

ABSTRACT

Response of *Bombyx mori* L. to native and exotic *Morus* genotypes under different ecological domains of Nepal. PhD Dissertation submitted to IAAS, Rampur, Chitwan, Nepal. 262p.

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Seri-farmers' survey and field as well as laboratory experimentations were carried out to assess the response of bivoltine silkworm, *Bombyx mori* L., to native and exotic mulberry genotypes under different ecological domains of Nepal. The study included review of climatic data, technological status of seri-farmers, bio-chemical assay of mulberry leaf, nutritional response of silkworm to mulberry genotypes and comparative performance of silkworm (pure and hybrids) under different ecological domains. The climatic data revealed the selected ecological domains were suitable for both mulberry cultivation and silkworm rearing. Technological status of seri-farmers illustrated to improve the mulberry garden management and silkworm rearing. Four native and fifteen exotic mulberry genotypes were used in bio-chemical analysis and bioassay. Mulberry leaf yield performance, leaf-moisture retention capacity and bio-chemical determination were performed in 19 mulberry genotypes, while bivoltine silkworm hybrid $J_{12} \times C_{12}$ was reared on each mulberry genotype for assessing the leaf quality. J_{12} and C_{12} were the pure bivoltine silkworm breeds, while $J_{12} \times C_{12}$, $C_{12} \times J_{12}$, $N_{107} \times N_{112}$, $N_{108} \times N_{112}$ and $N_{109} \times N_{112}$ were the bivoltine silkworm hybrids tested under different ecological domains. Among the tested mulberry genotypes, Victory-1 for yield performance, Victory-1, B1-23 and Samalbunge for moisture retention capacity and Kanva-2 for bio-chemical parameters were superior. Cent percent moulting resulted with 53, 50, 72 and 94 hours leaf feeding for first, second third and fourth instars silkworm larvae, respectively. Feeding the fifth instar larvae with mulberry leaves for first 72 hours was necessary to incite spinning but cocoon quality and quantity was directly proportional to feeding period. First and second instar moulting behavior and larval body weight gain during the fifth larval period was better on Kanva-2 followed by Victory-1, Chinese Hybrid, S_{54} and B1-23 mulberry genotypes. Desirable consumption-conversion was in Kanva-2 followed by Chinese hybrid, Victory-1, S_{54} and Khopasi-3 genotypes. Adaptability of two pure silkworm breeds tested under five ecological domains, the biggest cocoon size, the highest single cocoon weight, the highest shell percent and the highest seed cocoon productivity were found in Pokhara; while the highest good cocoon, and the lowest mortality was in Dhunibesi. Among five bivoltine silkworm hybrids tested under three ecological domains, $J_{12} \times C_{12}$ was suitable for Khopasi and Pokhara conditions, while $N_{109} \times N_{112}$ was suitable for Dhunibesi condition.

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