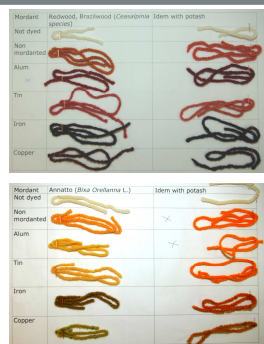


## Creating colours: The making of dyed textiles and organic pigments

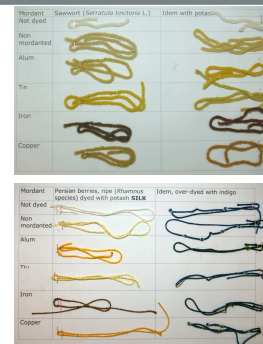
# Introduction



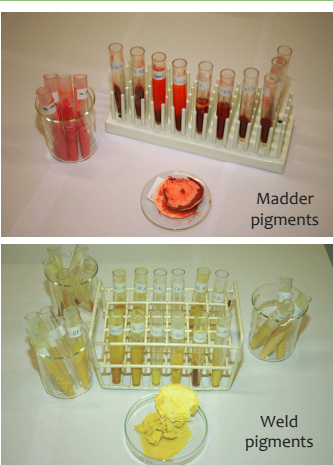
Maarten van Bommel<sup>1,\*</sup>, Jo Kirby<sup>2</sup>.

Within the framework of the European project CHARISMA, an expert meeting was organised at the Netherlands Institute for Cultural Heritage in which textiles were dyed and organic pigments were created using a range of natural dyes. The expert meeting was on the one hand intended to exchange general information on this topic; on the other hand it formed a first experiment to determine which factor in a recipe determines the final colour and properties of the created material. Beside members of the CHARISMA consortium, Prof. Dr R. Hofmann-de Keijzer and Dr. A. Wallert were also present.

On the first day, to demonstrate the principles and methods of dyeing, wool was dyed with natural dyes, including cochineal, dyer's broom, Persian berries, saffron, redwood, logwood, galls and several others on textiles pre-mordanted with alum, iron, tin and copper. In addition, each recipe was performed with and without potash in the dye bath. In this way, more than 110 materials were obtained, which gave a good overview of the effect of mordant and potash on the final colour as illustrated at the left.



## Dyeing wool and creating lakes with weld and madder



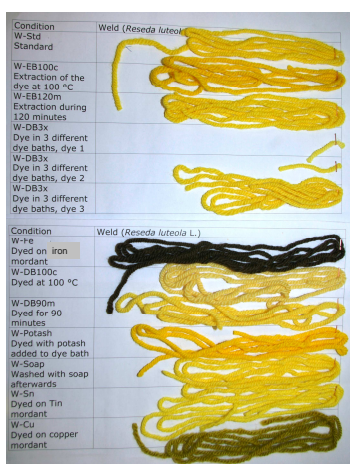
On the second day, the workshop was focussed on dyeing with weld and madder. For each species a standard recipe, based on historical recipes, was prepared. Within each recipe, 11 parameters, all derived from the recipes studied, were determined which could alter the colour and properties of the dyed wool: temperature and duration of the extraction of the dye from the biological source; temperature and duration of dyeing; number of dye baths applied (up to three); mordant applied (four different ones); the use of potash and washing with water or with a neutral soap afterwards. Obviously, if all these parameters were combined (and each parameter had two values) one could end up with 2048 recipes. To limit this number and enable the effect of each to be assessed, the standard recipe was varied for each parameter separately.

On the third day, a similar approach dependent on historical recipes was taken for the preparation of weld, madder, cochineal and redwood lake pigments. The number of different parameters for each lake was less, up to six, some, such as the temperature at which the dye was extracted, very similar to those identified for the textile dyeing, others, such as the order of addition of reagents, different.

On the last day, pigments were washed and the overall results were discussed. By creating standard recipes, the application and relevance of the historical recipes is somewhat lessened. However, their essential features are present while allowing us to monitor and explain changes in colour and hopefully, in the future, in behaviour.



## Preliminary results



### Weld on wool results

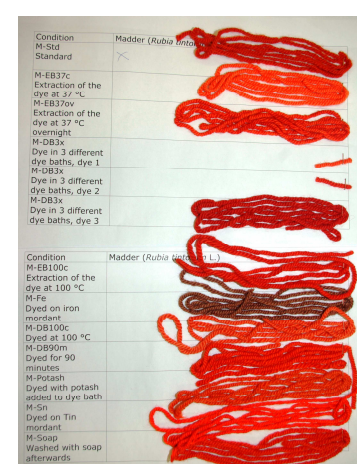
Analysis of the dyed wools and pigments to assess the effects of the parameters studied is still in progress. Examples of the dyed wools obtained from weld and madder, following the standard recipes and their variants, are illustrated (left and right).

### Standard weld recipe for wool (code: W-St)

2.5 gram weld, cut into small pieces, is put into a bag of polyester netting. The bag is transferred into a beaker with 250 ml water and left overnight. The solution is heated up to 60 °C for 30 minutes. Next the bag with weld is removed and the temperature is raised up to 70 °C. Then, 2.5 g alum-mordanted wool is added to the dye bath and dyeing takes place for 30 minutes at 70 °C. Stir a couple of times during dyeing to achieve a homogeneous result. After dyeing, the textile is taken out of the dye bath and rinsed carefully with water.

### Standard madder recipe for wool (code: M-St)

5 gram ground madder is brought put into a bag of polyester netting. The bag is transferred into a beaker with 250 ml water and left overnight. The solution is heated up to 70 °C for 60 minutes. Next the bag with madder is removed and the temperature is kept stable at 70 °C. Then, 2.5 g alum-mordanted wool is added to the dye bath and dyeing take place for 30 minutes at 70 °C. Stir a couple of times during dyeing to achieve a homogeneous result. After dyeing, the textile is taken out of the dye bath and rinsed carefully with water..



## Madder on wool results

## Announcement: Workshops 2011



The meeting was restricted to members of the CHARISMA consortium. However, to share our information, two workshops will be held in 2011. On March 23–25, 2011, a workshop devoted to pigment preparation will be hosted by the Doerner Institute, Bayerische Staatsgemäldesammlungen, Germany. In autumn 2011 a workshop focussed on textile dyeing will be organised at the Royal Institute for Cultural Heritage, Brussels. More information and application forms will be distributed via the CHARISMA website:

<http://www.charismaproject.eu/>



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