

**TITLE:** SYNERGIC EFFECT AMONG 6-SHOGAOL AND COMMONLY USED ANTIBIOTICS AGAINST METICILIN RESISTANT STAPHYLOCOCCUS AUREUS

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6-shogaol is a natural product found in the rhizomes of processed *Zingiber officinale* Roscoe (ginger) and is involved in several therapeutic ginger activities, including antimicrobial. 6-shogaol exhibits better antimicrobial activity when compared to 6-gingerol, the main secondary metabolite of ginger. However, there are few works that explore the biological activity of 6-shogaol. In addition, there are no studies evaluating the synergistic effect among 6-shogaol and currently used antimicrobials against bacteria, such as methicillin-resistant *Staphylococcus aureus* (MRSA). This microorganism is considered an opportunistic pathogen of great clinical importance, since the available antimicrobial options have been reduced due to the emergence of resistance to penicillin, methicillin and, more recently, vancomycin. This study aimed isolate 6-shogaol from *Zingiber officinale* rhizomes and determine the minimum inhibitory concentration, as well as evaluate its synergistic action when associated with different antimicrobials agents against MRSA. Ethanolic ginger extract was prepared and sequentially fractionated by classical liquid chromatography and the fraction containing the 6-shogaol was purified by high performance liquid chromatography (HPLC). The minimum inhibitory concentration (MIC) was determined by microdilution on 96 well plate and read spectrophotometry at 600nm. The synergistic effect was analyzed through the combination of 6-shogaol (25 and 12.5 µg/mL) and different antibiotics, penicillin, ofloxacin, neomycin, chloramphenicol, cefaldroxil or bacitracin by the modified Kirby and Bauer disk diffusion method. 6-shogaol presented high antimicrobial effect, with a MIC of 50 µg/mL. In addition, synergistic effects were detected after the associations of 6-shogaol (25 µg / mL) with all tested antibiotics. The increase on the halo diameter ranged from 1 to 6 mm. Considering the results obtained in this work and other studies, 6-shogaol is a potent antimicrobial agent and also came out as a promising substance to be used in combination with currently used antibiotics against multidrug resistant *S. aureus*.

**Keywords:** *Zingiber officinale*, 6-shogaol, antimicrobial, synergism, MRSA.

**Development Agency:** Universidade Federal de Sergipe.