A New Method of Silk Sheath Production Developed from Observation of Spinning Behavior of Silkworms

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The objective of this research was to apply a newly observed spinning behavior of silkworms in silk sheath production. The spinning behavior of each fifth instar larva of Bombyx mori (grown stage silkworm) in paper mountages with different shapes were observed in comparison to that without mountage. We found that the silkworms showed similar spinning behavior and formed cocoons in all shape of mountages. Without mountage, the silkworms could not make a cocoon but spun the silk into silk sheath instead. Therefore, we came up with the possibility of using this observation as an alternative method to produce silk sheath which was normally woven form the silk fiber obtained by boiling the cocoons which led to death of the silkworms. Factors affecting the silk sheath production were determined. The effect of frame surface and number of silkworms per frame were investigated. Sixty of fifth instar larva of silkworms were transferred on different frame surfaces namely foam board, fabric slat, paper and nylon-net at the same size of 20 x 30 cm and left for 36 hours. The frame surface which yielded the best quality silk sheath were placed with different number of silkworms per frame (20,40,60,80 worms). The result showed that the silk sheath made by the sixty of fifth instar larva on foam board had the most beautiful golden yellow color, highest silk weight per area and good homogeneity of silk. Cost evaluation by producers and customers showed that the calculated net return of silk sheath was twice that of the silk fiber prepared from cocoons. Moreover, this new method is a quick and easy way and the silkworms are still alive in the process and can propagate to the next generation.

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