

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

How Color Combination Changes in Textiles of Different Districts Depending upon Dye Plants Used

Dr. Şerife Atlihan

Professor, Department of Traditional Turkish Arts,
Faculty of Fine Arts, University of Marmara, Istanbul, Turkey

Abstract:

There are different types of designs and color combinations in traditional textiles in different districts in Turkey and in other countries. Turkey is a large country 814.578 square km. and has different types of landscape and climates. The country is long in a horizontal direction. There are seven topographical areas in the country on the map. They are from west to eastern: 1. Marmara (Northwest), 2. Aegean (West), 3. South (Mediterranean), 4. Central, 5. Eastern, 6. Southeast, 7. Black Sea (North), but there are not strong cultural differences between those areas. Generally mentioned are three areas: West, Central and East Anatolia. We have some similarities in textiles and other objects between all those areas. The local people use the materials and dye stuff in textiles which are found in their areas. Therefore, these types of textiles have their unique characteristics. There are traditional designs and motifs in each district, but the color pallets in the traditional textiles do not depend only on the local people's taste, material, technique and size. It depends especially upon the dye stuff and dyeing methods. Those rules are the same for all kind of textiles like garments, covers and wall hangings, etc. It would be displayed all these types of textiles from Turkey as samples, but it is impossible to give all samples in this article. So it will be giving the samples of carpets and kilims about this thesis.

Keywords: *Anatolia, dye stuff, textile, color, rug*

1. Introduction

Actually natural dyes were used all over the world for goods before synthetic dyes appeared on the market. The people used natural dyes from their environment or from what they found at the market. Böhmer mentions so "For the locally limited occurrence of certain dyes or combinations of dyes in Anatolian rugs, three different explanations can be given after evaluating all color analyses

- a) The limited territory of distribution of a dye-plant is almost identical with the territory of its use.
- b) A commonly occurring dye-plant is widely used, but the methods of dyeing differ locally.
- c) A commonly occurring dye-plant is used for dyeing only locally" (Brüggemann, Böhmer 1983: 113).

When counting the colors in a kilim or other type of flat weave, many people can find as many as ten. This is easily explained by noting the variations that are possible when using different mordant – alum, iron salts, copper, or tin-as well as variations in the water quality in different regions. The mordant effects the hue more or less strongly: e.g. madder dyeing on an alum mordant gives a brilliant red, while madder dyeing on iron mordant gives a russet color. In general, dyeing on alum mordant gives lighter colors than dyeing on iron mordant. The male and female dyers in Anatolia can, with simple processes and using a natural resource, create a broad palette of colors-a greater selection than what was available in the Ottoman court workshops (Böhmer 2004: 273).

2. Natural Dyes

There are three sources of gaining natural dye stuff; they are plants, animals, minerals. Mostly dye stuffs from plants are used in Anatolia. The carpet and *kilim* (a kind of flat woven tapestry) weaving is very popular in Anatolia. They are produced almost everywhere (Fig. 1). They have enough wool from their sheep. Weavers use colors on the field of their rugs and they need a large amount of dyed yarn, which they can get it easily and economically in their environments. Weavers dye the wool yarns themselves, what they need for weaving with traditional recipes (fig.2, 3, 4, 5).



Figure 1: Rug weaving places in Anatolia (Morehouse, B.1996: inside of book cover)



Figure 2: Grinding the madder root for dyeing (Photo: Böhmer, 1981)



Figure 3: Weaver with natural dyed wool yarn by herself. (Photo: Atlhan, 1987)



Figure 4: a. Collection chamomile for yellow (Photo: Böhmer, 1989)

b. Natural wool yarn dyeing in Kettles (Photo: Atlhan, 1987), c. Wool yarn balls colored with natural dyes. (Photo: Atlhan, 1987)

There are many large variety of dye stuff in Turkey. But not all of them are generally used for dyeing. Some of them are used from old time according people’s experiences. Most popular used dye stuffs are mention below

a. Red; all the reds used in Anatolian rugs are either *madder* red or *cochineal*. The former usually is a “warmer” red, with a tendency toward yellow; the latter is “cooler” hue, with a tendency toward blue.

Madder red (*Rubia Tinctorum*) used around the Mediterranean in Roman Times and are used still today. The roots of plant are used for dying (fig. 5, 6). Madder red almost placed in every textile in Turkey (Böhmer 2004: 272). See fig. 7, 8, 11, 12, 13, 14, 15, 16, 17, 18.

Madder is probably indigenous to Anatolia; it was cultivated over large areas of Western and Central Anatolia. *Madder* grows in Eastern Anatolia only in few valleys, thus often reaching the women at the loom only by commercial routes; it was most costly in the East than in the West. Owing to the emergence of synthetic dyes its cultivation declined rapidly in the last third of the 19th century; today *rubia tinctorum* can only be found growing wild in the old areas of cultivation (Brüggemann, Böhmer 1983: 94).



Figure 5: Madder roots
(Photo: Böhmer, 1986)



Figure 6: Wool yarn dyed with
madder from the kettle
(Photo: Atlhan, 1990)



Figure 7: Carpet, West Anatolia, 18th century, private coll. in İstanbul



Figure 8: Kilim, Central Anatolia 19th century, private coll. İstanbul

Cochinille scale insect is not native to Anatolia. The *cochenille* dye stuff, in the form of dried female insect, was first introduced from Mexico via Spain, and then, in the last half of nineteenth century, directly from Lanzarote (Canary Islands). It cannot be determined when Anatolian nomads first used cochineal. They purchased it at entrapots along the trade route from Constantinople via Aleppo around 1810; *cochenille* was purchased by nomads who did weaving (Burchards 1822).

Cochinille red is especially common in the kilims that attributed to Reyhanlı Confederation (fig.9), who also had a violet that is combination of cochineal red and indigo. The tribes of the Reyhanlı Confederation had their winter quarters west of Aleppo. *Cochinille* appears in kilim and carpets later in West Anatolia, around 1860. It was being imported into Anatolia via Izmir (Böhmer 2004: 272). *Cochinille* red was mostly used in small sizes of carpets in Central Anatolia (fig. 10). Kilims from Central Anatolia seldom have *cochenille* red (fig.12).



Figure 9: Kilim, Aleppo, 19th century, Private coll. in Istanbul

Figure 10: Piled cushion (Turkish yastik), Central Anatolia- Kırşehir, 19th century, Private coll. in Istanbul

Cochenille was competitive in price with *madder* in Eastern Anatolia. *Cochenille* is superior to *madder*: one kilograms of wool can be dyed deep red with as little as 30 to 50 gm of *cochenille*, whereas for the same effect with *madder* 1 kg of the dried roots is needed. *Cochenille* red a slightly blueish and therefore looks cooler than the more yellowish *madder* red. *Cochenille* colors can however vary in shade and particularly in intensity with variations in mordents and additions to the dye-bath, especially cream of tartar; compare rugs cat. Nos. 24, 67, 90, 110 (Brüggemann, Böhmer 1983: 95). The similar looking red in the kilims and carpets in Eastern Anatolia must not be dyed with *cochenille* when cochineal red is quite pale, it has been from Ararat *Kermes* (*Porphyrophora hamelii*), an insect that contains the same dye stuff (Böhmer 2004: 272).

Other Insect Dyes: *Vermillion* and *Indian Lac* native to the Orient and Mediterranean region. It was too expensive for the manufacture of rugs was used only for the dyeing of fabrics. To all appears Ottoman fabrics in the Okapimuseum in Istanbul contain insect dyes. These maybe derived from oak shields lice but hardly from *cochenille*; but there is the possibility of a third insect dye: *lac* from India. M. Whiting was able to show that it was used for the dyeing of rug wool in Persia and the Turkoman regions of Central Asia. It is quite possible that this dye reached the Ottoman workshops and cloth mills via Persia (Brüggemann, Böhmer 1983: 96)



Figure 11: Piled cushion (Turkish yastik), Central Anatolia, 19th cent., Private coll. in Istanbul

Figure 12: Kilim, Southeast Anatolia- Reyhanli, 19th cent., Private coll. in Istanbul

b. Violet; all violet dyes –which are especially characteristic of Central Anatolian kilims and carpets are the result of a cold dyeing process with *madder* root on iron mordant (Böhmer 2002: 117). See the violet on the ground in fig. 11.

c. Indigo is the source for all blue dyes in a vat-dyeing process-or by using the half-synthetic indigo sulphonic acid, which can be used directly, without a mordant. Indigo probably was imported into Anatolia from India at a very early date. Toward the end of nineteenth century, synthetic indigo from Germany reached the Anatolian market. It is chemically identical with natural indigo and no difference between them (Böhmer 2002: 230). See the blues in fig. 8, 11, 12 and in other rugs.

d. Green used with indigo and a yellow dye plant will tend, with intensive use, towards either a yellow-green (fig. 14) or a blue-green (fig 13) the former particularly when the yellow dye is applied first, since indigo blue is only weakly bound to the fibers and wears off with use, allowing the yellow to dominate. However, if the yellow dye is not especially lightfast, it will fade, allowing the blue to dominate-first as blue-green and then only as blue (fig. 13,14).



Figure 13: Prayer rug in kilim technique, Northeast Anatolia, late 18th century, private coll. in Istanbul

Figure 14: Kilim, Northeast Anatolia, late 19th century, private coll. in Istanbul

e. Yellow: A great number of Anatolian plants can be used for a yellow dye, but weld (or wold) (*Reseda luteola*) provides an adequate lightfast yellow (fig. 15). This yellow is present in many Anatolian rugs. *Luteolin* gives intensive yellow with alum mordant. Dyer's weed (*Reseda luteola*) contains *luteolin* in all parts of the plant, and has been known as a dye-plant since antiquity. It was much used and also cultivated in Europa, the Orient and in Africa. Even the analysis shows *luteolin*, it does not necessarily mean that dyeing has been done with *Reseda luteola*. In South Western Turkey the three-leaved sage, for example (*Salvia triloba*, Turkish: *ada çayı*) was mentioned as dye -plant with mordant, which produces light yellow. Most of the yellow dyes are namely *fisetin*, *luteolin*, *apigenin*, *quercetin*, *myricetin*, *rhamnetin* and *daticetin*, are chemically closed related (Brüggemann, Böhmer 1983: 97).



Figure 15: Yellow on the carpet, East of Central Anatolia, 19th century, private coll. in Istanbul

Figure 16: Yellow on Sili (brocaded designed on flat weave), Southwest Anatolia 20th century, private coll. In Istanbul

f. Brown can be dyed directly with a mordant using walnut husks (*Juglans regia*). Camel hair was used a lot in rugs, when the Nomad had a lot of camel. Today most of Nomads are settled and they don't need camel any more. They dyed wool yarn with walnut husks instead of using camel hair. The camel hair places in rugs in Western, Southern and Central Anatolia, where there was camel enough (fig. 17). There are commonly brown sheep in Eastern Anatolia. Weavers are using brown wool directly and dyed for red, black and blue to get dark colors. We see a lot of the brown and brownish red on rugs, garments and covers in Eastern Anatolia (fig. 18).



Figure 17: Camel hair on the kilim detail in Southwest Anatolia (Photo: Atlıhan 1987)

Figure 18: Braun woolonkilim, East Anatolia, 19th century, private coll. in Istanbul

g. Black can be used as black wool of Anatolian fat-tailed sheep is not lightfast. The other is dyed black and does not fade. Mostly the wool must be treated in a dye bath containing tannin, such as galls and acorn caps, after applying an iron mordant in Anatolia. Black is used on textiles for highlighting motifs. Black dyed wool yarn is not long lasting because of iron black dyeing recipe. Iron is become rusty in time and cells of wool fall down. Weavers don't use black on the ground of textiles. It can be seen on antic textile, which's material is wool.

3. Conclusion

There are many rug weaving areas in Anatolia. Each area has rugs with specific characters in pattern, color, material, weaving techniques and style of fringes. Because there are different ethnic groups settled in each area. There they have own cultural habits and ceremonies etc. They passed all those traditions through generations, like rug weaving. The people, who produce rugs was originally Nomads. Nomads had sheep herds, when they migrated to summer pasture on high Plato with their herds and return to mild places in winter. They had enough material and time to weave rugs and the other woolen textiles, which they needed in their life style. They lived in the tents. Mostly at the beginning of 20th century the Nomads started to settle down in the villages in the mountains. They are still weaving rugs, because they don't have enough possibilities to make agriculture and breed animals specially sheep and goats. They support and produce the material for weaving locally. They also collect the plants for dye stuff from their environment and dye the wool with their methods which they have learned from their ancestors. They buy several dye stuff from the market, when they don't have in their areas. There are also different races of sheep in each area. Their wool quality of sheep is different. The wool quality and color have very important role for reflecting colors. The plants grow depending on climate in areas. Dye plants in different area give different shades of color. All those effects make the characters of rugs in each area. Therefore it is not difficult to recognize the rugs, in which area they have been produced.

4. Acknowledgement

This research was supported by BAPKO (Project No: SOS-D-110908-0236), Marmara University.

Correspondence concerning this article should be addressed to Şerife Atlıhan, Department of Traditional Turkish Arts, Faculty of Fine Arts, Acıbadem Campus, TR 34660 Kadıköy, Istanbul.

5. Note

¹I am giving information about source of dye stuff from Böhmer's Books from the dates (Brüggemann, Böhmer 1983, Böhmer 2002 and Böhmer 2004. Because he is specialist about natural plant dye stuffs in Anatolia.

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