

**COMPARATIVE STUDIES ON THE PERFORMANCE OF MOUNTAGES ON COCOON QUALITY OF  
*BOMBYX MORI* (L.)**

**Shinde K. S., Avhad S. B., Jamdar S. V. and Hiware C. J\*.**

Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (M.S), India.

\* Director, Directorate of Sericulture Nagpur, Maharashtra State.

(E-mail- [skishor41082@gmail.com](mailto:skishor41082@gmail.com); [\\*drhiware@rediffmail.com](mailto:*drhiware@rediffmail.com))

**ABSTRACT**

Transferring of matured silkworm on to the mountage or cocoon frames is called "mounting". As the matured worms stop feeding they crawl on to the twigs searching for a support to spin the cocoon. It helps in uniform and hygienic cocoon formation in the sericulture industry. Mounting care should be taken to avoid overcrowding. A field experiment was conducted on a newly established mulberry garden at Pakni, Solapur, Maharashtra state, India. The experiment was conducted during January 2011 to February 2012. The experiment consisting of Shindi branches for the purpose of Mounting by rearing multivoltine Silkworm race (PMxCSR2). The present investigation correlated with the plastic mountages. This study shows positive results for Shindi branches on the quantity of cocoons per branch, less double cocoons, Shell ratio, shell weight, filament length, filament weight and denier.

**KEYWORDS:** Cocoon quality, Date Sugar branches, Plastic mountages, silkworm race (PM x CSR2).

**INTRODUCTION**

Mounting is the last stage of rearing operation. Transferring mature fifth instar larvae to mountages is called mounting. When larvae are fully mature, they become translucent, their body shrinks, and they stop feeding and start searching for suitable place to attach themselves for cocoon spinning and pupation. These movements clearly indicate to transfer the mature larvae into the mountages.

They are picked up and put on mountages. The worms attach themselves to the spirals of the mountages and start spinning the cocoon. By continuous movement of head, silk fluid is released in minute quantity which hardens to form a long continuous filament. The silkworm at first lays the foundation for the cocoon structure by weaving a preliminary web providing the necessary foot hold for the larva to spin the compact shell of cocoon. Owing to characteristic movements of the head, the silk filament is deposited in a series of short waves forming the figure of eight. This way layers are built and added to form the compact cocoon shell. After the compact shell of the cocoon is formed, the shrinking larva wraps itself and detaches from the shell and becomes pupa or chrysalis. The spinning completes within 2-3 days in multi-voltine varieties and 3-4 days in uni- and bivoltine. Mountages play a vital role in quality cocoon production. Farmers depend on resources and use different types of materials available locally for making Mountages. Types of material used, finishing of Mountages, space available for spinning worms in Mountages etc., will decide the quality of cocoon. Narrow space affects ventilation and results in poor reliability of cocoons. Similarly more space results in wastage of silk in the form of floss (Manual on Mountages, Mounting and Harvesting Technology for Quality Cocoon Production by Mathur and Quadri, (2010).

Different types of mountages are used in different parts of India. In addition to support the spinning worms, the mountages should satisfy the requirements like, it provide convenient space of suitable dimension for spinning good sized cocoons, should not promote formation of double cocoons, malformed cocoons and flimsy cocoons, should have provisions for drying up of the last excreta of the worm prior to spinning and prevention of its falling on the cocoons of other worms, should be suitable for easy mounting and harvesting. The common mountages which are used generally in India are,

- Dried grass and twigs spread in shallow bamboo baskets are used in Assam.
- Dried weeds, paddy straw and fresh weeds are used in Jammu and Kashmir. In these two moulting and harvesting is difficult and require more labour. Further, formation of double and deformed cocoons is high.
- Chandrika which is formed by a bamboo spiral is the most common mountage Used in South India and West Bengal. This consist of a bamboo mat of size 1.8 m x 1.2 m supported by split bamboo reapers on all sides. On this bamboo mat, a bamboo tape of 4 to 5 cm width is wound in a spiral manner. The bamboo tape has V-shaped struts supported by three long bamboo strips. About 1000 worms can be mounted on this mountage.
- Bottle brush mountage is introduced recently is not only cheap but can be fabricated very quickly and occupies very little space compared to Chandrika. It consists of a thick coconut or jute fiber-rope into which 6 to 9" sticks (midrib of coconut leaves) are inserted very closely. The silkworms used the sticks as support and spin the cocoons in the space between the sticks. (Mathur and Quadri, 2010). The present investigation indicates Comparative Studies on the Performance of Mountages on Cocoon Quality of *Bombyx mori* (L.)

**MATERIALS AND METHODS**

The present study is carried out at Pakni, Solapur District, Maharashtra state, India. Fresh disease free eggs of *Bombyx mori*. L (Race: PM × CSR2) were collected from the state Sericulture Department, Solapur District, Maharashtra, India and incubated, brushing was done and reared on field up to cocoon stage at temperature range 23 - 28 °C with humidity range up to 68 - 75 % during January 2011 to February 2012 . The experiments were conducted by self-mounting. All the rearing operations were carried out by Krishnaswami (1978) and Hiware (2001).

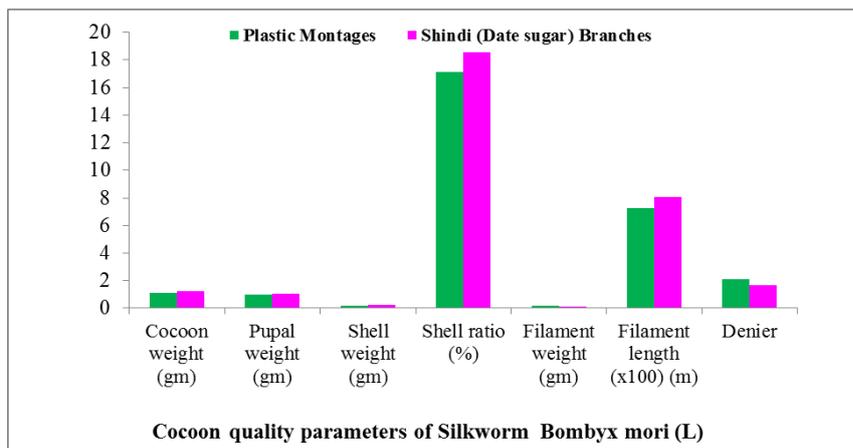
**RESULTS AND DISCUSSION**

Shindi / Date sugar branches shows better results of all economic characters like diameter of cocoon(4.1x7.2), cocoon weight(1.24), pupal weight(1.06), shell weight(0.23), shell ratio(18.55), filament length(803.6), filament weight(0.15) and denier(1.68), when compared with plastic mountage. On commercial bases for farmers point of view Shell ratio plays an important role because the cocoon rates are depends on this and another important character for the reelers i.e. Filament length. So the Date sugar (Shindi mountages) branches show better results for Shell ratio and filament length. According to Chandrakanth *et al.*, (2004) shows that the mountages considerably influences the quality of cocoons. The farmers are said to be losing about 5-8 % of yield due to improper Mountages and according to Mathur and Quadri, (2010) also estimated that farmers loss about 12-15 % of crop due to defective cocooning which is attributed to inadequate Mountages, poor quality of Mountages, shortage of time, lack of space, mounting care and management of environmental conditions.

It is evident from the mean data of the experiment that in general Shindi (Date sugar) branches shows improved or economical characters as compared with plastic mountage. The result showed in Table 1 and in Figure 1 and Figure 2 shows photos which are interesting in post – cocoon parameters. Figure 1 shows graphical presentation (X axis shows direct values of parameters and Y axis shows cocoon parameters), Figure 2 shows the photographs of a) Ripen larvae b) spinning larvae c) plastic mountages d) Shindi (Date sugar) branches e) cocoons on plastic mountages f) cocoons on Shindi branches f) Shindi tree g) self-mounting on Shindi branches. Vindhya (1985-86) used different mountages viz., bamboo mountages with ½” sq holes, plastic collapsible mountage, bamboo scaffolding-2 side type, round bamboo spiral, bottle brush and bamboo Chandrika were tested.

**Table 1: Cocoon quality parameters between Plastic Mountages and Shindi (Date Sugar) Branches.**

Types of Mountages	Plastic Montages	Shindi (Date sugar) Branches
Length of mountages (cm.)	150	230
Diameter of Cocoon (L x B) (cm.)	4.5 x 6.7	4.1 x 7.2
Cocoon weight (gm)	1.12	1.24
Pupal weight (gm)	1.02	1.06
Shell weight (gm)	0.204	0.23
Shell ratio (%)	17.14	18.55
Filament weight (gm)	0.17	0.15
Filament length (m)	728.2	803.6
Denier	2.1	1.68



**Figure 1. Cocoon quality parameters between Plastic Mountages and Shindi (Date Sugar) Branches.**



a) Ripen Larvae



b) Spinning Larvae



c) Plastic Mountages



d) Shindi (Date sugar) Branches



e) Cocoons on Plastic mountages



f) Cocoons on Shindi Branches



g) Shindi tree



h) Cocoons on Shindi Branches

**Figure 2. Showing comparison with Plastic Mountages and Shindi branches.**

Plastic collapsible mountages can be used in place of conventional type moutage without many disadvantages. He indicated that the percentage of urinated cocoon was more in bottle brush moutage (1.19% in NB18 x NB7 and 1.12% in PM x NB18) when compared to control (0.12% in NB18 x NB7 and 0.11% in PM x NB18). Whereas there is no significant variation in good cocoon percentage and double cocoon percentage etc. The percentage of urinated cocoon was more in bottle brush moutage compared to plastic collapsible moutage. Plastic collapsible mountages can be used in place of conventional type without many disadvantages. Four different types of mountages viz., plastic collapsible, plastic bottle brush, bamboo bottle brush and paddy straw were used in shoot rearing beds by self-mounting. According to Inokuchi *et al.*, (1995) rotary moutage was significantly superior over all the other mountages. Cocooning percentage was 95.22 and 90.22 and defective cocoon percent was 1.96 and 9.12 as recorded in rotary and bamboo chandrike mountages respectively. Maximum defective cocoons (14.5%) were observed in the paddy straw batches. Average filament length (1039 m) and reelability (89.96%) was significantly superior in rotary mountages than chandrika (993 m and 81.36 m respectively). The results of the present study also correlates with

Naphade *et al.*, (2011) and Chandrakanth *et al.*, (2004) where the used five types of Mountages, shoot rearing rack rotary type, plastic collapsible, fixed vertical type, bamboo Mountages, and rotary Mountages considering cocooning (%), Double cocoon (%), Floss (%), Defective cocoon(%), single cocoon weight (gm), shell weight (gm), shell ratio (%), and reliability (%). In which the bamboo mat base is easily available, cheap and can lasts for 4-5 years but demerit using lot of space during mounting. All of these Mountages shows some merits as well as demerits during study time and also shows variations in economic parameters of cocoon production and quality in each type of Mountages. Naphade *et al.*, (2011) were also studied on plastic Mountages and mango twigs comparing with each other on cocoon weight (gm), pupal weight (gm), shell weight (gm), shell ratio (%), filament weight (gm), filament length (m), denier and number of breakages. Datta *et al.*, (2007) also studied on plastic collapsible mountage an alternate to bamboo spiral mountage in Eastern India. Chikkanna *et al.*, (2009) also studied on qualitative improvement in terms of economic gained by using two different types of mountage for silk worm cocoon. He also quote that, types of mountage and mounting environmental conditions play an important role in determining the quality of cocoons of silkworm *Bombyx mori*. Pandey *et al.*, (2007) also using plant shoot mountage in North-Western India which shows better results during study period. Thus from the present study it is concluded that Shindi / Date sugar branches shows better results of all economic characters except Filament weight (gm) when compared with plastic mountage. On commercial bases for farmers point of view Shell ratio (%) plays an important role because the cocoon rates are depends on this and another important character for the reelers i.e. Filament length. So the Date sugar (Shindi mountages) branches show better results for Shell ratio and filament length. All such mountage are easily available at the local area, they are large in quantity and are easily available during emergency. These are used alternative of plastic mountage during the insufficient number of plastic mountage. These mountage are used as shelf mounting purpose are placed directly on rearing bed for spinning, which helps farmer to save labour and there will not be any problem of identifying and picking ripe worms those farmers which are new sericulturists. The costs of such branches or twigs are not calculated.

#### Importance of Shindi (Date sugar) branches:

These branches are easily available around streams, rivers, ponds and empty places etc. It's having sharp 'Thorns' because of this the cocoons are protected from rodents, Squirrels etc. Branches are long and its one side is flat because of this they are low weighted and are directly put on the rearing bed. Less urinated cocoons are found. For the self-mounting these mountages are use full and due to this labor cost decreases.

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