

SYNOPSIS

Synergism with an antibacterial activity or chemical composition of extracted essential oils of *Croton pulegioidorus* Linn and *Croton tetradenius* Linn against *Staphylococcus aureus*

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Synopsis



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Antibiotics have been widely used as potential drugs to fight against bacterial infections and play an essential role in combating bacterial diseases since their discovery. Currently, the world is facing a severe life-threatening problem of continuously increasing multidrug resistance in bacterial pathogens. Continuous use of antibiotics increases the emergence of resistance.

Plant-based extracts and compounds are currently being explored as alternatives to conventional antibiotics for their applications as antibacterial or antimicrobial agents. Synergism is a positive interface produced while two agents are mutual. To Rehan Ronalty Rocha et al. 2021, extracted essential oil of *C. tetradenius* and *C. pulegioidorus* shows antibacterial activity next to *S.*

aureus, which is a natural alternative in clinical therapy. Authors performed the synergistic effect of essential oil in combination with antibiotics oxacillin along with ampicillin with additional effect of antibiotic benzylpenicillin. Scientists experimented under Brazilian guidelines and ethical principles.

Authors collected leaves as plant material for essential oil. Extraction of the oil was performed by hydro-distillation using Clavenger kind apparatus. Extracted oil was then dried with sodium sulfate. For analysis of oil, gas chromatography with flame ionization detection and gas chromatography-mass spectrometry was operated by the team of authors. For qualitative examination of the oils, Shimadzu single quadrupole GCMS-QP2010 gas chromatography coupled with VG Analytical 70-250 S mass spectrometer was processed. Mainly, the volatile unstable compounds were *p*-cymene, α -phellandrene, and camphor α -phellandrene in *C. tetradenius*, and *trans*-chrysanthenyl acetate, *p*-cymene, and α -terpinene in *C. pulegioidorus*.

Scientists preferred Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) along with agar disc diffusion assay for antibacterial activity. In addition, the microbial growth curve was measured. Synergistic activity was tested by checkerboard assay. The results showed

antibacterial activity by a zone of inhibition which is higher for essential of *C. tetradenius* as compared to the essential oil of *C. pulegioidorus*.

In this issue of Microbial Pathogenesis by ELSEVIER, authors revealed that the combination of conventional antibiotics with natural products has shown potential for reducing the MIC of synthetic drugs permitting the use of lesser doses against multidrug-resistant strains. However, more study is needed to use this combination in clinical trials. The results of following study encourage researchers to use this idea of a combination of essential oil or natural product of antibiotics to reduce the global problem of multidrug resistance. Also, the synergistic ability of the essential oils combined with antibiotics even improved the antimicrobial effectiveness.

Competing Interest: Authors declare that no competing interest exists.

Reference:

Rocha, R. R., atos, M. N.C., Pérez Guerrero, J. A., Cavalcante, R. M.B., Melo, R.S., Azevedo, Á. M.A., Mateus Gomes Pereira, A., Lopes, P. H.R., Rodrigues, T. H.S., Bandeira, P. N., Gomes, G.A., Junior, F. E. A.C., Carneiro-Torres, D. S., Silva, J. R. V., &Carneiro, V. A. (2021). A comparative study of the chemical composition, antibacterial activity and synergic effects of the essential oils of *Croton tetradenius* baill. And *C. pulegioidorus* baill. *Microbial Pathogenesis*, 156, 104934, ISSN 0882-4010. <https://doi.org/10.1016/j.micpath.2021.104934>
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