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Studies on rearing techniques, cocoon quality and economic importance of mulberry silkworm (Bombyx Mori l.) in Villupuram district

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Abstract
The present study investigates the rearing techniques, cocoon quality, and economic importance of the mulberry silkworm (Bombyx mori L.) in the Villupuram district of Tamil Nadu. Field-based observations and farmer surveys revealed that temperature, humidity, mulberry leaf quality, and rearing hygiene play significant roles in cocoon yield and silk filament quality. This study highlights sericulture as a sustainable rural enterprise offering income and employment, particularly to women and marginal farmers. Recommendations for enhanced practices and government interventions are discussed.

Keywords: Bombyx mori, Sericulture, Cocoon quality, Mulberry, Villupuram, Rural economy

Introduction
Sericulture, the rearing of silkworms for silk production, is an agro-based, labor-intensive industry that significantly contributes to the rural economy of India. The mulberry silkworm (Bombyx mori L.) is a monophagous insect that feeds exclusively on mulberry leaves and is the primary species used in silk production. Tamil Nadu, including Villupuram district, is an emerging hub of sericulture due to its favorable climate, government support, and availability of resources.

The main objectives of this study are:

To observe and document current rearing practices of mulberry silkworms in Villupuram

To assess cocoon yield and quality based on environmental and feeding conditions

To evaluate the economic importance of sericulture for small and marginal farmers

Study Area
The study was conducted in various villages across Villupuram district, Tamil Nadu (11.9400° N, 79.5000° E). The region has a tropical climate with average temperatures ranging from 24°C to 34°C and moderate rainfall, making it suitable for mulberry cultivation and silkworm rearing.

Villages Covered
Koliyanur
Mugaiyur
Kandamangalam
Vikravandi
Thiruvennainallur
Information was collected through farmer interviews, observation of rearing practices, and cocoon sample analysis at local silk centers.

Results
The findings from the study are summarized below:

Environmental Parameters
Optimal temperature: 26°C to 28°C
Relative humidity: 75%–80%
Ventilation and hygiene significantly impacted larval survival

Mulberry saplings in nursery

Early instar silkworm

Mature Silkworm Larvae (Bombyx Mori) In Final Instar Stage Feeding On Mulberry Leaves

Eggs of bombyx mori

Harvested white cocoons of bombyx mori

Feeding and Mulberry Varieties

Popular varieties: V1 and S36
Feeding frequency: 4–5 times/day
Leaf quality directly influenced cocoon weight and shell ratio

Cocoon Quality Parameters

Parameter	Average Value
Cocoon weight	1.6 g
Shell weight	0.32g
Shell ratio	20.5%
Filament length	850 m

Economic Output

Yield per 100 DFLs: 45–55 kg of cocoon
Average revenue per cycle (small farm): ₹12,000–₹15,000
Annual income from 5 cycles: ₹70,000–₹1,00,000

Discussion

The present investigation has provided detailed insights into the practical aspects of sericulture in Villupuram district. The rearing techniques practiced by local farmers reflect a blend of traditional knowledge and recent technological inputs. The observed cocoon quality parameters fall in line With earlier reports by Kumar *et al*. (2018) [1, 2] and Ravindra and Somasundaram (2021) [6], who stressed the importance of
maintaining optimum temperature and humidity during the larval stages of Bombyx mori. The significant influence of leaf quality on cocoon development was evident in this study. Villupuram farmers using V1 mulberry leaves demonstrated better cocoon weight and shell ratios, similar to the findings of Krishnaswamy (2019) [3]. Feeding frequency and freshness were identified as crucial factors affecting silk filament length, as also supported by Kiran Kumar *et al*. (2017) [4]. A notable outcome of this study is the strong economic link between sericulture and rural livelihood. Women's participation in silkworm rearing and cocoon marketing confirms the gender-inclusive nature of the industry, as observed in studies by Lakshmi and Balasundaram (2020) [5]. The integration of SHGs and local sericulture training centers played a positive role in empowering the rural population. However, some challenges persist, including limited access to disease-free layings, inadequate chawki rearing infrastructure, and unpredictable market prices. Addressing these limitations could substantially enhance yield, income, and sustainability. As recommended by Dr. N. Arunpandiyan, targeted interventions such as farmer training, establishment of community rearing centers, and promotion of bivoltine

hybrid strains can further strengthen the sericulture economy in Villupuram district.

Overall, the results confirm that Bombyx mori rearing is not only viable but also a profitable venture when managed scientifically. With consistent support from government schemes and farmer education, Villupuram can emerge as a key player in Tamil Nadu's silk production landscape.

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