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Studies on Dyeing of Tussah Silk

<I.S.A. 發表論文 要約>

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柞蠶絹織物 染色에 對한 硏究

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摘 要

本硏究는 1981年 本人이 國際絹業協會技術硏究分科委員會議에 參席하였을 때 論議된바 있고 其後 柞蠶絹織物染色에 對한 問題點을 解決하기 爲하여 本人앞으로 試料가 到着하였으므로 비록 우리나라에서는 柞蠶고치가 生産되고 있지 않으나 韓國의 國際的 優位性을 보여주기 爲하여 이 硏究에 着手하였든 바 I.S.A側에서 問題視하고 있는 것을 成功하여 染色된 絹織物 샘플을 가지고 1982年 英國 런던에서 開催된 바 있는 國際絹業大會에 參席하여 發表한 內容要旨이다.

硏究結果는 柞蠶織物內에 蓚酸칼슘과 같은 不純物이 남어 있으므로 完全한 精練이 染色의 先決條件이고 酸性染料는 染着性이 不足하였으며 反應性染料가 適合한 事實을 發見하여 報告하였는데 伊太利代表가 反應性 染料는 纖維를 弱化시키는 關係로 不適合하다고 反對發表를 하여 本人은 纖維弱化가 使用强度를 維持하고 있는 限 問題삼을 것이 못된다고 反論을 提起하기에 이르렀는데 中共에서도 其前에 酸性染料를 使用하였지마는 最近 反應性染料로 轉換하였다는 事實을 밝힘으로서 論爭의 判決이 끝나고 말았다. 이 硏究는 完全精練이 技術的要題로 되고 있으며 本人이 만든 柞蠶絹織物染色資料는 中共代表의 要請으로 그들에게 引渡된 事實을 밝혀둔다.

Before we discuss the dyeing of tussah silk, we should be familliarize with tussah silk formation so that we can apply the fibre in proper method.

As all of us know, tussah cocoon is produced in China and India which the worms glow by eating some kinds of oak trees and the cocoon is much different from the mulberry silk cocoon after all. The tussah cocoon is made by tussah silkworm starting with hanging on a plant blanch and performing cocoon stalk at one end of the cocoon where there the place is very thin cocoon layer or perforated so that the moth may come out from the cocoon after emerging to moth. When the worm finishes to spin a cocoon, the worm secrets some Calsium liquid material, almost Calsium Oxalate, in order to cement the cocoon layer to protect enough the pupa from enemy attack.

The cocoon fibre, so far, has more impurity than mulberry cocoon and forms rather flat cross section and irrequlat cocoon color, deep color outside and light color inside layer. Also the cocoon fibre is felt as tougher like as ramie because the fibre has more crystalline region than mulberry silk fibre. Of course, the amino acid composition is also different from the mulberry silk fibre.

In the old days, the tussah cocoon fibre was reeled on a wooden disk after cooked, using slow hand reeling method. Choe was the first man to create the cocoon reeling in water reeling bath as well as mulberry cocoon using silk reeling machine in 1965. Since then, this method has been extended to foreign countries. In this case, the cocoon should be cooked in some chemical solution bath instead of pure water, taking care of the filament be released

from the cocoon in order, because tussah cocoon sericin is cemented together and hardly soften by normal water boiling method.

In Korea, we have industrialized the tussah silk reeling in 1967 at some silk reeling factories with multiends silk reeling method. The industry was, however, discountinued because of tussah silkworm disease attack. When we had solved the disease problems, we found the tussah silkworm rearing was to be no more economical feasibility and ended with a dead industry in Korea. Not only in Korea, tussah sericulture is not relyable industry because of much fluctuated production amount by year. May I introduce one fable regard as tussah sericulture in Korea. That is, never give any daughter to the man whoever engage with tussah sericulture because she will be hangly out.

Now, let us discuss about the tussah silk fibre. The reeled out tussah silk fibre has still some what impure material on its fibre which the matter is being to interrupt for dyeing process and the lustre of its textile. And the irregular fibre cross section causes irregular light reflection which is not to be uniform lustre.

The tussah silk has been sued for several hundreds years as its natural color shade specially in Asian countries, raw state or degumed silk. During such years, there was no need to dye the tussah silk and no body had any trouble to use of it. Since the tussah silk has been exported to Europian countries, there happened to be a serious problem how to dye the silk adequately for the use of them.

As all of us know, it is necessary to eliminate the included impure matter before dyeing process by refining process. This is the most important process to have a good result on dyeing. In case fail of this process, the tussah silk will loose its peculiar lustre, bringing poor dye affinity and staining upon water drops on the cloth.

Normal silk is well known to be dyed with acid dye stuff, but the dyeing was found as improper method for tussah silk because of poor dye affinity. According to my investigation, reactive dye is the most recommeneded. Not only for tussah but also mulberry silk is recommended to use such reactive dye as far as dyeing affinity is concerned.

In case the tussah silk is purified enough, there is no need any additional treat after dyeing, but it often stains by water drops on the cloth because of incomplete refining. For the proof of the problem, it is recommended to have some water repellent treat after any dyeing.