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It is said that Korean hemp was already in use in BCE 2333 and that by the 7th century it had become one of the primary fibers used. Today, Koreans manufacture hemp cloth for shrouds, funerary costumes, and everyday summer-wear. There are two types of Korean hemp cloth: *Andongpoh* (*Seang-neang-ii*), which is produced in Andong County and adjacent areas; and *Musam* (*Ik-neang-ii*), which is produced in eleven different regions throughout Korea. The majority of hemp fabric production in Korea is *Musam*, and in Boseong County, in southern Korea, there is a particularly long history of *Musam* hemp cultivation. Twenty-five percent of all Korean hemp is cultivated in this region, and 50% of market share in Korean hemp fabric is produced here.[1]

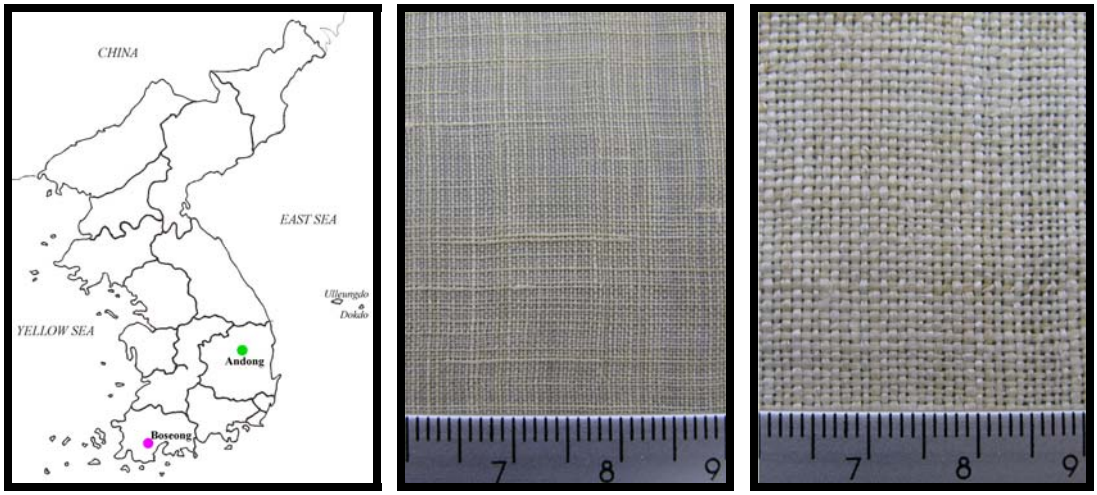

Figure 1 (left). *Andong and Boseong, two hemp producing areas in South Korea. Map by author.*
Figure 2a (center). *Andongpoh hemp.* ***Figure 2b (Right).*** *Musam hemp. Photographs by the author.*

Adding further research that was conducted on *Musam* hemp production in Boseong County in 2007, to a presentation made in Toronto (in 2006) on this subject, this paper will focus on a step by step comparison of the two types of hemp production. The ultimate goal is to point out how the differences in production create the two different qualities of hemp cloth. In addition, the paper will address ways the market for the two types of hemp has changed in the present day.

Both types of hemp are 35cm (14in) wide, but *Andongpoh* is much finer, as it is composed of 640 to 1200 warps.

It is considered an exquisite fabric, and some historical references have been found in which it was presented as an inter-class gift by members of the lower/ middle class to members of the upper class.[2] *Musam*, on the other hand, which is coarse but very durable, was historically produced for clothing for the middle and lower classes and also for funerary garments. *Musam*

[1] Lee, Chan-sik. Interview with author, Korea
[2] Museum of Andong University. "*Andong Sambe Research*"(Andong hemp research), 2002. pp.7

consists of 300 to 560 warps in the same width as *Andongphoh.*

Although the production of *Andongpoh* entails 8-10 steps from start to finish, and *Musam* takes 23 steps, both processes begin by controlling the planting of hemp seeds in the ground. For *Andongpoh*, which requires a finer yarn, the hemp seeds have to be planted close to each other in late March so that the plant will grow up thin and short. Boseong County gets warmer than Andong County, so hemp seeds can be planted two to three weeks earlier there than in Andong.

For *Musam*, seeds are planted spaciously in late February or early March and farmers even prune the shoots of the plant to make it grow thicker and taller, eventually generating more fiber per stalk.

Figure 3. *(Left) Andongpoh hemp hurds.* ***(Right)*** *Musam hemp hurds. Photographs by the author.*

There are regions where hemp is grown for seeds, but this does not happen in Andong or Boseong, where all hemp is harvested before it blooms. Harvesting in Andong County takes place in late June, before the stalks reach two meters in height. In Boseong County, the harvest is in early July – the height of the monsoon season – when the stalks reach two and a half to three meters in height and approximately four centimeters in diameter. Because hemp plants grow three to four weeks longer in Boseong than in Andong, hemp yarns from Boseong are tougher than yarns from Andong.

Figure 4. (Left) *Andongpoh plants.* ***(Right)*** *Musam hemp plants. Photographs by the author.*

Five hemp fiber samples from each region were analyzed, with comparison to mature hemp harvested in Japan.

Musam, planted earlier and harvested later, shows some distinctive characteristics common to all

mature hemp– one of which is the polygonal shape of the cell, and the multi-layered appearance of the cell walls. Also, in some cases, *Musam* fiber cells are larger than those of *Andongpoh* fibers. The hemp cells of *Andongpoh* look less developed. The size of the cell depends not only on its maturity but also on the climate and the area of the plant from which it was taken.

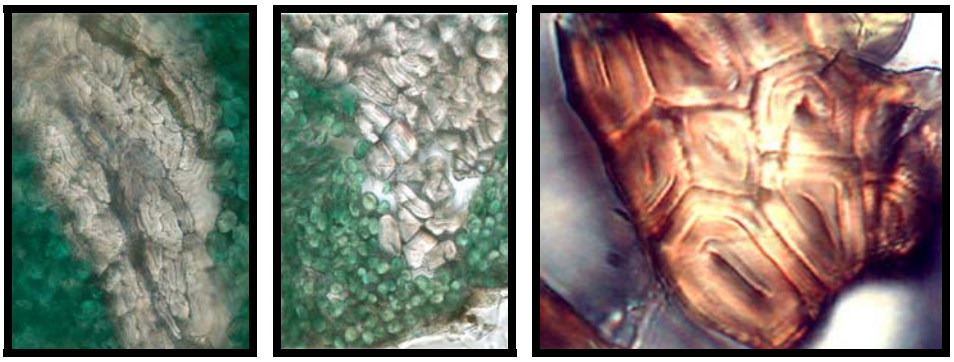

Figure 5. *Cross-sectional images- Andongpoh* ***(left)****, Musam* ***(center)****, and mature hemp from Japan* ***(right)****. Photographs by the author.*

In Andong County, the selling and buying of hemp begins with the harvested stalks. Farmers in Andong County sort the harvest by the diameter of the stalks, and bundle like sizes. Then weavers come to the hemp field and mark their stalk bundles with ties that have their names written on them.

When the buyers have made their selections, the sellers take all the bundles, whether they are marked or not, to the steaming place.

A modern steaming device, a pressure steamer built in the ground inside a warehouse, enables the sellers to steam about 500 - 600 bundles at one time. Each seller pays a flat fee for the steaming each time, so sellers try to fill the container as full as possible. Because the operation is performed inside the warehouse, it is not affected by the weather, and the steaming is done around the clock. After steaming, the marked bundles are separated for the weavers and at this point a second session of buying and selling is conducted, with the steamed bundles that were not sold originally.

In contrast to the larger growers, those who cultivate hemp in small quantities tend to use the traditional steaming place in their village. About 100-150 bundles can be steamed at one time. Villagers provide water from the nearby stream to fill the water container in the ground, and logs are used for the fire.

Figure 6. (Left) *A pressure steamer in Andong.* ***(Right)*** *Traditional steaming place in Andong. Photographs by the author.*

Once the weavers take their hemp stalks home, the rest of the yarn making process for *Andongpoh* hemp cloth is conducted individually. The bundles that did not sell are sold later – either by the bundle, or as yarn or skeins of yarn.

In Boseong County, the buying and selling of *Musam* is not conducted until the hemp is sellable for yarn making – which means it has not only been harvested, but the fiber layers have been peeled and dried. The farmers orchestrate the whole operation and it requires a collaborative effort on the part of the entire village – sometimes including extra workers from outside.

First of all, hot sunny weather is essential. The farmers carefully choose a good day and harvest the hemp stalks all together early in the morning. The stalks are not sorted but merely bundled. As soon as enough bundles have been harvested to fill the steamer they are sent to the steaming place, with more bundles following as they accrue.



Figure 7. (Left) *Musam hemp harvesting in Boseong.* ***Figure 7b. (Center)*** *Musam steaming place in Boseong.* ***Figure 8 (right).*** *Drying hemp fiber layers on the bridge railing in Boseong. Photographs by the author.*

When a batch of stalks has been steamed it is brought back to the village, where peelers are waiting to peel the fiber layers off the hurds. The peelers are mostly women who, for one reason or another, cannot work in the harvest field or at the steaming place.

Steaming of the next batch continues as the peelers peel the fibers off while the stalks are still wet. This process is monotonous. To avoid being bored, the women chat with each other, while their hands remain busy. They look more like they are enjoying a good sunny day outside than like production workers. Farmers bring snacks and drinks to them besides their daily pay.

When a substantial amount of peeled fiber layers has accumulated, the farmers take them to a drying place. In one village I visited in Boseong County there is a bridge that, ever since it was built, has been used to dry hemp fiber.

The farmers drape the long hemp fiber over the bridge railings. Drying takes half a day to a whole day. At this juncture, the fiber layers can be sold (at $14 per kg) and therefore are a target for theft. The farmers take turns on guard duty day and night, until the fibers are taken back to the village. During this vigil, they untie, turn over, and re-tie the fibers several times, to make sure they dry evenly.

In Andong, the bundles of hemp stalk are untied and the stalks are scattered to dry anywhere they can be placed. For instance, climate controlled pepper drying machines are often used in some places to dry hemp stalks.

In Andong County, a weaver rets a small bundle of hemp stalk, peels off the fiber layers, scrapes off their epidermis, and hangs them out to dry. These activities are usually done by one person. When the fibers are dry, she collects them and sets to work splitting them – alone or with her friends.

In Boseong County, a few weavers gather around, either outdoors or indoors, with the bundles of hemp fiber layers they have purchased. They ret the fiber, scrape the thicker ends to make them thin, and split the whole length of the fiber, chatting away loudly as they work.

Figure 9. (left) *Scraping epidermis off the hemp fiber layers in Andong.* ***(left-center)*** *Softening the thicker ends of the fiber layers in Boseong. Photographs by the author.*
Figure 10. (right-center) *Fiber layers are translucent after scraping epidermis off Andong.* ***(Right)*** *Dark green fiber layers with epidermis, Boseong. Photographs by the author.*

In Andong County, the epidermal layers, along with foreign particles, are scraped off the fiber layer before the splitting. The fiber layers for splitting look clean and translucent.
In Boseong County, on the other hand, the production of yarn does not include this scraping procedure. The weaver splits the whole fiber including the epidermal layer (which is why the hemp has a dark green look). The epidermal layer is later removed chemically through the bleaching process.

It is very important to split the fiber as fine as possible for *Andongpoh*. However for *Musam*, people do not worry about splitting the fiber finely and sometimes they comb it to produce more fibers quickly – resulting in thick and coarse fibers. After the fibers are split, they are hung to dry again.

Figure 11. *Splitting fiber layers in Boseong. Photograph by the author.*

In Andong County, the weaver splices the fiber to make yarn. By placing the spliced yarns in a small basket as she splices them, she automatically creates a small, neat bundle of yarn to be

used without spinning, for the next procedure. The yarn bundle can also be sold, by weight. In Boseong County, the split fiber is retted again for splicing. After splicing, the yarn bundles are dried, and spinning takes place.

Figure 12. *(Left) Splicing in Andong. (Right) Splicing in Boseong. Photographs by the author.*

As the yarn is spun it is wound onto a rolled bamboo leaf, creating an oblong bundle of yarn. Then it is pinned onto a wooden rod and transferred to a large skeining wheel.

The hemp skeins produced on this wheel are then placed in a large container with a solution of sodium hydroxide for 3-5 days for bleaching. As the fibers turn white, the epidermal layer separates itself from them and is dissolved. Hot weather accelerates the bleaching process. When the skein is bleached satisfactorily it is taken to the brook in the village and washed.

As the hemp skeins are drying, weavers pair up and shake them to align and separate the yarns that got stuck to each other during the bleaching and drying procedures (The aggressive bleaching process creates a lot of hair on the fibers and it can easily become tangled). Once the skeins are dry they need to be put back on the skeining wheel to be made into smaller skeins for the next procedure. Because the bleaching and drying process has shrunken them, they do not fit on the wheel's original rods, and there are extra rods and holes on the skeining wheel to allow for the shrinkage.

Figure 13. (Left) *A skein of yarn transferred to a large skeining wheel, Boseong.* ***(Right)*** *Washing skeins of bleached hemp yarns in the brook, Boseong. Photographs by the author.*

For warping in both regions, ten bundles of small skeins are laid out on the floor. The warping process for both types of hemp is the same.

Figure 14. (Left) *Warping process in Andong.* ***(Right)*** *Warping process in Boseong. Photographs by the author.*

The length of the warps is measured for a set of garments. One person collects the prepared yarns from the yarn feeder, creating the lease, and hands them over to a second person. The second person runs with the yarns and anchors them to a point where 2 round trips equal the total length of the warp. The third person feeds the ten yarns through the holes on the yarn feeder and keeps the skein bundles untangled by pouring sand over the skeins. When the warping circuit is finished, the lease of ten warp units is secured with strings and the rest of the warp length is wound into a bundle and secured with ties.

The only difference in the warping processes of the two regions is the equipment. In Andong County, the person who collects the ten yarns and creates the lease has to squat during the whole warping process because the yarn feeder is made for the eye level of someone squatting. As squatting and sitting on the floor are traditional, this setup is possibly close to the equipment used by Korean hemp weavers centuries ago.

In Boseong County, the weavers have developed a feeding stand that is as tall as their eye level when they are standing and that allows the person feeding the yarns to work in a less agonizing posture.

Reeding-in is done similarly in both regions, and takes place before sizing. One odd and one even strand are threaded in each dent of the reed, while the lease is kept secured with lease sticks.

The tied ends of the warp are then set up on the warp beam. The only difference between the two regions is that in Andong County one reed is used for sizing and the same reed is used for weaving; whereas in Boseong there are three reeds inserted, to be used in the sizing process and removed afterward.

Figure 15. Reeding-in procedure in Boseong. Photograph by the author.

The purpose of sizing the warps is to add strength to the fibers, to protect against the abrasion created by the reed and the movement of the upper and lower shed threads during weaving.

In Andong County, a few weavers work together to size the warps, laying them over rice husks that have been burned, so that the residual heat retained by the husks will dry the starch, once it has been applied.

The workers mix soybean paste with cooked millet grains to make the starch. The salt from the soybean paste is said to absorb the moisture in the air, which keeps the warp from breaking; the soy waxes the surface of the warp. Once the warps have been set up for sizing, the sizing process itself requires only two people. One person applies starch to the warps, and once the starch has dried, the other winds the warps onto the warp beam. Additional wooden rods are inserted, as the warps are wound on the warp beam to keep the tension even.

In Boseong, the starch is applied by the same process, but the starch mixture itself is different because for *Musam*, coloring is incorporated into the sizing step.

The dye is an extract from gardenia seed pods, and is mixed into starch made of either cooked buckwheat or barley grain. Salt is also added to the mixture. It is said that traditionally people believed that gardenia seed extract made the yarn stronger, and fixed the dye deeper in the fibers, strengthening the yellow color. Another benefit to adding the dye is that it eliminates a step in the production. The sizing procedure for *Musam* requires three people. One person untangles and lines up the warps using an extra reed, removing hairs that have been created by the bleaching. A second person applies the starch to the warps, separating warps using two reeds over heat, and the third person winds the warps onto the warp beam. At the end of the process, the three reeds are taken out and a new reed is inserted for weaving.

Figure 16. (Left) Warping in Andong. (Right) Warping in Boseong. Photographs by the author.

Weaving is conducted the same way in both areas. Even though mechanized looms have been used more popularly since the 1950s (after the Korean War), there are some weavers in both regions who are still using the traditional back-tension looms. Weaving is more difficult on back-tension looms because the weaver has to keep adjusting the tension on the warps. Also, as the weaving advances, the weaver has to get up and unroll the flat warp beam, and this slows down the weaving process.

At the weaving stage, the only difference between the two regions is the color of the warps dressed on the loom. Warps set on the loom in Andong County have the original yellow hemp color because they are not washed and dyed yet.

The warps in Boseong County have the yellow dye color from the gardenia seed pods.

Figure 17. (left) *A Korean traditional back-tension loom in Boseong. Photograph by the author.*
Figure 18. *Comparison of warp color between Andong* ***(center)*** *and Boseong* ***(right).*** *Photographs by the author.*

In Andong County, weavers either dye the hemp fabric at home after weaving or wait until market day, then send it to the dyer. Dyers usually do the bleaching and dyeing in a climate controlled room. Dyers also do the final processing – such as ironing and making a saleable parcel.

In Boseong County, the woven *Musam* fabric is taken back to the brook and washed. Then it is hung to dry, then collected in a semidry state.

Figure 19. *Drying Musam hemp fabric in Boseong. Photograph by the author.*

It is folded and several pieces at once are tamped down by foot. Two workers pair up to pound the fabric with wooden rods on a pounding stone, which is the traditional fabric care method in Korea. Then they sit facing each other, pulling the fabric out to stretch and iron it. They then roll it on a round wooden rod and conduct a second pounding. In the past, this process was always done by a mother-in-law and her daughter-in-law – as they stretched the fabric on both sides, the daughter-in-law had to be extra careful to maintain the right tension between herself and her mother-in-law. If she pulled too hard toward herself, her mother-in-law could lose her balance and get mad at her. At the end of this final handling, the fabric is rolled up to be sold.

Traditional markets are held every five days starting on the second day of each month (2^{nd}, 7^{th}, 12^{th}, 17^{th}, 22^{nd}, and 27^{th} day of every month) in the countryside. In both regions, weavers take the fabric to the hemp fabric stores in the market. They can also sell it on the street. It is not unusual to find people doing business on the street-corner.

In the early 20^{th} century, cotton and silk, which had been used as shrouds, became scarce due to the wars between Japan, China, and Russia. Because of the shortage, people began to use hemp to make shrouds. By the 1990's, commercial marketing had promoted hemp fabric as the standard material for shrouds, and today people do not mind spending $1,000 to $2,000 for their parents' shrouds. The more exquisite the quality of the hemp used, the more prestigious it is deemed to be – which has made *Andongpoh* the preferable material for shrouds.

While the demand for shrouds made of *Andongpoh* was growing, the demand for shrouds made of *Musam* diminished. Instead, people started using *Musam* fabrics to produce other items, such as fancy summer bedding, because it breathes better than other fabrics.

Hemp clothing in the modernized style of Korean traditional dress is also quite popular among people in the countryside of Korea, where air conditioning is not commonly used. Another reason hemp is popular is that it is cultivated with the minimum usage of pesticides, compared to other fabrics. Therefore, *Musam*, which costs less than *Andongpoh* (though it is more expensive than cotton or linen), is the preferred fabric for everyday summer wear.

Figure 20. *Shroud made of Andongpoh.*
http://navershop.lotteimall. (see references below).

Figure 21. *Modernized style of Korean traditional dresses made of Musam. From Sambe: Thousand years of color.*

As traditional culture in Korea changes with the adoption of a more westernized life style through international trade and the exchange of diverse cultural information, the usage of hemp fabric will also change. The role of this fabric – one of the primary fabrics in traditional use in Korea since ancient times – will continue to evolve according to the demands and preferences of the marketplace.

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