

Study on the Korean Traditional Dyeing: Unique features and understanding

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Abstract We know that humans are able to live comfortably when there is a balance between the living environment that surrounds us and us. Clothing, one of the necessities of life, serves a dual purpose of functioning as protection for the body as well as providing visual satisfaction, and so is the most effective bonding mechanism. A different type of comfort that has been provided through industrialization and advancements in technology has resulted in pollution problems in the environment, and it has reached a point of seriously thinking about its effects. The biggest problems in environmental pollution are air pollution and waste disposal, and something that cannot be ignored is that environmental hormones and harmful heavy metals have been discovered in the synthetic dyes used in the clothing product, and not only are they harmful to the body, but they also have adverse effects on skin allergies such as atopic dermatitis. Its effects on clothing, especially underwear and baby products, can become a serious issue. The use of natural vegetable dye can be considered the basis for the traditional Korean dyeing process, however not all natural dyeing process can be thought of as traditional Korean dyeing. This is because natural dyeing used to be the most common method of dyeing before synthetic dyes came along and became the dye of choice for most clothing. Natural dyes are beneficial to the body, and the nature colors, achieved from the natural materials, relieve eye strains as well as have a healing effect for people who are suffering from psychological instability such as stress. However, the use of mordant in order to increase the fastness and get better color effects can lead to even more damage to the environment, and it cannot be a dyeing method that is good for the body. Traditional natural dyeing is different from regular natural dyeing because it uses colors that the Korean people can identify with and applies specific methods in order to achieve those colors. Even though experimental study with dyestuff and practical use of the dyeing methods for traditional Korean dyeing has been started(Soh, H., 1983) and has been ongoing, it is still not easy for regular people to use the method on their own. At the present time, natural dye materials are getting made and sold more than ever, but there is a lot of confusion among consumers regarding the difference between traditional Korean dyeing and natural dyeing, as companies are using the two terms interchangeably to market their natural dye products. So getting a better understanding of the characteristics of traditional Korean dyeing and traditional colors should be considered first priority at this time. The purpose of this thesis is to study the traditional Korean view of color, which developed the culture of traditional dyeing in Korea, and the characteristics of traditional Korean dyeing, a method that pursued achieving Korea's color through natural dyeing.

Understanding Natural Dyeing

The Developmental Process of Natural Dyeing

Though the beginnings of dyeing (i.e. exact time or method) cannot be known, evidences of textile dyeing date back to the Neolithic period. A fabric dyed in madder (red) was discovered in the ruins of Mohenjo Daro in India, one of the great Neolithic civilizations. However, if we do not limit the definition of dyeing to a process of boiling the dyestuff then infusing it into goods, then we can think of the mineral dyes that used dyestuff produced from pigments of soil and rocks as the origin of dyeing. In this case, it can be said that the origin of dyeing started along with the beginning of mankind, and as the dye process was adopted by different civilizations, went through different ethnic modifications depending on their sentiments and thoughts.

There have actually been discoveries that have predated India. A fabric that was dyed in blue, dated between B.C. 7160~6150, was found in the Neolithic Hemal Cave in the Palestinian desert region. Also, bone beads with traces of red in its holes, dated around B.C. 6000, was found in Catal Huyuk of Anatolia, and red is considered to be evidence of threads dyed in red being used with the beads.

On top of these, in Egypt, a mummy wrapped in red and brown linen was discovered, and it was dated to be from the 1st Kingdom (B.C. 3100~2890), and an excavation of a tomb from the 12th Kingdom (B.C. 1991~1786) uncovered women's clothing with patterns containing blue, green and red (Min, G., 1998).

Natural dyeing was closely related to all types of cultures, from agricultural to nomadic, and they used any available material that gave off color in their surrounding environment. Religion and the supernatural, in general, was at the center of all the societies, and color was used to represent symbols in those realms, and it was also used for everyday necessities, which satisfied and developed the aesthetic instinct of humans.

The different types of natural dyes are as follows. 1) Vegetable dyes, which extract color from plant parts such as roots, stalk, leaves, and the flower. 2) Animal dyestuff, which extract color from body parts of animals, such as cochineal, kermes, and Tyrian purple, or secretions. 3) Mineral dyestuff, which extract colors from the metallic oxide inside soil and rocks, or in other words, mineral pigments. Of the three types of natural dyeing, vegetable dyeing is the most commonly used.

Up until 1856, when W.H. Perkin of England invented the synthetic dye, Mauveine, these natural dyeing methods were used by all the cultures in the world since getting color from the surrounding environment was the only method available. There were slight differences in type of dye and method, which depended on geographical and environmental factors.

So, as the geological and environmental conditions of a country, along with its people's sense of aesthetics and ideals, influenced the details of that country's natural dyeing process, a tradition was developed over a long period of time.

The Culture of Traditional Dyeing in Korea and Natural Dyeing

The production of dye goods during the Silla (新羅) period was produced in two ways. Mapo (麻布), a hemp linen, was produced by naturalized slaves (歸化人 奴隸) as well as common craftsmen, while goods meant for the aristocrats and exports to Japan and China, were made by craftsmen belonging to the Royal Palace (宮營工人). Managing department of dyeing (染宮), department of purple dyeing (蘇芳典), and department of red dyeing (紅典) were the departments responsible for dyeing white fabric as well as dyeing threads before sending it to the weaving department. There was a government department in charge of producing leather goods (皮典中), and there was a branch of this department that was responsible for making shoes for the palace (靴典). They had plum colored leather (紫皮) and plum colored leather with black stripes (烏纒皺文紫皮), and these were produced using the finest purple dye (紫色染) on the leather (皮革). The goods that used the dyed threads were gae (闕), silk (繡), fancy silk (錦), gauze(羅), different types of 4-end complex gauzes (<總羅>, <野草羅>, <布紡羅>, <越羅>), hemp with no patterns (無文獨織), type of gauze from Silla (乘天羅), silk tabby(綿紬), twill damask (小文綾), gold and silver sticking and clamp-resist dyeing. And besides the above-mentioned goods, patterned dyeing such as clamp-resist dyeing also occurred. The departments that were responsible for dyeing in Silla were the six people in the department of purple dyeing, 11 people in the Yum-Gwan-Mo, 6 people in the Gwan-Yum-Juhn, 6 people in the Pyo-Juhn, and 6 people in the department of red dyeing(三國史記, 39(8)).

Dyed fabric in the Goryo (高麗) period were produced in government-owned and privately-owned factories. Doh-yum-suh (都染署) dyed colors such as orange, reddish purple, green, blue, and navy(高麗史, 89) for sang-bohk-suh (裳腹署) and ek-jung-gook (掖庭局), which produced goods.

Dyeing in the Chosun (朝鮮時代) period was performed in government factories, privately owned factories, agricultural factories, and butcher factories. Butcher factories were the most active of these and each process became more organized and compartmentalized. In the government factory, each color had an artisan called gwan-jang (官匠 京工匠樣相), including a blue artisan (靑染匠), and a red artisan (紅染匠).

The dye and color in the prehistoric age (先史時代) are not known, however it is assumed that basic dyeing methods composed of mineral dyeing such as colored soil and rocks, and vegetable dyeing were used. Dyeing in the Three Kingdom period were influenced by dyed goods from the Chinese Han (中國 漢代) and developed greatly. The development in mineral dyeing produced colors such as deep red(주사, 朱砂), petrol blue (綠靑), Prussian blue(紺靑), and navy (藍色), and developments in dip dyeing (浸染) made it possible to extract and use saps from fruits and plant parts to produce extravagant dyes and colors. This led to plain dyes (平染) to develop into tie-dyeing and clamp-resist dyeing(Lee, E., 2000).

It is noted in the Go-gur-yeo part of the old historical book of Tang (舊唐書) that the royal robes of the Go-gur-yeo period were dyed in lavish colors, and it stated that though the robes were made with silk, the purple resist dyeing pattern (자지힐문, 紫地纒文) was the finest aspect of the robe with fancy

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silk (五色錦) coming in second. It can be inferred from this statement that the clamp-resist and resist dyeing were developed by this time.

By looking at the examples of dye and color(Kim, W., 1974) in the paints of Go-gur-yeo tumulus murals, diverse patterns and dyes can be seen. Though there are lots of examples of patterned dyes on a white good, fancy cotton and silk in diver colors such as light brown (淡褐色地), rust (赤褐色地), navy(藍色地), rose pink (淡紅色地), black (黑色地), yellow (黃色地), red (朱色地), and gray (灰色地) could be seen as well.

According to the old historical book of Tang(百濟條), in the Dohng-ee-Juhn Baek-Jae-Juhn (東夷傳百濟條), red pictures were drawn on robes(三國史記, 33(2)) of the government officials in the Baek-jae (百濟) period. From this, it can be noted that painting (彩繪) dyeing technique was applied during this period. Silla-Jo (新羅條), in the history of the Northern dynasties(北史), stated that people of this period drew pictures on silk that did not have any patterns (素絹), from which we know that dye and color were promoted on clothes, and there are records of clamp-resist dyeing being banned on clothes during King Heungdok's reign during the Silla period. Meanwhile, if we suppose that the lavish dye and color techniques of the Asuka(飛鳥時代) and Tempyo (天平時代) periods of Japan(明石染人, 1927) had a big influence on BaekJae and Silla periods, we can infer that diverse dye printing techniques such as tie dyeing, clamp-resist dyeing, textile printing, and painting(Lee, Y., 1947) were developed already.

Clamp-resist dyeing was practiced during the Tang Age (唐代), and the process consisted of two symmetrically carved blocks being used to clamp the folded textiles, and then it being dyed. Tie dyeing was done by tying the cloth (布帛) with threads then dyeing it.

Navy dyeing (藍染) used knotweed and polygonum indigo leaf(Jung, T.), an annual, as dye material. The book, "bohn-cho-gang-mohk", stated that both the stem and the leaves were used as dye-stuff(本草綱目, 李時珍), however the leaf was a better dyestuff than the stem. The seeds of Indian indigo (印度藍), *Isatis indigotica* (松藍), *Polygonum tinctorium* Ait. (蓼藍), and *Mercurialis leiocarpa* (山藍) contained pigments for blue as well as different shades of blue such as reddish-blue (赤青), yellowish-blue (黃青) and brownish-blue (褐青).

Safflower(褐青), a type of compositae (褐青) annual, contains the water-soluble yellow pigment and the insoluble red pigment in the leaves, but it was mainly used as a red dyestuff. Besides the safflower, *caesalpinia sappan* (蘇方木)(Scientific *Caesalpinia Sappan* L.) and *rubia akane* (茜)(Scientific *Ruibia Akane* Nakai) were used as red vegetable dyestuff, and organic acids such as *schisandra chinensis*(五味子), Japanese apricot, and oh-mae (褐青) were used to neutralize the lye.

Gardenia fruits(Scientific *Gardenia jasminoides* Ellis *Gardenia florida* L. *Gardenia lucida* Roxb), amur cork tree(Scientific *Phellodendron Ruprecht*), turmeric(Scientific *Curcuma longa*), golden thread (Scientific *Plugioregma dubium* Maximowicz), safflower, *arthraxon hispidus* (蓋草)(Scientific *Arthraxon hispidus*(Thunberg) MAKINO Var. *brevista*(Rgel) Hera), and Japanese pagoda trees(Scientific *Styphnolobium japonicum* Linne Schott) were used as yellow vegetable dyestuff. A pigment component of *Lithospermum erythrorhizon* Siebold (紫草) plant mainly used as dyestuff, gave off a red color in acid, and a blue color in alkaline mordant, which resulted in a purple color. In the Joseon period, this was

used with yellow lye to get a bluish purple color.

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Traditional Colors of Korea and The Five Colors of The Five Directions

Yin-Yang, The Five Elements, and The Five Colors of The Five Direction

The temperament of a nation is created and maintained through various challenges and influences from geological and societal factors, and it is something that has carried a country's unique tradition for long period of time. The most deeply rooted feature of everyday life for the people is their beliefs. It is the foundation that influences their daily philosophies as well as their ideologies, and it shows on their entire necessities in life. During the Joseon period, the concept of the universe was based on the ying-yang (陰陽) and the five elements philosophy. They believed that the universe was based on the ying and the yang, and so it became the philosophy of their lives. Due to these national sentiments, they had the wisdom and the ability to adapt to changes of the times and led to the people having a view of life colors that was distinct to its people. Also, it could be possible that the Korean ancestors were able to find the colors of the ying-yang naturally through the beautiful natural environment that surrounded them, and learned to express them.

The five colors of the five directions are made of two sets of colors: the red, blue, yellow, black, and white, which are the solid colors of five direction (五方正色), and red, aquamarine, and dark yellow(www.cnki.com.cn), which make up the mixed colors of the five directions. The primary colors are the Yang (陽) and the secondary colors are the Yin (陰), also the Yang (陽) represents the sky (乾) and men, while the Yin (陰) represents the ground (坤). So colors such as pine pollen, yellow (from chrysanthemums), peach, and pale pink (mixed from light and dark pink colors of azalea) made up the base colors of women's clothing. These colors provided the clothes with a soft color look. When women and men's clothes were seen together, a sense of balance was achieved through the colors.

The theory of Yin-Yang and the Five Elements sees the Ying-Yang as the phenomenon that made the universe, and the Five Elements are the five types of nature that can form depending on the balance of the Ying-Yang. Its worldview emphasizes balance and unity, and it has been passed down from the period of the Three Kingdoms to present day Korea. Sung-Rhee-Hak (性理學) started to spread slowly since the mid Gor-yeo period, then became the dominant religion during the Jo-seon period. It spoke of not caring for status, and influenced the people in all facets of their everyday life. This philosophy was so deeply rooted that in everyday life that even the colors that were used could not escape its influence.

The concept of the four directions (north, south, east, and west) and the center having a color, as well as secondary colors that derive from those colors is part of the idea of the Five Elements. The five colors of the directions are composed of blue (for the east), white (for the west), yellow (for the center), red (for the south), and black (for the north). The areas between the directions are composed of the secondary colors. The secondary colors, composed of the mixed colors between the directional colors, are green (a mix of blue and yellow), dark blue (a mix of blue and white), red (a mix of red and white), purple (a mix of black and red), and a compound color mix of black and yellow. And depending on the

ratio of the colors in the mix, diverse set of colors can be achieved. The color foundations of traditional dyeing of Korea are composed of these colors (red, blue, yellow, white, and black), and it symbolizes a significant meaning as clothing colors. The other colors in the clothing are made up of the secondary colors.

This concept of color, which corresponds the theory of Yin-Yang and the Five Elements, can be seen in the records of the Gor-yeo government office in 1275 (the year of coronation for King Choong-Ryeol), as well as the White Clothes Ban in the annals of the Joseon Dynasty. It shows that it had a huge influence on the personal attire policies of Koreans, who were known as the white-clad folk. The East, which is where Korea is located, has the nature of a tree (木), and the best-fit color is blue. However, the Koreans wore lots of white, which was the color of the West, and the nature of the West was gold, which was incompatible with tree, the nature of East. So this was the reason for the White Clothes Ban.

O: Compatible Relationship

X: Incompatible Relationship

So royal clothing was based on the colors of the five directions, and the artisans put in great effort to find and extract the colors, red, blue, and yellow from the natural environment because those colors symbolized nobility. Even today, there are still a very limited amount of dye artisans who still practice these methods that have been passed down to them through several generations of artisans.

Natural Dyeing of the Five Directions Colors

The traditional dyeing method in Korea is based on the natural dyeing method that was used since the beginning of civilization. The color of the natural dyestuff came from the surrounding environment of mountains, prairies, rivers and seas. The environment provided diverse dyestuff, sources ranging from vegetables like flowers and trees, to minerals like soil and rock, to animals like marine plants. However, the colors that are in the natural environment are not as easy to use as the synthetic dyes.

As an example, vegetable dyeing, which is the most common form of natural dyeing, is a complex process because each individual plant could have different pigment ingredients depending on the growth conditions as well as unique changes that it could have gone through. So the key to vegetable dyeing is finding a way to extract the refined pigment from the plant in order to get the right color of that plant. And the ability to use the mordant that nature provides in order to get diverse colors, while achieving the desired color fastness is a unique and individualistic dyeing technique that can only be acquired through abundant experience.

Compared to the processes of other countries, Korea's natural dyeing tradition is one of the few processes that repeat the dyeing over ten times in order to get the blue, red and yellow colors. Repeated dyeing requires intense effort of dyeing, hand laundry, long-winded drying process, and general hard la-

bor, however it results in high color fastness as well as most effectively bringing out the natural colors of the dyestuff. So it can be called the best dyeing technique.

Dyeing Red and its Affiliated Colors

Of the Five-direction colors, the color red has the nature of fire, and it is affiliated with the south. In terms of seasons, it is associated with summer, and it includes all the reddish colors (紅色系) and purplish colors (紫色系).

Gang-sa-po and a red skirt, or hoon-sang (勳裳) make up the king's court dress. As it can be noticed from the name, depending on the shade and chroma of the red, different names such as gang (絳), hoon (勳), be (緋) are used. The color red is also categorized into the categories of toh-hong (土紅), jin-hong (眞紅), and doh-hong(桃紅) or dae-hong (大紅), and (多紅).

Red was used in the king's gohn-ryong-po and the queen's won-sahm and sseu-rahn skirt in accordance with ee-deung-chaе-gang-won-chihk (China's policy of wearing clothes that are two levels lower). In lower levels, it was also used in civil servant's clothing like dahn-ryung, geum-gwan-jo-bohk, dong-dah-rhee. The most commonly used red dyestuff was safflower, caesalpinia sappan, and rubia akane.

Safflower, of all the vegetable dyestuff, brings out the most vivid red color, but it was too expensive for the common person to use. Since it was too difficult to use safflower for the red dyeing, it seemed like people used caesalpinia sappan as a substitute.

Caesalpinia sappan, a tropical plant, is used to achieve red dyeing, purple dyeing, and other diverse color dyes. caesalpinia sappan can be divided into soluble red wood and insoluble red wood, and the soluble red wood is the type that can be used as dyestuff. Brasilin, a pigment in the caesalpinia sappan, is water soluble, which makes it useful for extracting color and producing dyeing solutions. Once it comes into contact with air, it becomes oxidized and turns into brazilein, and slowly transforms into brown.

Besides these, soo-eun-ju (水銀柱) and soil containing ferric acid called ju-toh (주토, 朱土) were used for red dyeing.

Jah-choh (紫草), which is used for purple dyeing, is also called jah-chi. During the Gor-yeo period, Korea was famous for jah-choh and jahchoh dyeing technique. Jah-choh's purple pigment is not stable, so it takes high quality ingredient as well as the proper dyeing requirements to get a vivid color. In order to get a deep violet color, dyeing solution extracted through boiling caesalpinia sappan, was often used to re-dye the fabrics. Another method was using dyeing solution called jjohk-mool, which was extracted from polygonum indigo, to dye the fabric first, and then to use safflower to get the purple color.

Dyeing Blue and its Affiliated Colors

Of the Five-direction colors, the color blue has the nature of a tree, and it is affiliated with the east. In terms of seasons, it is associated with spring, and according to the suhk-myong (釋名), a book from the Late Han period, blue had the meaning of birth, so it was a color that represented recovery of

the universe (青色也 象物生時色也). The affiliate colors of blue include greenish colors(綠色系), mixed from blue and yellow, and dark bluish colors (碧色系), mixed from blue and white. These are the mixed colors, or gahn-saek (間色). The blue affiliate of the dark bluish color, chang-saek (蒼色) can be found on marbles(赤白蒼色) hanging from the royal crown. Navy refers to blue mixed with black, however in order to do a blue dye, a type of Indigo plant called nahm (藍) is used, so this seems like the reason why most of the blue affiliate colors are referred to as navy. As an example, the palace ceremonial costumes of the queen and her court ladies wore either a red skirt or a navy seu-ran , but the jeok-ui, court dress of the prince's wife, used the navy color. This shows that the name navy was used for the color blue, in general, instead of being affiliated with a specific color.

Darkish blue (鴉青色), blackish blue, used in the costumes of court officials, such as the danryung, yiyeom, and gamut. Compared to the navy cheolik of the state councilor , the chung-hyun-saek (清玄色), which was used on the dang-ha-gwan , was expressed as bluish black.

The greenish colors (綠色系), which was achieved by alternating the blue dye and the yellow dye, was green with a navy tint. Celadon green, dark green, and yellow green are colors in between green and yellow, and it was often used in women's and children's clothing, such as wonsam, dang-u'i, jeogori, and durumagi.

Jade green was used frequently on the queen's hwe-jang jeogori and min-jeogori jade green jeogori and jade green durumagi of the king's home wear, as well as the everyday clothing of the common people. The jade green dyed ramie was very popular due to its incredible color.

The navy dye was achieved by repeatedly dyeing white, jade green, and dark blue. Also, suhk-myong (釋名) stated that dark navy with a black tint (紺色) had the meaning of hahm (含), and the color is made up of blue as well as red (紺含也 青而含赤色也). It could be achieved through initially dyeing (下染) red, and then applying navy.

Dyeing Yellow and its Affiliated Colors

Of the Five-direction colors, the color yellow has the meaning of brightness. It is located in the center of the directions, and has the nature of a soil. It is the color of the emperor, as it symbolizes the center. The king and queen of the Joseon period had to wear red dragon robes and red wonsam instead of yellow dragon robes and yellow wonsam, and only Emperor Gojong and Emperor Sunjong was able to wear the yellow versions. Bans regarding yellow clothing was the most common ban in the prohibition of clothing policy during the Joseon period. However, yellowish colors are related to all the other colors, so the ban was mostly regarding the pure yellow colors. Other yellow affiliates such as the song-hwa color (송화색), hong-hwang color and orange were used in diverse fashion by the common people.

The color song-hwa is a light yellow color, and it was used as the color of jeogori on the red or navy skirts that was worn inside the palace. It can be seen on Queen Youngchin's song-hwa jeogori. This can be seen on the sahm-hwae-jang jeogori and sahm-jahk-yong jeogori, which was worn with dang-u'i.

The yellow dyestuff was achieved by using turmeric, amur cork tree, golden thread, rubia akan, and common dayflower. Turmeric and amur cork tree were used to dye scrapbook paper as well as clothing. The rubia akan pigments are still used in foods.

Dyeing Black and its Affiliated Colors

Black points towards the north and it has the nature of water, and in terms of the seasons, it is associated with winter.

The court officials after the Joseon period wore black danryung, and the common people wore black as part of their everyday clothing as well. The affiliate colors of black include oh (烏), jo (早), hyun (玄), hwae-saek(灰色), goo-saek (鳩色), and chi-saek (緇色).

The book, suhk-myong (釋名), stated that chi-saek (緇色) is the color of ashes and that the black part of Eeh(悒) is called jae (滓) (緇縹也 悒黑者曰滓 此色然也). Jo (早) had the meaning of morning, and it was referring to the black color that seemed to appear before sunrise. Even though black is made by combining all the colors together, there is more red than blue in its composition. The explanation regarding johng-ssi (鍾氏) in the Jurye (周禮)(林己奈夫, 1976) stated that hoon-saek was a secondary color that was achieved through thrice repeated dyeing. If this was dyed twice using a black dyeing solution, it became the color chwee(翠), then if it was dyed twice more, then it became chi-saek (緇色). So it was assumed that jung-hyun (正玄) was the intermediate color between chwee(翠) and chi-saek (緇色), and that chwee(翠) is present day, jahk-doo-saek (爵頭色)

Gray is a secondary color of black, and the government officials of the early Joseon period wore gray danryung. It was also used on the gray jungdan, which was part of the undergarments of the jeok-ui (翟衣), a court dress worn during the crown princess' garye.

Goo-sehk (鳩色), pigeon color, was a type of gray that was used often for men's pants as well as monk's robe. Black affiliate colors were often extracted from used ink stick, charcoal, the bottom of cauldron, or the ashes of the tree roots.

Dyeing White and its Affiliate Colors

The nature of white is gold and it points to the west side. It is associated with the fall.

For the Korean people, who were known as the white-clad folks, white clothing was the purest colored clothes. It is not known whether the color white refers to just the color or also to so-saek (素色), which was the natural color of the raw materials for clothing. However, it is known that the natural colors of silk and cotton were bleached naturally through repeated washing and sun drying, and slowly turned into pure white clothing.

Natural Mordant

Dyeability refers to the ability of the dye to combine with the fabric that it comes in touch with. In normal dyeing process, mordant is used to influence the dyeability and get a higher color fastness. The

mordant used in natural dyeing is essential because it reacts to the various pigments in the natural dyes and brings out diverse colors.

Since the dyeing solution extracted from plants contain various types of color pigments, even if the dyeing solution was extracted from the same dyestuff, the using different mordant can bring out diverse colors. Generally, if the mordant solution is too watery compared to the concentration of the dyeing solution, mordant stains can form easily, as well as the color not showing off well, so it can lead to pollution during the washing and drying process. On the other hand, if the mordant solution is too strong, the fabric can turn into a different color from the intended color due to the influence of the mordant pigments. So, the natural dyeing process is not just about following a certain recipe to complete, but rather a deep understanding of the process needs to be acquired through experience in order to figure out the intricate details such as the proper amount of dye solution that is needed, the right temperature, and the proper use of mordant. An additive color is added in the process at times, so it is important to add the proper amount of mordant into the process.

Mordant is used to enhance color formation, absorption, and color fastness during the dyeing process. Materials used as mordant are rice straws, camellia lye, aluminum, alum, chrome, tin, lime, and copper. The color of the dyed fabric always changes depending on the type, concentration, temperature and duration of the mordant application, so the same color cannot be achieve again. This makes it a unique nature color.

When attempting to mix two or more five-direction colors, it is important to dye in a specific order. So light color to dark color should be followed, so color with high chroma should be dyed first, and then lower chromas should be mixed.

The white clothes ban that started from the reign of King Choong-Ryeol, which was influenced by the theory of the Five Elements, was not a simple matter of just banning a certain color or a type of clothes because of ambiguity in color. The lower class people had to rely on the natural clothing that did not go through the process of dyeing, which could have allowed the tradition of the white clad folk to continue.

The Characteristics of Traditional Dyeing in Korea

By repeating the process of washing and drying over ten times for every dyeing, Koreans were able to improve the color fastness and uniformity of the dyed fabrics despite using natural dyeing methods, which had a low color fastness. This made it possible for the colors of the fabrics to achieve its natural colors consistently, and resultant vivid colors were unique to Korea.

Also, the red dyeing process was recorded in the Gyu-hap-chong-seo . It stated that “if repeat dyeing is drained until the hween-chung is coming out, then the water contains red, so it is good enough to start dyeing the fabric”, “press the fabric with the hands, then red and yellow water will come out so do not let anything go to waste”. This shows the thriftiness of the ancestors, as well as the importance and value of the dyes.

Korean dyeing culture was based on the natural vegetable dyes, which was extracted from its beautiful land. The people found the colors that surrounded them in the natural environment, and this was used in combination with the life philosophy and mindset of the people to express the ethnic colors of Korea. This has been at the forefront of the culture of the traditional dyeing.

Indigo pigments, which is a pigment that has been used as a source of blue dye in all parts of the world for a long period of time, have been used to make navy dyes in many countries, however the Korean navy dye is unique, and along with the red dye (safflower)(Scientific *Carthamus tinctorius* L.), are good examples that represent traditional dyeing in Korea.

The following is a summary of the traditional navy and red dye technique gathered by Gwang-Suk Han, who was able to learn the process after going through several trial and errors. After a long period of time, he was able to acquire the technique by collecting various research materials in literature as well as oral stories from the elderly.

“The side of the stem that was cut should be placed inside the jar and be stepped on. Then water should be poured inside then rocks should be placed on top of it. The best type of water to use is soft-flowing water from the brook, which is better than rainwater or spring water. Han stated that this was because the acidity and the movement of water are intermediate. After about a week, when the stem is taken out of the jar, the water should be blue. Here, lime powder gotten from roasting cockle or oyster shells should be mixed in and stirred. Then white bubbles will start to appear, which will turn in to blue bubbles, then plum colored. Then after couple hours, the jar will overflow with dark purple bubbles. These purple bubbles are called flower bubbles, this is because the colors “bloomed” into the proper color. If the flower bubbles do not appear, then the water cannot be used for dye, even if it seems like it can be used as blue dye, and the appearance of the flower bubble is dependent on the quantity and quality of the lime powder. When the flower bubbles are left in the jar overnight, clear water will rise to the top of the jar, this is because the lime powder absorbs the pigments and sinks to the bottom. Once this happens, carefully pour the clear water out of the jar, and then pour lye, made from burning various types of stems, into the jar. The amount of lye should be about 4-5 times the amount, and then it should be mixed occasionally. Then after a while, the water will turn into navy blue. The surface of the water should be blown with the mouth, and this will unpeel the top layer that was formed, and when this happens, the water below the layer will be blue like a cabbage leaf. This water should be carefully scooped up. This is the Jjok water .

If this water is placed on hemp cloth, it becomes oxidized and turns into jade green, if it is dyed again, it becomes sky blue, then one more dyeing would turn it navy.”

“Safflower is used to dye red, and the process starts with getting the safflower leaves and placing it inside a jar. Then after splashing water into the jar, it should be left alone until it rots and maggots start to appear. During the summer, this process takes about 15 days, however it could take up to a month during the winter. Once this happens, place the leaves inside hemp cloth bag, and then place it in the water and massage it. This will result in yellow colors coming out, and this needs to be thrown out. Once most of the yellow color comes out, then place the bag inside boiling water and continue to

massage it, then rest of the yellow water will come out. Then soak the bag in lukewarm water and knead it, this will result in pinkish red coming out. Then pour some schisandra water as well as lye, made from burning various types of stems, into the jar. Mixing this solution will result in bubbles rising, and the color turning red. Once this happens, put a fabric inside the jar and knead it continuously. This will result in a dyed fabric. The concentration of the red is controlled through repeated process, in other words, the more the process is repeated, the darker the red becomes. Not only should the weight proportion of the safflower and the schisandra should be the same, but if the schisandra water is not included, then the fabric will not dye. This is because schisandra is a substance that helps color to get absorbed into the fabric. After the fabric is dried, following the dyeing process, if it is washed in alum-added lukewarm water, the color will become more vivid. However, safflower, which was easily collected in nature, has almost gone extinct along with the decline of the traditional dyeing. Presently, imported safflower leaves can be found in herbal medicine shops, however it is not effective for dyeing due to preservatives in the leaves, which prevents the leaves from fermenting inside the jars. In order to use these leaves for dyeing, the leaves have to be washed thoroughly for about 5 days, in order to wash away the preservatives, and then be placed inside the jars for the fermentation process”.

The general method of extracting pigments from vegetable dyes in natural dyeing is to boil the material past the boiling point. However, the traditional dyeing method in Korea frequently used a low heat extraction method. Also, for dyes with diverse colors, the extraction process focused on the most vivid color that the dyestuff could provide, and threw away the other pigments in order to achieve the most ideal and vivid color possible. Though there may have been differences in the intensity of the brightness, the artisans did not accept murky chroma in their dyes. So they made sure to take out the needless pigments i.e. taking out the yellow pigments from dyestuff intended for red dyeing before the red dyeing gets started.

Conclusion

Through different ebbs and flows of society, people have put a lot of effort to make everything around them beautiful including the continued development of tattoos, which are intended to decorate and express beauty on the human body. Presently, beauty design, which has been distinguished from fashion, has started to find its place in academia. Color is the medium that influences people the most in our surroundings. And the preferred colors of a people can show the cultural identity of a specific region. This is because the colors that they have been provided by the surrounding environment as well as the dyes that came from it have been present and alive with them throughout generations. These colors have transcended time and space, and have become a source of healing for the people of that region.

The Korean culture of traditional dyeing is based achieving its colors from natural vegetable dyeing, and these colors have been used in accordance with the theory of the Yin-Yang and the Five Elements. This can be seen in the separation of the Five-direction colors and the secondary colors in the traditional clothing. The recognition of aesthetics in Korea can be seen through the intense effort of ach-

ieving pure nature colors in its dyed fabrics, which is noticeable in the solid patterned fabrics of the jeogori and skirt, jeogori and pants, and durumagi of their traditional clothing.

Currently, though there have been proposals regarding solving the problems of harmful materials resulting from synthetic dyes and waste disposal, the indiscriminate use of metal mordant and general use of the term natural dyeing has hindered the tradition and characteristics of traditional dyeing in Korea. As a result, the fact that these things have become an obstacle to promoting and developing traditional dyeing in Korea should not be ignored.

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