S3

Application to Human Affinity Materials Using Silk Protein

Joo-Hong Yeo[1], Kwang-Gill Lee[1], HaeYong Kweon[1], Soon-Ok Woo[1], Sang-Mi Han[1], Bum-Koo Lee[2] and Chung-Sub Han[3]

Department of Sericultural Biology, National Institute of Agricultural Science & Technology, RDA, Suwon, 441-100, South Korea; Dongsung Pharm. Co., Ltd., South Korea; Peauciel Cosmetic Co., Ltd. Chungnam, South Korea.

Recently, the silk protein has been widely used as industrial materials such as cosmetics and functional food. In this report, we are reviewed studies on recent development by our research group for application to human affinity materials using silk peptide.

Silk fiber has been used as textile fiber for thousands of years due to its good human touch and physicochemical properties. However, the consumption of silk fiber has been gradually decreased due to too much appear of synthetic textile fibers. Nowadays, silk fiber is used only for specialist and high quality luxury items.

On the other hand, silk protein is still attractive materials because it can be produced in pure and mass product by silkworm rearing. Moreover, it is environmental and biological compatible, reproducible, and inert immune responsible. Based on these biological merits of silk protein, we have been tried to develop novel application for human affinity materials.

Silk protein is one of the non-toxic natural proteins produced by insect. Although, it can be edible but it is not digested due to its huge molecular weight. To use silk protein as edible and/or functional peptide application, we have to fractionate silk protein by enzyme or inorganic acid. The edible silk peptides were produced through several processes and purified through chromatographic method.

These fractionated silk protein; we have application to high quality beauty soap, a hair-dye, functional cosmetics, toothpaste and drug like peptide and so on. Figure 1 shows commercialized various products using sulk protein through cooperative research. Silk cosmetics are characterized by its acceleration of human collagen secretion, water-retention property, and so forth. We also developed silk hair-dye, which is skin-safe and quick dyeing effect. Commercialized hair-dye has been known to some skin trouble including an eruption forming on users'neck, erythema of skin, and damage on hair. Our developed hair-dye reveals that skin trouble is minimized, dye

ability was increased, and hair was protected through excellent coating effect.

One of attractive research fields of silk protein is biomedical application. We have known that wound on the rat skin effectively recovered by covering of silk protein due to facilitation of collagen secretion.

Using in this collagen-stimulated effect, we have to application to toothpaste that is protection of oral an epithelial cell.

We reviewed application to human affinities materials use of silk protein. Recently, silk protein research trends are speeded non-textile research fields including functional food and pharmaceutical resources, skin-compatible and biomedical materials. Based on the biological properties of silk protein and cooperation with interdisciplinary research, which could be able to diffusing various high quality fields. Especially, drug like peptide research are very attractive one. We are now on it.

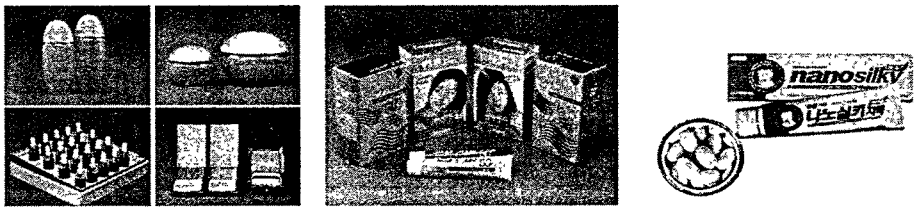

Fig.1 Commercialized various products using sulk protein
(left;functional-cosmetics, middle;hair-dye, right;toothpaste)

[References]

1. Yeo, Joo-Hong; Kwang-Gill Lee; Ho-Cheol Kim; Young-Lyun Oh; Ae-Jeong Kim and Sun-Yeou Kim, *Biol. Pharm. Bull.* 2000, 23, 1120.
2. Yeo J-H; K-G Lee; Y-W Lee and S-Y Kim, *Europ. Polym. J.*, 2003, 39, 1195.
3. Demura M.; J-H Yeo; K-G Lee and Y-W Lee, *Int. J. Indust. Entomol.*, 2002, 4(1), 1.
4. Lee, Kwang-Gill; Joo-Hong Yeo; Yong-Woo Lee; HaeYong Kweon; Jong-Ho Kim, *Korean J. Seric. Sci.* 2001, 43, 109.
5. Kweon, HaeYong and Chong Su Cho, *Int. J. Indust. Entomol.* 2001, 3, 1.
6. Une T.; K. Kusaki and H. Takai, *Fragrance J.*, 2000, 28(4), 15.
7. Kato N. and M. Sasaki, 2000, *Fragrance J.*, 28(4), 28.
8. Yamada H.; H. Nakao; Y. Takasu and K. Tsubouchi, 2001, *Mate. Sci. Engin.*, C14, 41.