

# Effect of YEMECIN antibiotic on bacteria gram positive *Streptococcus mutans*, *Staphylococcus albus* and gram negative *E. coli*, *Salmonella typhi*

## Abstract

**Introduction and objective:** This study aims to identify the effectiveness of YEMECIN antibiotic that has been recently discovered in Yemen and its impact on some Gram Positive bacteria (*Streptococcus mutans*, *Staphylococcus albus*) and some Gram Negative (*E. coli*, *Salmonella typhi*), which have been obtained pure in hospitals and others have been isolated at Laboratory. The organisms have been obtained as pure cultures from hospitals and laboratories.

**Materials and methods:** The study was conducted to validate the effectiveness of extracts and their effects on bacteria. The following microorganisms were employed in the study (Positive and Negative): *Staphylococcus albus*, *Streptococcus mutans*, *Salmonella typhi*, *E. coli*.

**Results:** The results of sensitivity screening, which were performed in the following ways: (CD-proliferation plates and confirmation way), showed the sensitivity of these microbes with rates ranging between (99%) for YEMECIN antibiotic to (36.2%) for Oxacillin with X antibiotics. While the less ones were antibiotics for *Streptococcus mutans*, *Staphylococcus albus*.

**The inferences:** The results showed the effectiveness of YEMECIN antibiotic with its quality in eliminating most microbes especially *E. coli* and less influence on *Salmonella typhi* and *Staphylococcus albus*.

**Keywords:** YEMECIN antibiotic, resistant, sensitivity, *Escherichia coli*, *Salmonella typhi*, *Streptococcus mutans*, *Staphylococcus albus*

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## Introduction

Garlic is one amongst the edible plants that has generated a great deal of interest throughout human history as a medicinal panacea. A wide range of microorganisms including, bacteria, fungi, protozoa and viruses have been shown to be sensitive to crushed garlic preparations. Moreover, garlic has been reported to cut back blood lipids and to own metastatic tumour effects. Chemical Analyses of garlic cloves have unconcealed an uncommon concentration of sulfur-containing compounds (1-3%).<sup>1,2</sup> search of the medical database at the National Library of Medicine in the USA reveals that garlic is top of the league for published research papers that cover a wide variety of disease conditions, the most prevalent of which are its significant antimicrobial properties.<sup>3</sup> Products have created giant contributions to human health and well-being. the inexperienced pharmacy might become the bottom for the event of medicines by providing a pharmacophore that might be used for the event of the latest drug with novel mechanisms of action.<sup>4</sup> Garlic (*Allium sativum*) could be a common spice used for seasoned and has been historically fashionable robust folkloric awareness. it's the edible bulb of lily family, *Liliaceae*. It contains aromatic sulfur based mostly compounds, that contribute to the characteristic odor and style. Antimicrobial activity of garlic is attributed to its key component Allicin.<sup>5</sup> The YEMECIN antibiotic this is new antibiotic it's discovery in Yemen which were this antibiotic showed effect of eliminating most microbes (bacteria and fungi) and that effect more than some antibiotic.<sup>6</sup>

## Study objectives

a. This study aims to identify the effectiveness of the YEMECIN

antibiotic on some Gram positive and some Gram negative.

b. Using the YEMECIN antibiotic as an essential antibiotic and an alternative to industrial antibiotics that have side effects on public health.

## Materials and Methods

### Culture media

I attended all agricultural communities as instructed by the company processed and sterilized with a temperature of autoclaves 121°C and under pressure (15) lbs/Wang for a period of 15 minute.

### Solutions and staining used

Distilled water; YEMECIN antibiotic, Sodium Hydroxide (NaOH); and Bromocresol Purple dye.

### Sterilization

All work has been carried out under strict sterilization procedures and sterile conditions during the course of isolation, reclamation, bacteriological and dietary tests.

### Devices and tools

- a) **Devices:** Centrifuge, a device measure pH, a delicate balance, refrigerator cooling room, hood, and an incubator.
- b) **Tools and glassware:** Pirate glass of different sizes, Petri dishes, glass pipettes, test tubes, DH pipes, Loeb, a Needle, a filter paper, and paper punch.

## Working methods

Sensitivity screening test for *Streptococcus mutans*, *Staphylococcus albus*, *E. coli*, *Salmonella typhi* bacteria.

### Disk Diffusion

It is way in which we use the pre-wetted filter paper in the extracts of (YEMECIN) antibiotic.

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It's approach within which we tend to use the pre-wetted paper within the extracts of (YEMECIN) antibiotic.

The circle's area unit prepares that area unit wont to develop the microorganism mentioned earlier. Conjointly making ready the extracts of (YEMECIN) antibiotic and Pharmacy antibiotics to be placed within the clean, striated and day pipes. Then a precise quantity of paper that was fashioned within the form of tiny disks during a diameter starting from zero.5 cm; in every tube, there are associate extracts of (YEMECIN) antibiotic and Pharmacy antibiotics. The disks ought to be left within the tube for an amount between a 0.5 on hour to 2 hours to soak up a solvent quantity of (YEMECIN) antibiotic and Pharmacy antibiotics.<sup>7</sup> When analytic microorganism, we tend to table the paper saturated with the extracts of (YEMECIN) antibiotic and Pharmacy antibiotics and place it in several places by sterilized extractor with alcohol and flame to put in on the surface by the sunshine pressure by forceps; all ought to be alone. When words, incubating the growth dishes on a temperature of 37°C and for an amount between (24-48) hours.

### Confirmatory test to detect the inhibitory ability of the extract of (YEMECIN) antibiotic and Pharmacy antibiotics

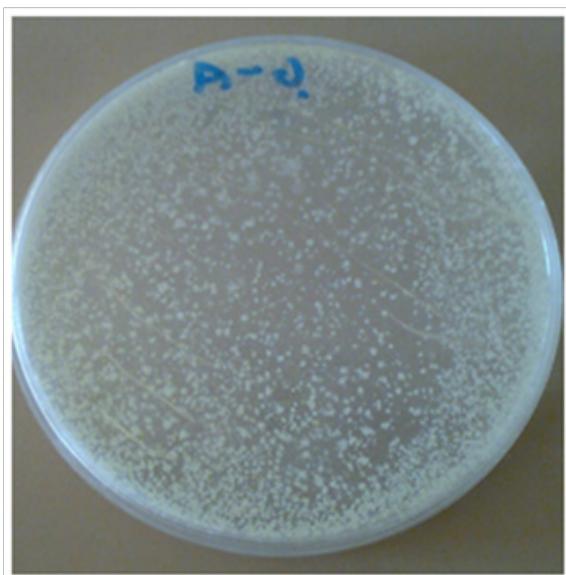
This way is dove by pouring the extract of (YEMECIN) antibiotic and Pharmacy antibiotics on the growth after transplanting bacteria by planning to observe the inhibition. The way is the same way of (Disk-proliferation), but the difference lies in that after isolation, the process of pouring a certain amount of (YEMECIN) antibiotic and Pharmacy antibiotics on the growth disks and placing the dishes into the incubator to grow at a temperature of 37°C for a period, the results are recorded. All work has been carried out under strict sterilization procedures and sterile conditions during the course of isolation, reclamation, bacteriological and dietary tests.

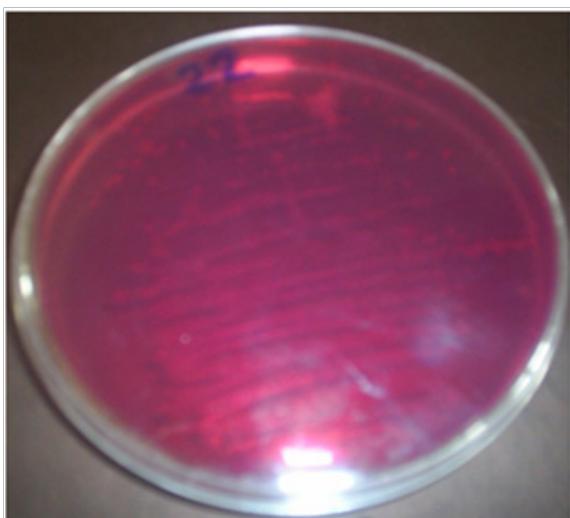
## Results

The results refer to the sensitivity of YEMECIN antibiotic, Ampicillin antibiotic, Oxacillin antibiotic & X antibiotic, and their percentages. The results of the sensitivity examination state the sensitivity of those microbes for many of those extracts employed in this study with rates vary between (99%) for YEMECIN antibiotic, (81.5%) for Ampicillin antibiotic, and (67.3%) for Oxacillin antibiotic. (50%) for X antibiotic, everyone sort of Oxacillin with X antibiotics and (36.2%) for antibiotics. The variations will be seen through the sensitivity of YEMECIN and antibiotics will be seen that variation in sensitivity through numerous sorts of ID (Figures 1-9).

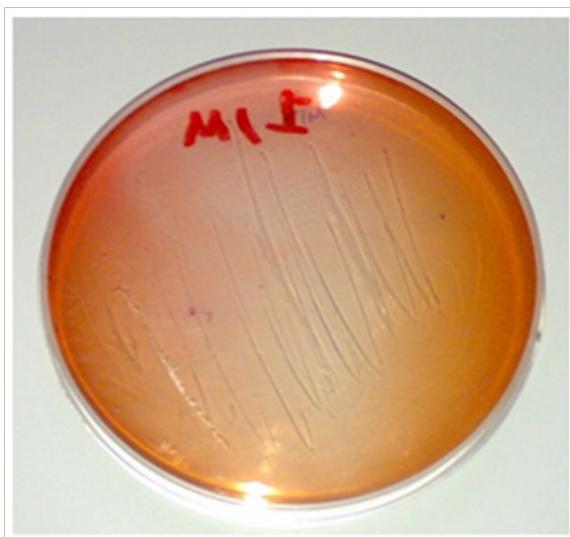
The affected bacteria were *Streptococcus mutans*, *Staphylococcus albus* treated by YEMECIN antibiotic, but it was not affected by P antibiotic, X antibiotic and X1 antibiotic. Regarding the effectiveness of P antibiotic was high on *Salmonella typhi* and no the plates

treated. When mixing X antibiotic and X1 antibiotic both, these is growth. Regarding *E. coli* the results stated that this bacteria was affected by YEMECIN antibiotic with less affected by all Antibiotics (Disk diffusion way).<sup>7</sup> For *Salmonella* bacteria, the result stated the effectiveness of P antibiotic on *Salmonella typhi*, with less affected by YEMECIN antibiotic, however these was no growth for this bacteria when using the X1 antibiotic, those is no growth when mixing X antibiotic and X1 antibiotic both, these is growth. This means that the mixture of X and X1 antibiotic does not give effectiveness. Some results failed to state the effectiveness of YEMECIN extracts by mistreatment them one by one or mixture them along on *Salmonella typhi*. Through the results, it was stated that there is no effect of YEMECIN antibiotic on bacteria *E. coli*, *Streptococcus mutans*, & *Staphylococcus albus*. These results correspond with (ATAA, 2017-2018; Rees et al., 1993; Breithaupt-Grolger et al, 1997), which state that is an effect on bacteria *E. coli*. Lysozyme effect on bacteria *Salmonella* was similar to (ATAA, 2017 -2018; Michel et al, 2007) study which stated that there is effectiveness on *Salmonella*.

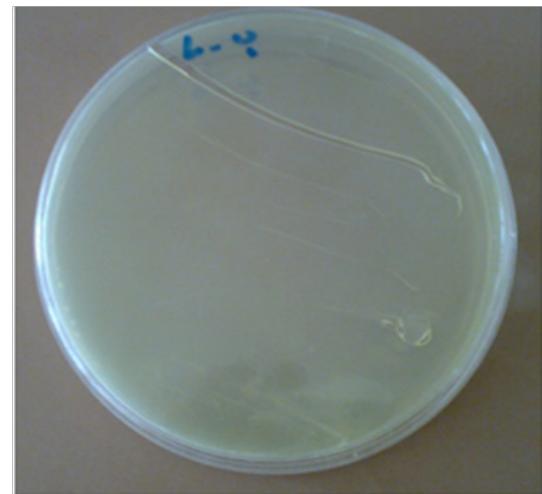




**Figure 1** Showed control samples on Gram Positive and Gram negative.



**Figure 2** The inhibitory capacity of the extracts on, *Staphylococcus aureus*, method Confirmatory test.



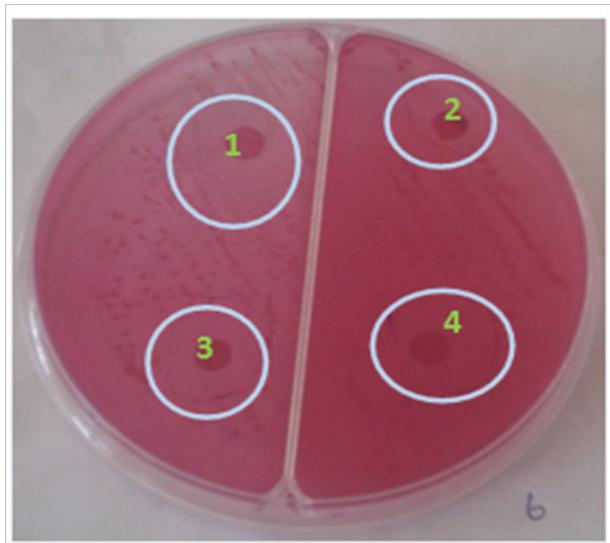
**Figure 3** The inhibitory capacity of the extracts on, *E. coli*, method Confirmatory test.



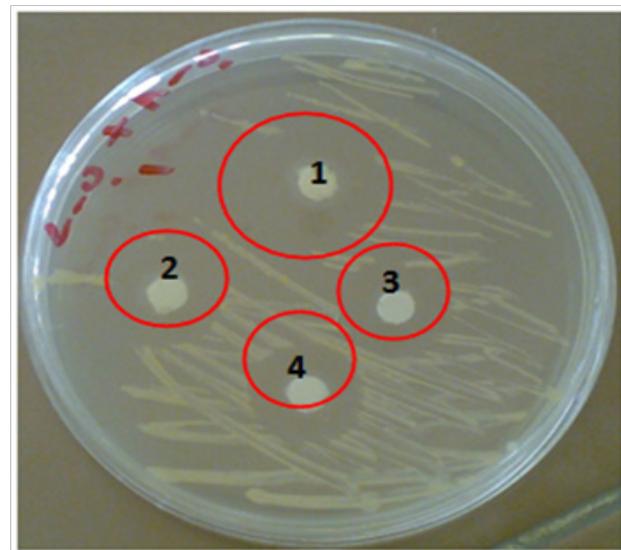
**Figure 4** The inhibitory capacity of the extracts on, *Staphylococcus albus*, method Confirmatory test.



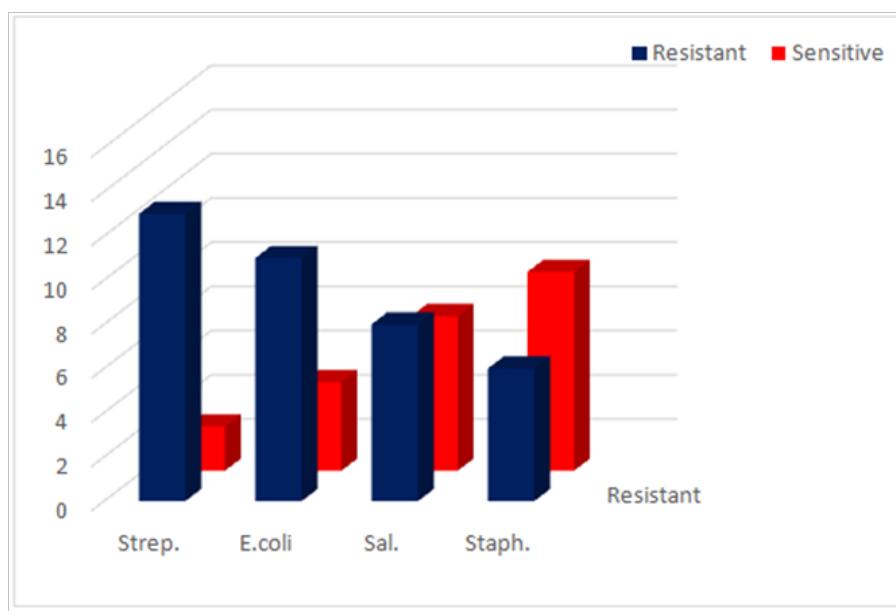
**Figure 5** The inhibitory capacity of the extracts on, *Salmonella typhi*, method Confirmatory test.



**Figure 6** The inhibitory capacity of the extracts on *Staphylococcus albus*, method Disk Diffusion. (1)YEMECIN antibiotic, (2) P antibiotic, (3) X antibiotic,(4) XI antibiotic. Zone of inhibition (1) 2.6 Cm, (2) 0.5 Cm, (3) 1.4 Cm, (4) 2.8 Cm.



**Figure 7** The inhibitory capacity of the extracts on, *E.coli*, method Disk Diffusion. (1) YEMECIN antibiotic, (2) P antibiotic, (3) X antibiotic,(4) XI antibiotic. Zone of inhibition (1) 3 Cm, (2) 1.8 Cm, (3) 1.1 Cm, (4) 1.2 Cm.



**Figure 8** Sensitive of Bacteria (YEMECIN and Antibiotics) (method of disks spread and confirmed test)

- YEMECIN antibiotic 89.7%

- Ampicillin antibiotic 72.4%

- Oxacillin antibiotic 48%

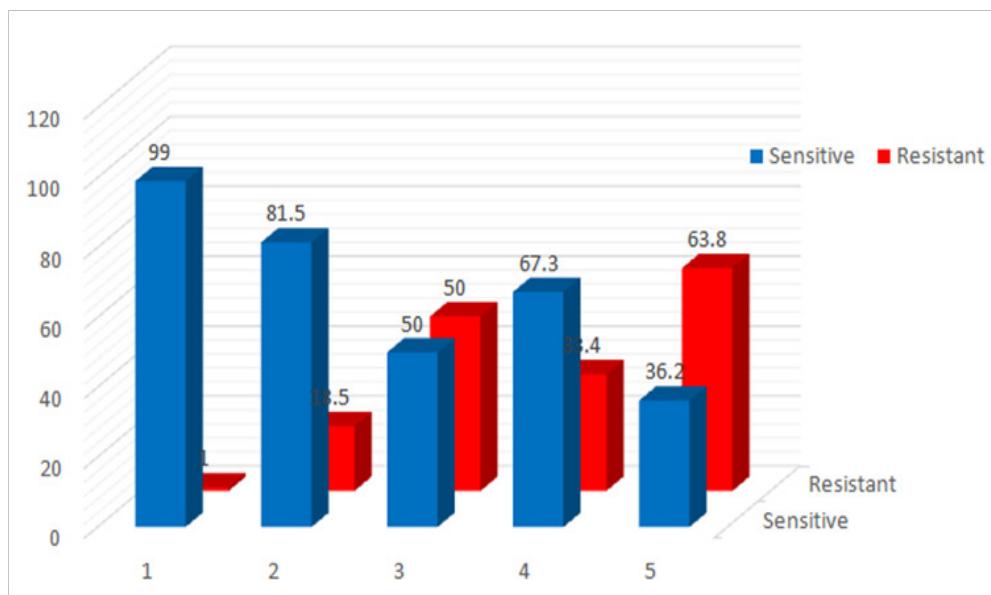
- X antibiotic 34.5%

- \* **Strep. *Streptococcus mutans***

- \* **E.coli . *Escherichia. Coli***

- \* **Sal. *Salmonella typhi***

- \* **Staph. *Staphylococcus albus***



**Figure 9** The sensitivity of bacteria to (YEMECIN and Antibiotics)

## Conclusions

- High efficiency of the YEMECIN antibiotic with P antibiotic on *Streptococcus mutans* and *Salmonella typhi* & *Staphylococcus albus*,
- The effectiveness of YEMECIN antibiotic in eradicating *E. coli* in all transactions.

## Acknowledgments

None.

## Conflicts of interest

Author declares that there is no conflict of interest.

## References

- Alli JA, Boboye BE, Okonko IO, et al. *In-Vitro* assessments of the effects of garlic (*Allium sativum*) extract on clinical isolates of *Pseudomonas aeruginosa* and *Staphylococcus albus*. *Adv Appl Sci Res*. 2011;2(4):25–36.
- Menghani E, Pareek A, Negi RS, et al. Search for antimicrobial potential from certain Indian medicinal plants. *Res J Med Plants*. 2011;5(3):295–301.
- Al-Bari MAA, Khan A, Islam MR, et al. Isolation and *in vitro* antimicrobial activities of ethyl acetate extract from *Streptomyces bangladeshensis*. *Res J Microbiol*. 2007;2(3):272–277.
- Pranoto Y, Rakshit SK, Salokhe VM. Enhancing antimicrobial activity of chitosan films by incorporating garlic oil, potassium sorbate and nisin. *LWT–Food Science and Technology*. 2005;38(8):859–865.
- Darbyshire B, Henry RJ. Differences in fructan content and synthesis in some Allium species. *New Phytol*. 1981;87(2):249–256.
- Koch HP, Lawson LD. *Garlic, the science and therapeutic application of Allium sativum L. and related species*. In: Retford DC, eds. Lippincott Williams & Wilkins. Baltimore: Wolters Kluwer; 1996. 233 p.
- Asaad MA Ataa. Use of Enzyme Lysozyme & anti-bacterial Allicin for food preservation and prevent at damage. *World Journal of Biology and Biotechnology*. 2017;2(3):169–173.
- Asaad MA Ataa. Study of the Effects of YEMECIN Antibiotic on Bacteria Causing Food Corruption and also as a Preservation for Milk, Meat and Canned Food. *BAOJ Microbiol*. 2018;4(2):034.