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RESEARCH ARTICLE

IDENTIFICATION AND COMPARISON OF CHEMICAL PROFILING OF SOME CROPS AND WEEDS AT SEEDLINGS STAGE IN THE FIELDS OF BALURGHAT BLOCK, DAKSHIN DINAJPUR, WEST BENGAL

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ABSTRACT

Seedlings of eight weeds and seven crops are described and quantitatively analyzed with six chemical parameters viz. leaf extract pH, ascorbic acid contents, total chlorophyll content, protein content, total phenolic content and peroxidase activity. Morphological traits of seedlings of both crops and weeds are used for the preparation of artificial keys separately for their proper identification. Of many chemical parameters, only these six parameters may address towards better adaptation of weeds and crops to the stressful environment. However, very little differences have been resulted in the above chemical parameters under numerical analysis through ANOVA and Principal component analysis.

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INTRODUCTION

Weeds are undesired plant species that grow with cultivated crops and intervene or compete with the crops for growth and nutrients, and in this way affect productivity leading to economic loss (Marwart *et al.* 2013). Since, number of seed production, seed production rate, seed viability and resistance to the environment are higher in weeds compared to crops, vigorous germination of seeds occurs during pre or post-harvest periods establishing abundant seedlings. Even the occurrence of flowering can be observed in these weeds at the seedling stage indicating their partly ephemeral behavior. This makes it a lot of harder for their total eradication from the field because they immediately disperse innumerable seeds. However, eradication at the seedling stage minimizes the chance of further weed dispersal by limiting their life cycle before flowering. There are, however, relatively few previous publications dealing with weed seedling identification (Kumar, 1951; Chancellor, 1959; Singh, 1963; Stucky, 1984;

Singh and Singh, 1994; Bhattacharya and Paria, 1996; Anonymous, 2008; Singh and Sahu, 2010; Singh *et al.*, 2011; Singh and Sahu, 2012; Parkinson, 2013; Singh, 2015 and Das and Kamilya, 2020). Secondary metabolites apparently act as defense (against herbivores, microbes, viruses, or competing plants) and signal compounds (to attract pollinating or seed-dispersing animals), as well as protecting the plant from several biotic and abiotic stressors (Chon *et al.*, 2002; Tegelberg *et al.*, 2004) from the beginning of their life cycle. Studies on Australian Proteaceae (Hanley and Lamont, 2002) provide evidence that high leaf phenolic contents and antioxidants deter herbivores as well as abiotic stressors. These phenolic compounds as well as other primary or secondary metabolites may have highly diverse biological activities. Usually, it has been seen that survival abilities and regeneration capabilities of some weeds are greater as compared to many crops even under unfavorable environments. Considering the stress enduring capacity of majority of weeds, some chemical parameters are adopted experimentally at the juvenile stages which are hardly