



Review article

## Effectiveness of Herbal Treatment on Otitis Media: A Literature Review

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### Abstract

**Introduction:** Otitis media is inflammation of part or all of the middle ear mucosa, Eustachian tube, mastoid antrum, and mastoid cells. Treatment that can be given to otitis media is by using antibiotics. However, herbal medicine can also be used.

**Method:** This research is secondary research using the literature review method.

**Results:** The use of herbal ingredients such as ginger, tebel-tebel (*Hoya carnosa*), and ethanol extract of kaffir lime (*Citrus hystrix*) turned out to be effective and has strong antifungal and/or antibacterial properties. However, binahong (*Anredera cordifolia*) leaf extract was not effective against bacteria, the antibacterial activity showed a weak inhibitory response, with an average inhibitory area diameter (DDH) of 0.00 mm.

**Conclusion:** Overall, several herbal medicines showed great potential as alternatives to antibiotics, except for *binahong* leaf extract which was less effective. Further studies are needed to strengthen the results and clinical applications.

**Keywords:** Anti-Bacterial Agents, Anti-Fungal Agents, Herbal Medicine, Otitis Media, Treatment

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### INTRODUCTION

Otitis media is an inflammation of part or all of the mucosa of the middle ear, Eustachian tube, antrum/mastoid, and mastoid cells. If the process occurs for more than 12 weeks, it is called chronic. (Alkatiri, 2019). Otitis media is an inflammation of part or all of the mucosa of the middle ear, Eustachian tube, mastoid antrum and mastoid cells. (Samantha & Almalik, 2021). Otitis media (OM) is the medical name for an infection of the tympanic membrane or middle ear, and is characterized by ear pain or discharge. Infections of the ear canal can be acute or chronic. (Almuhayawi et al., 2023). Acute Otitis Media is an inflammation that occurs quickly and briefly (in less than 2 months) which is accompanied by local and systemic symptoms. (Waqqas et al., 2024). Chronic Suppurative Otitis Media (CSOM) is a chronic inflammation of the mucosa of the middle ear and mastoid characterized by perforation of the tympanic membrane accompanied by purulent otorrhea which persists for more than 6 weeks despite adequate therapy for acute otitis media. (Pranitasari et al., 2022).

Current management of otitis media is based on the therapy standards of the Indonesian Ministry of Health and the Social Security Administering Agency (BPJS) at the primary care level in health centers using topical antibiotic preparations of Chloramphenicol 1% ear drops based on previous studies. However, Currently, the antibiotic Chloramphenicol ear drops 1% do not appear to be effective due to bacterial resistance, ototoxic effects, and idiosyncratic responses. (Lesmana et al., 2020). Management of otitis media is still a challenge for clinicians. Topical antibiotic administration combined with ear cleaning is an effective therapeutic option for otitis media without cholesteatoma. The use of topical antibiotics has the advantage of high drug concentrations distributed directly to the infected ear. However, its penetration ability will be reduced if accompanied by tympanic membrane perforation and the presence of a lot of ear fluid. (Pranitasari et al., 2022).

Based on the description above, the treatment of otitis media with medical treatment is apparently less effective. There are several studies that discuss the treatment of otitis media using herbal medicine. The purpose of this literature review is to determine the effectiveness of herbal medicine for various types of otitis media.

## METHOD

This research is a secondary research using the method *literature review*, namely describing theories, findings and other research materials. The journals obtained are journals published in 5 years the last one is from the year 2019 until 2022 with the number four journals using the keywords “anti-bacterial agents”, “anti-fungal agents”, “herbal medicine”, “otitis media” and “treatment”. All data and information obtained were selected based on their relevance and then analyzed descriptively to explain the various existing methods.

## RESULTS

The four journals were identified by the author based on inclusion and exclusion criteria. The author then extracted data from the four selected articles. Data extraction was done by analyzing and grouping important data according to author name, year, title, research methodology, and results. The extracted data can be seen in Table 1.

**Table 1.** Extraction results

| No | Author and Year            | Title  | Journal                  | Method  | Research Result  |
|----|----------------------------|--|--------------------------|---|--|
| 1  | Al-Attraqchi et al. (2019) | The Vitro Study Effect of Ginger Extracts on Fungal Isolated from A Suppurative Otitis Media and Externa   | Iraqi Journal of Medical | This study is a descriptive statistical study with the agar diffusion test method. Data were analyzed using statistical software. | The results showed that there was a significant effect of ginger extract (chloroform, methanol, and water) on pathogenic fungi. Ginger extract has shown a significant inhibitory effect zone against pathogenic fungi by chloroform more than ethanol, with less effect by water extract.   |
| 2  | Lesmana et al. (2020)      | Inhibitory test of ear drop preparation of “Tebel-tebel” leaf extract (Hoya carnososa) against gram-positive and gram-negative bacteria causing active benign type Chronic Suppurative Otitis Media (CSOM) in vitro at Sanglah General Hospital, Bali, Indonesia | Intisari Sains Medis     | This research is an experimental research with a post-test only control group design.   | The results of the study showed that there was inhibitory power (DDH) from ear drops containing Hoya carnososa leaf extract at concentrations of 1%, 3% and 5% against Streptococcus pyogenes bacteria, indicating the presence of bacteriostatic or antibacterial effects from active compounds contained in the leaves such as flavonoids, saponins, tannins and alkaloids.  |
| 3  | Fadlan et al. (2021)       | Activity Test of Ethanol Extract of Kaffir Lime on Histopathological Features of Middle Ear Mucosa Infected with Staphylo-coccus aureus in Wistar Strain   | Prima Medical Journal    | This research is a research experimental with a post-test only control group design.  | The results of this study indicate that for each treatment group from the control treatment, 50% concentration of kaffir lime peel extract, and Ofloxacin, on average have effectiveness against the growth of staphylococcus aureus bacteria in the middle ear mucosa histopathologically, with a significance value of 0.009 for the control group, 0.002 for the 50% extract and 0.000 for the Ofloxacin extract. |
| 4  | Pranitasari et al. (2022)  | Antibacterial Potential of Ear Drops Anredera Cordifolia Leaf Extract against  | Intisari Sains Medi      | This research is a research experimental with post-test only control group  | Antibacterial activity showed a weak inhibitory response, with an average diameter of inhibition area (DDH) of 0.00 mm. Binahong leaf extract ear  |

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Pseudomonas  
aeruginosa which  
causes  
Chronic  
Suppurative Otitis  
Media (CSOM)

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design

drops were not effective against  
Pseudomonas aeruginosa in  
vitro.

## DISCUSSION

Otitis media is an inflammation of the mucosa of the middle ear. Common symptoms of otitis media are pain, malaise, fever and symptoms of upper respiratory tract infection that last for several days (Ratnasari, 2023). Treatment that can be given for otitis media is by using antibiotics. However, the use of herbal medicine can also be done. Natural medicine or herbal medicine is a medicine that contains active compounds derived from plants and/or medicinal preparations from plants. Herbal medicine is made from plants, mineral materials, animal body parts, or galenic preparations that are believed to have been passed down from generation to generation to help overcome various health problems (Agoes, 2007 in Shufyani et al., 2024). Herbs are parts of plants or all parts of plants, either fresh or dried (dried) that have medicinal properties. The term herbal is identical to medicinal ingredients that come from plants. Traditional medicine is a medicinal ingredient that can be in the form of plants, plant parts, minerals, animals, and extracts that are used for generations that have medicinal properties. (Rizki & Wathan, 2022). The use of herbal/traditional medicine is generally considered safer than the use of chemical/synthetic drugs. This is because herbal/traditional medicine has relatively fewer side effects than chemical/synthetic drugs (Dirhamsyah, 2021).

In this literature review, the herbal ingredients used are ginger, tebel-tebel (*Hoya carnosa*), ethanol extract of kaffir lime (*Citrus hystrix*), and extract of binahong leaves (*Anredera cordifolia*). The results of the research conducted Al-Attraqchi et al. (2019) showed that there was a significant effect of ginger extract (chloroform, methanol, and water) against pathogenic fungi. Ginger extract was effective against pathogenic fungi, especially with chloroform solvent. Chloroform extract of ginger showed the strongest antifungal effect. Ginger is a strong antioxidant and can reduce or prevent the formation of free radicals. This natural herbal product is known to have strong antifungal properties.



**Figure 1.** Ginger

Source: <https://images.app.goo.gl/UuvfcCFUzgbGsJAH6>

In line with research conducted by Lesmana et al. (2020) that the use of herbs is effective. The results of the study showed the inhibitory power (DDH) of ear drops of *Hoya carnosa* leaf extract at concentrations of 1%, 3% and 5% against *Streptococcus pyogenes* bacteria, indicating the presence of bacteriostatic or antibacterial effects of active compounds contained in the leaves such as flavonoids, saponins, tannins and alkaloids. *Hoya carnosa* leaf extract shows antibacterial potential, although it still needs optimization of the formulation for more effective results.



**Figure 2.** *Tebel-tebel (Hoya carnosa)*

Source: <https://images.app.goo.gl/ijPYix2FysdkJHyz6>

The results of research conducted by Fadlan et al. (2021), regarding the activity test of ethanol extract of kaffir lime, it was obtained for each treatment group from the control treatment, kaffir lime peel extract with a concentration of 50%, and Ofloxacin, on average had effectiveness against the growth of staphylococcus aureus bacteria in the middle ear mucosa histopathologically, with a significance value of 0.009 for the control group, 0.002 for the 50% extract and 0.000 for the Ofloxacin extract. All treatments were effective against the growth of Staphylococcus aureus in the middle ear mucosa histopathologically, but Ofloxacin had the highest effectiveness.



**Figure 3.** Kaffir lime (*Citrus hystrix*)

Source: <https://images.app.goo.gl/ms1Dceiog7MnTkKm8>

Binahong leaf extract (*Anredera cordifolia*) contains active compounds found including alkaloids, flavonoids, saponins, phenols, and tannins. Research conducted byPranitasari et al. (2022)on the use of ear drops of *Anredera cordifolia* leaf extract or binahong leaves, the results showed that the antibacterial activity showed a weak inhibitory response, with an average inhibition area diameter (DDH) of 0.00 mm. Ear drops of binahong leaf extract were not effective against *Pseudomonas aeruginosa* in vitro.



**Figure 4.** Binahong (*anredera cordifolia*)

Source: <https://images.app.goo.gl/9aF1dXo6nLaJzHY99>

## CONCLUSION

The results of the literature review of the research that the author has conducted in 4 journals The article on the effectiveness of herbal medicine for otitis media is that the use of herbal ingredients such as ginger, tebel-tebel (*Hoya carnosa*), and ethanol extract of kaffir lime (*Citrus hystrix*) are effective and have strong antifungal and/or antibacterial properties. However, binahong leaf extract (*Anredera cordifolia*) is not effective against bacteria, antibacterial activity shows a weak inhibitory response, with an average inhibition area diameter (DDH) of 0.00 mm.

Overall, several herbal medicines showed great potential as alternatives to antibiotics, except for binahong leaf extract which was less effective. Further studies are needed to strengthen the results and clinical applications.

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