

SEASONAL INFLUENCE ON PROTEIN CONTENT AND PROTEIN PROFILE OF DEVELOPMENTAL STAGES OF FIVE SESAMUM GENOTYPES

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ABSTRACT

To investigate seasonal influence on total protein content of seed and protein banding pattern through protein profile of five sesamum genotypes (Uma, Amrit, Nirmal, CUMS-17, and Prachi) in six seed developmental stages (7DAA, 14DAA, 21DAA, 28DAA, 35DAA, 42DAA) evaluated in three seasons (summer, *kharif* and *rabi*). Result showed, the total soluble protein in the developing seeds increased consistently till 35 DAA (Days after anthesis) after which there was no further accumulation. All the varieties showed similar trends with initial slow accumulation up to 21 DAA followed by rapid increase up to 35 DAA. Irrespective of growing seasons, Prachi and CUMS-17 recorded the highest soluble protein in seeds (26.0%, 25.2%) throughout the period of seed development and Uma consistently recorded the lowest protein (22.6%) at maturity stage. The *kharif* seeds had the highest soluble protein (25.6%) followed by summer (24.4%) and *rabi* (22.8%) at maturity stage. Storage protein accumulation and characterization of the sesamum after 7, 21 and 35 DAA was estimated. During *kharif* season, most of the tested genotypes showed minimum level of storage protein appearance on 7 DAA except the variety Uma in which no protein band was seen and minimum number of bands (02) occurred in Uma and maximum (07) in Nirmal after 21 DAA. In summer, after 7 DAA, only (02) distinct fragments were observed in 'Prachi' and 'CUMS-17' and not observed other tested genotypes but after 21DAA, there were appearance of two more fragments in variety Prachi and CUMS-17. Nirmal, Amrit, and Uma, only two bands were appeared but after 35 DAA, there were appearance of a greater number of protein fragments (07) in case of Prachi and 'CUMS-17'. During *rabi*, after 7 DAA, Amrit and Uma exhibited the minimum number (01) of protein band while Prachi, CUMS-17 and Nirmal exhibited more (02) bands and showed the minimum number (02) of protein band while, Prachi, CUMS-17 and Nirmal showed more (03) bands and no appearance of new storage protein after 21 DAA. The pattern of protein profile in the tested genotypes was similar after 35DAA. Based on similarity analysis of protein banding pattern under different seasons among the five varieties tested, Prachi showed a single cluster having 55% similarity, Nirmal and CUMS-17 showed 94% similarity however, the var. UMA and Amrit making one cluster having 78% similarity regarding protein profile.

Key Words: Genotype, Protein, Protein profile, Season, Variety

CONCLUSION

Accumulation of soluble protein in developing seeds increased gradually with progress of seed maturity and attained the highest values around 35 DAA. Among the varieties, Prachi, and CUMS-17 and among the seasons, seeds produced in *kharif*, exhibited higher values in respect of the biochemical traits. SDS-PAGE analysis of seed storage protein at different stages of seed development indicated gradual increase in number of protein bands with advancement of seed development. Few bands were observed on 7DAA which increased to 7 – 8 at the maturity stage of seed. Greater polymorphism was observed in summer and *kharif* seasons as compared to *rabi* season. Basing on the degree of polymorphism, the five sesamum varieties under study fell into three distinct groups. Maximum polymorphism was observed in Nirmal and CUMS-17 (94%) followed by Uma and Amrit (78%) while, Prachi remained as a single group (55%). Among the available sesamum varieties, Prachi and CUMS-17 excelled others in respect of total seed protein content and protein profile. Thus, for quality seed production, the *kharif* and summer seasons to be considered favorable for coastal regions of the state.

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