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minutes and were incubated in the dark at 25±2 °C for 7 days in Seed Germinator (REMI-6C).

After seven days the following assessments were made on Biochemical parameters like Protein (Lowary et al., 1957), Amino Acids (Moore and Stein, 1948), DNA and RNA (Schmeider, 1957) and Sugar (Yoshida et al., 1972) following standard procedures. The experiment was set in three replicates.

Statistical Analysis
The data are expressed as mean values of (n=5) and were analyzed employing Correlation Analysis to determine whether the values were significantly different from control at 0.05P with 4 d.f. (XLSTAT 2015 software)

Results
The observations made in relation to morphological traits and phyto-pigments are given in Fig. 1-5, showing the correlation analysis of profenofos concentration (%) and parameters studied. Fig. No.-1 shows the effect of profenofos on Protein content of Shoot and Root of 7days old Mung seedlings recorded after 96h of treatment under laboratory conditions. It was found that, there is a gradual increase in protein content in both shoot and root with the increase in profenofos concentration and response of Root was less than shoot with the increase in profenofos treatment.

Fig. 2-5 showed the declining trend in DNA, RNA, Amino Acids and Sugar content in root and shoot of 7days old seedlings after profenofos exposure. All the parameters decreased with the increase in profenofos concentration. The decline in DNA and RNA content in Shoot of the seedling with the profenofos exposure was more pronounced in comparison to Root. However, an exception was found in case of 0.02% profenofos treatment where it elevated the parameters studied.

The correlation analysis (r values) was carried out between each parameter observed with the Concentration of Profenofos (%) are given in Fig No.1-5. The biochemical traits like DNA, RNA, Amino Acids and Sugar showed a statistically significant result.
Fig. 5: Changes in Sugar Content in 10d Old Seedlings of V. radiata after profenophos treatment

Discussion

Extensive use of organophosphorus insecticide profenofos (PFF) for agricultural and house-hold purposes has led to serious environmental pollution, with potential risk to organisms in the ecosystem. This study examined the toxicity of PFF to the soil springtail Folsomia candida and ammonia-oxidizers through a series of toxicity tests conducted on two agricultural soils. The results of the acute toxicity tests suggested that the survival of F. candida could be considered as the most suitable bio indicator for fast screening of PFF toxicity because of its fast and easy test procedure.

The growth and fruiting pattern of cotton plants were noticeably altered in association with the use of two systemic organophosphorus insecticides. Phorate was applied as a seed treatment, and phorate and Di-Syston® (O,O-die thyl S-[2-(ethylthio)- ethyl] phosphorodithioate) were applied as granular formulations in the soil either at planting time or in June. Phorate treatments at planting time delayed seedling emergence and reduced the number of plants per acre at one or more locations, and resulted in greater plant height and leaf size in all tests. Insect and spider mite control obtained with these materials apparently was not a contributing cause for growth and fruiting differences. (Leigh, 1963)

Insecticide mixtures viz., Roket, colphos, Nimbicidine + Biolep, eucalyptus + lemon grass oil + neem oil and profenofos (organophosphate insecticide) generally used against Helicoverpa armigera significantly increased chlorophyll content ‘a’ in chickpea leaves while application of endosulfan + Biolep showed sharp decline in chlorophyll content ‘a’. Endosulfan at 0.07% concentration with 0.5% Biolep proved more toxic to chlorophyll content ‘a’ than endosulfan at 0.05%. (Srivastava et al., 2006).

The organ phosphorus compounds are taking the major share of insecticide consumption in India (Aditya et al., 1997). Chlorpyrifos is a broad-spectrum organophosphate insecticide being used for more than a decade to control foliar insects that affect agricultural crops, to reduce pod damage (Khan et al., 2009; Wu and Laird 2003; Rusyniak and Nanagas 2004), and subterranean termites (Venkateswara et al., 2005). Chlorpyrifos produces hazardous effects on the environment when it is applied directly on plants or mixed with soil (Howard 1991). The absorption and translocation of chlorpyrifos residue by wheat and oil seed rape root has been studied by Wang et al. (2007) and it concluded that, the uptake rate of chlorpyrifos residue by these two plants increased with an increase in the amount of chlorpyrifos residue in soil. Parween et al. (2011) revealed that the exposure of an organophosphorous insecticide chlorpyrifos proved depressing for nitrogen metabolism and plant growth in Vigna radiata L. Previous studies have demonstrated that dimethoate causes a reduction in plant growth, photosynthetic pigments and photosynthetic activity of Glycine max L. (Panduranga et al., 2005) and Vigna unguiculata L. (Mishra et al., 2008). Continuous exposure to imadacloprid at higher doses significantly impaired the germination and growth of rice seed and seedlings (Stevens et al., 2008) whereas adverse effects of mancozeb on morphological and anatomical traits of Lens culinaris L. at different developmental stages has been investigated by Bashir et al. (2007a, b). The blocked growth might have resulted from the inhibition of normal cell division or elongation.
Disturbance of seed germination and mitosis could produce severe consequences for root growth and development. This was clearly demonstrated for the roots of *Pisum sativum* and *Zea mays* with different concentrations of the sulfonylurea herbicides chlorsulfuron and metsulfuron methyl which caused severe injuries of the root growth (Fayez et al. 1994). After the treatment with different concentrations of pesticides, we observed that the percentages of seed germination decreased while the concentrations increased for each concentration of profenofos.

**Acknowledgements**

Authors are grateful to Principal, Khallikote Autonomous College, Berhampur and Head, P.G. Department of Botany and Biotechnology for encouragement in research activity and for providing necessary laboratory facilities.

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