ABSTRACT

Bivoltine sericulture in India gained its popularity since 1997. The bivoltine hybrid of CSR2 x CSR4 is in current use and produce international grade silk. The consistency in the popularity of this hybrid is possible only when its parents are maintained systematically to retain its original breed characteristics so that the hybrid vigour for various quantitative characters is retained at desirable level. As on today, silkworm race maintenance has been followed through visual observation for cocoon uniformity, shape and size with higher pupation rate following inter batch crossing system. In spite of adoption of one way system of silkworm race maintenance, decline in some of the quantitative traits was noticed. To over come this, the effect of different types of selection i.e., directional, stabilizing, disruptive and cyclical selection on cocoon weight, shell weight and cocoon shell percentage was applied for twelve generations to understand their impact on the racial characters. Application of different selection methods on the popular breeds CSR2 and CSR4 expressed marginal variability for the cocoon traits. The significant (P < 0.05) difference in most of the selection methods for the cocoon characters can be attributed for the seasonal effect rather than selection pressure. In addition, the measure for hybrid vigour at 9th and 12th generation for the breeds subjected to the selection methods along with the control did not express any difference in the hybrid vigour over the mid parent and better parent values.

From the outcome of the present study, it is very much clear that directional selection can be applied when there is decline in the expression of cocoon trait then the selection of a particular trait higher value helps to regain the racial characters with xx
in a few cycles. With regard to stabilizing selection, not much difference was observed when compared to control. In case of disruptive selection utilizing both higher and lower values for a trait which, helps to maintain vigour in the breed. The alternate generation of selection for higher and lower values for a trait has shown much variability in the expression of the trait. Among the four types of selection, stabilizing selection is one of the best methods that can be applied so that there will not be any change in the racial characters. If there is any decline in the original breed characters other methods of selection can be adopted depending on the breed requirement / improvement. The effect of different methods of selection on the racial characters is discussed.