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*NOTE*

# Pharmacological Evaluation of Some Indoloimidazoles

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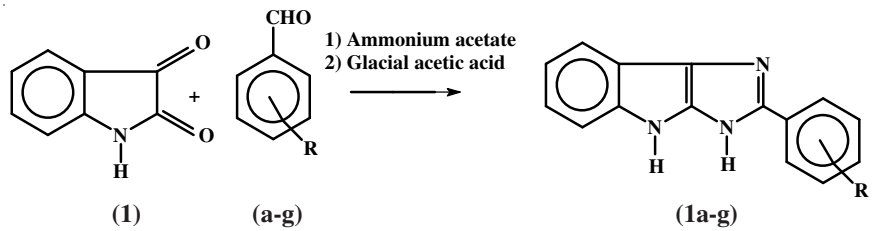
A variety of novel substituted indolimidazoles have been synthesized by reacting 1-H-indole-2,3-dione (isatin) with various aryl aldehydes. These compounds were characterized by spectral analysis. Newly synthesized compounds were screened for their antiinflammatory and antifungal activity.

**Key Words: Isatin, Indoloimidazole, Antiinflammatory activity, Antifungal activity.**

Imidazoles[1] are important class of compounds which possess a variety of pharmacological activities[2,3] like cardiovascular, antineoplastic, antifungal, anthelmintic, analgesic and antiinflammatory activity. Isatin and its derivatives are reported to have antimicrobial, antiviral[4], antihypertensive[5], anticonvulsant, antineoplastic[6], antiinflammatory and antiulcer activity[7]. These observations prompted us to synthesize some indole derivative of imidazole moiety to get compounds with higher biological efficacy.

Melting point was taken in open capillary tubes and is uncorrected. The compounds were routinely checked for their purity by TLC on silica gel G plates using iodine vapours as visualizing agent. The FT-IR (KBr) spectra were recorded on Nicolet 5PC spectrometer ($\nu_{max}$ $cm^{-1}$) and $^1H$ NMR spectra on a Bruker DRX-300 (300 MHz FT-NMR) spectrophotometer using TMS as internal reference (chemical shift in $\delta$, ppm). Mass spectra were recorded at Jeol-102 (FAB) spectrometer.

Indole-2,3-dione (**1**) (0.025 mmol, 3.7 g) was refluxed with different aromatic aldehyde (**a-g**) (0.025 mmol) in acetic acid (50 mL) in the presence of ammonium acetate (10 g). After refluxing for 5-6 h, the reaction mixture was diluted with water and cooled to room temperature, then successively extracted three times with chloroform (30 mL each). The chloroform extracts were combined and evaporated. The residue thus remained was purified by recrystallization from ethanol. The completion of the reaction was checked by TLC with benzene + ethyl acetate mixture as mobile phase (4:1). 3-phenyl indolo[2,3] imidazoles (**Scheme-I**).




**(1)** **(a-g)** **(1a-g)**

R = H, 2-Cl, 3-Cl, 4-Cl, 4-F, 3-$NO_2$, 4-$NO_2$

**Scheme-I**

**1c:** IR (KBr, $\nu_{max}$): 3424 (N-H), 1510 (C=N), 1544 (C=C), 663, 787. $^1$H NMR (DMSO-$d_6$): δ 8.8 (b, 1H, N-H of imidazole), 8.1 (b, 1H, N-H of indole), 7.7-7.2 (m, 8H, aromatic protons).

TABLE-1
PHYSICAL CHARACTERISTICS OF THE SYNTHESIZED COMPOUNDS

| Compound | m.p. (ºC) | Inhibition (%) | Zone of inhibition (mm) | |
|---|---|---|---|---|
| | | | 100 | 200 |
| Ia | 120 | 6.63 | 15 | 18 |
| Ib | 105 | 19.38 | 24 | 30 |
| Ic | 155 | 41.48 | 20 | 28 |
| Id | 190 | 10.20 | 13 | 17 |
| Ie | >200 | 11.60 | 17 | 23 |
| If | 230 | 37.40 | 17 | 20 |
| Ig | 180 | 23.60 | 18 | 21 |

Concentration in µgm/mL

**Antiinflammatory activity:** All the synthesized compounds were screened for their antiinflammatory and antifungal activity. Antiinflammatory activity is performed in albino rats using carrageenan induced paw edema method[8] at a dose of 10 mg/kg body weight. Compound **Ic** showed potent antiinflammatory activity. Compounds (**If** & **Ig**) showed moderate activity.

**Antifungal activity:** All the synthesized compound were screened *in vitro* for their antifungal activity at the concentration of 200 and 100 µg/mL against *Candida albicans* fungi by cup plate method using DMF as solvent. After 48 h of incubation at 37ºC, the zone of inhibition was measured in mm. Compounds Ib and Ic show good antifungal activity and compounds **Ie**, **If** and **Ig** show moderate antifungal activity.

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