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Visible light mediated eosin-Y catalysed direct synthesis of biologically potent of [1,2,4]triazolo [3,4-*b*] [1,3,4] thiadiazols

Pravin K Singh[a]* Vishal Srivastava[a] & Praveen P Singh[b]

[a]Department of Chemistry, C.M.P. Degree College, University of Allahabad, Prayagraj 211 002, India
[b]Department of Chemistry, United College of Engineering & Research, Naini, Prayagraj 211 010, India

E-mail: dr.pkschem@gmail.com

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A green light promoted, facile, one-pot approach for the synthesis of biologically important 6-(substituted/unsubstituted benzylthio)-3-phenyl-[1,2,4]triazolo[3,4-b][1,3,4]thiadiazole **6a-m** has been developed. New synthetic approach for the preparation of tailor-made synthesis of triazolo [3,4-b] [1,3,4] thiadiazol derivatives **6a-m** are in extremely high demand as they display significant potent activity against fungal strains as well as on mutant strains. Herein, we have designed an efficient, cheap and easy photo-induced synthetic strategy to obtain the target compound with excellent yield. Compounds **6a-m** have been evaluated *in vitro* for their fungitoxicities against *Penicillium citrinum* and *Fusarium oxysporum*. All the synthesized compounds have been found to be antifungal active. Among them, activities of some of the compounds displayed are comparable with that of the commercial fungicide griseofulvin and Dithane M-45. Structure activity relationships (SAR) for the screened compounds have been discussed.

Keywords: 1,2,4-Triazoles, [3,4-b][1,3,4] Thiadiazols, Fused heterocyclic, Fungicidal activity, Photoredox catalysis, Reduced-risk fungicides

Literature survey