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A Review on Antimicrobial Activity of Medicinal Plants Against Human Pathogens

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INTRODUCTION

1.1 Development of antibiotics

The discovery and development of antibiotics are among the most powerful and successful achievements of modern science and technology for the control of infectious diseases. However, the rate of resistance of pathogenic microorganisms to conventionally used antimicrobial agents is increasing with an alarming frequency (Ge et al., 2002; Nair and Chanda 2005; Neogi et al., 2008). Isolation of microbial agents less susceptible to regular antibiotics and recovery of resistant isolates during antibacterial therapy is increasing throughout the world (Cohen 2002; Hancock 2005). In addition to this problem antibiotics are sometimes associated with adverse side effects on the host, which include hypersensitivity, depletion of beneficial gut and mucosal microorganisms, immune suppression and allergic reactions (Al-Jabri 2005).

1.2 Antibiotic resistant microorganisms

Bacteria naturally develop resistance to antimicrobial drugs. In recent years, however, the overuse and misuse of antibiotics has caused a growing emergence of multidrug-resistant pathogens. The incidence of epidemics due to drug resistant microorganisms and the emergence of new diseases pose challenges in public health concerns. Historically, plants have already proved to be alternative source to the currently existing anti-infective agents. Plant derived medicines have made contributions to human health. The number of multi-drug resistant microbial strains and the appearance of strains with reduced susceptibility to antibiotics are continuously increasing. This increase has been attributed to indiscriminate use of broad-spectrum antibiotics, immunosuppressive agent, intravenous catheters, organ transplantation and ongoing epidemics of HIV infection (Ng 1994; Dean and Burchard, 1996; Gonzalez *et al.,* 1996). Examples include methicillin-resistant *Staphylococci*, *Pneumococci* resistant to penicillin and macrolides, vancomycin-resistant *Enterococci* as well as multi-drug resistant gram negative organisms (Norrby *et al.,* 2005). There is an urgent need to control antimicrobial resistance by improved antibiotic usage and reduction of hospital cross-infection (Voravuthi kunchai and Kitpipit, 2005; Sung and Lee, 2007) however, the development of new antibiotics should be continued as they are of primary importance to maintain the effectiveness of antimicrobial treatment (van der Waaij and Nord, 2000; Marchese and Shito, 2001).

1.3 Need to develop antibiotics from natural plant source

The potential for developing antimicrobials from higher plants appears rewarding as it would be lead to the development of a medicine to act against microbes; as a result, plants are one of the bedrocks for modern medicine to attain new principles (Evans *et al.,* 2002). Plant based antimicrobials represent a vast untapped source of medicine. Plant based antimicrobials have enormous therapeutic potential as they can serve the purpose without any side effects that are often associated with synthetic antimicrobials. Further continued exploration of plant derived antimicrobials is needed today (Hussain and Gorsi,2004).Historically, plants have provided a source of inspiration for novel drug compounds, as plant derived medicines have made large contributions to human health and well-being (Iwu *et al.,*1999).

Medicinal plants constitute an effective source of both traditional and modern medicines. Herbal medicine has been shown to have genuine utility and about 80% of rural population depends on it as primary health care (Farnsworth et *al,* .1985; Akinyemi *et al.,* 2005). Over the years, the World Health Organization advocated that countries should encourage traditional medicine with a view to identifying and exploiting aspects that provide safe and effective remedies for ailments of both microbial and non-microbial origins (WHO, 1978). In recent years, pharmaceutical companies have spent a lot of time and money in developing natural products extracted from plants, to produce more cost effective remedies that are affordable to the population (Doughari,2006).Scientific experiments on the antimicrobial properties of plant components were first documented in the late 19th century (Zaika,1975). It is estimated that today, plant materials are present in, or have provided the models for 50% Western drugs (Robbers *et al.,*1996).Many commercially proven drugs used in modern medicine were initially used in crude form in traditional or folk healing practices, or for other purposes that suggested potentially useful biological activity. The primary benefits of using plant derived medicines are that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits and more affordable treatment.

1.4 Medicinal plants are used for antimicrobial activity

The medicinal plants around the world contain many compounds with antibacterial activity (Marjorie, 1999).Many efforts have been made to discover new antimicrobial compounds from various sources such as microorganisms, animals, and plants. Systematic screening of them may result in the discovery of novel effective antimicrobial compounds (Tomoko et al., 2002). The use of botanical medicines is generally on the rise in many parts of the world (Bbosa et al., 2007). The screening of plant extracts and plant products for antimicrobial activity has shown that plants represent a potential source of new anti-infective agents (Amani et al., 1998; Salvat et al., 2001; Costa et al., 2008). Numerous experiments have been carried out to screen natural products for antimicrobial property (Martinez et al., 1996; Ateb and Erdourul, 2003; Nair and Chanda, 2006; Nair et al., 2007; Ndhlala et al., 2009). Medicinal plants possess immune modulatory and antioxidant properties, leading to antibacterial activities. They are known to have versatile immune modulatory activity by stimulating both non-specific and specific immunity (Pandey and Chowdhry, 2006). The use of plant extracts and phytochemicals, both with known antimicrobial properties, can be of great significance in therapeutic treatments. In the last few years, a number of studies have been conducted in different countries to prove such efficiency. Many plants have been used because of their antimicrobial traits, which are due to compounds synthesized in the secondary metabolism of the plant (Nascimento et al., 2000).

1.5 Phytochemicals from medicinal plants

Plants as a source of medicinal compounds have continued to play a dominant role in the maintenance of human health since ancient times. According to the World Health Organization plant extracts or their active constituents are used as folk medicine in traditional therapies of 80% of the world's population. Over 50% of all modern clinical drugs are of natural product origin (Kirbag *et al.,*2009).Phytochemicals such as vitamins (A, C, E and K), carotenoids, terpenoids, flavonoids, polyphenols, alkaloids, tannins, saponins, pigments, enzymes and minerals that have antimicrobial and antioxidant activity (Madhuri and Pandey, 2009).The specific function of many phytochemicals is still unclear; however, a considerable number of studies have shown that they are involved in the interaction of plants/pests/diseases. Antimicrobial screening of plant extracts and phytochemicals, then, represents a starting point for antimicrobial drug discovery. Phytochemical studies have attracted the attention of plant scientists due to the development of new and sophisticated techniques. These techniques played a significant role in the search for additional resources of raw material for pharmaceutical industry (Shakeri et al., 2012).

1.6 Herbal drugs

Herbal drugs have got official recognition and gained a lot of acceptance worldwide due to their high therapeutic worth, fewer side effects, and economic value (Gupta et al,. 2010; Kumar et al,. 2010). Ethiopia has between 650 and 1,000 medicinal plants, comprising about 10% of the entire flora of the country (Fulas, 2007). The current literature survey revealed that a large number of these plants have long been in use by local people; however, many of them are lacking modern scientific investigations. It has been widely claimed that about 80% of Ethiopian population rely on traditional medicine (Geleta et al., 2015). According to World Health Organization, majority of the population in developing countries like: Ethiopia (90%), Benin (80%), India (70%), Rwanda (70%), Uganda (60%), and Tanzania (60%) extensively use traditional medicines in health care (WHO, 2003).

1.7 Ethiopian Medicinal Plants

In Ethiopia, plant remedies are still the most important and sometimes the only sources of therapeutics for nearly 80% of human and more than 90% in livestock population. Estimated floras of 6500 to 7000 species of higher plants are of medically important and out of these medicinal plants 12% are endemic to Ethiopia(Tadeg et al.,2005: Giday et al.,2009). Despite their vital role in catering for the health of human and livestock population, large part of the knowledge of ethno medicinal plants is on the verge of irreversible loss and declining to deterioration due the oral passage of herbal heritage from generation to generation rather than in writings (Mesfin *et al.,* 2009). Environmental degradation, agricultural expansions, cultivation of marginal lands and urbanization are also posing a significant threat to the future wellbeing of human and animal populations that have relied on these resources to combat various ailments for generations (Lulekal *et al.,*2008: Devi *et al.,*2009). Warranting urgent need to document and preserve the indigenous knowledge.

Ethno-pharmacology is a highly diversified approach to drug discovery involving the observation, description, and experimental investigation of indigenous drugs and their biologic activities. It is based on botany, chemistry, biochemistry, pharmacology, and many other disciplines (anthropology, archeology, history and linguistics) that contribute to the discovery of natural products with biologic activity (Vlietink and Vanden, 1991). In addition, Taxonomy and the newer discipline ethno botany have now become an integral part of drug discovery from plants (Jachak and Sakalani, 2007). Searching new drug from traditionally used medicinal plant can be the shortest path to success (Berhanemeskel Weldegerima, 2009) and indigenous people remain the

ultimate resource for retrieving this information for the purpose of application, particularly in modern medicine (MacDonald, 2009). According to Kokwaro (1976), Drug plants may be broadly classified into three major categories, first, botanically, according to the species from which drugs are obtained, secondly, according to the purpose for which species are used and finally according to the chemical nature of plants.

2. REVIEW OF LITERATURE

2.1. GLOBAL REVIEW

2.1.1 Origin and Development of ethno medicine

Since time immemorial, people have used plants as medicine. The investigation of plants and their uses is one of the most primary human concerns and has been practiced by all cultures for tens, if not hundreds, of thousands of years, though it wasn't called 'ethno medicine' (MacDonald, 2009). Perhaps as early as Neanderthal human, plants were believed to have healing powers (Connive and Steven, 1996). The earliest recorded uses are found in Babylon about 1770 BC and in the code of Hammurabi an ancient Egypt about 1550 BC. In the early 1500's, Indian fever bark was one of the first medicinal plants to find appreciative consumers in Europe which taken from the cinchona tree (*Cinchona officinalis*), the bark was used as an infusion by native people of the Andes and Amazon highlands to treat fevers. Jesuit missionaries brought the bark back to Europe. By the early sixteenth century, this medicine was known as "Jesuit fever bark," quite a transformation (Connive and Steven, 1996).

Ethno medicine is a rapidly growing science, attracting people with widely varying academic background and interests (MacDonald, 2009) and nowadays Medicinal Plants has tended to become more analytical, quantitative, cross disciplinary, and multi institutional (Hamilton, *et al.,* 2003). This can be categorized under postclassical ethno medicinal research stage. WHO redefined traditional medicine in 2008 as it is the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses. Traditional medicine covers a wide variety of therapies and practices which vary from country to country and region to region (in some countries, it is referred to as alternative or complimentary medicine (CAM). Complementary/alternative medicine often refers to traditional medicine that is practiced in a country but is not part of the country's own traditions. Along with the rapidly increasing human population and cultural resistances towards the use of modern medicines means that the majority of the people in Ethiopia are dependent on traditional medicines of mainly plant origins to manage various human ailments (Dawit Abebe, 2001).

2.1.2 Herbal Medicine

Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been derived from natural sources, many of these isolations were based on the uses of the agents in traditional medicine (Cragg and Newman, 2001).Herbal Medicine is defined as a branch of science in which plant based formulations are used to alleviate diseases. It is also known as botanical medicine or phytomedicine. Lately phytotherapy has been introduced as more accurate synonym of herbal or botanical medicine. In the early twentieth century herbal medicine was prime healthcare system as antibiotics or analgesics were not as yet discovered. With the advent of allopathic system of medicine, herbal medicine gradually lost its popularity among people, which is based on the fast therapeutic actions of synthetic drugs (Singh, 2007). Recently there has been a shift in universal trend from synthetic to herbal medicine, which can be said "Return to Nature". Medicinal plants have been known for millennia and are highly esteemed all over the world as a rich source of therapeutic agents for the prevention of diseases and ailments (Sharma *et al.,* 2008).The search for eternal health and longevity and for remedies to relieve pain and discomfort drove early man to explore his immediate natural surroundings and led to the use of many plants, animal products, minerals etc. and the development of a variety of therapeutic agents (Nair and Chanda, 2007).

Most of the developing countries have adopted traditional medical practice as an integral part of their culture. Historically, all medicinal preparations are derived from plants, whether in the simple form of raw plant materials or in the refined form of crude extracts, mixtures, etc (Krishnaraju *et al.,* 2005). Investigation of the chemical and biological activities of plants during the past two centuries have yielded compounds for the development of modern synthetic organic chemistry as a major route for discovery of novel and more effective therapeutic agents (Nair *et al.,* 2007).

2.1.3 The Recent Development of Natural Drugs

A conservative estimate of the number of flowering plants occurring on the planet is 2, 50,000. Of these, only about 6% have been screened for biological activity and a reported 15% have been evaluated phytochemically. Consistent findings should be carried out to discover a probable abundance of medicinal extracts in these plants (Turker and Usta, 2008). The use of traditional medicine and medicinal plants in most developing countries, as a normative basis for the maintenance of good health, has been widely observed (UNESCO, 1996). Furthermore, an increasing reliance on the use of medicinal plants in the industrialized societies has been traced to the extraction and development of several drugs and chemotherapeutics from these plants as well as from

traditionally used rural herbal remedies (UNESCO, 1998).The increasing use of traditional therapies demands more scientifically sound evidence for the principles behind such therapies and for effectiveness of medicines. Recent advance in the analytical and biological sciences, along with innovations in genomics and proteomics can play an important role in validation of these therapies. Western scientific community views traditional medicines cautiously and stresses the concerns related to research development and quality (Patwardhan *et al.,* 2003; Fabricant and Farnsworth, 2001).

A large proportion of such medicinal compounds have been discovered with the aid of ethno botanical knowledge of their traditional uses. The rich knowledge base of countries like India and China in medicinal plants and health care has led to the keen interest by pharmaceutical companies to use this knowledge as a resource for research and development programs in the pursuit of discovering novel drugs (Krishnaraju *et al.,* 2005).The rapid pace of research and development in herbal medicine has made it an interdisciplinary science. If any scientific monograph of a medicinal plant is seen, it can be concluded that knowledge of Alternative and Complementary Systems of Medicines like Ayurveda, botany, pharmacognosy and phytochemistry, biochemistry, ethno pharmacology and toxicology is integral part of herbal medicine. There has been an explosive growth of herbal drug industry recently. Data analysis has shown that more and more people are consulting the herbal medicine practitioners. World Health Organization has also identified the importance of herbal medicines. According to a study from U.S., 60-70% patients living in rural areas are dependent on herbal medicine for their day to day diseases. Several authors have reported favorable results with herbal drugs (mostly in the form of extracts) either in animal or in human studies (Padma, 2005).

2.1.4 Antimicrobial studies

The leaves of five different plants, belonging to the different family and which have some ethno medicinal applications were studied for antibacterial activity (Girish and Satish, 2008).The methanol extracts had wider range of activity on these organisms than the aqueous extracts. This study supports, the traditional medicines (herbal extracts) to cure many diseases like diarrhea, intestinal tract, throat, ear infections, fever and skin diseases. Antibacterial activity of neem oil was found to show 92% susceptibility against *P. aeruginosa, S. pyogenes, E. coli, Proteus* group and *K. aerugenes* (Jahan *et al*.,2007).The study of Dongmo(2008), demonstrated that the essential oils from leaves of the two species *Eucalyptus globules* and *Eucalyptus camaldulensis* have an excellent inhibitory effect on *S. aureus* than that of *E.coli*.

The study was done by Chandra (2013) to analyses the antimicrobial potential of two medicinally important plants viz., *Lagerstroemia indica* and *Annona reticulata* leaf extracts against human bacterial pathogens viz.,*Klebsiella pneumoniae, Staphylococcus auerus, Salmonella typhi, Proteus vulgaris* and *Pseudomonas aeruginosa* and the results showed the presence of wide spectrum of antibacterial activities against all the above bacterial pathogens studied. The antibacterial activity of *Nelumbonucifera* flower extracts was tested by (Chougale *et al.,* 2009) and found that the activity increased in dose dependent manner. Gram-negative bacteria were found to be more susceptible to the *Nelumbonucifera* flower extracts than gram-positive bacteria. Manghani (2011) used the crude extracts of selected plants viz. *A. nobilils, G. indica, B. Diffusa, S. albicaule, V. nigundu, B. persicum, A. concinna* and *A. lebbeck* to test the antibacterial activity and reported that those extracts have good antimicrobial activity against selected test bacterial strains.

The result of leaves of *Lantana indica,* clarified the antibacterial and antifungal activity of the extracts of *L. indica* (Venkataswamy *et al.,* 2010). The methanol and aqueous extracts of the leaves were reported to exhibited strong activity against the tested microorganisms. The results revealed that, the methanol and aqueous extracts of leaves exhibited strong inhibitory action *against Bacillus subtilis, Staphylococcus aureus, Streptococcus pyrogens, E. coli, Proteus vulgaris, Klebsiella pneumonia* and *Candida albicans .Adhatodavasica* (acanthaceae) known as chuemue, is a stout straggling prostrate shrubby plant with the compound leaves which gets sensitive on touching. The medicinal properties of *Adhatodavasica* exert bacteriostatic and bactericidal effects on both gram positive and gram negative bacteria on animal models. These effects have been attributed to the peptides, alkaloids, and flavonols, which are major components in these plants (Umamaheswari, 2007 and Vinothpooshan, 2010). *Ocimum sanctum* extracts are effective against *Staphylococcus aureus, E. coli. P. aeruginosa, S. typhimurium* and used as better alternative in food preservation (Poonam Mishra, 2011).

2.2 ETHIOPIAN REVIEW

2.2.1 Ethno medicine

Traditional medicine has also drawbacks as various authors stated (Amare Getahun, 1976; Sofo wora, 1982 and DawitAbebe, 1986) lack of precision in standardization is one drawback for the recognition of the traditional healthcare system. Although plants have been used as source of medicine to treat both human and livestock ailments in Ethiopia, research and documentation on medicinal plants have been started only very recently (MesfinTadesse and Sebsibe Demissew, 1992).

Ethno medicinal uses of 230 plants species were documented from Manna Angetu District, which is found in Bale Zone of Oromia Region. Of these, 181 (78.70%) were used as human medicine, 27 (11.74%) as livestock

medicine and the remaining 22 (9.7%) were for treating both human and livestock ailments (Ermias Lulkal *et al.,* (2008). People use medicinal plant parts, to treat human or livestock ailments while they are fresh, dried or both. The study of GideyYirga (2010) on Central Tigray revealed as some of medicinal preparation were used fresh or in dried state, as these plants are used in both forms, the chance of using the medicinal plants under different seasons of the year is increased and traditional healers preserve the plant that they could not find in dry season in different ways like hanging the plant material. Ethiopia is not legally known in exporting and importing medicinal plants and the only medicinal plants export from Ethiopia is *Catha edulis* (DesalegnDessisa, 2001). Medicinal plants are also on sell in domestic markets; for instance, it accounts for an average of 5000 plant species (40%) of the medicine market in China (Medhin Zewdu *et al.,* 2001) and in South Africa, between 400 to 550 plant species are currently sold for use in traditional medicine (Boadker, 2005). India uses about 7000 plant species (Verma and Singh, 2008).

2.2.2 Antibacterial activity studies:

Ethno botanical studies revealed that a wider range of Ethiopian plants are being used in the treatment of wounds and other diseases in the traditional health care system of the country(Giday *et al.,* 2007;Teklehaymanot *et al.,* 2007;Assefa *etal.,*2010;Mesfin *etal.,*2009;Teklehaymanot *et al.,* 2010). Crude extracts of Ethiopian plants and others used elsewhere (Tadege *et al.,*2005;Goyal *et al.,*2007;Lopez *et al.,*2011;Bayoud *etal.,*2007;Ermolaeva *etal.,*2011) revealed strong antibacterial activities indicating that these plants can serve as sources of effective drugs against wound-causing bacteria. The crude extracts of *Albizzia gummifera, Syzygeum guineense*, showed good antimicrobial activities against a diarrhea causing bacterial pathogens.

Thymus species are well known for their medicinal importance because of their biological and pharmacological properties. The substances extracted from thyme especially the phenolic components *thymol* and *carvacrol* showed antibacterial activity against gram-positive and gram-negative bacteria due to their effects on the bacterial membrane (Asfaw *et al.,*2000). Because of its antibacterial activity, thyme is also useful as an antiseptic for the urinary tract, mouth and skin wounds. Tea and decoction prepared from thyme have successfully been used against gastro-intestinal complaints. Thyme oils are remedies to expel intestinal parasites, particularly hookworm (Mufti, 2011). *Thymus schimperi* (locally called Tosign) was found to have significant antioxidant activity and food preservative effect (Hailemariam and Emire, 2013). However, it is not well investigated on the modern scientific grounds. Keeping in view the common use of *T. schimperi* in traditional medicine, the present study was designed to evaluate its antibacterial activity against some human pathogenic bacteria to bridge information gap pertaining in the community.

In Ethiopia, roots and leaves are the most widely utilized plant parts. According to Tizazu Gebre (2005), roots are the most used plant part (35.7%), followed by leaves (32.9%). Moreover, the study explained that 68.6% of herbal remedies were applied orally and 31.4% were applied externally. Further, swelling, rheumatism, spasm, snakebite, tooth pain and eye pain were among the human ailments treated with medicinal plants. However, the finding of (Debela Hunde *et al.,* 2004) indicated that leaves are the most widely used plant part (33%) followed by roots (28%). Crude preparations of four types of traditional medicinal plants like *Artemisia afra* (5%), *Vernonia amygdalina*(7%), *Lepidium sativum*((2%) and *Carum copticum* (10%) were collected from local markets in Ethiopia and assessed for their antimicrobial activity against some foodborne pathogens like *Bacillus cereus, Staphylococcus aureus, Shigella boydii, Shigella flexineri, Salmonella typhimurium, and Escherichia coli* and found that promising activities (Ashebir and Ashenafi,1999). Recent research by Abreham Bekele *et al.,* 2015 pretended that, chloroform extract of *Thymus schimperi Ronninger* exhibited highest potential activity against *E.coli, K.pneumoniae* and *Shigella flexneri*.

Due to rapid development of resistance and high cost of the new generation antibiotics, lots of efforts are being made to discover new antimicrobial agents from different sources. On the study carried out by (Habtamu *et al.,* 2010) on aqueous and hydro-alcoholic extracts of leaves of *Jasminium abyssinicum, Myrsine africana, Foenicum vulgare* and aerial part of *Leonotisocymifolia* for antibacterial activity against Species of bacteria that cause various diseases in domestic animals namely, *Escherichia coli, Pasteurella gallinarum, Manhaemia haemolytica, Salmonella gallinarum, Salmonella typhimurium, Staphylococcus aureus* and *Streptococcus agalactae* showed good results. A number of medicinal plants with significant antimicrobial activity have also been reported by different workers (Desta,1993; Ashebir and Ashenafi, 1999; Geyid *et al.,* 2005).Another study revealed that extracts *from J. abysinicum* showed promising activity against S. *aureus, P. aeruginosa and S. pyogenes* isolated from human patients (Goji *et al.,*2006).

Antimicrobial activity screened from nine medicinal plants *Achyranthes aspera, Ficuscaria, Malviparviflora, Vernonia* species*, Solanum hastifolium, Calpurinia aurea, Nicotiana tabacum, Ziziphusspina-christi, Croton macrostachys* were traditionally used against mastitis, wound and gastrointestinal tract complication in Tigray Region, by (Kalayou *et al.,*2012) and results show out of 9, 8 showed good results followed by Taye (2011) studied the plants *C. aurea, C. macrostachyus, N. tabacum, A. aspera and Vernonia* species (local name Alakit) showed promising activity against some of the common microorganisms of veterinary importance. Indigenous knowledge and standard practices for human and livestock disease control, of

three ethnic groups (Aari, Maale and Bena-Tsemay) in South Omo Zone of Southern Nations, Ethiopia was conducted by Tolossa *et al.,* (2013) by taking stastical analysis on 91 plants and his reports said that most of the plants are playing a significant role in meeting the primary healthcare needs of the three ethnic groups. The methanolic extracts of Aloe vera, *Zingiber officinale and Vinca major* medicinal plants were evaluated for their antibacterial activity on the Gram negative (*S.typhimurium* and *E. coli*) and Gram positive (*S. aureus* and *S. agalactia*) bacteria. The results of this study showed that the compounds from *A. vera* and *Z. officinale* medicinal plants have an activity against the selected Gram-negative and Gram-positive bacteria (Redda *et al.,* 2014).

3. Conclusions

This review stated that plants are valuable sources for new compounds and should receive special attention in research strategies to develop new antimicrobials urgently required in the near future. The importance of medicinal plants and traditional health systems in solving the health care problems of the world is gaining increasing attention. Because of this resurgence of interest, the research on plants of medicinal importance is growing phenomenally at the international level, often to the detriment of natural habitats and protects populations in the countries of origin. In Ethiopia since many years the peoples are using plants as the medicine. The plant contains various phytochemical, which would act on the pathogenic microorganism and hinder their growth. The scanty of researches are available on antibacterial activity of medicinal plants in Ethiopia, but still we need to explore many antimicrobial compounds from plants. These kinds of the research are baseline information for the development of new drugs, which is bench mark in science. Commercially many synthetic drugs are available in market, but microorganisms are resistant to many antibiotics. So research should need to develop new synthetic compound from the plant source.

Competing Interests

The authors declare that they have no competing interests.

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