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## Infection Prevention 2019: Evaluation of the antibacterial potential and bio enhancing effect of hydro-alcoholic leaves extract of Moringaoleifera and solar heat distilled cow urine against pathogenic *Staphylococcus aureus* -Syamantak M. Tripathi - College of Veterinary Science and A.H

## Syamantak M. Tripathi

College of Veterinary Science and A.H, India

After the ban in the use of antibiotic growth promoter, the search of an alternative led to the utilization of the plants which have been using by ethnic people as a part of their meal from ancient time and Moringaoleifera is one of those plants. Leaves of M. oleifera are known to have an important component of macronutrients, micronutrients and of anti-nutritive factors etc. In the aim to give more knowledge about it, leaves are collected, dried, pulverized and soaked in ethanol-water (50/50). The mixing obtained is homogenized, filtered and evaporated to obtain hydro alcoholic extract (HAE). This extract was used to determine its contents in some chemical groups such as total phenols, tannin, total flavonoids and polysaccharides. Antibiotic resistance has progressed substantially in the recent years and is showing an ever increasing therapeutic problem. One of the methods to reduce the resistance to antibiotics is by using antibiotic resistance inhibitors from plants and some bioenhancers.

Bioenhancers are drug facilitator which do not show the typical drug activity but in combination enhance the activity of other molecule in several way including increase in the bioavailability of drug across the membrane, potentiating the drug molecules by conformational interaction, acting as receptor for drug molecules and making target cell more receptive to drugs and by promoting the uptake of drugs in combination therapy. The aim of this study was to evaluate the antibacterial and bioenhancing properties of hydro-alcoholic leaves extract of M. oleifera (HAE-MO) alone and in combination with solar heat distilled cow urine distillate (SHD-CUD) against pathogenic S. aureus isolated from urinary tract infected equines. The antibacterial activity of HAE-MO and SHD-CUD at 12.5%, 25%, 50% and 100% concentrations was determined in vitro and compared with sensitivity testing of standard antibiotic Imepeneme using disc diffusion method.

The results obtained showed that 25%, 50% and 100% concentration of HAE-MO had moderate inhibitory effects on *S. aureus* when used alone while only 100% concentration of SHD-CUD showed some inhibitory effect on *S. aureus* when used alone. Furthermore, HAE-MO at 12.5%, 25%, 50% and 100% in combination with SHD-CUD at 100% concentrations showed very high inhibitory effects of on pathogenic *S. aureus*. These results were compared with standard antibiotics Amoxiclav and Imepeneme, which showed high and moderate sensitivity against *S. aureus* respectively. These results provide

valuable information that *M. oleifera* possess great promise as highly effective antibacterial agents. The antibacterial effect of HAE-MO in combination with SHD-CUD was higher than the inhibition caused by extract alone and is suggestive of bioenhancing role of cow urine distillate and *M. oleifera*. Moreover, inhibition of test bacteria was also observed with less concentration (12.5%) of extract on combining with SHD-CUD. Results indicate the potential of *M. oleifera* for further work on isolation and characterization of the active principle responsible for antibacterial activity and its exploitation as therapeutic agent.

Staphylococcus aureus is a Gram-positive, round-shaped bacterium that is a part of the Firmicutes, and it is a common member of the microbiota of the body, frequently found in the upper respiratory tract and on the skin. It is often positive for catalase and nitrate reduction and is a facultative anaerobe that can reside without the need for oxygen. Although S. aureus usually acts as a commensal of the human microbiota it can also become an opportunistic pathogen, being a common cause of skin infections comprising abscesses, respiratory infections such as sinusitis, and food poisoning. Pathogenic strains often support infections by producing virulence factors such as potent protein toxins, and the expression of a cell-surface protein that binds and inactivates antibodies. The emergence of antibioticresistant strains of S. aureus such as methicillin-resistant S. aureus (MRSA) is a worldwide problem in clinical medicine. Despite much research and development, no vaccine for S. aureus has been approved.

An estimated 20% to 30% of the human population are longterm carriers *S. aureus* which can be found as part of the normal skin flora, in the nostrils, and as a normal inhabitant of the lower reproductive tract of women. *S. aureus* can bring a range of illnesses, from minor skin infections, such as pimples, impetigo, boils, cellulitis, folliculitis, carbuncles, scalded skin syndrome, and abscesses, to life-ending diseases such as pneumonia, meningitis, osteomyelitis, endocarditis, toxic shock syndrome, bacteremia, and sepsis. It is still one of the five most common causes of hospital-acquired infections and is often the cause of wound infections following surgery. Each year, around 500,000 patients in hospitals of the United States face a staphylococcal infection, chiefly by *S. aureus*. Up to 50,000 fatalities each year in the USA are linked with *S. aureus* infections.