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Nutritive values and elemental composition of *Epiprinus mallotiformis* Muell.

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ABSTRACT  
*Epiprinus mallotiformis* Muell. belongs to the family Euphorbiaceae. The plant is traditionally used to treat the diuretic, digestive problems, dysentery, external wounds, antimicrobial, laxative, remedy for vesicle calculi, ulcers, gonorrhea etc. Young and mature leaves of *E. mallotiformis*; have been collected from Agumbe and Kudremukh regions and were separately subjected for proximate analysis of micro, macro and toxic element composition. The study revealed that, there is no significant different in the composition of the elements among Agumbe and Kudremukh samples. The leaves are rich in carbohydrate, crude protein contents, and they also show high level of moisture, fiber and ash values. However, the young leaves are rich in macro nutrients whereas mature leaves are rich in micro nutrients. But, the overall nutritive values of young and mature leaves are also similar. Among the macronutrients, Ca is dominant, which is followed by Mg, N, K and P; in case of micronutrients Mn was dominant followed by Fe, Zn and Cu in both young and matured leaf samples. Pb was the highest toxic element present in matured leaf in both the regions. The results were subjected for statistical analysis.  
Key Words: *Epiprinus mallotiformis*, micronutrients, nutritive value, Agumbe

INTRODUCTION  
All human beings require a number of complex organic compounds as added caloric requirements to meet the need of there muscular activity. Carbohydrates, fats and proteins form the major portion of the diet, while minerals and vitamins form comparatively a similar part. Plant materials form a major position of the diet, their nutritive value is important. The most important nutrients present in the plants are carbohydrates, such as the starch and free sugars, oils, proteins, minerals, ascorbic acid, and the antioxidant phenols, such as chlorogenic acid and its phenols, other than nutrients plants has secondary metabolites like alkaloids, glycosides, gum, resins and latex. These constituents are usually produced in different parts of the plants like leaves, roots, fruits, bark and other parts of the plants. The trace elements together with other essential nutrients, which are essential for growth and normal physiological functioning of the body to lead healthy life; they must be supplied through the food only. The exact classification of trace versus macro minerals are not yet clear, but trace elements are often considered as minerals, which are required by the body in
Preliminary phytochemical analysis and Antimicrobial Activity of leaf extract of *Epiprinusmallotiformis*

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**ABSTRACT**

*Epiprinus mallotiformis* (Muell.) is a tree belongs to the family Euphorbiaceae grows in the evergreen forests of the Western Ghats. The present study was performed to investigate the preliminary phytochemical analysis and antimicrobial activity of leaf extracts of *E. mallotiformis* the powdered leaf materials was subjected to soxhlet extraction successively by using low polar to high polar solvents. The antimicrobial activity of leaf extracts was performed by agar well diffusion method. The preliminary phytochemical analysis shows the presence of Flavonoids, glycosides, saponins, steroids and tannins. Among the extracts methanol extract shows the significant activity when compare to all the solvent extracts. The maximum inhibition was found in *Escherichia coli*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Salmonella typhimurium* shows greater inhibition was found in *Microsporum gypseum*, *Trichophyton rubrum*, *Chrysosporium merdarium*. The leaves of *E. mallotiformis* could be used in the treatment of bacterial and fungal infections; the presence of various phytochemicals might be the responsible for these activities of the extract. Further studies on isolation of constituents from the extract and their biological activities are under investigation.

**Key words:** Phytochemical analysis, antimicrobial activity, leaf extract, *Epiprinus mallotiformis*.

**INTRODUCTION**

Many efforts have been made to discover new antimicrobial compounds from various kinds of sources such as micro-organisms, animals and plants. One of such resource is folk medicines. Systematic screening of them may result in the discovery of novel effective compounds [1]. The increasing prevalence of multi drug resistant strains of bacteria and the recent appearance of strains with reduced susceptibility to antibiotics raises the specter of untreatable bacterial infections and adds urgency to the search for new infection-fighting strategies [2]. Traditional medicine like orthodox medicine has its own methods and techniques of application which however aims at healing disease [3]. The treatment and control of diseases by the use of the available medicinal plants in a locality will continue to play significant roles in medical health care implementation in the developing countries of the world. Nearly, all cultures and civilizations from ancient times to the present day have depended fully or partially on herbal medicine because of their effectiveness, affordability, availability, low toxicity and acceptability. Due to ineffectiveness of most drugs as a result of microbial resistance to available agents most especially in developing countries, more patients are seen in medical centers. The intractable problem of antimicrobial resistance has led to the resurgence of interest in herbal products as sources of novel compounds to suppress or possibly eradicate the everincreasing problems of emergence of newer diseases thought to be brought under control. In view of this, it is therefore very important to search for effective but of low cost and reliable traditional therapeutic agents, hence also the abuse of drugs for ailment is in high increase which motivated drug resistant organisms [4]. This situation forced scientists to search for new antimicrobial substances [5]. Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of infectious diseases from medicinal plants [6].

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EVALUATION OF ANTHelmINTIC AND ANTioxidANT ACTIVITYs OF EPIPRINUS MALLOTIFORMIS LEAF EXTRACTS

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ABSTRACT

Objective: Development of anthelmintic resistance and high cost of conventional anthelmintic drugs led to the evaluation of medicinal plants as an alternative source of anthelmintics. The aim of the present study was to investigate the anthelmintic activity and antioxidant activity of the leaves of Epipnus mallotiformis extract using adult earthworm, Peritima posthuma.

Methods: The leaves extracts of Epipnus mallotiformis at different concentrations of 20 mg/mL, 40 mg/mL, 60 mg/mL, 80 mg/mL and 100 mg/mL were tested, which involve determination of paralysis time and death time. Results: It was found that the extract exhibited significant dose dependent anthelmintic activity. Piperazine citrate 10 mg/ml as standard reference. Whereas antioxidant activity of the extracts were performed by four method, DPPH free radical scavenging activity, H2O2 scavenging activity, Reducing power assay and Metal chelating activity using ascorbic acid as a standard. The antioxidant activity was found more in the methanol extracts show comparable activity with ascorbic acid. In the metal chelating activity the petroleum ether show maximum activity when compare with chloroform and methanol.

Conclusion: The leaves extracts of Epipnus mallotiformis possess antioxidant and anthelmintic property. Further investigations on in vivo antioxidant activity need to be carried out to unmask its mode of action.

Keywords: Epipnus mallotiformis; anthelmintic; antioxidant; leaf extracts.

INTRODUCTION

People living in poverty in developing countries often suffer from helminth infections, which more often physically impair their hosts then kill them. Although the majority of infections due to worms are generally limited to tropical regions, they can occur to travelers who have visited those areas and some of them can develop in temperate climates [1]. As an important component of complementary and alternative medicine, traditional Ayurvedic medicinal plants may be useful model for the discovery and development of new chemical substances for helminth control which are generally considered to be very important sources of bioactive substances [2]. Helminthiasis, or infection with parasitic worms, affects over two billion people worldwide. Human beings can spread these pathogens to previously uninvolved population through travel, migration, and military operations.

Worms pathogenic for human beings are Metazoa, classified into roundworms (nematodes) and two types of flatworms, flukes (trematodes) and tapeworms (cestodes). These biologically diverse eukaryotes vary with respect to life cycle, bodily structure, development, physiology, localization within the host, and susceptibility to chemotherapy. Immature forms invade human beings via the skin or gastrointestinal tract and evolve into well-differentiated adult worms that have characteristic tissue distributions. With few exceptions, such as Strongylus and Echinococcus, these organisms cannot complete their life cycles, that is they replicate themselves, within the human host. Therefore, the extent of exposure to these parasites dictates the severity of infection, and reduction in the number of adult organisms by chemotherapy is sustained unless reinfection occurs. The prevalence of parasitic helminths typically displays a negative binomial distribution within an infected population such that relatively few persons carry heavy parasite burdens. Without treatment, those individuals are most likely to become ill and to perpetuate infection within their community [3].

Anthelmintics are drugs that either kill (vermicide) or expel (vermifuse) infesting helminths. Helminthiasis is prevalent globally [One third of world's population harbors them], but is more common in developing countries with poorer personal and environmental hygiene. Multiple infestations in the same individual are not infrequent. In the human body, gastrointestinal tract is the abode of many helminths, but some also live in tissues or their larvae migrate into tissues. They harm the host by depriving him of normal cell aerobic respiration against ROS, other antioxidants are taken both from natural and synthetic origin [7]. Although organisms have endogenous antioxidant defenses produced during normal cell aerobic respiration against ROS, other antioxidants are taken by depriving him of food, causing blood loss, injury to organs, intestinal or lymphatic obstruction and by secreting toxins. Helminthiasis is rarely fatal, but is a major cause of ill health [4].

Free radicals are found to be a product of normal metabolism. Although oxygen is essential for aerobic forms of life, oxygen metabolites are highly toxic. As a consequence, reactive oxygen species (ROS) are known to be implicated in many cell disorders and in the development of many diseases including cardiovascular diseases, atherosclerosis, chronic inflammation etc [5, 6]. Although organisms have endogenous antioxidant defenses produced during normal cell aerobic respiration against ROS, other antioxidants are taken both from natural and synthetic origin [7]. Antioxidants that can inhibit or delay the oxidation of an oxidizable substrate in a chain reaction, therefore, appear to be very important. Synthetic antioxidants are widely used but their use is being restricted nowadays because of their toxic and carcinogenic effects. Thus, interest in finding natural antioxidants, without any undesirable effect, has increased greatly [8].

Epipnus mallotiformis Mull. belongs to the family Euphorbiaceae, it is distributed throughout Western Ghats, South Canara, Coorg, Nilgiris, Kigga, evergreen and semi evergreen forest of Karnataka [9, 10]. The plant is traditionally used in traditionally used to treat the diuretic, digestive problems, dysentery, external wounds, antimicrobial, laxative, remedy for vesical calculi, ulcers, gonorrhea...
INTRODUCTION

Pain is one of the major responses of body physiological imbalance and thus affects the lifestyle of human beings. Every organ imparts pain in response to dysfunction due to potentially dangerous stimulus or injury as a defensive reaction and relieves pain by producing chemicals at the site of injury, this leads to pronounced consciousness [2]. Inflammation is the response of injury in any CNS or on peripheral pain mechanisms without significantly altering side-effects on the physiology of the body [1]. Analgesia is the term used to refer the reduction of pain. Many agents are available that act as analgesics, selectively arrests pain by acting either in the CNS or on peripheral pain mechanisms without significantly altering consciousness [2]. Inflammation is the response of injury in any tissue, which begins by any stimulus viz., infection, physical or chemical insult, cellular damage etc [5]. This damage is reported to be due to hypersensitivity, ionizing radiation, foreign bodies (including splinters, dirt and debris), stress, trauma etc [5].

Keywords: Epiprinus mallotiformis; Acute toxicity studies; Antinociceptive activity; Anti-inflammatory activity.

ABSTRACT

Objective: To evaluate the antinociceptive and anti-inflammatory properties of Epiprinus mallotiformis leaf methanolic extract.

Methods: Epiprinus mallotiformis Muell is traditionally well known medicinal plant, traditional medicinal practitioners use this plant to treat digestive problems, dysentery, external wounds, antimicrobial, laxative, vesicle calculi, ulcers, gonorrhea etc. In present investigation, the antinociceptive and anti-inflammatory effect of Epiprinus mallotiformis leaf methanol extract was evaluated by dose dependent study with three different concentrations viz., 100, 200 and 300 mg/kg using rats and mice. Antinociceptive activity was carried out by abdominal writhing, tail flick and hot plate methods. Where as, anti-inflammatory activity was carried out using carrageenan induced rat paw edema model.

Results: Acute toxicity studies revealed that LD50 for leaf methanolic extract of E. mallotiformis was 3000 mg/kg b.w. Antinociceptive activity by writhing method revealed that the methanolic extract at 300 mg/kg showed 73% inhibition of acetic acid induced writhing. Tail flick and hot plate method indicated that maximum possible analgesia (MPAj was observed in the animals administered with 300 mg/kg of methanolic extract. Anti-inflammatory studies revealed that E. mallotiformis exhibited maximum percentage-inhibition of paw volume (P<0.01) at 300 mg/kg of methanolic extract by 54.28 %, 56.94%, 58.11% and 61.84% after +1 h and +4 h of carrageenan administration.

Conclusion: Results of the present investigation supported the traditional claims on Epiprinus mallotiformis as a potent medicinal plant. This also indicates that this plant can also be used to treat pain and inflammation conditions in human and well as animals.

Keywords: Epiprinus mallotiformis; Acute toxicity studies; Antinociceptive activity; Anti-inflammatory activity.