

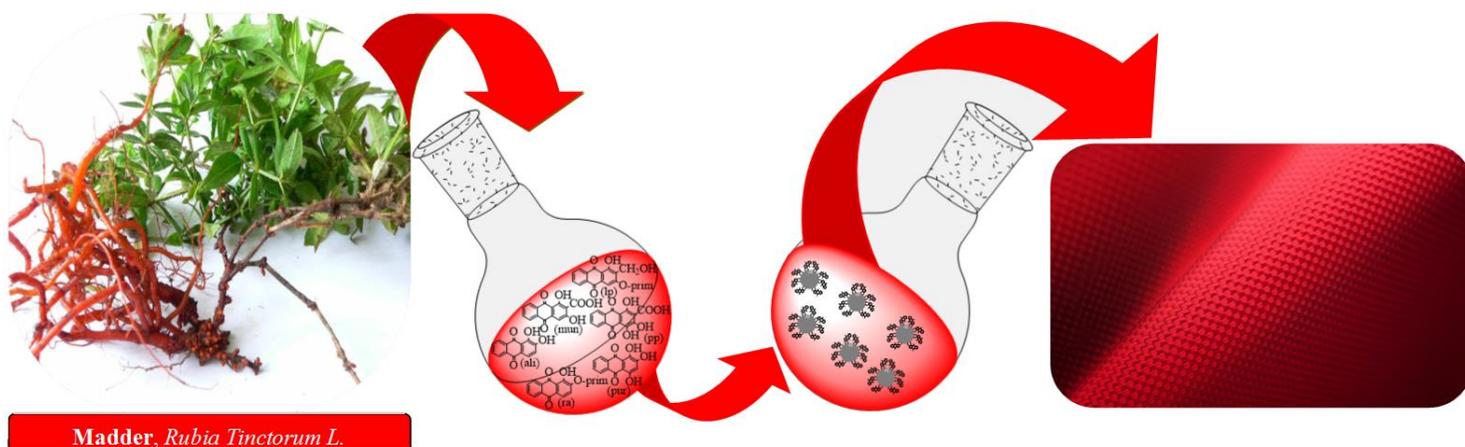
## Michel de Haan

<b>Supervisors</b>	Prof. Dr. Han Zuilhof, Dr. Ir. Dorien Derksen, Dr. Ir. Hendra Willemen, Dr Ir. Bauke Albada
<b>Project</b>	Improving natural colorants for processing in man-made, bio-based fibers
<b>Keywords</b>	Natural colorant extraction, nanoparticles, zeolites, fiber processing

Natural colorants have been employed as early as the 12th-11th millennium BC. The most valued colors were 6,6-dibromoindigo for purple, indigo for blue and anthraquinone-based chromophores for reds. For the yellow color typically flavonoids were employed. Indigo was generally extracted from Chinese indigo or Japanese indigo, anthraquinones from *Rubia Tinctorum* (madder) and flavonoids from *Reseda Luteola* (weld).

Although common practice for millennia, its replacement started with the first synthetic dye Tyrian blue or Mauve which was marketed in 1859. Due to the superior color properties, greater stability and much lower production costs synthetic dyes dominated the market by the 1900s. However, in recent years the concerns regarding toxicity and sustainability of synthetic colors provides a renewed interest towards improving and employing natural colorants.

This project aims to improve the (photo)stability of natural colorants by employing nanotechnology, followed by processing the improved colorants into bio-based plastic fibers.



Madder, *Rubia Tinctorum L.*

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