



**PG & RESEARCH DEPARTMENT OF ZOOLOGY**  
**MUSLIM ARTS COLLEGE**  
(Affiliated to Manonmaniam Sundaranar University)  
Thiruvithancode-629174, Kanyakumari District,  
Tamil Nadu, India

*National Seminar*  
*On*

**CURRENT ENVIRONMENTAL ISSUES  
AND MEASURES OF MITIGATION**  
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This is to certify that Prof./Dr./Mr./Mrs./Ms. *M. Ramani Bai, Associate Professor Dept. of Zoology, Muslim Arts College, Thiruvithancode* has participated / presented a research paper entitled *Effect of foliar spray micronutrients on mulberry and economic parameters of silkworm, Bombyx mori L.* in the National Seminar on "Current Environmental Issues and Measures of Mitigation" organized by the PG & Research Department of Zoology, Muslim Arts College, Thiruvithancode- 629174, held on February 17, 2023.

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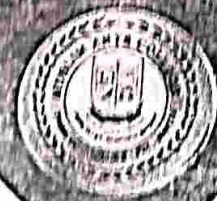
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# CURRENT ENVIRONMENTAL ISSUES AND MEASURES OF MITIGATION

PROCEEDINGS OF  
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*Edited By*

Dr. C. Christo Queensly  
Dr. T. Kumaran  
Dr. M. Thilsath Fathima Quralza  
Dr. N. Yasmin

PG & RES  
DEPARTMENT

**MUSLIM ARTS COLLEGE**

THIRUVITHANCODE - 629 765,

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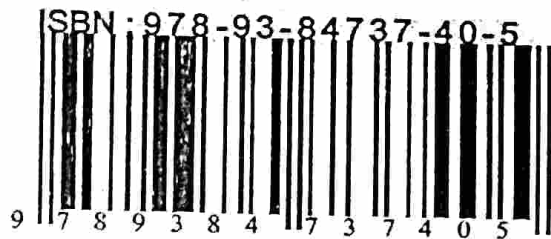
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EFFECT OF FOLIAR SPRAY MICRONUTRIENTS ON MULBERRY AND ECONOMIC PARAMETERS OF SILKWORM, *BOMBYX MORI* L.D. JEBA JINI<sup>1</sup> AND Dr. M. RAMANI BAI<sup>2</sup><sup>1</sup>Research Scholar, (Reg.No:19223092272030), Department of Zoology, Muslim Arts College, Thiruvithancode, Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli.<sup>2</sup>Associate Professor in Zoology, Muslim Arts College, Thiruvithancode, Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli.

Corresponding Author: E-mail: jlnld624@gmail.com

**Abstract**

Mulberry (*Morus spp*) is a perennial deep-rooted high bio-mass producing foliage crop cultivated as a sole food for silkworm, *Bombyx mori* L. Due to repeated harvests and soil problems, mulberry is exhibiting nutrient deficiencies in recent years. Besides other measures, foliar application is particularly relevant for timely application of specific nutrients to the foliage during growth and development. Keeping this in view, foliar application of micronutrients was evaluated using MR<sub>2</sub> variety with respect to mulberry which can play a significant role in sustainable improvement on silkworms growth and cocoon parameters the data revealed that treatment of poshan recorded significantly higher values of shoot length (79.51±0.334 cm), number of shoots per plant (17.22±0.22 numbers), length of leaf (20.84±3.70cm) and weight of leaf (3.56±0.97mg), and in silkworm, recorded higher values of cocoon weight (1.87±0.11g), shell weight (0.39±0.09g), shell ratio (19.30±0.26%), filament length (823±5.28m), and denier (2.15±0.14) with seriboost compared to other treatments.

**Keywords :** Mulberry, Silkworm, micronutrients, cocoon, denier.

**Introduction**

Mulberry leaf is a sole source of food for silkworm. The quality of mulberry leaf is being considered as the prime factor governing the production of good cocoon. Among the various factors contributed for vertical development in the crop production, the contribution by micronutrients is quite remarkable. Micronutrients directly influences the growth of mulberry and is also capable of enhancing the productivity of mulberry (Dhiraj and Venkatesh Kumar, 2012).

Foliar application of micronutrients has improved the yield, quality and micronutrient status of mulberry leaf and the quantitative traits of silkworm, *Bombyx mori* (Yasmin et al., 1995 and Bose and Majumder, 1996). Micronutrients stimulate the metabolic activity in silkworm leading to improved rearing performance and silk content. The present study was carried out to know the effect of foliar application of micronutrients on mulberry growth and economic parameters of silkworm, *Bombyx mori*.

**Materials and Methods**

The experiment was laid out in a randomized block design with three replications. The study comprised of individual application of Zinc (5ppm) Iron (5ppm) Poshan (5ppm) and Seriboost (5ppm) in the form of ZnSO<sub>4</sub>, FeSO<sub>4</sub>, N, P, K and Sericorn along with the untreated control in mulberry variety MR<sub>2</sub>. The silkworm race cross breed (PMxCSR2) were fed with micronutrients treated leaves of mulberry. The micronutrients were applied as foliar spray on 15<sup>th</sup> day after pruning of mulberry. Package of practices was

followed as per the recommended standards. The ripe worms were handpicked and mounted on bamboo mountage as per the treatment and cocoons were harvested manually on the 5<sup>th</sup> day of mounting.

Observations on growth of mulberry and cocoon parameters namely cocoon weight, shell weight, shell ratio, filament length and denier were recorded treatment-wise as per the standard procedure and analyzed statistically.

**Results and Discussions**

Effect of foliar sprays on growth parameters of mulberry are presented in Table 1. Maximum average shoot length (79.51±0.29cm) and number of shoots per plant (17.22±0.16) length of leaves (20.84±3.70cm) and weight of leaves (1.95±0.55mg) were registered in the foliar spray of 5ppm poshan, and were found to be statistically superior over the control and other treatments. Increased in growth of mulberry by the foliar application of micronutrients might be due to the involvement of micronutrients in chlorophyll formation, which might have helped to influence physiological activity of plants viz., cell division, meristematic activity in apical tissue, expansion of cell and formation of cell wall which in turn enhanced the growth and yield parameters as reported by Lokanath and Shivashankar (1986), Prasannakumar et al. (2001), Bose et al. (1994) and Misra et al. (1995).

The micronutrient Seriboost (5ppm) significantly influenced the cocoon characters like cocoon weight (1.87±0.11g), shell weight (0.39±0.06g), shell ratio (19.30±0.25%), filament length

(823.83±8.05m), and denier (2.05±0.09) (Table 2), than other treatments and control. Gowda et al., (2000) studied the efficacy of foliar spray 'seriboost' on mulberry on its impact on cocoon production. Foliar spray on mulberry enhanced the cocoon weight and cocoon yield (Viswanathan and Krishnamurthy, 1982). Various minerals viz., N,P,K,Ca,Mg and Cu in various concentrations were enhanced silk production of *B.mori* (Ashfaq et al.,2000). Dhiraj and Venkatesh Kumar (2012) reported the application of foliar nutrients to

increase productivity in sericulture. They concluded that foliar nutrients improved the yield of mulberry, enhanced silkworm growth and cocoon productivity without harming flora and fauna. Nithya et al., (2018) studied the effect of foliar spray of micronutrients applied individually and in combination on mulberry leaf production, and cocoon production. They reported that 0.5% ZnSO<sub>4</sub>+0.1% Citric acid +0.2% Boric acid +0.5% MnSO<sub>4</sub>+0.01% influenced the cocoon characters like cocoon weight, shell weight and shell ratio.

**Table 1**  
Effect of foliar sprays on growth of mulberry plant

| Treatments (Sppm) | Shoot length (cm)      | No of Shoots/Plant     | Length of leaf (cm)    | Weight of the leaf (mg) |
|-------------------|------------------------|------------------------|------------------------|-------------------------|
| Zinc              | 70.41±0.34<br>(15.52)  | 15.21± 0.19<br>(34.72) | 15.50 ±1.76<br>(47.75) | 1.95± 0.55<br>(31.14)   |
| Iron              | 66.42± 0.26<br>(8.97)  | 13.34± 0.22<br>(18.15) | 13.84± 1.63<br>(31.93) | 1.47± 0.38<br>(1.20)    |
| Poshan            | 79.51± 0.29<br>(30.45) | 17.22± 0.16<br>(52.52) | 20.84± 3.70<br>(98.66) | 3.564± 0.97<br>(39.1)   |
| Seriboost         | 78.46± 0.31<br>(28.72) | 16.27± 0.20<br>(44.10) | 20.41± 1.38<br>(94.56) | 2.04± 1.39<br>(36.91)   |
| Control           | 60.95 ±0.51            | 11.29 ±0.22            | 10.49 ±0.09            | 0.49± 0.09              |

Note: Percent change over control values in parentheses

**Table 2**  
Effect of foliar sprays on cocoon characters of *B.mori*

| Parameters Treatments (Sppm) | Single cocoon weight (g) | Shell weight (g)      | Shell ratio (%)           | Filament length (m)       | Filament denier       |
|------------------------------|--------------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| Iron                         | 1.68± 0.07<br>(17.48)    | 0.25± 0.03<br>(13.63) | 16.09± 0.25<br>(46.16)    | 757.33 ±7.04<br>(2.26)    | 1.85± 0.03<br>(12.12) |
| Zinc                         | 1.66± 0.09<br>(16.08)    | 0.27± 0.05<br>(10.27) | 16.14± 0.10<br>(4.94)     | 768.34±<br>7.07<br>(3.74) | 1.78 ±0.05<br>(7.87)  |
| Poshan                       | 1.79 ±0.11<br>(25.17)    | 0.37 ±0.09<br>(68.17) | 18.19±<br>0.26<br>(18.27) | 806.3± 9.02<br>(8.87)     | 1.98± 0.06<br>(20.10) |
| Seriboost                    | 1.87 ±0.11<br>(30.76)    | 0.39± 0.06<br>(12.27) | 19.30±0.25<br>(3.92)      | 823.83± 8.05<br>(11.24)   | 2.05 ±0.09<br>(24.24) |
| Control                      | 1.43± 0.05               | 0.22± 0.02            | 15.38± 0.10               | 740.58 ±8.28              | 1.65±02               |

Note: Percent change over control values in parentheses.

#### Conclusion

This study has shown that zinc, iron, poshan and seriboost were used as foliar spray on mulberry

affect the mulberry growth and cocoon parameters of silkworm. However among different treatments mulberry treated with 5ppm poshan recorded

higher mulberry yield and 5ppm seriboost recorded higher cocoon parameters over control.

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