ABSTRACT

MORPHOPHYSIOLOGICAL AND BIOCHEMICAL UPGRADATION OF KALMEGH (Andrographis paniculata Nees.) GERMPLASMS AND THEIR PROSPECT AS BIOPESTICIDE

Six genotypes of kalmegh, namely Sarisha local, Medinipur local, N.B.R.I.(Lukhnow), Shyamnagar local and Majhdia local were collected from different sources to study the variability of different agromorphological and biochemical characters among the genotypes along with heritability, character association and yield components of different characters for the construction of selection criteria. The data revealed considerable variations among different genotypes. High Heritability% coupled with considerable good Genetic Advancement% of mean were observed for the characters like plant height, leaf number and leaf area suggesting these traits were governed by additive gene. Plant height, Number of node/plant, Branch number/plant and Branch length registered positive direct effect on fresh weight in three different years. These characters also produced positive indirect effects of different magnitudes when correlation of different characters with fresh weight was elaborated in different years.

In another experiment, selected genotype Majhdia Local was grown to the drought prone areas of Purulia and saline prone soil of Sundarban to impose abiotic stress for two consecutive years and they were compared with the control grown situation at Baruipur. Kalmegh qualified with good score in terms of fresh and dry mass specially biochemical contents in respect of controlled condition. Implementation of ratooning in all six genotypes of Kalmegh was done in successive two generations and compared with the mother generation and result revealed that ratoon cultivation improved the fresh and dry herbage in huge almost four to five times by increasing branch number and leaf number/plant allowing harvesting thrice within a calendar year. Application of foliar spray of sugar and salt solutions over Kalmegh population has resulted significant increase in fresh and dry weight as well as water and alcohol soluble extractive along with andrographolide content over the control.

The kalmegh genotype Majhdia local was treated with three different colchicine treatments namely 0.5%, 1.0% and 1.5% to induce colchiplodidy(C) followed by the advancement of C₁, C₂ and C₃ generations. To investigate any significant change in colchiploids they were compared with the control plants in respect of yield attributing characters in each generation. Some outstanding lines were selected in C₃ generations on the basis of good fresh weight and andrographolide content have a good promise in future breeding programme.

Finally, extract of Kalmegh applied over paddy, lentil, moong and gram seeds by soaking-drying method has shown significantly beneficial result against store grain pests as well on seed viability, vigor, germination%. In storage condition efficacy increased as the treatment gradually diluted. The treated seeds further sown in field during respective cultivation seasons for two years subjected to the same level of foliar treatments and the results revealed that efficacy of the treatments increased as the treatment concentration gradually increased. Therefore there is immense scope of Kalmegh cultivation with improved approach and formation of biopesticide from Kalmegh.

\[\text{Abhijit Samanta}\]