

SYNERGISTIC EFFECT MANGOSTEEN PEEL EXTRACT (GARCINIA MANGOSTANA L)

NAND AMOXICILLIN AGAINST BACTERIA METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA)

CLINICAL
MICROBIOLOGY

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Introduction

Antibiotic resistance occurred worldwide, the data shows that antimicrobial resistance has been a global issue needed to be solve immediately because it is a threat not only to the related environment but also to broader society (Suthar, Joseph, Lohan, & Alex, 2012). Methicillin resistant *Staphylococcus aureus* (MRSA) is one of the multiresistant strains which has been a global health problem for the last 50 years. Until now, there is no effective treatment of MRSA infections. Several in vitro studies have shown that active compounds such as xanton derived from the pericarp of GML extract are reported to possess antibacterial effects on *Mycobacterium tuberculosis*, penicillin-resistant *Enterococci* and MRSA (Gutierrez-Orozco & Failla, 2013), yet the action mechanism is still unidentified.

Methods

The antibacterial activity and drug interactions of pericarp of GML extract with amoxicillin will be analyzed by MIC and checkerboard assays using broth macrodilution procedure respectively. These assays are conducted by following the methods of Clinical and Laboratory Standard Institute guidelines (Liu, Durham, & Richards, 2000).

The interaction between the two agents were calculated by the fractional inhibitory concentration (FIC) index of the combination. The FIC of each agent were calculated by the complete growth inhibition of microorganism in the combination tube. This experiment were carried out to confirm antibacterial and synergistic activities of pericarp of GML extract when used as single and in combination with amoxcillin as previously described by Mun et al. and Richards et al. (1993) and (Mun et al., 2013). The concentrations Mg^{2+} seen with AAS.

Results

The MIC of amoxicillin, alpha mangostin and the pericarp of GML extract to *Staphylococcus aureus* ATCC BAA-38 bacteria were 250 $\mu g/mL$, 19.5 $\mu g/mL$ and 137,5 $\mu g/mL$ respectively. Checkerboard assay revealed synergistic activity in the combination of pericarp of GML extract (34,38 $\mu g/mL$) and amoxicillin (62,5 $\mu g/mL$) at fractional inhibitory concentration index (FICI) < 0,5. Results indicate the presence of bacterial cell wall damage due to the increased concentration of Mg^{2+} in treatment.

Conclusions

These findings provide evidence that pericarp of GML extract has the high potential to reverse bacterial resistance to originate traditional drug susceptibility of it.

References

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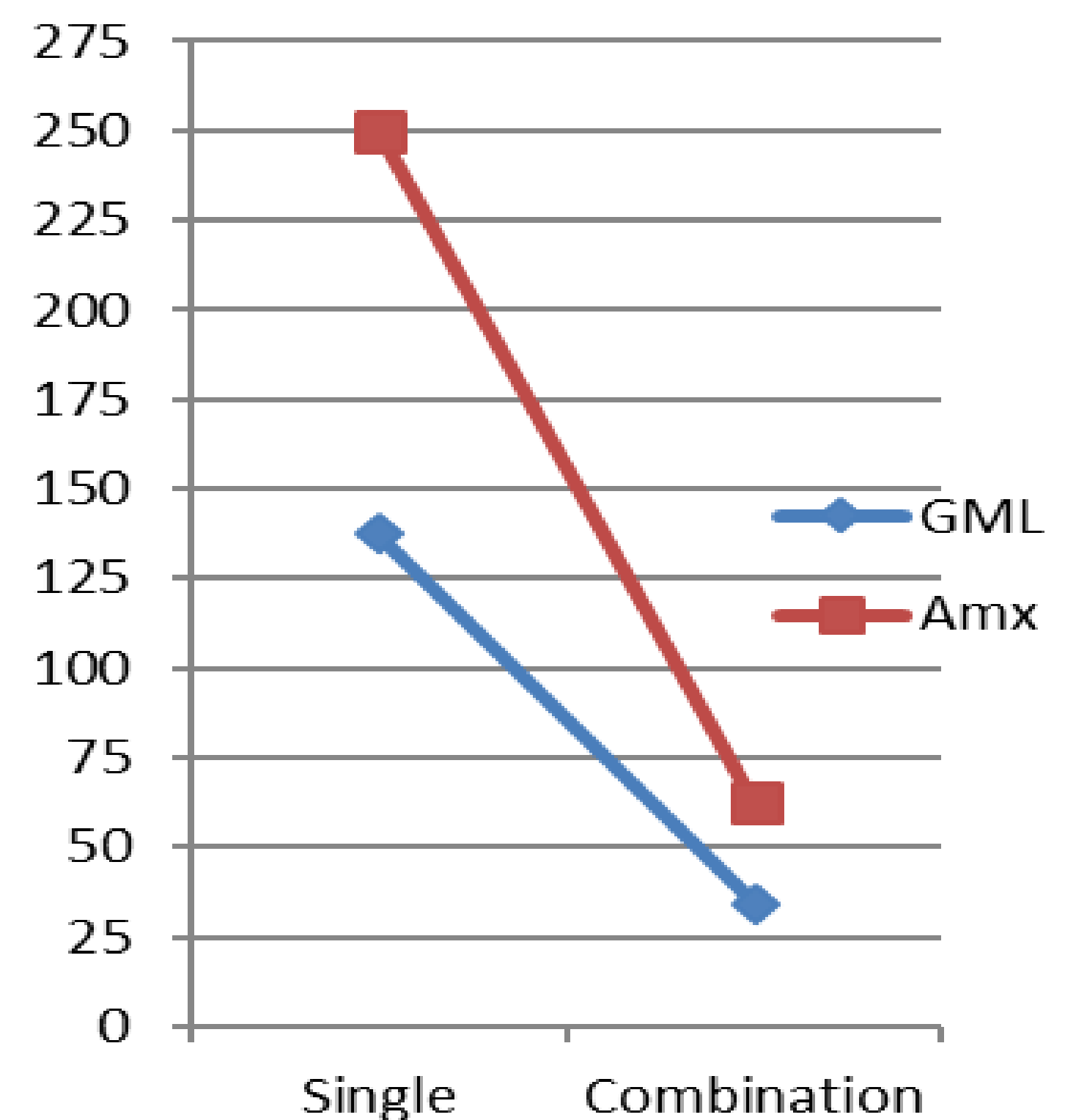


Fig.1. MIC of pericarp GML & Amx single and combination

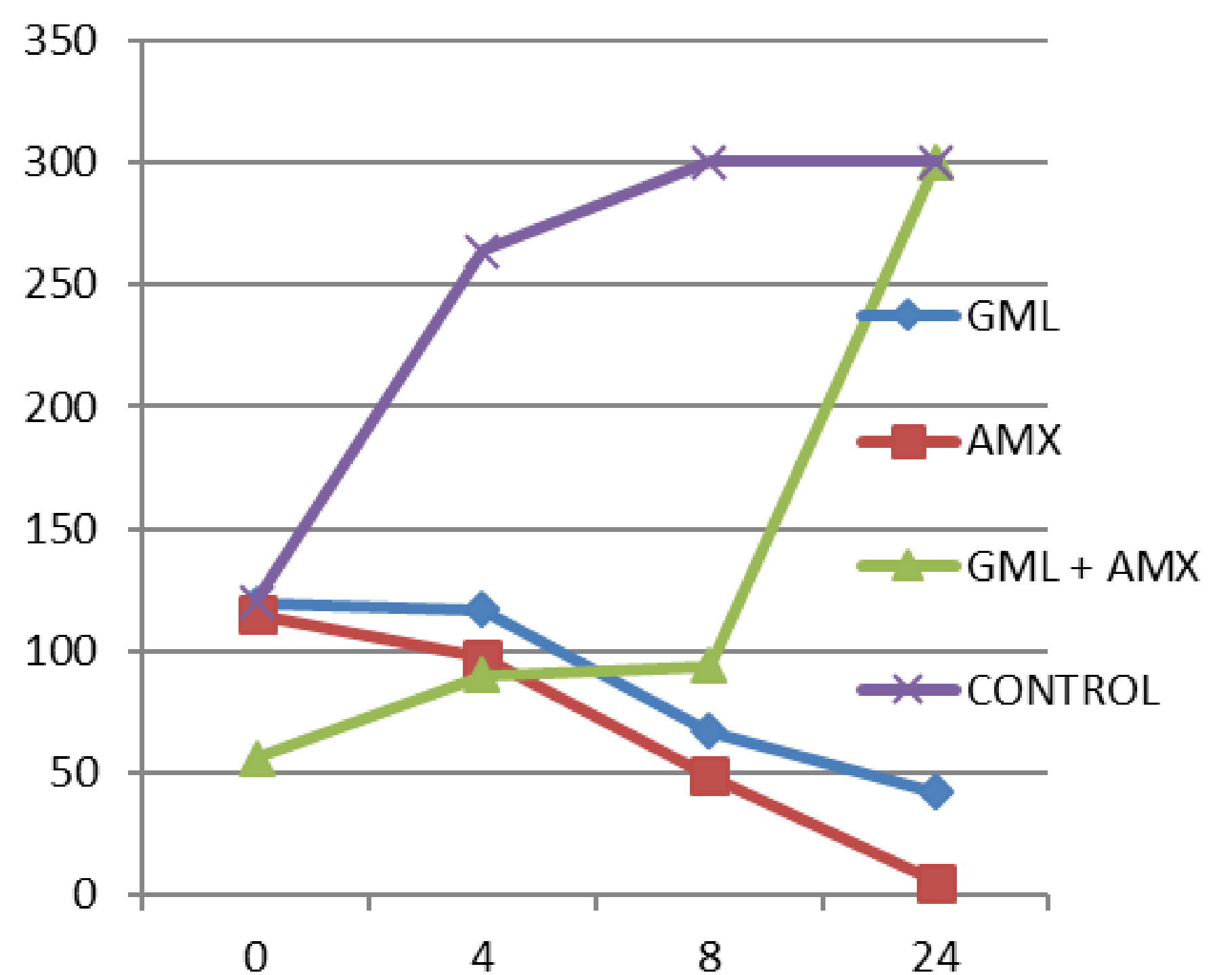


Fig.2. Time Kill Curve GML, AMX, GML + AMX, CONTROL

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