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Phytochemical and larvicidal evaluations of extracts of *Hyptis suaveolens* (Magnoliopsida: Lamiaceae) as potential source of lead-agent for vector control of mosquito borne microbial pathogens

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The paucity of sustainable insecticidal lead-agents of public health importance was the reason why this study was carried out to evaluate the potentials of extracts of *Hyptis suaveolens* in vector control of Mosquito-borne diseases. Multi-solvent extracts of vegetative parts (i.e., leaves, stems and roots) of *H. Suaveolens* were prepared and bio-assayed against 4th instar larvae of *Culex pipiens* mosquitoes, following World Health Organisation's recommended protocols for testing the efficacy of insecticides. The results showed that the vegetative parts of the plant species contained seven phytochemical compounds namely, balsam, carbohydrates, glycosides, saponnins, steroids, tannins and terpenes, though in varied relative concentrations. Larvicidal tests revealed that, irrespective of solvent type, the leaf extracts were most toxic to the mosquitoes followed by those of the stem while, the roots extracts were the least toxic. The lethal concentrations of the extracts varied considerably both among solvent types within a plant material as well as among the vegetative parts. The mean LC50 and LC90 were respectively 0.35 ± 0.18 and 0.86 ± 0.59 mg/l, 0.53 ± 0.27 and 0.90 ± 0.51 mg/l, 1.08 ± 0.79 and 1.90 ± 1.26 mg/l for the leaf, stem and root extracts, respectively. These results indicate that *H. Suaveolens* contains bio-active phytochemicals with significant mosquito larvicidal activities and hence is a potential veritable source of sustainable lead-agent for reducing the burdens of mosquito-borne diseases.

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Optimization of cultural conditions and synergistic effect of corn cobs on cellulase production by *Bacillus cereus* LAZ518 isolated from cow dung

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Cellulases are the enzymes hydrolyzing cellulosic biomass and are produced by the microorganisms that grown over cellulosic matters. Bacterial cellulases possess more advantages when compared to the cellulases from other sources. Cellulase producing bacteria was isolated from Cow dung. The organism was identified using 16 SrRNA sequencing and BLAST search. One hundred different strains of Bacteria were isolated from cow dunk in Sohag governorate. Isolates were tested for their ability to produce extracellular Cellulases and hemicellulases. Of all these isolates *Bacillus* sp. that had the highest potential for Celluolytic and hemicelluolytic activity was chosen. From various morphological and physiological and properties, this isolate was found to belong to *Bacillus* sp. Physiological studies were conducted to determine the optimum cultural conditions for maximal cellulases and hemicellulases formation by *B. cereus* LAZ 518. Shaking condition at 150 rpm is favorable for the production of cellulases and hemicellulases from corn cobs. The highest enzyme yield was obtained at the second day of incubation (after 48 hours) at 50 °C. however cellulases and hemicellulases formation occurred at a broad range of pH values, with maximal formation of *B. cereus* LAZ 518 cellulases and hemicellulases at pH 7.0 when corn cobs was used as sole carbon source, respectively Carboxymethyl cellulose (CMC) was found to be a good inducer for cellulases and hemicellulases formation with CMC concentrations of 1.0% (w/v) in case of corn cobs. High level of enzyme formation was obtained with the addition of yeast extract as a nitrogen source and at a concentration of 0.1% (v/v) Tween-80 as an addition to medium containing corn cobs increases enzymes production.

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