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Xie, a Technical Term for Resist Dye in China: Analysis Based on the Burial Inventory from Tomb 26, Bijiatan, Huahai, Gansu

Le Wang and Feng Zhao

In May 2002, a burial site was found in Bijiatan, Huahai, in the Gansu province. During the following two months, the Gansu Institute of Archaeology excavated the graveyard and 55 tombs were excavated in total. A female corpse wrapped in several layers of silk garments was found in tomb 26 together with a burial inventory.¹

The Burial Inventory from Tomb 26

A burial inventory is a list of buried items that would accompany the deceased to the afterlife. It was commonly found in the tombs in northwest China during the 4th to 7th centuries AD. The inventory of Tomb 26 is a rectangular pine wood tablet with characters written on both sides. On one side of the inventory are the names and numbers of the garments and other articles buried in the tomb; on the other side is the name of the tomb owner and the year in which she had died. According to the record, the tomb occupant was “the eldest daughter *Gounv Sun*” who lived in the Eastern Jin Dynasty and died in the year 377 AD.

Three columns and a total of 35 items are recorded in the inventory:

故紺絰一枚 故紬頭一枚 故絳纏相一枚 故鍤
石叉三枚 故紺青頭衣一枚 故巾一枚 故
練面衣一枚 故纏絲一斤 故練衫一領
故緋羅綉兩當一領 故綠襦一領 故紫綉襦一
領 故碧褙一立 故緋綉袴一立 故布帛一
牒 故緋碧帛一牒 故碧襪一量 故頭系履
一量 故銀履簾一具
故布□一枚 故紺綉被一牒 練里 故邊□囊一枚
故縷囊一枚 故練手巾四枚 故布衫一領
故青延一枚 故鏡鑷一枚
故銀鏡一枚 故發刀一枚 故尉斗一枚 故疏二
枚 含一枚 故雜綵五百匹 為道用 故雜綵
瓢一具 松柏器一口

As used by the owner, *gan-gua* [dark red coarse silk] (headscarf?) – 1 piece.

As used by the owner, *chou-tou* (headscarf?) – 1 piece.

As used by the owner, red *chan-xiang* (headscarf?) – 1 piece.²

As used by the owner, hairpins made of copper alloy – 3 pieces.

As used by the owner, navy blue hood – 1 piece.

1. Zhao *et al.* 2008, 94.

2. According to the research by Dou Lei, *gan-gua*, *chou-tou*, and *chan-xiang* could all belong to headdresses, maybe headscarves. Dou 2013, 96.

As used by the owner, shawl (?) – 1 piece.
 As used by the owner, face cover made of *lian* – 1 piece.
 As used by the owner, silk floss – 1 *jin*.
 As used by the owner, shirt made of *lian* – 1 piece.
 As used by the owner, red gauze vest with embroidery – 1 piece.
 As used by the owner, green jacket – 1 piece.
 As used by the owner, purple jacket with embroidery – 1 piece.
 As used by the owner, green trousers (with crotch) – 1 piece.
 As used by the owner, red trousers (without crotch) with embroidery – 1 piece.
 As used by the owner, hemp skirt – 1 piece.
 As used by the owner, skirt in red and green – 1 piece.
 As used by the owner, green socks – 2 pieces.
 As used by the owner, *tou-xi* (uncertain) shoes – 1 pair.
 As used by the owner, silver box for shoes – 1 piece.
 As used by the owner, hemp [text missing] – 1 piece.
 As used by the owner, navy blue quilt with a lining made of *lian* – 1 piece.
 As used by the owner, *bian*-[text missing]-*nang* (uncertain) – 1 piece.
 As used by the owner, *lv-nang* (uncertain) – 1 piece.
 As used by the owner, hand towels made of *lian* – 4 pieces.
 As used by the owner, hemp shirt – 1 piece.
 As used by the owner, green bamboo mat – 1 piece.
 As used by the owner, mirror cover/box (?) – 1 piece.
 As used by the owner, silver mirror – 1 piece.
 As used by the owner, hair cutting knife – 1 piece.
 As used by the owner, iron – 1 piece.
 As used by the owner, *shu* (combs?) – 2 pieces.
 Gem formerly put into the mouth of the corpse (?) – 1 piece.

As used by the owner, colourful silks – 500 bolts.

For the ritual:

As used by the owner, ladle decorated with colourful silks – 1 piece.

Pine coffin – 1 piece.

Most of the items listed in the burial inventory are the clothing items and accessories used by the owner of the tomb and 25 of them are associated with textiles or costumes. The materials for the costume include silk and hemp. *Lian*, degummed plain weave silk, were used mostly. The smaller quantities are more likely to be descriptions of real items while larger quantities (500 bolts) probably represent desired amounts for use in the next world. The burial inventory is important for identifying the accurate date of the tomb, and for providing the names of garments to match with the excavated items.

The Silk Garments Found in Tomb 26

The clothes worn by the female corpse are not in good condition. Only the textiles on the upper part of the body were relatively well preserved, while those on the back were decayed. These garments were conserved by the China National Silk Museum. With the aid of the burial inventory, the silk fragments were grouped into eight garments, one quilt and one face cover.

According to the study by Feng Zhao, the eight garments are: a purple jacket with resist dyed pattern, red trousers (without crotch) with embroidery, a red gauze vest with embroidery, a green jacket, a skirt in red and green, a shirt made of *lian*, green pants (with crotch), and navy blue hood.³ The weave structures of the fabrics include plain weave, gauze and weft-faced compound tabby. Other techniques used for the pattern are embroidery and resist dye. Most of them match the burial inventory very well except the purple jacket with resist dyed pattern.

This jacket was reconstructed from two fragments (fig. 1), which were the two front sides. It has an overlapping collar with right over left and has loose sleeves. The main fabric of the upper part of the jacket is purple tabby with resist dyed patterns and

3. Zhao *et al.* 2008, 95-109.

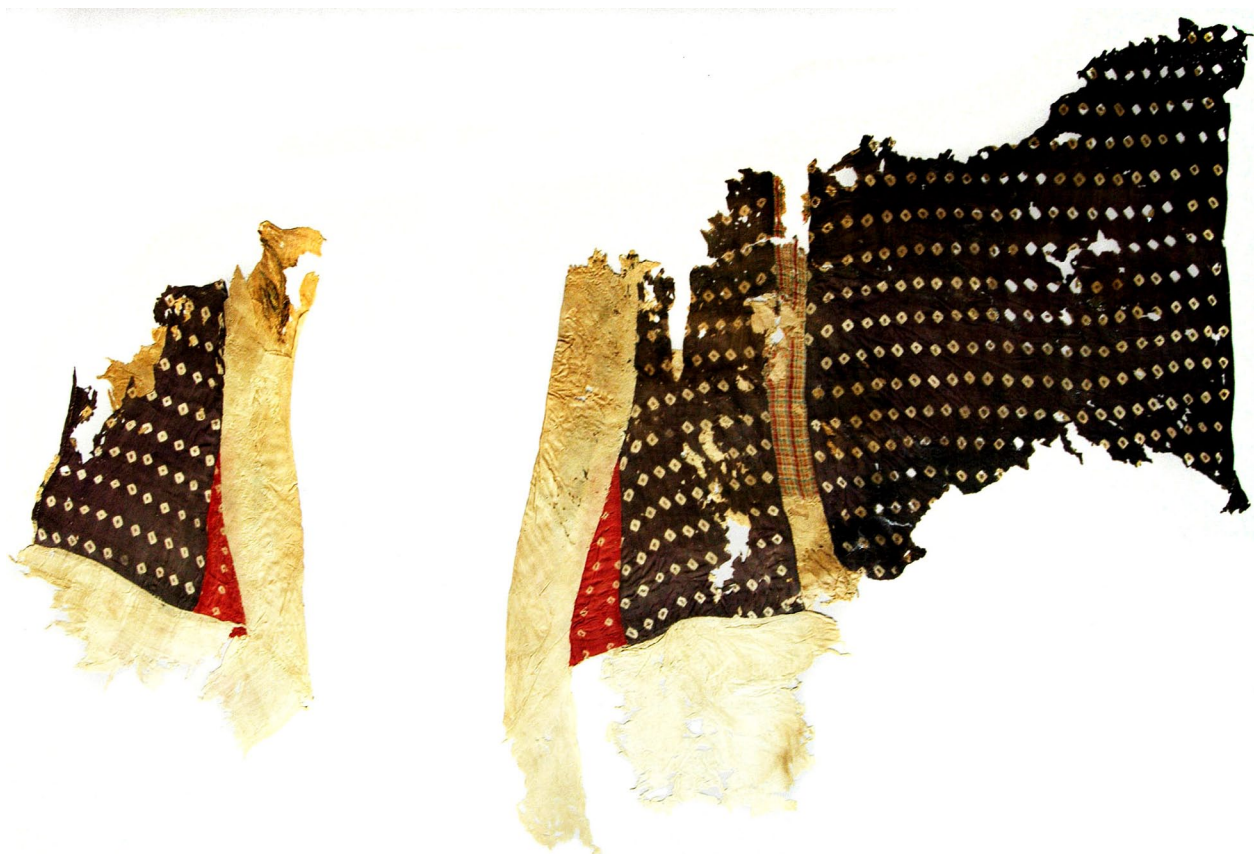


Fig. 1. Purple jacket with resist dyed pattern. Gansu Institute of Archaeology

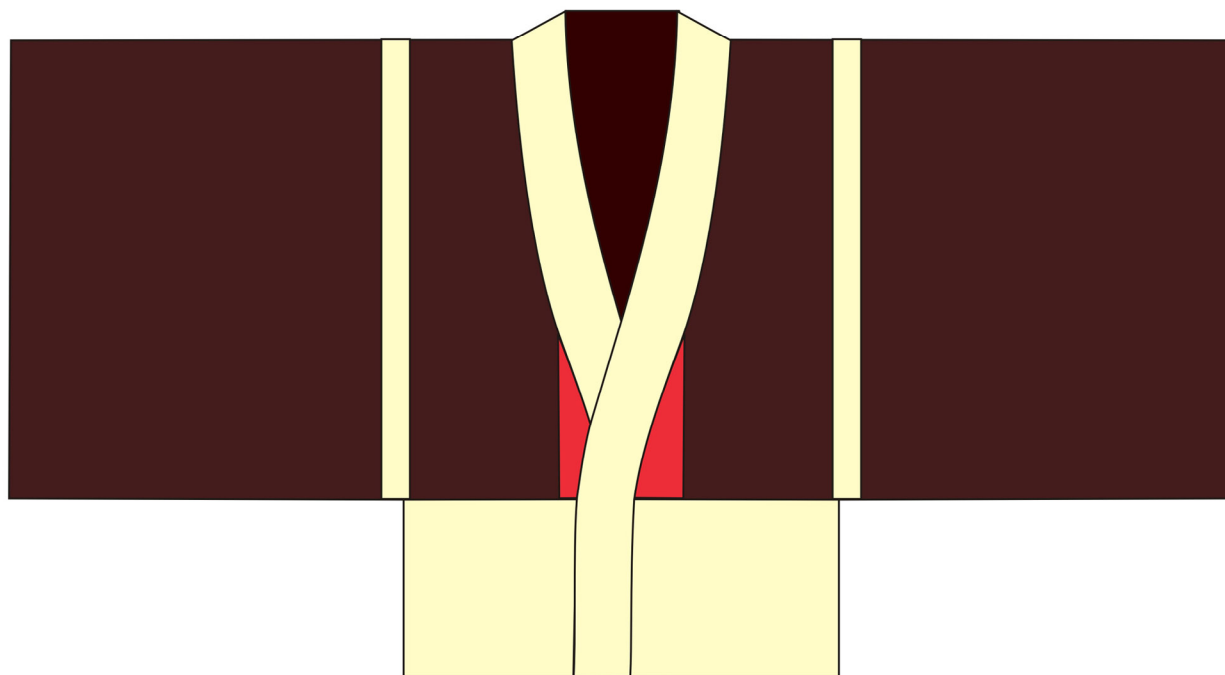


Fig. 2. Reconstruction of purple jacket with resist dyed pattern. Drawn by Wan Fang.

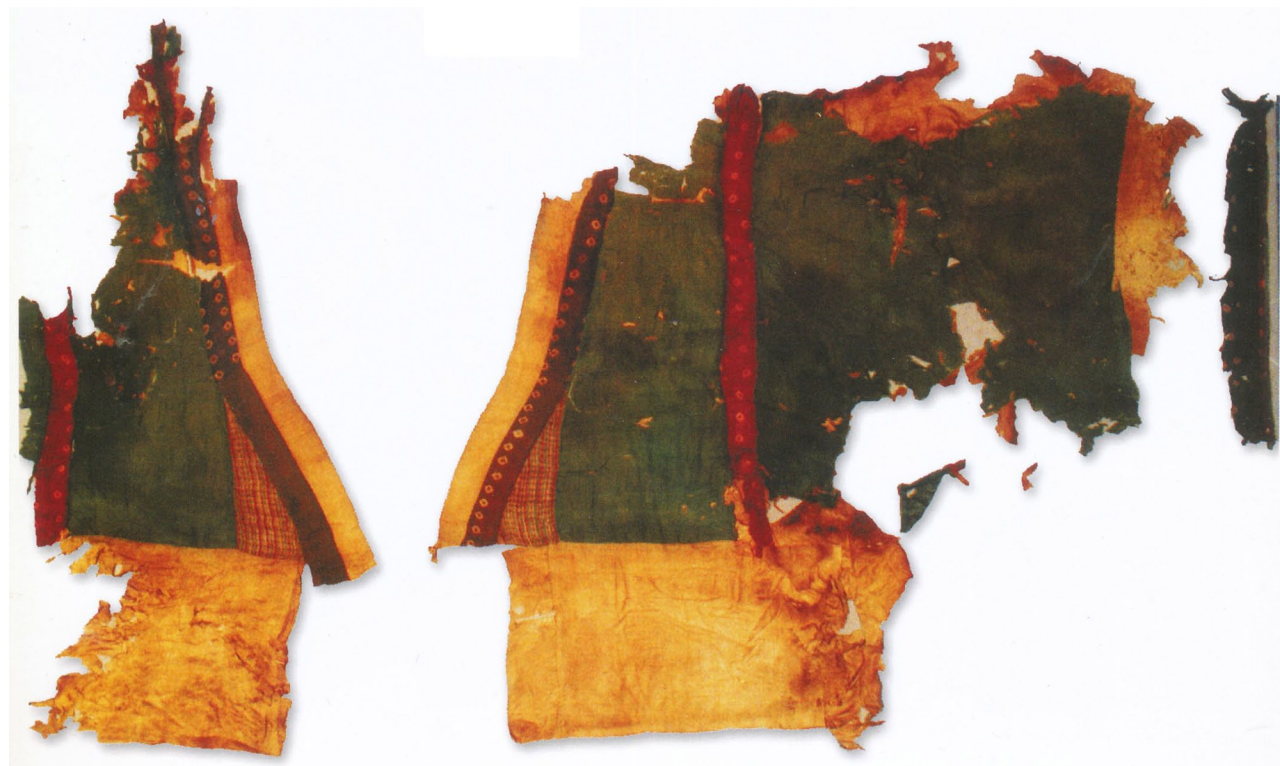


Fig. 3. Green jacket. Gansu Institute of Archaeology

the lower part is white tabby. There is a piece of red triangular resist dyed tabby sewn between the collar and the panel and a strip of checked pattern silk sewn between the panel and the sleeve (fig. 2).

The design of this purple jacket is quite similar to the green jacket found in the same tomb. The green jacket also has overlapped collar with right over left and loose sleeves. The main fabric is green and white tabby. The collar was made of white tabby and purple resist dyed tabby. There is a piece of checked pattern silk sewn between the collar and the panel and a strip of red resist dyed silk sewn between the panel and the sleeve (fig. 3).

The pattern of these resist dyed silks are similar: small, white spots on purple/red background. The spots are about 1 cm × 1 cm in size with small irregular tiny dots in the centre. The four edges of the spots are 45 degrees from both the warp and the weft directions. About six spots are arranged in 10 cm in warp direction, and 4 spots in 10 cm in weft direction (fig.

4). The technique of this kind of resist dye is called *xie* in Chinese.

According to the burial inventory, there were only two jackets buried with the tomb owner: one purple jacket with embroidery and one green jacket. Looking through the archaeological findings, there are indeed two jackets: the purple jacket with resist dyed pattern and one green jacket. We can deduce that the purple jacket described as with embroidery and recorded in the burial inventory should be identified as the purple jacket with resist dyed pattern.

The Appearance of Resist Dye (*xie*) in China

The origin of dyed silk in China could date to West Jin dynasty (265-316 AD) in northwest China. Closest to *Huahai* in location, a piece of blue tabby with resist dyed patterns was found in tomb M1 which is date to 405 AD at Foyemiaowan in Dunhuang.⁴ Another deep red tabby with resist dyed patterns was

4. Museum of Dunhuang County 1983, fig. 13.



Fig. 4. Detail of the purple tabby with resist dyed pattern. Gansu Institute of Archaeology

found in tomb 63TAM1 in Astana dating to 417 AD.⁵ In tomb 95BYMC in Yingpan which dates from the 4th to 5th century AD, a red tabby with resist dyed pattern was excavated (fig. 5).⁶

However, the Chinese character *xie* appeared much later, in about 5th to 6th century AD. *Wei Shu* [The Book of Wei] is an important text recording the history of the Northern Wei and Eastern Wei dynasties

from 386 to 550 AD. In a proposal presented by Yuan Yong (470?-528 AD), the Prince *Wenmu* of *Gaoyang*, he suggested Empress Dowager Hu to forbid the servants wearing damasks and *xie*. *Luoyang qie lan ji* [The monasteries of Luoyang] is a report of all Buddhist monasteries in the Northern Wei dynasty (386-534 AD). It recorded the wealth of Yuan Chen, one of the richest men in the Northern Wei dynasty. In his warehouses there were countless jewels and textiles, including *jin*, gauzes, damasks, embroideries and *xie* etc.

From the records above we know that the character *xie* appeared in the Northern and Southern dynasties. This kind of silk was different from embroidery and was precious during that period.

In China the original meaning of *xie* was tie dyeing.⁷ Before dyeing, a series of knots are made in the textile by stitching or binding, so when it is dyed, the dye will not penetrate the knotted area. The textile then gets a resist dyed pattern. The resist dyed silk for the purple jacket found in Tomb 26 at Huahai and other silks dated from the 3rd to 5th centuries found in northwest China were all made by the technique of tie dye.

The reason, therefore, for using the term “*xiu* [embroidery]” for “*xie* [tie dyeing]” in the burial inventory of Tomb 26 might be the following: firstly, tie dyeing was still a new technology and a new type of decoration at that time and the patterns made by tie dyeing look like those made by embroidery; secondly, the Chinese character for tie dyeing appeared later than the technique itself, so people first used *xiu* as a term which also covered the meaning of *xie*.

The Types of Resist Dye in China

Though the original meaning of *xie* is tie dye, it gradually became a general term for resist dye in ancient China, including: tie dye, clamp resist dye, wax resist dye and ash resist dye.

5. Xinjiang Uyghur Autonomous Region Museum 1973, fig. 50.

6. Zhao (ed.) 2002, pl. 12.

7. In *yi qie jing yin yi* [Phonetic and semantic dictionary for all Buddhist Sutras], the explanation of *xie* is: tying the silk with silk threads and dyeing, resulting in a pattern called *xie*.



Fig. 5. Red tabby with resist dyed pattern found in Yingpan. Xinjiang Institute of Archaeology

Tie Dye

Tied with knots first and then dyed, the textile gets a resist dyed effect. This method appeared in the 3rd to 4th century AD, became prevalent in the 7th to 9th centuries and is still used today. The methods of tie

dye typically include stitching, binding and knotting.

Stitching is the most widely used method in ancient China: sewing stitches into a pattern and then bunching the fabric along the seams before dyeing. Net, floret and coin patterns were commonly seen on the tie dyed silks found in Turfan, Xinjiang.



Fig. 6. Tie dye silk with net pattern found in Astana. Xinjiang Uyghur Autonomous Region Museum

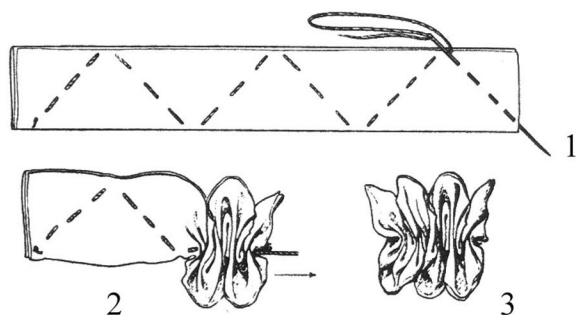


Fig. 7. Stitching method. *Wang Xu & Textile Archaeology in China*, p. 83.

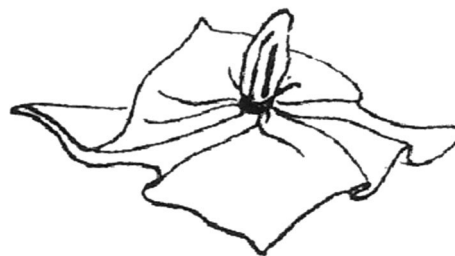


Fig. 8. Binding method. *Wang Xu & Textile Archaeology in China*, p. 93.

A tie dyed silk with net pattern was found in Astana Turfan. It was dated to about 683 AD.⁸ There are obvious folds and needle holes on the silk (fig. 6). The tying process was: folding white tabby first; then sewing long stitches into a zigzag pattern; in the end, tightly gathering the stitching (fig. 7).⁹ When the

tabby was dyed, the brown dye could not penetrate the stitched area, resulting in a white net pattern on brown background.

The binding method is very simple: wrapping the fabric and then binding it tightly with threads (fig. 8).¹⁰ The areas of the fabric that are under the binding

8. Xinjiang Uyghur Autonomous Region Museum *et al.* 1973, pl. 50.

9. Wang 2001, 83.

10. Wang 2001, 93.

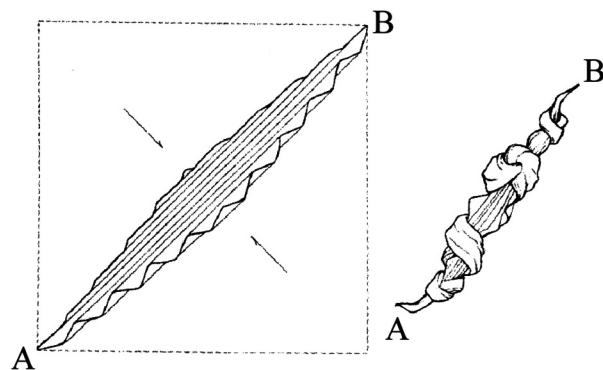


Fig. 9. Knotting method. Wang Xu & *Textile Archaeology in China*, p. 92.

will remain undyed when dipping in the dye. Compared to the stitching method, the binding method usually results in a limited range of patterns, usually small dots. If the binding areas are small enough, the pattern will result in tiny square spots. The purple jacket found in Tomb 26 was made by applying the binding method. The tie dye in China probably derived from this method.

The knotting method is the simplest one among all the tie dye methods. No needle or thread is required when applying the knotting method. It is just to knot the textile, and the knotting area will remain undyed and commonly results in a striped patterns.¹¹ The damask with grape motif found in the Dulan Qinghai province was an example dyed by the knotting method. It was dyed into alternating stripes of green and white (fig. 10).¹²

Clamp Resist Dye

By using two symmetrically carved concave blocks to clamp the folded textiles and dye, the pattern of the convex part is obtained. It is said that the sister

of Liu Jieyu during the reign of Emperor Xuanzong in the Tang dynasty invented this method.¹³ A piece with a floral pattern created by using carved blocks was presented to the Empress Wang, whereupon Xuanzong ordered more pieces to be made within the palace. The technique was kept secret at first, but gradually spread until clamp resist dyed textiles became commonplace.

The written records give us a preliminary understanding of clamp resist dye. First, it was invented in the middle of the Kaiyuan period (713-741) but before 724;¹⁴ second, clamp resist dye is a technique involving the use of two symmetrically carved blocks, which are placed on either side of the textile, clamped together, and placed in a dyeing vat; third, the earliest pattern attested by clamp resist dye was a floral pattern.

Actually most of the clamp resist dyed textiles from Dunhuang and Turfan have floral motifs. Clamp resist dyed textiles with animal motifs appeared later, mainly in the mid-late Tang and Five Dynasties (9th-10th century AD).

By using blocks with areas specially designed for different colours of dye, clamp resist dyed textiles could be dyed with more than one colour. Clamp resist dyed textiles of the Tang dynasty were usually dyed in blue and orange (sometimes in reddish brown, which would originally have been red, but later faded). However, clamp resist dyed textiles could also be in more than two colours. Most examples from Dunhuang were dyed in blue and red, then yellow was added by brush to some blue areas to create green, and to some red areas to form orange, such as the plain woven silk with clamp resist dyed confronting geese in a roundel (fig. 11).¹⁵ In this way, textiles that were clamp resist dyed with two wooden blocks in two colours could achieve four colours.

11. Wang 2001, 92.

12. Zhao (ed.) 2002, pl. 41.

13. According to *Xian yuan* [Great Ladies] in Wang Dang's *Tang yulin* [Historical Documents of the Tang Dynasty] (originally in *Yin hualu* [A Collection of Notes and Novels of the Tang Dynasty]), clamp-resist dyeing was invented in the Tang dynasty, allegedly by the sister of an imperial concubine Liu Jieyu during the reign of Xuanzong (712-756 AD).

14. According to *Xuanzong ji* [Records of Xuanzong] in *Jiu Tang shu* [Old Records of the Tang Dynasty], this was the last date for the Empress Wang.

15. Zhao *et al.* (eds) 2007, 197.



Fig. 10. Damask with grape motif dyed in stripes. Qinghai Institute of Archaeology



Fig. 11. a. Clamp resist dyed silk with a pattern of confronting geese inside rosette roundel (MAS.876.a-b). British Museum

Clamp resist dye was very popular in the Tang and Song dynasties and still applied for the Tanka cover in Ming and Qing dynasties.

Wax Resist Dye

When painting with melted wax on the textile first and dyeing then, the dye will not penetrate the wax



Fig. 11. b.

printed areas. Wax resist dye did not originate in China. The earliest wax dye textile found in China is a piece of wax dyed cotton excavated from an Eastern Han dynasty (25-220 AD) tomb in Niya. The images on the fabric are all Hellenistic: the woman holding a

cornucopia in the left bottom corner is the Greek goddess Tyche; the image on the top right might be Hercules wrestling the Nemean lion.¹⁶ This wax dyed fabric is probably not a Chinese production and possibly comes from India.

16. Zhao 2012, 97.



Fig. 12. Wax resist dyed tabby (400-421 AD) found in Turfan. Xinjiang Uyghur Autonomous Region Museum

The technique of wax resist dye was probably introduced into northwest China along the Silk Road between the 3rd and 5th centuries. The wax resist dyed pattern on silk began from dots. Several single dots were arranged to form a more complicate pattern, such as floret or lozenge (fig. 12).¹⁷ Wax resist dye became popular in the Tang dynasty. After that, this method became very limited to the minority area of southwestern China.

Ash Resist Dye

As wax was limited in China, people turned to use ash or other alkaline materials as the resist agent instead of wax. This will achieve a similar result to wax resist dyeing. The alkaline paste adopted in the Tang dynasty was mainly plant ash or alkaline lime. According to Wu Min's research most of the paste resist dyed silks found in Turfan are ash resist dyed.¹⁸

Sometimes ash resisted dye was combined with clamp resist dye technique. Applying the paste made of an alkaline substance on the convex parts of blocks and then clamping the textile, a paste pattern was created. The areas of the fabric that are coated by the paste will remain undyed when dipping in the dye. Such technique was commonly applied to the ash resist dyed silk in northwest China in the Tang dynasty (fig. 13).¹⁹

Since then ash resist dye was adapted to cotton cloth and became the popular blue-and-white printed clothes known in modern times.

Conclusion

Our study of the textiles and burial inventory found in tomb 26 Huahai, Gansu province, confirmed that the textiles match the textual records in the burial inventory well. The purple jacket with *xiu* [embroidery] recorded in the burial inventory should be the purple jacket with *xie* [resist dyeing]. The reason might be: firstly, tie dyeing was still a new way of decoration in the late 4th century and the patterns made by tie dyeing look like those made by embroidery; secondly, the Chinese character for tie dyeing appeared later than the technique itself, so people used *xiu* as a loan word for *xie* before *xie* appeared.

The original meaning of *xie* was tie dyeing. It gradually became a general term for resist dye in ancient China, including: tie dye, clamp resist dye, wax resist dye and ash resist dye. Tie dye appeared in the 3rd to 4th centuries, became prevalent in the 7th to 9th centuries and is still used today. Clamp resist dye was invented in the early 8th century. At first floral motifs were prevalent. Animal motifs appeared later, mainly in the 9th to 10th centuries. The technique of wax resist dye was probably introduced into northwest

17. Xinjiang Uyghur Autonomous Region Museum *et al.* 1973, pl. 49.

18. Wu 1973, 40-46.

19. Xinjiang Uyghur Autonomous Region Museum *et al.* 1973, pl. 59.



Fig. 13. Ash resist dyed silk with a pattern of confronting ducks and flowers (c. 721 AD) found in Tuffan. Xinjiang Uygur Autonomous Region Museum

China along the Silk Road in the 3rd to 5th centuries, and became popular in the Tang dynasty. After that, this technique became very limited to the minority area of southwestern China. As wax was limited in China, people turned to use ash or another alkaline material as the resist agent instead of wax. After the Tang dynasty, ash resist dye was adapted to cotton cloth and became the popular blue-and-white printed clothes.

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