World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:16, No:05, 2022

Antibacterial Activity and Kinetic Parameters of the Essential Oils of Drypetes Gossweileri S.Moore, Ocimun Gratissimum L. and Cymbopogon Citratus DC Stapf on 5 Multidrug-Resistant Strains of Shigella

Authors : Elsa Makue Nguuffo, Esther Del Florence Moni Ndedi, Jacky Njiki Bikoï, Jean Paul Assam Assam, Maximilienne Ascension Nyegue

Abstract : Aims: The present study aims to evaluate the kinetic parameters of essential oils (EOs) and combinations fromDrypetes gossweileri Stem Bark, Ocimum gratissimum leaves, Cymbopogon citratusleaves after evaluation of their antibacterial activityonmultidrug-resistant strains ofShigella. Material and Methods:fiveclinical strains of Shigellaisolated from patients with diarrhoeaincluding Shigella flexneri, and 4 otherstrains of Shigella sppwere selected. Their antibiotic profile was established using agar test diffusion with seven antibiotics belonging to seven classes.EOs were extracted from each plant using hydrodistillation process. The activity of Ciprofloxacin®, OEs, and their combination formulatedinthe followingratios(w/w/w): C1: 1/1/1; C2: 2/1/1; C3: 1/2/1, C4:1/1/2 was evaluated microdilution assay. The various interactions of OEs in the different combinations were determined then the OE and the most active combination were retained to determine their kinetic parameters on S. flexneri. Results: Antibiotic susceptibility tests revealed that most Shigella isolates (n = 4) were resistant to six antibiotics tested. Ciprofloxacin (40%), Nalidixic acid (60%), Tetracycline (80%), Amoxicillin (100%), Cefotaxime (80%), Erythromycin (100%), and Cotrimoxazole (80%) were the profiles found in the different strains of Shigella. About the antibacterial activity of OEs, Drypetes gossweileriOE and C2 combination had shown a higher Shigellicide property with a Minimal Inhibitory Concentration(MIC) respectivelyranging from 0.078 mg/mL to 0.312 mg/mL and 0.012 to 1.562 mg/mL. Combinations of OEs showed various interactions whose synergistic effects were mostly encountered. The best deactivation was obtained by the combination C2 at 16 MIC withb= 1.962. Conclusion: the susceptibility of Shigella to OEs and their combinations justifies their use in traditional medicine in the treatment of shigellosis.

Keywords : shigella, multidrug-resistant, EOs, kinetic
Conference Title : ICAGDT 2022 : International Conference on Advances in Gastrointestinal Disease Treatments
Conference Location : Montreal, Canada
Conference Dates : May 23-24, 2022