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# Anti-fungal activity and structural relationship of 3-benzylidene indolin-2-one synthesized from microwave-assisted green method

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**Background:** Synthetic versatility of the indolin-2-ones, due to its privileged scaffold oxindole, has led to the development of an extensive range of medicinally important compounds. These compounds have shown a broad spectrum of biological effects including anti-cancer, anti-viral, anti-bacterial and anti-inflammatory. Recently, many research has focused on the structural characteristics of these compounds exerting significant pharmacological activity.

**Objective:** To investigate the anti-fungal activity and the structural relationship of microwave-assisted green synthesized 3-benzylidine indolin-2-one.

**Method:** Oxindole and benzaldehyde is thoroughly mixed with piperidine catalyst and irradiated inside modified microwave oven for 15 minutes. Resulted 3-benzylidine indolin-2-one (A1) was purified by column chromatography. N-acetylated 3-benzylidine indolin-2-one (A2) was obtained by refluxing A1 with acetic anhydride (in acidic pH) inside the modified microwave oven for 30 seconds. Both A1 and A2 compounds were characterized by Nuclear Magnetic Resonance spectroscopy ($^1$H NMR), Fourier-Transform Infrared spectroscopy (FTIR) and melting point analysis. The compounds were tested for *in-vitro* anti-fungal activity against *Candida albicans* (ATCC 10231) and *Candida glabrata* (ATCC 90030) using well diffusion assay.

**Results:** Melting points of the synthesized compounds A1 and A2 were 178 ºC and 103 ºC. Both $^1$HNMR and FTIR spectra confirmed the formation of A1 and A2. The mean Zones of Inhibition (ZOI) against *Candida albicans* for compound A1 and the positive control miconazole were 20.0±0 mm and 11.3±0.5 mm, respectively. The mean ZOI against *Candida glabrata* of compound A1 and the miconazole were 14.7±0.5 mm and 24.7±0.5 mm, respectively. Compound A2 did not show any anti-fungal activity against both *Candida species*.

**Conclusion:** These findings revealed that 3-benzylidene-indolin-2-one retains a significant anti-fungal activity against *Candida albicans*, an important pathogen while N-acetylation diminished the reported activity. N-H functionality of 3-benzylidene-indolin-2-one is essential for its anti-fungal activity and the structural characteristics we found here may contribute future development of novel therapeutic agents.

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