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Inhibition of Methicillin-resistant *Staphylococcus aureus* by pteridophyte *Nephrolepis cordifolia* (Linn.) Presl. and its associated fungal endophytes

Judee N. Nogodula[1,2], Ma. Eva C. San Juan[2], Reynaldo M. Nogodula[3], Roberth Riggs L. Rondilla[4], Kin Israel R. Notarte[4], Thomas Edison E. Dela Cruz[4,5]

[1]College of Arts and Sciences, University of Southeastern Philippines, Philippines
[2]Pharmacy Department, University of the Immaculate Conception, Philippines
[3]College of Education, University of Southeastern Philippines, Philippines
[4]Fungal Biodiversity, Ecogenomics and Systematics Group, University of Santo Tomas, Philippines
[5]Research Center for Natural and Applied Sciences, University of Santo Tomas, Philippines

Purpose: The misuse of antibiotics has led to the rapid development of multi drug-resistant bacteria. Asia, for instance, has one of the highest prevalence rates of healthcare-and community-associated methicillin-resistant *Staphylococcus aureus* (MRSA). The need to find new antibiotics has brought to the investigation of the tropical fern *Nephrolepis cordifolia* and its associated fungal endophytes (FE) as sources of metabolites against MRSA.

Methods: The crude extract of *N. cordifolia* underwent fractionation with butanol and dichloromethane. The fungal endophytes associated with the host pteridophyte were also isolated using a variety of culture media. DNA barcoding with ITS was further employed for molecular identification of selected endophytes. In testing the metabolite bioactivity extracted from the host plant and fungal endophytes, TLC-bioautography was performed for the detection of chemical constituents antagonistic to MRSA. The bioactivity had further validated by minimum inhibitory concentration (MIC) of the test sample against MRSA.

Results and Conclusion: The butanol extract inhibited the MRSA at the Rf values of 0.54 and 0.74, whereas the dichloromethane extract elicited inhibition at Rf value of 0.58. The MIC of the leaf fractions was at 100ug/mL. A total of 49 fungal endophytes were also isolated from the host pteridophyte. Five of these FE inhibited MRSA with zones of inhibition (ZOI) of > 14mm. Genetic analysis identified these fungal endophytes with bioactive metabolites as *Fusarium equiseti* , *Colletotrichum* sp., *Lassiodiplodia theobromae* , *Harknessiai* sp., and *Aspergillus* sp. Among these, *F. equiseti* showed the ZOI of 23 mm against MRSA with an MIC value of 12.5 ug/mL. Fractionated extracts from *F. equiseti* showed a putative terpenoid at Rf value of 0.63.

Keywords: antimicrobials, bioprospecting, Philippine fern, tropical fungi