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A STUDY OF ANTIBACTERIAL ACTIVITY OF CRUDE EXTRACTS OF EUPHORBIA HIRTA ALIGNED WITH SOME BACTERIA RELATED TO ENTERIC INFECTIONS

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A Study of Antibacterial Activity of Crude Extracts of Euphorbia Hirta Aligned With Some Bacteria Related To Enteric Infections

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Abstract – Euphorbia hirta powdered plant material was extracted using 3 solvents methanol, hexane and distilled water. The water extracts provided the higher yield and also more antibacterial effectiveness than when organic solvents used. Phytochemical screening of the crude extracts revealed the presence of tannins, saponins, phenolics, flavonoids, cardiac glycosides, anthroquinones and alkaloids.

Keywords: Euphorbia Hirta, Phytochemical, Methanolic Extract, Hexane Extract, Infections, Antimicrobial Activity.

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INTRODUCTION

Infectious diseases are major causes of morbidity and mortality in the developing world and accounts for about 50% of all deaths. In Bangladesh, about 17% of all children admitted to the paediatric wards die of diarrhea (Alam et al., 2001). Some 5.8 million deaths each year in infants and children below 5 years are caused by enteric diseases worldwide (Amita et al., 2003). Records of morbidity and mortality occurring as a result of enteric infections are scanty in Nigeria. Most of the pathogens causing enteric infections have developed resistance to the commonly prescribed antibiotics. Bacterial resistance to antibiotics increases mortality, likelihood of hospitalization and the length of stay in the hospital (Winstanley et al., 1997). For most bacteria, there is evidence that increased usage of a particularly antimicrobial correlates with increased levels of bacterial resistance to that agent (Mordi and Erah, 2006). Spread of resistance, which is transferable amongst members of the enterobacteriaceae has been attributed to the mobilization of drug resistance markers by a variety of agents encoded on plasmids, transposons and integrons (Amita et al., 2003). Isolation of bacteria less susceptible to regular antibiotics and recovery of resistant isolates during antibacterial therapy is now a global problem (Muhammad and Muhammad, 2005).

India is very affluent in variety of medicinal plants and is one of the richest countries in the world in regard to genetic resources of medicinal plants. It exhibits a wide range in topography and climate, which has a bearing on its vegetation and floristic composition. Moreover, the agro-climatic conditions are conducive for introducing and domesticating new exotic plant varieties (Martins, 2001).

Multiple drug resistance has developed due to indiscriminate use of commercial antimicrobial drugs which are commonly used for the treatment of bacterial infections. Frequent use of antibiotics are associated with various side effects including hypersensitivity, immune-suppression, allergic reactions and also the development of resistance against pathogenic bacteria. Therefore, the demands for new and effective antibacterial agents with broad spectrum activities from natural sources are increasing day by day. Wide verities of broad spectrum antibiotics are available in the markets for the treatment of UTI. However, there are certain limitation associated with the commercially drugs available in the market. Firstly, multiple drug resistance has developed due to the excessive and indiscriminate use of commercial available antimicrobial drugs to treat UTI (Davis J *et al*., 1994). Secondly, lots of side effects are also associated with the use of marketed drugs including hypersensitivity, immune-suppression and allergic reactions.

REVIEW OF LITERATURE:

Bacteria can develop ways to fight off antibiotics by: preventing antibiotics from reaching their target cells (*e.g.,* changing the permeability of cell walls or pumping the drugs out of the cells); changing the structure of target cells or entirely replacing them; or producing enzymes that destroy antibiotics. Bacteria may gain resistance by getting copies of resistance genes from other bacteria.

Resistance is magnified because bacteria multiply rapidly. Antibiotic resistance will eventually occur because of evolutionary natural selection, but the misuse and overuse of antibiotics is dramatically escalating the process. When antibiotics are used incorrectly in human or animal medicine for too short a time, or too small a dose, at inadequate strengths, or for the wrong disease, bacteria are not killed and can pass on survival traits to even more bacteria. This results in stronger infections, increased illness and even death. Increasing resistance also comes from the excessive use of antibiotics, including prolonged treatments of insufficient strength to kill all the bacteria, which occurs commonly on industrial animal farms. Antibiotics are used in cattle, poultry, swine and other food animals not only for disease treatment in individuals, but also to stave off disease in entire herds or flocks living in crowded, unsanitary conditions, as well as for growth promotion and improving "feed efficiency" (*i.e*., the amount of feed it takes to produce a pound of animal). In fact, up to 70 percent of all antibiotics produced in the U.S. are given to food and animals, not people. According to the World Health Organization, "widespread use of antimicrobials for disease control and growth promotion in animals has been paralleled by an increase in resistance in those bacteria (such as *Salmonella* and *Campylobacter*) that can spread from animals, often through food, to cause infections in humans.

Urinary tract infections (UTI) are the major common health problem affecting both males and females, predominately females. They are classified as uncomplicated and complicated. Uncomplicated UTIs occurs in sexually active healthy female patients with structurally and functionally normal urinary tracts. Whereas, Complicated UTIs are associated with abnormal conditions include abnormalities of the urinary tract that impede urine flow or the presence of any foreign body (e.g., indwelling catheter, stone) or infection with multidrug resistance pathogens (Hooton TM, 2000).

DETERMINATION OF THE ANTIMICROBIAL ACTIVITY:

The method described by Emeruwa (1982) was used. Briefly, 1.0 ml of 18 h culture of bacteria adjusted to 1.0 x 10 8 cfu/ml was spread into a sterile plate so as to achieve a confluent growth. 3 petri dishes containing particular bacteria was used. Then 19.0 ml of Mueller Hinton agar at 45°C was added to each plate and the plates were rocked for even spread and proper mixing of bacteria and agar. The content of the plates were allowed to solidify and wells approximately 6 mm in diameter and 2.5 mm deep were bored on the surfaces of the agar medium using a sterile cork borer. Then 0.5 ml of the reconstituted extract at a concentration of 100 mg/ml was pipetted in to one of the holes. 0.5 ml of pure solvent was pippeted into another hole as negative control while an aqueous solution of 12.5 ug amoxicillin was used as positive control. The plates were allowed to stand for 1 h for prediffusion of the extract to occur and then incubated at 37°C for 24 h and the zones of inhibition were measured to the nearest mm. The mean of triplicate results were taken.

CONCLUSION:

A low dose of antibiotics that are not strong enough to kill all bacteria encourage some bacteria to develop means of survival, or to become "resistant." The presence of alkaloids is interesting, as significant quantities are used as antimalarials, analgesics and stumilants (Duke and Ayensu, 1985). The presence of glycosides moieties like saponins, anthraquinones, cardiac glycosides and flavornoids which are known to inhibit tumor growth and serve also to protect against gastrointestinal infections are of pharmacognostic importance and give credence to the use of the plant in ethnomedicine.

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