition. The chemicals in rue help decrease and reduce swelling (inflammation)(14). The extracted rue acted an inhibitory factor for growth of bacteria and this explain by the culturing of swabs taken from patient 's mouth. One of other important features of *harmala* alkaloids is their bactericidal activity (15) that is comparable with that of common antibiotics, which have many adverse effects. Different species of bacteria have been shown to be susceptible to these alkaloids (5). Study have shown that tobacco use may be one of the most significant risk factors in the development and progression of periodontal disease. Study indicated that older people have the highest rates of periodontal disease and need to do more to maintain good oral health.

Study indicate that gingivitis (the first stage of periodontal disease) is nearly a universal finding in children and adolescents. In puberty, an increased level of sex hormones, such as progesterone and possibly estrogen. This may cause an increase in the gum's sensitivity and lead to a greater reaction to any irritation, including food particles and plaque, this happened because increased blood circulation to the gums, so the gums may become swollen, red, feel tender and tendency to bleeding. The extracted rue had a significant effect in treatment all the signs and symptoms for the patients mouth in all groups which explain before. Duration of treatment were 10 days only without using any chemical antibiotics or drugs. The concentration of this water extracted rue that used in this study gave a amazing results in all groups of patients without any differences between them.

Conclusion

The extracted rue used in this study had antibacterial, antimicrobial and antifungal effect. For this purpose and reasons can be used as disinfectants and mouth wash solutions instead of chemical solutions or antibiotics, and can be used safely without any side effects in oral cavity almost in more oral infections and all ages.

The dentist was training to diagnosis, and prevention the gum diseases through the regular routine dental visits in order to maintain comprehensive oral health by learning the patients about regular and appropriate brushing and flossing and ultimately help to reduce and diminish the gum diseases, and treatment of diseases affecting the gums and supporting structures of the teeth.

Acknowledgements

Just wishing to recognize the valuable help of all provided during my research. Without their care and funding, it was impossible to reach the goal. I would like to pay special thankfulness, warmth and appreciation to the persons who made my research successful and assisted me at every point. A lot of thanks also to my patients for acceptance to work with me in this research in order to get the benefit of research in our community. Last but not the least; emotional support can also be considered as a key to success. So, I wish to thank such supporters like my husband, daughters and sons, and friends.

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Cite this article as:

Ibrahim Sana'a Abdulrazzaq. Antibacterial effect of medicinal Rue extracts on the infectious mouth in AL –Najaf community. An *In vivo* study. *International Journal of Bioassays* 7.1 (2018) pp. 5464-5467.

DOI: http://dx.doi.org/10.21746/ijbio.2018.7.1.1

Source of support: Nil.

Conflict of interest: None Declared