In Vitro Activity of Methanol Extract of Microalgae Hapalosiphon aureus Against Trichomonas vaginalis

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Abstract —The present study targets the protozoan parasite Trichomonas vaginalis that causes a healthy problem among women and rarely among men, by the application of natural product or secondary metabolites extracted from the microalgae Hapalosiphon aureus for the first time in Iraq. methanol extract was explained high activity in three concentration recording 100% of parasite death at 200 µg/ml of methanol extract in about two days while 150 and 100 µg/ml of extract reports activity against the parasite after four and fivedays post treatment respectively. GC- Mass spectrum of the methanol extract has explain presence of the compound (2-deca-3, d-dienyloxy) carbonyl benzeoic acid in about 13.28 % from the total composition of methanol extract of microalgae.

Keywords— Sexually transmitted disease, T. vaginalis, methanol extract.

I. INTRODUCTION
Trichomoniasis is a sexually transmitted disease (STD) with important health ramification; it has been associated with vaginatis, Urethritis, and pelvic inflammatory disease (PID). Trichomoniasis also impacts upon birth outcomes and is co–factor in human immunodeficiency virus (HIV) transmission and acquisition (Swygard et al., 2004). Symptoms in women with Trichomoniasis include vaginal discharge, dysuria, and pruritus, in men symptoms include the urethral discharge, urethral pruritus, and dysuria (Schwebke and Burgess 2004). Approximately 180 million women worldwide may be infected with T. vaginalis. Prevalence estimates vary between population studies but ranging from 5-74 % in women and 5 – 59 % in men, with the highest rate reported in either sex from sexually transmitted infection (STI) clinic and in other high risk population (Karyakarte and Damle 2004). The undesirable side effects associated with this classical drug, as well as the development of resistance, are encouraging research into alternative synthetic or natural compounds effective for the treatment of hydatid disease. In this regard, most studies have been focused on activity of natural products from algae chlorophyta and cyanophyta as antibacterial, antifungal, anticancer, and anti-parasitic compounds (Takeaki et al., 2003; Abass, 2010).

II. MATERIAL AND METHODS
• Microalgae and methanol extract preparation

Hapalosiphon aureus were cultured by using Chu – 10 mediums, briefly, jars of 5 liters were filled with 3 liters of liquid medium, inoculated with desired algae, and then transferred to growth chamber at 12-25 °C. Constant illumination was used at 60 µE/m²/cm intensity with white fluorescent loup. Algae was harvested at the medium of stationary phase by using GFA pre weighed filter paper and centrifuge methods. Freeze – dried weighted again to reach a fixed weight of dried microalgae. The methanol extracts to be prepared; dry mass in ratio (1: 15 g/ml) was extracted using magnetic starrier through 24 hours. The precipitates were removed by filtration and left to dry until use, and then the filtrates were concentrated at room temperature.

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MEASUREMENTS
Gas chromatography - mass spectra of fraction applied for the identification and determination of the molecular weight and chemical formula and structure of the purified chemical active compounds. It was done in Bruker company, Iran and Al-Elbait university in Jordin.

III. Results
Methanol extract of Hapalosiphon aureus recorded high activity at 200 μg/ml after 2 – days post treatment, while 100 μg/ml has explained activity after 5 days and 150 μg/ml revealed activity after 4 days – post treatment. The previous results of extract activity reported after days for each concentration till use, but the activity of this product were observed after one hour as explain at the following table(1).

<table>
<thead>
<tr>
<th>Compound</th>
<th>% of total</th>
<th>Peak</th>
<th>R.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Phyol</td>
<td></td>
<td>1</td>
<td>20.264</td>
</tr>
<tr>
<td>- (2- deca - 3,d- dienlyoxy) carcinyl benzoic acid</td>
<td></td>
<td>2</td>
<td>22.647</td>
</tr>
<tr>
<td>- Ethyl linoleolate</td>
<td></td>
<td>3</td>
<td>25.946</td>
</tr>
<tr>
<td>- Diterpine</td>
<td></td>
<td>4</td>
<td>32.411</td>
</tr>
</tbody>
</table>

IV. IV. DISCUSSION

Natural products have been the source of therapies since the advent of traditional medicine and healing; it remains a dominant source to date. The World Health Organization (WHO) estimates that 80% of the world’s inhabitants depend mainly on traditional medicine for their primary health care (Tuney et al., 2006; Taran et al., 2009). The biochemical medicinal activity of natural products results from inhibition of enzymes action by interaction with thymol group (Sh) of enzymes and linking with DNA & RND, then destruction of these nucleic acids and finally inhibition the biosynthesis of cell proteins, metabolism of each of carbohydrates, and lipids.

Three concentrations of the methanol extract of H. aureus were used in the present study and it had an in vitro activity against T. vaginalis, and the time plays an important role in the treatment since the decreased concentration leads to increase the time of treatment. The activity of the methanol extract could be explained by the presence of the compound (2- deca - 3,d- dienlyoxy) carcinyl benzoic acid.

It is difficult to speculate the mechanism by which these bioactive compounds act as parasiticidal agents. In this
regard Sepulveda-Boza and Cassels (1996) suggested that many bioactive chemical compounds exhibited their parasitecidal activity by virtue of their interference with the redox balance of the parasites, acting either on the respiratory chain or the cellular defenses against oxidative stress. It is also known that some bioactive compounds act by binding with the DNA of the parasite. For example, dihydroorotate dehydrogenase (DHOD), the fourth enzyme in the de novo pyrimidine biosynthetic pathway, is essential to parasites, including the electron acceptor capacity and cellular localization (Morales-Landa et al., 2007). In this way, it has been recently demonstrated that the methanol extracts of brown algae Ishige okamurae, Fucus evanescens, and Pelvetia babingtonii contain potent noncompetitive inhibitors against Trypanosoma cruzi DHOD (Takeaki et al., 2003; Morales-Landa et al., 2007).

V. REFRENCE


