

# Combined Efficacy of *Lawsonia inermis* and *Myrtus communis* Extract as a Potential Factor in Bacterial Treatment to Hospital Wastewater, Iraq

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**Abstract.** The current study aimed to use biological treatment using plant extracts; extracted from some locally available plants: *Lawsonia inermis* (Henna), and *Myrtus communis* (Yass), against pathogenic bacteria isolated from heavy water in hospitals that do not have treatment plants. The two studied plants were extracted using two different solvents (water and alcohol). Diagnosis of these extracted using Gas chromatography (GC -MS) showed that the alcoholic extraction led to a higher percentage of effective phenolic compounds than the aqueous extract. Sewage water was used to isolate bacteria and according to the morphological, and biochemical, confirmed by using the vitke II instrument; six types of pathogenic bacteria were identified (*Staphylococcus lentus*, *Staphylococcus xylosus* *Sphingomonas paucimobilis*, *Escherichia coli*, *klebsiella oxytoca*, *Serratia ficaria*).The two Alcoholic plant extracted showed excellent antibacterial activity against all pathogenic bacteria than the water extracted as revealed by the diameter of the inhibition zone.

**Keywords.** Bacterial treatment, *Lawsonia inermis* (Henna), *Myrtus communis* (Yass), Medical extracts, Private and government hospitals.

## 1. Introduction

Nature has always been and continues to be a source of foods and ingredients beneficial to human health and plant extracts are increasingly becoming important additives in the food industry due to their content of bioactive compounds such as polyphenols and carotenoids [1], which have antimicrobial and antioxidant activity, especially against Low-density lipoprotein [2]. *Lawsonia inermis* (Henna) is a shrub or small tree grown in many regions as a commercial ornamental dye crop [3]. They are mostly found in tropical, subtropical and semi-arid regions of Africa (tropical savanna and tropical arid regions), southern Asia and northern Australia [4], a wide range of chemical constituents have been isolated from henna which includes naphthoquinone derivatives (lawson which is the main component and coloring matter in leaves), phenol derivatives, coumarins, xanthonnes, flavonoids, aliphatic components, triterpene, sterols and other chemical components such as glucose and gallic acid. And amino acids, mannitol, trace elements and minerals [5]. While *Myrtus communis* (Yass), common myrtle or true myrtle, is a type of flowering plant in the myrtle family Myrtaceae. It

