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Analysis of Two Chinese Canton Silks: Jiāo-chou and Xiang-yun-shā

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Jiāo-chou (黑絞绸) and Xiang-yun-shā (香雲紗) and are two types of Chinese Canton silk. According to Qing (or Ching) Dynasty documents, Jiāo-chou and Xiang-yun-shā were available as early as the 5th century and these textiles, as well as garments fabricated from them, were exported from Canton as early as the 15th century.[1] Contemporary historians suggested that garments fabricated in Jiāo-chou and Xiang-yun-shā were worn by Chinese in the Honolulu area in the early-20th century.[2] A few of these garments can now be found in the Antique Asian Costume Collection at the University of Hawai'i at Mānoa (UHM). According to the accession notes on the artifacts, the oldest artifact dates to the late Qing Dynasty, placing it well before the year 1906-- the Qing Dynasty ended in 1911. These garments serve as the sample, 15 garment and 2 rolls of fabric of this study. Eleven tunics, a dress, three suits (both tunic and trousers), and two rolls of fabric were examined both in UHM and the Honolulu Academy of Arts.

The terms Jiāo-chou and Xiang-yun-shā were used as both fabric and garment names. One translation of the word Xiang-yun-shā (in Chinese 响云纱 or 香雲纱) is 'perfumed cloud clothing,' suggesting that Xiang-yun-shā clothing made people feel like floating clouds.[3] Another translation of Xiang-yun-shā is 'clothing that makes a noise when the body moves.' Garments constructed with these fabrics are not only light and airy, but they make a rustling noise when they are worn.

These textiles are more complex than they initially appear. Jiāo-chou and Xiang-yun-shā have a number of unique characteristics such as their color, weave patterns, and textile characteristics, and warrant thorough research. The purpose of this study to explore the characteristics of the two fabrics. The results of this study will help museum curators to identify Jiāo-chou and Xiang-yun-shā in their collections and to educate them about these textiles and garments. Further, since modern versions of Jiāo-chou and Xiang-yun-shā are being produced today, and products made out of these silks are becoming a trend in new luxury textile items, this study may help fine-tune the modern day products. Therefore, this study explores the many different types of detailed woven structures within these fabrics.

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[1] Zhou, Xin, & Chun-Ming Kau. Jiāo-chou (黑絞绸) as in "Silk."*Chinese Clothing, Cap, and Gown Dictionary*. Shang-Hi: Shang-Hi, China, 1996: 488, 575. (Written in Chinese.)

[2] Chong, Douglas D. L. *Reflections of Time: A Chronology of Chinese Fashions in Hawaii*. Honolulu HI: Hawaii Chinese History Center, 1976: 20, 21, 37; Lum, Arlene. *Sailing for the Sun: The Chinese in Hawaii 1789–1989*. Honolulu HI: University of Hawaii Center for Chinese Studies, 1988.

[3] Zhou, Xin, & Chun-Ming Kau. Xiang-yun-shā (香雲紗) as in "Silk."*Chinese Clothing, Cap, and Gown Dictionary*. Shang-Hi: Shang-Hi, China, 1996: 488, 575. (Written in Chinese.)

Colors

A key characteristic of both Jiāo-chou and Xiang-yun-shā is their coloration: They are black on one side and reddish-brown on the other side. A special dye technique is used to produce this distinctive coloration. The first step in this process is to dye the greige fabric more than twenty times, even up to thirty or more times, with juice from the Ju-Liang root (薯莨, *Dioscorea rhipogonioides*). This juice not only dyes the fabric reddish-brown, it also causes the fabric to become stiff due to the starch in the juice.[4] One side is then coated with a layer of mud which contains iron ions (F^{++}). When the iron from the mud contacts the Ju-Liang juice a chemical reaction produces a black color on that side of the fabric.[5] The other side of fabric maintain reddish-brown color and only one side of fabric was then coated with a special black mud from the Lian-Na area of Canton. Once this mud was applied, the fabric was laid out in the sun for five to seven days.[6] After being exposed to the sun, the fabric is cleaned and ready to be made into finished goods. According to local reports this dyeing process could only be performed between April and September as the process requires the hot summer sun.[7] Research suggests that this seasonal restriction of the process could be one of the reasons for the shortage of these textiles and why production was so costly.[8] The appearance of Jiāo-chou and Xiang-yun-shā are the same in terms of colors but they have different fabric structures.

Fabric structures

Jiāo-chou and Xiang-yun-shā textiles look very similar to the naked eye but differ greatly in their weave structure. The microscopic examination revealed that Jiāo-chou can be constructed in both plain and crepe weaves while Xiang-yun-shā is constructed only with leno weaves. A leno weave is characterized by the spaces within the fabric structure created by changing warp yarns' position. Plain weave, a simplest interlacing, is weft passes over and under alternating warp yarns across the cloth.

Digital microscope images show that Jiāo-chou is a plain weave and Xiang-yun-shā is a leno weave. Studies also suggest that the fabric texture was designed for a warm and humid climate.[9] A study by Peterson involved technical analysis of gauze fabrications of the Western Han Dynasty (206 B.C.–A.D. 9) including one of the most popular Xiang-yun-shā textiles with a lattice or maze-like pattern.[10] Peterson also analyzed a gauze textile (A.K.A. Xiang-yun-shā) with a maze-like pattern weave and set up a loom to reproduce the weave structure. Since Xiang-yun-shā is a high-end product, the weaving structures tend toward sophisticated design motifs with special meaning.

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[4] Fu, Lee-Yee. "A Study of Atayal Anarchist's Dyed Material: Ju-Liang." National Tsing-Hwa University, Center for Teacher Education, np. Article retrieved March 23, 2005, from http://teens.theweb.org.tw/excel6/paper/No5_4LYFu_09.pdf

[5] Chung, Yee-Choa. "Chinese Traditional Textile and Dyed Materials," Chapter III in *Taiwan Textile Monthly,* 80 (2003): np. (Written in Chinese.)

[6] Li Shan-Xi. "Jiāo-chou, Jiāo- shā, and Xiang-yun-shā." *Chinese Costume Dictionary*. Shan Xi, China: Shan Xi People Publish, (1990): 84–91. (Written in Chinese.)

[7] YoungCheng Evening News, Xiang-yun-shā http://www.ycwb.com (Written in Chinese.)

[8] Chung. "Chinese Traditional Textile. . ."; Li Shan-Xi. "Jiāo-chou, Jiāo- shā, and Xiang-yun-shā."

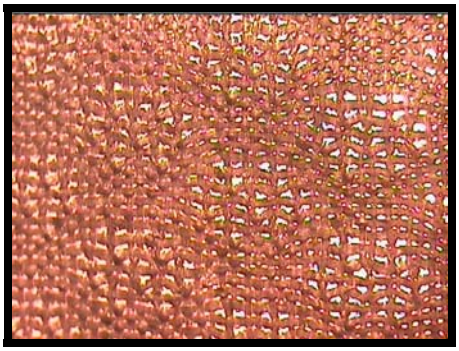
[9] Chen, C. T., & S. J. Hung. "Study of Plant Dye of Sunlight and Washing Fastness, Part I." - *Taiwan Hand Craft* 3 (2000): 47–64. (Written in Chinese.)

[10] Peterson, Lisa. "From Image to Woven Structure: A Video-Computer System for Textile Designers." *Ars Textrina 7* (1987): 109–160.

In Chinese culture motif shapes and patterns play an important role in design due to the abundant meanings behind the different symbols. The various leno weaves of Xiang-yun-shā produce several geometric designs of circle, square, diamond or lozenge, bamboo basket weave or Manji (人), and lattice or maze-like patterns. These design patterns are seen throughout the textile samples of the study.

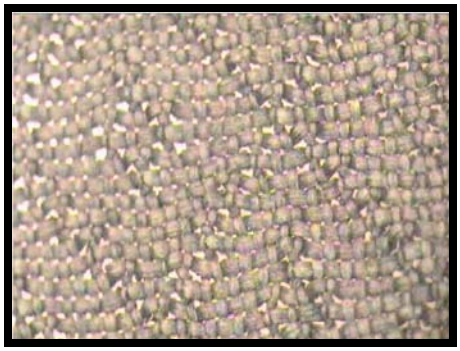
The circle and square are traditional Chinese symbols that reinforce the importance of living in a harmonious universe are therefore often incorporated in decorative designs.[11] A circle represents the sky and a square symbolizes the ground (天圓地方). Thus, together they symbolize the necessity for the emperor to follow God (sky) and pursue harmony of the universe. The diamond or lozenge pattern is a variation of the square pattern which is created by rotation of the squares. Square (口) represents earth and four squares form a Chinese character of rice field (田) which suggests prosperity or a land owner. Kao suggested that in ancient Chinese textile design, diamonds were one of the most frequently used geometric patterns.[12] Circle not only represents round but also perfection in Chinese term (圓滿).

The bamboo basket weave or Manji (人) is similar to the Chinese character for 'people. It is a Buddhist symbol that represents happiness, benevolence, and or charitable acts. Historically, this design element appeared in many different versions and was widely used as a background pattern in printed textiles. The lattice or maze-like design is a symbol similar to the Wan-Zi symbol which translates to propitious innumerable blessings, and refers to riches and honor, long life, endless life, or an ideal life.[13] The designs are found in the leno-weave patterns of Xiang-yun-shā textiles. Costly to weave due to hand wove and complex weaving patterns. Thus, Xiang-yun-shā textiles were infused with the culturally specific meanings of traditional design motifs, such as perfection life, endless blessing and prosperity etc.



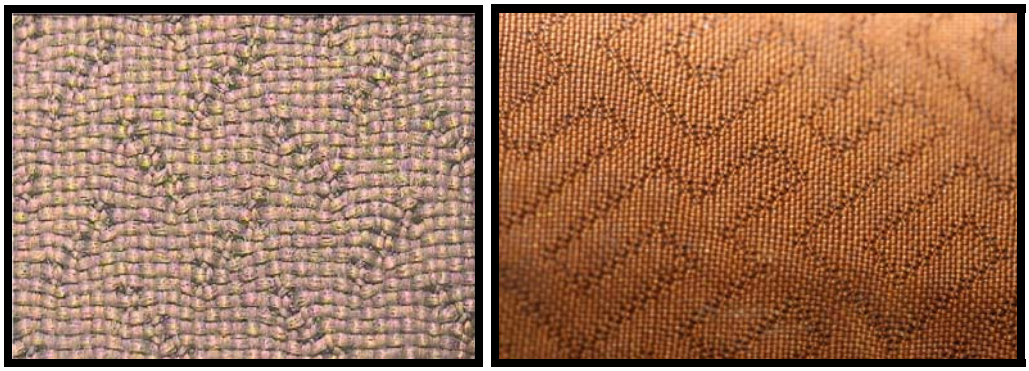
1a

1b



1c

[11] Sung, Keein. *The Symbolic Meaning of Chinese Patterns*. Taipei, Taiwan: National Museum of History, 2003: 157–162. (Written in Chinese.)
[12] Kao, Chien-Hui. *The Cross: Cultural Exchange of Han and Tang Dynasty Weaving Via the Silk Road.* Taipei, Taiwan: National Museum of History, 2003: 96-117. (Written in Chinese.)
[13] Sung. *The Symbolic Meaning . . .*



1d ***1e***

Figure 1 a – e. *The leno weaves of Xiang-yun-shā seen in these samples were categorized into five pattern groups:* ***(a, top left)*** *circle or dot patterns, such as:* ○, ∘, ⊙*;* ***(b, top center)*** *square patterns, such as:* ■,□, 田 *;* ***(c, top right)*** *diamond or lozenge patterns, which include shapes such as:* ◊, ♦*;* ***(d, bottom left)*** *bamboo basket weave or arranged Manji, such as:* 人*; and* ***(e, bottom right)*** *Wan-Zi, lattice or maze-like patterns, such as:* 卍, 弓, 亞**.**

Of the eleven Xiang-yun-shā samples studied, three were constructed with circle leno weave patterns, one was constructed in a square leno weave pattern, a suit was made out of Xiang-yun-shā with a lozenge or diamond leno weave pattern, two samples were made in the basket weave or Manji pattern, and four samples were made in the Wan-Zi or maze-like pattern.

An example of the square pattern leno weave was also found in the Xiang-yun-shā collection at the Honolulu Academy of Arts. When viewed under the microscope the square pattern leno weave created the greatest number of spaces in the surface of the fabric while maintaining a fabric count as high as 103 x 80 threads per square 2.5 cm.

The diamond or lozenge is a variation of square and also a favorite pattern in Chinese textiles.[14] The diamond or lozenge pattern was found in a suit of Xiang-yun-shā in the Honolulu Academy of Arts. The computer graphic design shows that the geometric pattern design forms many spaces in the pattern. Two examples of the bamboo basket weaves or Manji were found in the University of Hawaii costume collection.

The four Wan-Zi, lattice, or maze-like leno weave patterns were found in both The Honolulu Academy of Arts collections and the University of Hawaii costume collection. Among the samples in this study of Xiang-yun-shā, Wan-Zi leno weave patterns were seen the most frequently. The Wan-Zi patterns also had the greatest number of variations in the sample textiles. Wan-Zi patterns are popular and have been applied in many Chinese textiles. This design pattern was also widely used throughout history and appears in paintings, architecture, and other artifacts.[15] Based on Taoism indoctrinate the three stars of good fortune; Fu (lucky), longevity and prosperity; are always three Chinese favors' motifs. There are many geometric designs to interpret these favors' motifs. Under the feudality, majority people are seeking the prosperity and wish for fortune and wealth due to poverty.

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[14] Chen, C. T., & S. J. Hung. ”Study of Plant Dye of Sunlight and Washing Fastness, Part I.” - *Taiwan Hand Craft* 3 (2000): 47–64. (Written in Chinese.)

[15] Kao. *The Cross . . . .;* Sung. *The Symbolic Meaning . . . .*

The presence and diversity of these symbolic patterns in the Xiang-yun-shā textiles are especially noteworthy because they are only visible through microscopic examination and not to the naked eye. It is remarkable that so much symbolic detail was put into these fabrics knowing that few people would notice the fine motifs created through intricate craftsmanship.

As a means to determine fabric quality, fabric count was determined. A high fabric count often represents a high quality fabric. To determine fabric count a linen tester was used to examine the fabrics. Analysis revealed that, although both Jiāo-chou and Xiang-yun-shā textiles are light and thin fabrics, their fabric counts are very high. Fabric counts for Jiāo-chou ranged from a low of approximately 112 x 56 threads per square 2.5 cm to a high of 144 x 134 threads per square 2.5 cm. Fabric counts for Xiang-yun-shā ranged from 85 x 88 per square 2.5 cm to 120 x 88 per square 2.5 cm. The results of fabric count analysis suggest that Jiāo-chou and Xiang-yun-shā are high quality textiles.

Price

Documents suggest that Jiāo-chou and Xiang-yun-shā have always been expensive textiles.[16] Both Jiāo-chou and Xiang-yun-shā are for local market and export to abroad Chinese market, such as South East Asia and Honolulu. During the Ming Dynasty (1368–1644), one roll or Chinese kilometer of Jiāo-chou and Xiang-yun-shā (approximately 12.5 Meters or 4.2 yards) could cost about 12 Chinese silver (a little over 1.5 ounces of gold). The high price probably resulted from the complex weaving, dyeing, and finishing processes that were necessary to produce these fabrics, and the fact that production was limited to the six months of the year when there was a sufficient amount of bright sunlight to bake the mud onto the fabrics. The intensive processes to produce these fabrics and the seasonal restriction for production made these textiles relatively scarce, thus increasing their value and selling price. Since the Ming dynasty, Jiāo-chou and Xiang-yun-shā have been the highest in price of all Chinese silk textiles.[17] Archival records related to the Honolulu artifacts indicate that the prices of Jiāo-chou and Xiang-yun-shā fabrics in Hawaii were indeed very high–about three times higher than the price of cotton fabrics. Since the prices for these fabrics were very high, mainly merchants and wealthy people wore garments made out of these fabrics. On occasion, however, people of lower classes would also wear garments made out of these fabrics.[18] It is possible that these garments could be given from people who can afford them or some rich person's servant might wear this type clothing. During the late-Qing Dynasty, some southern officers wore off-duty clothing fashioned from these fabrics.[19]

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[16] Watt, James. C. Y., & Wardwell, A. E. *When Silk was Gold: Central Asian and Chinese Textiles.* New York: Metropolitan Museum of Art, 1997: 21-24, 50; Chao, Feng. *Treasures in Silk: An Illustrated History of Chinese Textiles (Chih hsiu chen p'in : t'u shuo Chung-kuo ssu ch'ou i shu shih)*. Hong Kong: ISAT/ The Costume Squad Ltd., 1999: 44, 212, 335. (Written in Chinese.)

[17] Yan, Sin. Ju-Liang Dyed. *Taiwan Daily*, Nov. 3, 2004. Article retrieved March 23, 2005, from www.taiwandaily.com.tw: np. " *Written in Chinese*".

[18] Chung. "Chinese Traditional Textile. . . ."

[19] Chao, Feng. *Treasures in Silk: An Illustrated History of Chinese Textiles (Chih hsiu chen p'in : t'u shuo Chung-kuo ssu ch'ou i shu shih).*

Foreign silver currency has flowed into China to exchange silk and tea since Ming dynasty.[20] Long before the Qing Dynasty, Chinese currency is staple condition and inflation is about the long term duration of the price based on stale monetary system. During the Tang dynasty, a roll of fabric was measured at 40 meters in ancient Chinese measurement (or in modern terms, approximately 12.5 meters). In ancient times, a roll of Xiang-yun-shā fabric cost 12 Chinese silver pieces, or about 1.5 Chinese gold pieces.[21] One Chinese gold piece could be exchanged for about 8 Chinese silver pieces before 1600 AD. One Chinese gold piece was about 1.202 ounces of gold (37.5 grams). Therefore, in the distant past of the Tang Dynasty, a roll of fabric of approximately 12.5 meters was worth 1.5 Chinese gold pieces which weighed 1.803 oz. (67.6125 grams). At today's gold price of $755 /oz, the price will be about $108.9 per meter.

Conclusion

Jiāo-chou and Xiang-yun-shā, while apparently simple two-tone color fabrics, are made from a set of complex processes and materials that demonstrate a wearer's wealth. The complex weaves of Xiang-yun-shā, and the long and complex coloration and finishing process demanded a high price.

Both Jiāo-chou and Xiang-yun-shā are bi-colored dyed reddish-brown with juice from the Ju-Liang root and then covered with black mud to produce black on one side. The mud adhesion provides protective qualities such as gloss, smooth and luster. The leno weaves of Xiang-yun-shā produce many patterns and motifs that suggest unique meanings within the Chinese motif lexicon. Not only did the lightweight silk filaments used to produce these fabrics make the textiles light and airy, but the twisted warp yarns and detailed weave patterns created an airy surface in the Xiang-yun-shā fabric. The intensive dyeing and finishing processes and intricate weaving patterns explored in this research will help people to better understand the value and importance of these unusual fabrics.

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[20] Sources related Chinese Monterey system websites:
http://tw.knowledge.yahoo.com/question/question?qid=1305092311879
http://tw.knowledge.yahoo.com/question/question?qid=1005012100257
http://tw.knowledge.yahoo.com/question/question?qid=1305092311879
http://en.wikipedia.org/wiki/Table_of_historical_exchange_rates
http://tw.knowledge.yahoo.com/question/question?qid=1005011302439

[21] Source from websites: http://tw.knowledge.yahoo.com/question/question?qid=1507070804969
http://tw.knowledge.yahoo.com/question/question?qid=1005012100257