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SARIHAN ECORACE OF *ANTHERAEA MYLITTA* DRURY: A COMPREHENSIVE CONSERVATION STUDY IN JHARKHAND

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ABSTRACT

The Sarihan ecorace of *Antheraea mylitta* Drury, a tropical Tasar silkworm variant, predominantly inhabits the Dumka district of Jharkhand, India. Feeding primarily on *Terminalia arjuna* and *Terminalia tomentosa*, this silkworm follows a trivoltine life cycle, producing three generations annually within an altitude range of 100 to 200 meters above sea level. Notably, A. mylitta includes 45 ecoraces with complex interrelations between their morphological, physiological, and behavioural traits. This review delves into the unique characteristics of the Sarihan ecorace and the crucial conservation efforts undertaken to conserve it in its natural habitat. Focusing on the Dumka region's rich biological resources, the study emphasizes the importance of conserving this ecorace *in-situ* despite the challenges posed by *ex-situ* conditions. The conservation strategy involves a comprehensive approach covering every stage of the silkworm's life cycle, from the collection of wild cocoons to meticulous sorting and preservation. Selected forest ecopockets, chosen for their canopy size and food plant density, serve as conservation sites. Innovative structures like pagodas for cocoon processing and conservation nets demonstrate a commitment to maintaining genetic diversity and ecosystem health.

The habitat conservation strategy integrates sustainable practices and community involvement, positioning sericulture as an agro-based sector capable of generating employment for local tribal communities. The review also explores the distribution of various Tasar ecoraces in Jharkhand and highlights the unique ecological characteristics of the Sarihan ecorace's conservation sites, including Gopikandar, Barachaputra, and Mahuldabar. Performance analysis of the Sarihan ecorace from 2019 to 2023 by the Regional Sericultural Research Station (RSRS) in Dumka reveals significant insights into sericulture dynamics. Variations in hatching percentages and cocoon yields per Disease-Free Layings (DFL) underscore the ecorace's adaptability and resilience. Noteworthy fluctuations in cocoon production highlight the impact of environmental factors and sericulture practices, emphasizing the need for sustainable development. Grainage performance data from RSRS Dumka and adopted farmers reveal dynamic trends in cocoon preservation, DFL production, and utilization patterns over the years. The study also compares the reproductive behavior of the Sarihan ecorace in native and non-native habitats, revealing challenges in maintaining commercial traits outside its natural environment.

In-situ conservation efforts by RSRS Dumka and CTRTI, Ranchi, focus on conserving the Sarihan ecorace in selected ecopockets with high densities of *T. tomentosa* and *T. arjuna*. Detailed conservation techniques, including the use of pagodas and conservation nets, underscore the holistic approach to preserving this economically significant species. The study highlights the interplay between environmental factors, sericulture practices, and community involvement in ensuring the sustainable conservation and utilization of the Sarihan ecorace, contributing to the overall health of the ecosystem and the livelihoods of local communities.

Keywords: Ecorace, Sarihan, *A. mylitta* Drury, Conservation.

Introduction

The Sarihan ecorace of *A. mylitta* Drury, a distinctive variant of the tropical Tasar silkworm, represents a crucial component of the sericultural landscape in the Dumka district of Jharkhand, India. This specific ecorace primarily thrives on the foliage of *Terminalia arjuna* (Arjun) and *Terminalia tomentosa* (Asan), reflecting a symbiotic relationship with these native plant species. Exhibiting a trivoltine reproductive cycle, the Sarihan ecorace produces three generations annually, distributed across an altitude range from 100 meters Above Sea Level (mASL) to 200 mASL within the Dumka forest. *A. mylitta*, encompassing 45 diverse ecoraces, holds significant economic value due to its silk-producing capabilities. Among these, the Sarihan ecorace stands out due to its unique morphological, physiological, and behavioural traits, as documented by Singh and Srivastava (1997), Srivastava (2002), Srivastava et al. (2007), and Sinha and Prasad (2011). This review article delves into the distinctive attributes of the Sarihan ecorace, emphasizing the urgent need for its conservation within its native habitat.

The rich biological landscape of Dumka, abundant with *T. tomentosa* and *T. arjuna*, provides an ideal environment for the Sarihan ecorace. The conservation strategy focuses on *In-situ* preservation, acknowledging the challenges posed by *ex-situ* conditions. This comprehensive approach encompasses all stages of the silkworm's life cycle, from the collection of wild cocoons in specific areas to meticulous sorting and preservation processes. Conservation efforts are concentrated in forest ecopockets selected for their canopy size and food plant density, ensuring an optimal habitat for the Sarihan ecorace.

Innovative conservation methods, including the use of conservation nets and structures like pagodas for cocoon processing, highlight the commitment to maintaining genetic diversity and ecosystem health. The careful release of breeding stock further underscores this dedication, promoting the sustainability of the Sarihan ecorace population. The habitat preservation strategy integrates sustainable practices and community involvement, positioning sericulture as a viable agro-based sector capable of generating employment for local tribal communities. This approach not only aims to preserve the Sarihan ecorace but also enhances the overall health of the ecosystem and improves the livelihoods of individuals closely associated with it.

As this study progresses, it has the potential to provide substantial benefits beyond the conservation of an economically vital species. It offers a framework for sustainable development, balancing ecological preservation with economic growth, and fostering a deeper understanding of the intricate relationships within the ecosystem. Through these efforts, the conservation of the Sarihan ecorace serves as a model for similar initiatives, highlighting the importance of preserving biodiversity while supporting local communities.

Distribution of Tasar ecoraces in Jharkhand

The diverse ecoraces of the Tasar silkworm (*A. mylitta*) exhibit a wide distribution across the state of Jharkhand, particularly flourishing in the northeastern Santhal Pargana region, as well as in the central and southern parts of the state. These regions are characterized by their distinct damp deciduous woodlands and red loamy soils, providing an ideal habitat for the growth and sustenance of various Tasar ecoraces.

The identified ecoraces in Jharkhand include:

- **Sarihan & Munga (Santhal Pargana)**: These ecoraces are predominantly found in the Santhal Pargana region, benefiting from the area's lush vegetation and suitable climatic conditions.
- **Kowa and Japla (Palamau)**: Located in the Palamau district, these ecoraces thrive in the unique ecological niches provided by the region's diverse flora and fauna.
- **Laria (Peterbar)**: This ecorace is concentrated in the Peterbar area, where the specific environmental conditions favor its growth and development.
- **Wild Daba (West Singhbhum)**: Found in the West Singhbhum district, the Wild Daba ecorace adapts well to the region's forested landscapes.
- **Modia (East Singhbhum)**: The East Singhbhum district hosts the Modia ecorace, which benefits from the region's distinctive ecosystem.
- **Palma and Lodhma (Ranchi)**: These ecoraces are located in the Ranchi district, where the varied topography and abundant natural resources support their thriving populations.

Each of these ecoraces contributes uniquely to the sericultural tapestry of Jharkhand, reflecting the rich biodiversity and ecological variability of the region. The distribution of these ecoraces underscores the importance of region-specific conservation efforts, tailored to preserve the genetic diversity and ecological

balance critical to the sustainability of Tasar silk production in Jharkhand.

Distribution of Sarihan ecorace in Jharkhand

The conservation of the Sarihan ecorace is meticulously carried out across various strategic locations in Jharkhand, each contributing uniquely to the region's complex sericultural landscape. These conservation sites are integral to the production of Tasar silk and underscore the diverse ecological settings within the state. Key conservation areas include Gopikandar, Barachaputra, and Mahuldabar, which are pivotal to the conservation narrative (Figure 1). These sites are complemented by other significant areas such as Saraihat, Masalia, Taldih, Salaipahari, and Kathikund in Dumka; Golgo and Mehabank in Giridih; and Harladih in the Dhanbad district.

These regions are characterized by a high density of crucial flora, primarily *T. tomentosa* (Asan) and *T. arjuna* (Arjun), which are vital for the thriving Sarihan ecorace. The presence of these plants creates an optimal environment for the Sarihan ecorace, facilitating its growth and development (Figure 2). The distinct ecological characteristics of each location contribute significantly to the overall geographic mosaic, which is essential for effective conservation efforts (Table 1).

The strategic understanding of the roles played by these regions highlights a comprehensive conservation strategy that recognizes the interdependence of these sites. This approach not only ensures the preservation of genetic diversity within the Sarihan ecorace but also supports the broader framework of biodiversity conservation in Jharkhand. The collective efforts in these varied locations exemplify a dedicated commitment to maintaining the health of ecosystems and securing the legacy of Tasar silk production in the state. By emphasizing the interconnectedness of these conservation sites, the strategy underscores the holistic nature of efforts to protect and sustain the Sarihan ecorace within its natural habitat.

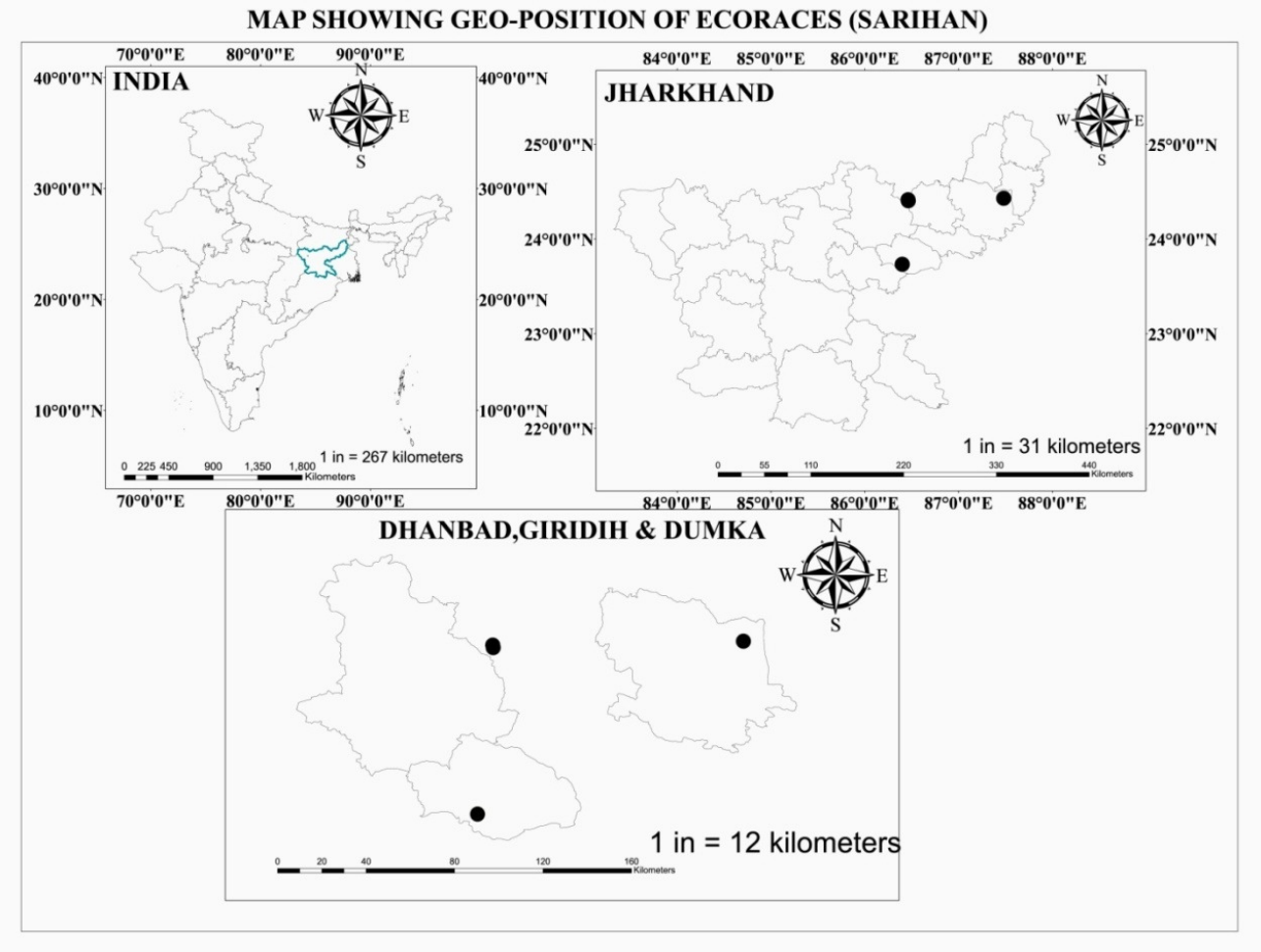

Fig. 1: Map Showing Geo-position of Sarihan Ecorace

Table 1: Characteristics of Sarihan ecorace

Geographical pocket/places	Santhal Pargana, Dumka (Jharkhand)
Eco – niches	Saraiahat forest
Forest type	Tropical moist deciduous
Food plant	*T. tomentosa, T. arjuna*
Soil type	Red loamy
Latitude	24.30º N
Longitude	87.00º E
Altitude	140 m
Cocoon colour	Whitish Grey
Cocoons weight (g)	
Male	5.20 - 8.34
Female	6.64 - 9.98
Shell Weight (g)	
Male	0.76 - 1.25
Female	0.77 - 1.46
Shell Ratio (%)	
Male	11.0 - 19.0
Female	0.9 - 15.0
Cocoon length (cm)	3.2 - 3.6
Cocoon breadth (cm)	2.4 - 2.6
Peduncle length (cm)	3.5 - 4.8
Volume (cc)	14.0 - 16.0
Silk Recovery (%)	55 – 61
Elongation (%)	20 – 31
Filament length (m)	560 – 585
Denier	7.0 - 8.0
Reelability (%)	15 – 21
Tenacity(g/d)	2.00 - 2.02

Fig. 2: Cocoon of Sarihan Ecorace

Rearing and grainage performance of Sarihan Ecorace by Regional Sericultural Research Station, Dumka

Rearing Performance of Sarihan ecorace by RSRS Dumka during 2019-2023: Comparison of Sarihan ecorace rearing and cocoon production from 2019 to 2023 reveals an engrossing story about the sericulture scene in Dumka, Jharkhand. The Regional Sericultural Research Stations carefully recorded important factors against the backdrop of attempts to preserve regional eco-races, especially the Sarihan ecorace, providing a detailed insight of the dynamics of

the sector. The consistency of hatching percentages throughout these years suggests a strong reproductive success, with small variations possibly indicating flexibility in response to subtle environmental changes. The most interesting aspect, though, is how the cocoon output per DFL varies, which is a critical indicator of total production. For the first two years, the cocoon yield remained constant, indicating that the Sarihan ecorace has been performing consistently. However, a significant fall in 2021–2022, particularly in the second crop, begs important concerns about possible difficulties like environmental stress and inadequate sericulture techniques. The next year, 2022–2023, shows a notable recovery in cocoon output per DFL, especially in the second crop, suggesting that tactics or practices have been modified, 3rd crop is not reared (Table 2) (Chowdary *et al.,* 2023) (Sathyanarayana *et al.,* 2022). Examining cocoon weight, shell weight, and silk ratio in addition to quantity demonstrates a comforting uniformity that highlights the Sarihan ecorace's capacity to uphold a consistent standard of silk production quality. A fundamental theme that shapes the complex patterns seen is the interaction between environmental elements and sericulture techniques. The decrease and subsequent increase in cocoon output per DFL call for a more thorough examination of the industry's adaptability, resilience, and the delicate balance necessary for long-term sericulture success. In addition to deepening our knowledge of the Sarihan ecorace's journey in Dumka, this thorough investigation lays the groundwork for future studies that will steer the sericulture community towards sustainable development and improved practices in the ever-changing sericulture context (Chowdary *et al.,* 2023; Sathyanarayana *et al.,* 2022; Sathyanarayana *et al.,* 2021; Bajipeyi *et al.,* 2020; Sahay *et al*., 2019).

Table 2 : Sarihan ecorace rearing and cocoon production by the Regional Sericultural Research Stations, Dumka under conservation of local eco-races during 2019-2023.

Year	Crop	No.of dfl reared	Hatching %	No. of cocoon produced	Cocoon yield/dfl	Cocoon wt. (g)	Shell wt. (g)	Silk ratio %
2022-2023	1st	30	65.00	175	5.80	12.10	1.54	12.72
	2nd	46	62.00	1288	28.00	11.18	1.78	15.92
	3rd	-	-	-	-	-	-	-
2021-2022	1st	100	84.00	2450	24.50	8.95	0.97	10.83
	2nd	100	82.00	2260	22.60	8.74	1.00	11.44
	3rd	200	83.00	3475	17.25	8.93	1.20	13.43
2020-2021	1st	100	84.00	1980	19.80	9.20	0.95	10.33
	2nd	100	82.00	2300	23.00	9.37	0.97	10.35
	3rd	100	83.00	2750	27.50	9.42	0.98	10.40
2019-2020	1st	300	79.50	6036	20.12	9.10	0.92	10.11
	2nd	200	82.50	3160	15.80	9.35	0.97	10.37
	3rd	300	84.00	10848	36.16	9.37	0.97	10.35

Grainage performance of Sarihan Ecorace by RSRS Dumka during 2019-2023

Over the span of 2019 to 2023, the Dumka Regional Sericultural Research Station witnessed dynamic trends in Sarihan ecorace seed production and utilization. Focusing on the 2022-2023 season, the 1st and 2nd crops displayed consistent patterns in cocoon preservation, Disease-Free Larvae (DFL) production, and processing, while the 3rd crop experienced a substantial increase in preservation and DFL production, with a noteworthy portion allocated for external utilization. The 2021-2022 season demonstrated uniform practices in preservation, DFL production, and processing across all crops. In the 2020-2021 season, the 1st crop stood out for significant preservation and DFL production, emphasizing external utilization. The 2nd crop lacked specific processing details, and variations in utilization were observed in the 3rd crop (Table 3). Variances in DFL utilization and preservation during the 2019–2020 season underscored external use. In conclusion, the findings reveal fluctuations in DFL production and cocoon preservation, coupled with significant differences in utilization patterns, signaling evolving practices at the Dumka Regional Sericultural Research Station over the specified years (Chowdary *et al.,* 2023; Sathyanarayana *et al.,* 2022; Sathyanarayana *et al.,* 2021; Bajipeyi *et al.,* 2020; Sahay *et al.,* 2019).

Table 3 : Sarihan ecorace seed production and utilization by the Regional Sericultural Research Station Dumka during 2019-2023

Year	Crop	No of cocoons Preserved	No of cocoons Processed	Dfls produces	Dfls utilized	
					For Own	Others
2022-2023	1st	3350	1500	200	50	150
	2nd	1500	1500	200	50	150
	3rd	5300	5300	850	100	750
2021-2022	1st	2750	1000	100	100	150
	2nd	2450	1000	100	100	150
	3rd	2260	1500	200	200	750
2020-2021	1st	10800	8780	1100	100	1000
	2nd	1980	1200	100	100	-
	3rd	2300	1300	200	100	-
2019-2020	1st	10500	8450	1400	300	1100
	2nd	6036	5350	1200	200	1000
	3rd	6160	5600	1100	300	800

Rearing and grainage performance of Sarihan ecorace by Adopted Farmers in Dumka

Rearing Performance of Sarihan ecorace by adopted farmers during 2019-2023

Key performance indicators for Adopted Farmers raising Sarihan silkworms in Dumka fluctuated dynamically over a four-year period. Notably, the season with the highest Disease-Free Larvae (DFL) count, 2019–2020, was recorded at 3700, while the season with the lowest DFL count, 2022–2023—was recorded at 2350. Hatching percentages varied from a peak of 84.67% in 2019-2020 to a low of 72.00% in 2022-2023. The production of cocoons peaked in 2020–2021 at 91000 units, while it fell to 50850 units in 2021–2022. The cocoon yield per DFL was 24.59 in 2019–2020 and 2020–2021, but dropped to 19.43 in 2021–2022, then significantly increased to 28.79 in 2022–2023. The ratios of silk varied slightly, ranging from 10.28% to 10.77% (Table 4). The complex and dynamic process of rearing silkworms is brought to light by this comparative analysis, which also emphasises the necessity of adaptable techniques and ongoing observation to guarantee reliable cocoon production (Chowdary *et al.,* 2023; Sathyanarayana *et al.,* 2022; Sathyanarayana *et al.,* 2021; Bajipeyi *et al.,* 2020; Sahay *et al.,* 2019).

Table 4 : Silkworm rearing and cocoon production by the Adopted Farmers during 2019-23

Year	Crop	Total No of dfl reared	Hatching %	Total No of cocoon produced	Cocoon Yield / dfl	Cocoon Wt. (g)	Shell Wt. (g)	Silk ratio %
2022-2023	1st,2nd&3rd	2350	72.00	67650	28.79	9.42	0.97	10.30
2021-2022	1st,2nd&3rd	2600	83.00	50,850	19.43	9.33	0.96	10.28
2020-2021	1st,2nd&3rd	3700	83.00	91000	24.59	9.32	0.96	10.30
2019-2020	1st,2nd&3rd	2900	84.67	74350	24.59	9.33	1.01	10.77

Grainage performance of Sarihan ecorace by adopted farmers in Dumka during 2020-2023

For a period of three years, the adopted farmers of Dumka who produced Sarihan seeds demonstrated dynamic differences in their methods. Due to a lack of data for the first crop in the 2022–2023 season (Table 5), attention was directed on the second and third crops, of which 2394 cocoons were processed and produced 550 DFLs (Cocoon DFL ratio 4.35:1) and 5000 cocoons produced 750 DFLs (Cocoon DFL ratio 6.67:1), respectively. The first crop (2021–2022) processed 5000 cocoons, producing 1000 DFLs (cocoon DFL ratio: 5.00:1), all of which were used.

800 DFLs (cocoon DFL ratio 3.75:1) were produced by processing 3000 cocoons apiece in the second and third crops, all of which were used. The first harvest in the 2020–2021 season was not well documented (Table 5), however the second crop processed 5000 cocoons and yielded 1200 DFLs (cocoon DFL ratio: 4.00:1), all of which were used. Using a cocoon-to-DFL ratio of 5.00:1, the third crop processed 7,500 cocoons to produce 1500 DFLs that were completely used. Variations in the amount of cocoons processed and the production of DFL reflect differences in utilisation practices; on the other hand, the lack of data highlights the necessity of thorough recording for a comprehensive understanding of the dynamics of seed production (Chowdary *et al.,* 2023; Sathyanarayana *et al.,* 2022; Sathyanarayana *et al.,* 2021; Bajipeyi *et al.,* 2020; Sahay *et al.,* 2019).

Table 5 : Seed production and utilization through adopted farmers during 2020-23

Year	Crop	No of cocoons Preserved	No of cocoons Processed	No. of Dfls produced	Cocoon dfl ratio	Dfls utilized
2022-2023	1st	-	-	-	-	-
	2nd	2394	2394	550	4.35:1	550
	3rd	5000	5000	750	6.67:1	750
2021-2022	1st	5000	5000	1000	5.00:1	1000
	2nd	3000	800	800	3.75:1	800
	3rd	3000	800	800	3.75:1	800
2020-2021	1st	-				
	2nd	5000	5000	1200	4.00:1	1200
	3rd	7500	7500	1500	5.00:1	1500

Showing details of Sarihan ecorace collected from Santhal pargana, their food plants and quantity in cocoonase secreted by Sarihan ecorace.

The Sarihan ecorace, which was gathered from Santhal Pargana in Jharkhand, exhibits unique traits when compared to other *A. mylitta* ecoraces. The Sarihan ecorace silkworms' quantitative examination of their cocoonase secretion shows a volume range of 800 to 1500 µl and a protein content of 4.18 ± 0.45 mg/ml (Table 6). An important function for the important enzyme cocoonase in the synthesis of silk is played, and the observed differences highlight the variety among ecoraces. Furthermore, *T. arjuna* is identified as the main food plant for the Sarihan ecorace. The information provided by this research is useful for both the production of silk and sericulture techniques. It also sheds light on the ecological uniqueness of the biochemical differences in cocoonase secretion among various ecoraces (Sathyanarayana *et al.,* 2022).

Table 6 : Showing details of Sarihan ecorace collected from Santhal pargana, their food plants and quantity in cocoonase secreted by Sarihan ecorace

Ecorace	Volume of Cocoonase secretion (µl)	Protein secreted cocoonase (mg/ml)	Places of Cocoonase collection	Primary Food plant
Sarihan	800-1500	4.18±0.45	Santhal Pargana (Jharkhand)	*T. arjuna*

Reproductive behavior of Sarihan ecorace in native and non-native places

A. mylitta Drury, the most common silk moth in the Dumka region, has three generations annually, or trivoltine traits, in its Sarihan ecorace. Its capacity to adapt to environments outside of its natural habitat, notably the woodlands of the Similipal Biosphere Reserve, is limited. Even if Dumka and other places have comparable forest types, climatological elements like temperature, relative humidity, and the amount of rainfall are important in controlling the grainage and silkworm raising processes. The Sarihan ecorace's reproductive behaviour, or grainage, suggests that during different rearing seasons, the percentage of

emergence in other locations is somewhat higher. Different environmental factors, such as fluctuations in relative humidity, may be to blame for this. Nonetheless, in non-native settings, coupling percentages vary less with the seasons, presumably because of a larger temperature range. Under these alien conditions, commercial features like cocoon volume, cocoon weight, shell weight, and silk ratio show reduced values over the course of several seasons. One of the contributing factors is the disruption of larval nutrition caused by irregular rains. In non-native settings, high temperatures, high humidity, and stormy weather are linked to decreased rearing performance in the autumn (Ullal and Narasimhanna, 1987; Nayak, 1997). High temperature and humidity (RH) have also been connected in previous research in comparable species to the generation of low-quality cocoons (Pandit *et al.,2014;* Tanaka,1964) first reported this connection. The Sarihan ecorace's survival outside of its natural habitat is important for maintaining and conserving germplasm, despite the difficulties it faces. Researchers are motivated to investigate and preserve this wild ecorace's germplasm more thoroughly because there are no well-established techniques for conserving it in non-native environments. The objective of this proactive method is to avert the deterioration of the Sarihan ecorace in its natural habitat, serving as a protection against possible threats.(Pandit *et al.,*2014*;* Pandit *et al.,*2016*)*

In-situ conservation efforts for Sarihan ecorace

The conservation efforts for Sarihan ecorace was carried out by RSRS Dumka and CTRTI,Ranchi which includes the ecopockets of Gopikandar, Barachaputra, and Mahuldabar, which are distinguished by rich densities of *T. tomentosa* and *T. arjuna* were the focus of the conservation effort, which was centred on the Dumka, Jharkhand area. The study described how wild Sarihan cocoons were collected in August and October, coinciding with the second and third generations, from Masalia, Dumka, and Sarasbadia, Jamui. Based on factors including food plant density, canopy and size, three conservation camps were placed in a suitable location close to settlements that bordered forests. These camps catered to the second and third generations and ran twice a year.

As part of the conservation approach, the gathered cocoons were processed and preserved using pagodas. Each of these bamboo-framed buildings was equipped with a green agro-shade net covering that could process and keep 20,000 natural cocoons. At designated locations, nylon polyamide conservation nets covering Sal plants were erected in an effort to further protect the Sarihan ecorace. Breeding stock was released by permitting mating inside pagodas, releasing gravid moths via the conventional "Chullu" method, and encouraging outbreeding in neighbouring forests. In order to minimise predator incursion during stock proliferation, strict hygiene measures were maintained. Additionally, periodic cordoning off of the forest regions promoted natural multiplication. The environment and the livelihoods of the local populations benefited from this research's contribution to the Sarihan ecorace's holistic protection and sustainable use.

Conclusion

The review of the Sarihan ecorace of *A. mylitta* Drury highlights the intricate balance between conservation efforts and sericulture practices within the unique ecological landscape of the Dumka district in Jharkhand, India. The Sarihan ecorace, thriving on *T. arjuna* and *T. tomentosa*, demonstrates distinct morphological, physiological, and behavioural traits that necessitate targeted preservation strategies. The conservation efforts, spearheaded by the RSRS Dumka and CTRTI Ranchi, emphasize *In-situ* preservation within carefully selected forest ecopockets. These initiatives underscore the significance of utilizing innovative structures like pagodas for cocoon processing, conservation nets, and meticulous release procedures for breeding stock. This holistic approach not only ensures the genetic diversity and health of ecosystems but also integrates sustainable practices and community involvement, presenting sericulture as a viable agro-based sector capable of generating employment for local tribal communities.

The detailed analysis of rearing and grainage performance from 2019 to 2023 reveals dynamic trends and challenges faced by the Sarihan ecorace. Consistent hatching percentages and variations in cocoon yield per Disease-Free Layings (DFL) highlight the adaptability and resilience of this ecorace. The fluctuations in cocoon production, influenced by environmental factors and sericulture techniques, underscore the need for continuous monitoring and adaptable practices to ensure sustainable development. Grainage performance data from RSRS Dumka and adopted farmers further illustrate evolving practices and utilization patterns, reflecting the complex dynamics of seed production and preservation. The reproductive behavior of the Sarihan ecorace in both native and non-native habitats reveals the critical influence of environmental factors such as temperature, relative humidity, and rainfall on grainage and rearing processes. The challenges faced in non-native environments highlight the necessity of in-depth

research and well-established conservation techniques to preserve the germplasm of this economically significant ecorace.

In conclusion, the concerted efforts to conserve the Sarihan ecorace through comprehensive strategies have demonstrated significant progress in preserving this unique variant of the Tasar silkworm. The integration of sustainable practices, community involvement, and innovative conservation methods not only ensures the survival of the Sarihan ecorace but also contributes to the overall health of the ecosystem and the livelihoods of local communities. The insights gained from this review provide a foundation for future studies aimed at enhancing sericulture practices and achieving long-term sustainability in the dynamic field of sericulture.

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