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Research Article

Effect of UVC rays on biomass production by *Metarhizium anisopliae* (Metschinikoff) Sorokin when mixed with various adjuvants

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ABSTRACT : The effect of UVC rays on the viability of entomopathogenic fungus, *Metarhizium anisopliae* (Metschinikoff) Sorokin, in the presence of various concentrations of adjuvants comprising glycerol (1.0, 2.0, 3.0 and 5.0%), tween-80 (0.5 and 1.0%), boric acid (1.0, 2.0 and 3.0%), carboxymethyl cellulose (0.5 and 1.0%), indigo (0.5 and 1.0%), turmeric (0.5 and 1.0%), molasses (0.5 and 1.0%), honey (1.0 and 2.0%), milk (1.0 and 2.0%), sunflower oil (0.5 and 1.0%), groundnut oil (0.5, 1.0 and 2.0%), mustard oil (0.5 and 1.0%), soybean oil (0.5 and 1.0%) and ghee (0.5 and 1.0%) and formulations without adjuvants, when exposed for 10 to 50 minutes, 2,3 and 5 hours was studied under laboratory conditions. The UVC rays proved detrimental to the fungus and the effect increased with increase in exposure period. After 5 hours exposure to UVC rays, the fungal culture with *M.a.*+sunflower oil 1.0 per cent produced maximum (5.0g) biomass to rest of the treatments. However, it was at par with *M.a.*+sunflower oil 0.5 per cent (4.90g). The next effective treatment for fungal biomass production was *M.a.*+groundnut oil 0.5 per cent (4.73g), *M.a.*+groundnut oil 1.0 per cent (4.67g) and *M.a.*+groundnut oil 2.0 per cent (4.60g). The *M.anisopliae* without adjuvants exposed to UVC rays produced biomass of 2.23g while, the control *M.a.*alone without UVC exposure produced 6.50g of fungal biomass. Among the various oils sunflower and groundnut oil, among chemical adjuvant glycerol 2.0 per cent, CMC 0.50 per cent, boric acid and among nutrient sources honey, milk act as appreciable UVC protectant.

KEY WORDS : *Metarhizium anisopliae*, Media, Yeast extract, Ultraviolet formulations, Biomass

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INTRODUCTION

Metarhizium anisopliae (Metschinikoff) Sorokin is one of the main fungal candidates for use in microbial control of pests. Special attributes such as pathogenicity for wide group of insects easy mass production on simple substrates and good viability in soil and shelf life have emerged great interest in this mycoagent. The efficacy of pathogens in the field depends on environmental conditions. The extreme temperatures and light including ultraviolet (UV) may influence the distribution of micro-organisms and their persistence in nature (Zimmermann and Butin, 1973 and Ignoffo *et al*., 1977). Roberts and Campbell (1977) reported a rapid decrease of viable spores exposed to direct sunlight and they suggested that the spore mortality was caused by UV radiation. The solar radiation (UV-B radiation) are the major challenges to mycoinsecticide viability. Several reports are available on effect of temperature on growth and activity of fungi (Lomer *et al*., 2001 and Leland, 2005).

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EXPERIMENTAL METHODS

The study was carried out in the Biocontrol Research Laboratory of the Department of Entomology of the University at MPKV, Rahuri, Maharashtra. The Sabouraud's dextrose broth with yeast extract medium was used for multiplication and