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STUDY THE ANTIBACTERIAL ACTIVITIES OF *ALHAGI MAURORUM* AQUEOUS EXTRACT AGAINST ORAL STREPTOCOCCI ISOLATED FROM GINGIVITIS CASE

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Abstract

30 samples were taken from patient in Al-Refaee general hospital/ teeth unit. Only 19 from 30 sample were positive (as an oral streptococci). The samples were cultured in laboratory using blood agar medium to make a checks specialized to oral streptococci. *Alhagi maurorum* collected from different district in Dhi Qar province, then the aqueous extract of this plant was prepared indifferent concentrations as: 10%, 20%, 30%, 40%, 50%.

Diagnostic tests of oral streptococci showed that only 19 from 30 samples were positive. and the results also showed that the use of aqueous extract at the concentration of 40% and 50% have an anti-bacterial activity in comparison with the use of aqueous extract at the concentration of 10%. 20% and 30% which lack the activity against oral streptococci. The study concluded that *Alhagi maurorum* aqueous extract have an effect against oral streptococci at the concentrations of 40%, and 50%, so, this study recommended using this plant as anti-bacterial natural source to protect peoples from gingivitis.

Key words: *Alhagi maurorum*; antbacterial activities; gingivite case

Introduction

Since ancient times, herbs have been used to protect human and treat chronic health maladies in addition to flavor food improvement (panickay, 2013). Herbal drugs are playing an important role in the health care programmes in world (Raina, 1998). *Alhagi maurorum* is considered as one of the important medicinal plants in Iraq. It's used fro urinary tract in fection, rheumatic pains and liver disorders (Nedhal *et al.,* 2010). Also, this plant may be used as an alternative solvent to the use of drugs. *Alhagi maurorum* belongs to the family of fabaceae, and it produces numbers of biologically important second metabolites. The species of *A. maurorum* is legumes (Duke, 2007). This plant is rhizomatous, shrub and the roots are extended six to seven feet into the earth. *Alhagi maurorum* is found in Asia: (Iraq, China, India, Palestine, Saudi Arabia, Armeni) (encyclopedia, 2005). Also, it native to the region from the Mediterranean to Russia (Duke, 2007). This plant has an antibacterial properties. Many of gum diseases are caused by the presence of food remains locked between teeth and gum lead to the rot infection, provides a suitable environment to the growing of bacteria, then the gingivitis and swollen gums will occurred (Kohler *et al*., 1984). The most important bacterial species responsible for the gingivitis are oral streptococci (Mossa *et al*., 1987). *Alhagi maurorum* is considered as one of the most important plants that have many different biological features like impact and effectiveness against oral bacteria and fungi (Al-bagieh Almas, 1997).

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Materials and methods

Collection of samples

30 samples were taken from patients in Al - Refaee general hospital / teeth unit. cotton swaps were used for this purpose. This samples were taken from person's experience gingivitis in addition to person experience bleeding gum. Cotton swaps were flooded in stuart transport medium. Then cultured in laboratory, using blood agar medium to make a checks specialized to oral streptococci, finding the produce of dextrane, anaerobic

Table 1: The effect of aqueous extract of *Alhagi maurorum* against oral streptococci isolates at the concentration of10%.

Strept-omycin	Amox-icillin	Inhibition zone diameter	Concen-tration of extract (%)	isolate
16	16	-	10%	1
10	17	-	10%	2
17	14	-	10%	3
18	14	-	10%	4
13	15	-	10%	5
14	12	-	10%	6
15	12	-	10%	7
15	14	-	10%	8
12	13	-	10%	9
12	13	-	10%	10
14	15	-	10%	11
14	12	-	10%	12
10	12	-	10%	13
12	14	-	10%	14
13	13	-	10%	15
14	12	-	10%	16
13	15	-	10%	17
13	12	-	10%	18
13	12	-	10%	19

Table 2: The effect of aqueous extract of *Alhagi maurorum* against oral streptococci isolates at the concentration of20%.

Strept-omycin	Amox-icillin	Inhibition zone diameter	Concen-tration of extract (%)	isolate
12	14	-	20%	1
14	16	-	20%	2
15	13	-	20%	3
14	14	-	20%	4
14	13	-	20%	5
14	12	-	20%	6
12	11	-	20%	7
14	13	-	20%	8
12	12	-	20%	9
12	13	-	20%	10
14	13	-	20%	11
10	12	-	20%	12
11	12	-	20%	13
14	13	-	20%	14
14	16	-	20%	15
13	15	-	20%	16
10	12	-	20%	17
11	10	-	20%	18
14	14	-	20%	19

Table 3: The effect of aqueous extract of *Alhagi manrorum* against oral streptococci isolates at the contention of30%.

Strept-omycin	Amox-icillin	Inhibition zone diameter	Concen-tration of extract (%)	isolate
12	12	-	30%	1
14	13	-	30%	2
15	14	-	30%	3
14	13	-	30%	4
14	15	-	30%	5
12	13	-	30%	6
13	14	-	30%	7
12	14	-	30%	8
11	11	-	30%	9
13	12	-	30%	10
14	14	-	30%	11
12	14	-	30%	12
12	12	-	30%	13
14	14	-	30%	14
14	14	-	30%	15
16	16	-	30%	16
12	11	-	30%	17
12	10	-	30%	18
14	12	-	30%	19

Table 4: The effect of aqueous extract of *Alhagi manrorum* against oral streptococci isolates at the concentration of40%.

Strept-omycin	Amox-icillin	Inhibition zone diameter	Concen-tration of extract (%)	isolate
14	14	10	40%	1
14	14	8	40%	2
13	12	10	40%	3
12	11	10	40%	4
16	14	11	40%	5
10	12	8	40%	6
16	12	12	40%	7
11	14	12	40%	8
10	12	10	40%	9
16	14	10	40%	10
14	15	9	40%	11
12	16	8	40%	12
11	12	11	40%	13
11	11	11	40%	14
11	10	9	40%	15
10	12	8	40%	16
10	10	7	40%	17
10	10	9	40%	18
11	12	10	40%	19

Table 5: The effect of aqueous extract of *Alhagi manrorum* against oral streptococci isolates at the concentration of 50%.

Strept-omycin	Amox-icillin	Inhibition zone diameter	Concen-tration of extract (%)	isolate
14	14	12	50%	1
12	12	10	50%	2
11	12	11	50%	3
10	12	11	50%	4
11	12	13	50%	5
11	13	10	50%	6
14	14	14	50%	7
14	13	14	50%	8
13	11	12	50%	9
11	11	10	50%	10
12	12	10	50%	11
11	10	10	50%	12
13	11	11	50%	13
12	12	12	50%	14
12	11	10	50%	15
12	12	10	50%	16
11	11	10	50%	17
13	12	11	50%	18
12	11	12	50%	19

growth and mannitol fermentation using Brain heart infusion broth. Doses of isolated bacteria were injected in tubes contain this medium with sucrose. Glass bars put in this tubes then inculcated at 37^0C for 24 hours. Medium were disposed and the same amount of medium of ethanol (70%) then added. The same amount of distilled water were added after disposed of ethanol inadditoon to the used of safranine.

The result comes as a grouping of dextrane on the wall of test tubes also at the glass bars in a red colour. This result represents the diagnostic feature of oral streptococci. This bacteria used sucrose and produced dextrane which considered as essential elements at medium structures (Remel Mic. product, 1990).

Collection of *Alhagi maurorum*

Alhagi maurorum samples were collected from different district in Dhi Qar province: Al- Refaee, Al-Shatra, Al - Nasr, Al- Nasseria and Al- Fajr from 1 June to 1 September 2018. In this study, we use the leaves, steam and roots of a plant, plant classified in the laboratories of Basic - education college - department of science at Sumer university.

Plant was dried in shade, then grinded to get a homogeneous powder then saved unitl utilized (Nedhal *et al.,* 2010).

Preparation of aqueous extract of *Alhagi maurorum*

10gm of prepared powder were taken and put in flask100ml of distil water were added, and let the infusion for 48h. Centrifuge was used to starts the precipitation at 2000 cycle/minute for 10 minutes. Fluied were used after pass through filter papers. Extract prepared at the concentration of: 10%, 20%, 30%, 40% and 50% using sterilized distil water, saved at 4c and used during 2weeks only (Harborae, 1984). Muller-Hinton agar used to culture the oral streptococcal isolate holes make at the medium at 5 millimeter diameter. 100 microlitters of extract put at the holes to all the prepared concentrations in addition to the founded of controlled sample. 10 microgram of Amoxicillin and streptomycin were used like discs for sensitive tests (Al-Bagieh & Almas, 1997).

Results and Discussion

Diagnostic tests of oral streptococci showed that 19 of 30 samples that taken from patients were positive. Also, the results showed that the use of different concentrations of *Alhagi maurorum* extract were as follow:

The concentrations of 10%, 20%, 30% had not any inhibition effect against oral streptococci asin table (1, 2, 3) when we used the concentration of 40% and 50%, it has an inhibition effect against oral streptococci in different ratios, in comparison with antibiotic discs (Amoxicillin and streptomycin) as in table 4, 5. Many studies showed that *Alhagi maurorum* contains many active components have an inhibition effect against microorganisms. These components are: Tanin, glycosides, resins, flavonoids and turbines (Al-kanteeb & Marie, 2005). This compatible with the study referred by mossa *et al.,* (1987).

The inhibition effect of *Alhagi maurorum* aqueous extract against oral streptococci return to the founded of these active components these have an effect by suspend the activity of oral bacteria in gingivitis case (Al-Lafi & Ababneh, 1995). The lack of inhibition effect at the concentration and: 10%, 20% and 30% of *Alhagi maurorum* aqueous extract, may be returned to the limits or decline of active components in these low concentrations of aqueous extract. Studies indicated that the most of oral streptococci as: *Streptococcus mitis*, *Streptococcus sanguis* and *Streptococcus mutans*, are sensitive against many of antibiotics like Amoxicillin and streptomycin. Also, studies indicate that there are many factors have an effect in the minimizing the impact of plant extracts. Against bacterial isolates as: Age, smoking and chronic diseases (like diabetes). (Lewis, 2003).

This study concluded that the aqueous extract of *Alhagi maurorum* at the concentration of 40% and 50% have an antibacterial activity so, we recommend using this plant as antibacterial natural source to protect peoples from gingivitis.

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