Supporting Information

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Dyeing Performance of Aqueous Extract and Flavanone Glycosides from the Flowers of *Butea monosperma* (Lam.) Kuntze

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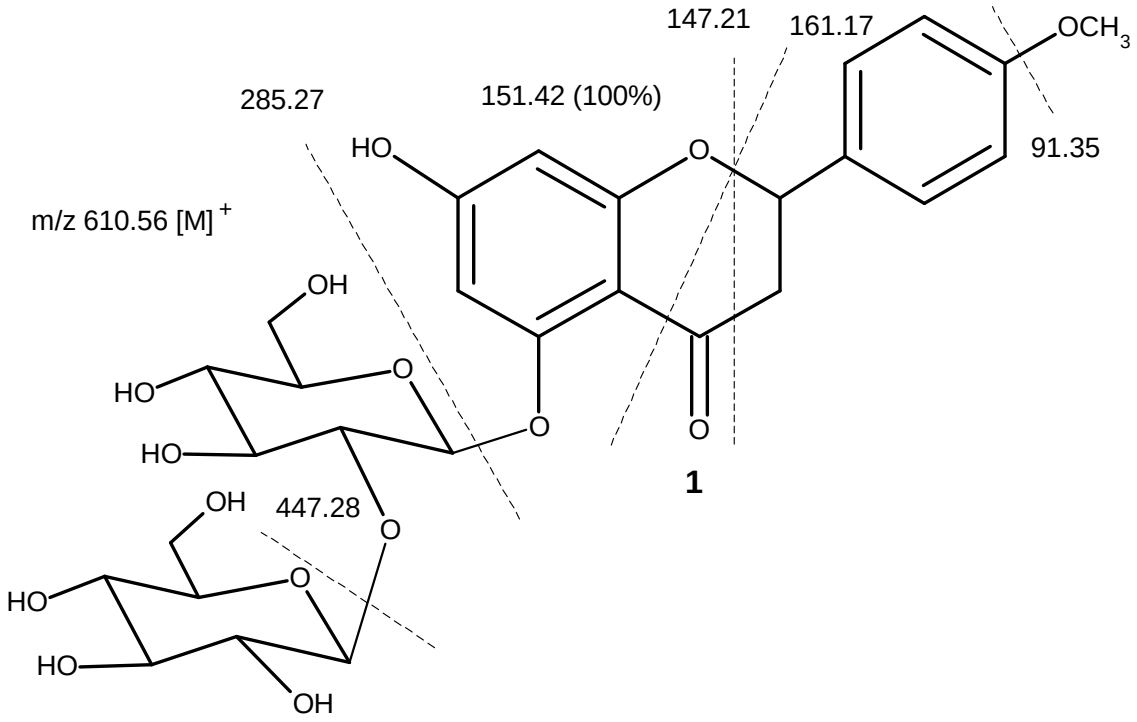
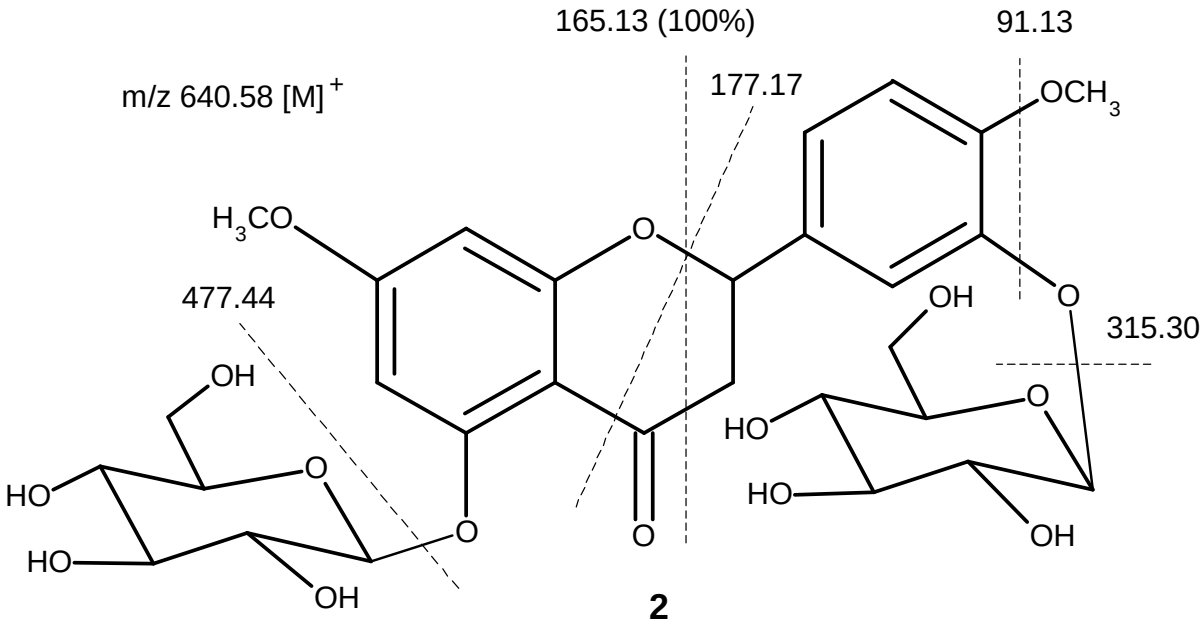
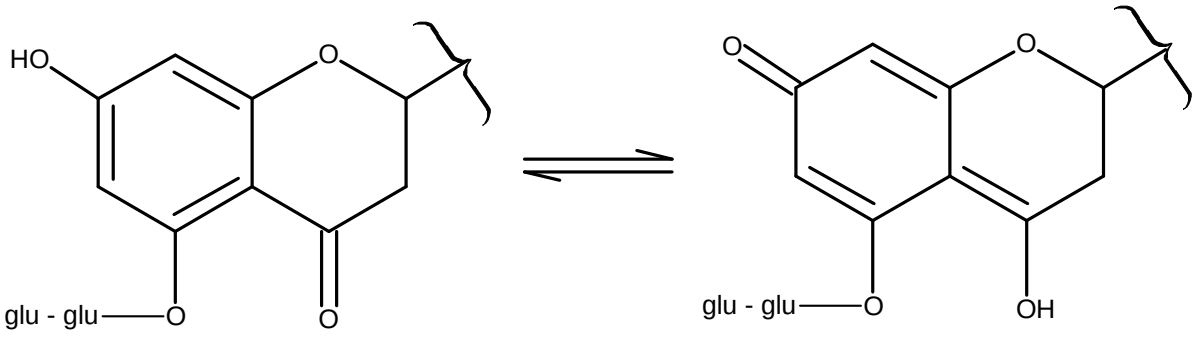
S1: Flowers of *B. monosperma*



S2: Proposed mass fragmentation in compound **1**



S3: Proposed mass fragmentation in compound **2**



S4: Chromophore and auxochrome in compound **1**

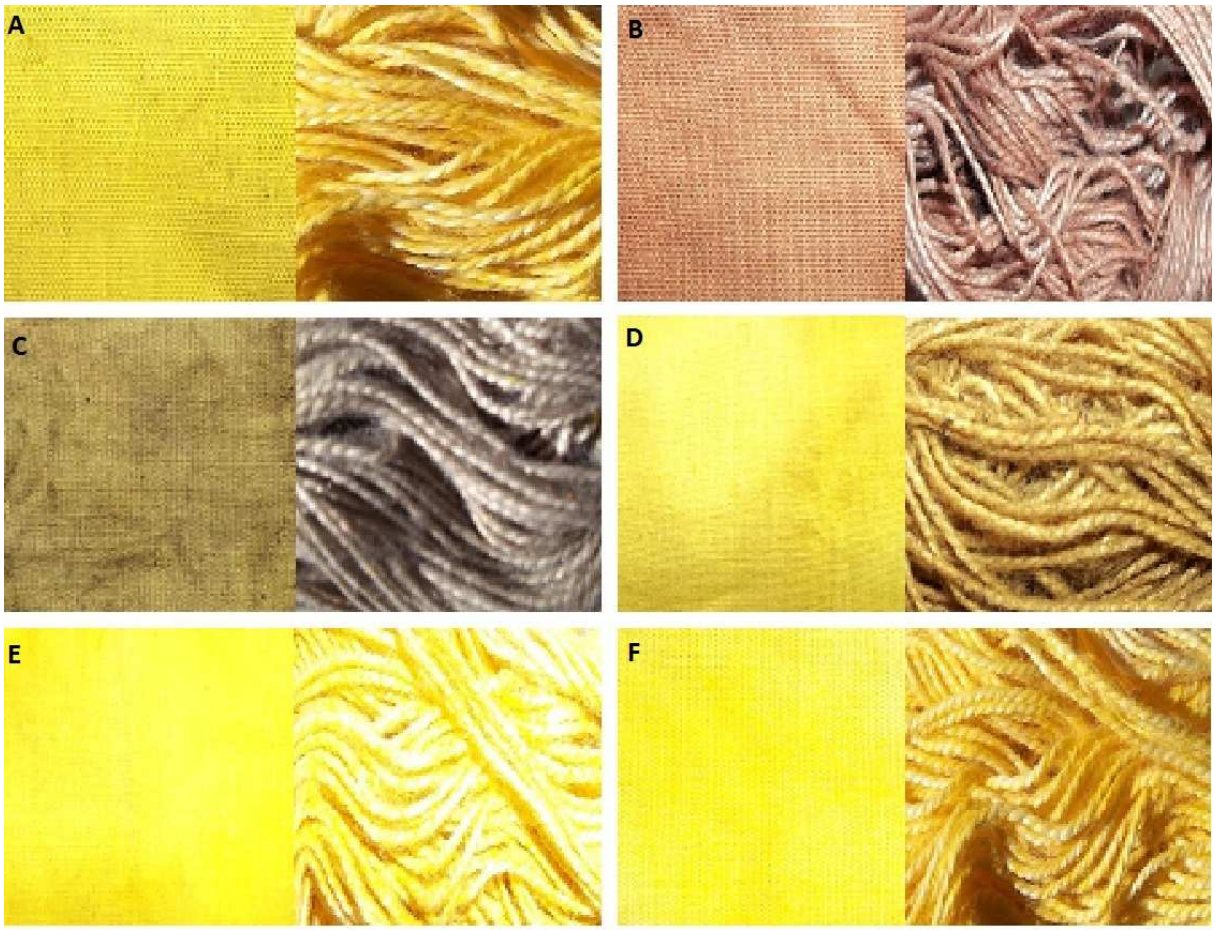
S5: Background and significance of the study

Nowadays, there is increasing awareness among people towards eco-friendly natural dyes. Due to the non-toxic properties, low pollution and less adverse effects, natural dyes are being used in day-to-day life. The Indian subcontinent possesses large plant resources especially of dyeing properties have been in use since ancient time. Various ethnic groups have their traditional methods of dyeing. The natural dyes are very much important in terms of wastage management and can give the additional benefits including, the residual biomass could be utilized for energy generation after extraction of the dye. These might provide higher UV absorption by the fabric resulting in reduced incidence of diseases. Although, natural dyes in the form of crude extract can produce a good dye but due to limited resources, there is need of isolation of chemical compounds which are responsible for the dye so that these can synthesize in the laboratory to fulfill the demand of population.

Although, the flowers of *B. monosperma* are being used in traditional dyeing in various parts of India but no valid scientific evidence is yet available. Hence, the aim of present work is to investigate the dyeing properties of the flowers and its chemical constituents responsible for the same. This paper reports the dyeing properties of the flowers extract and two flavanone glycosides named 5,7-dihydroxy-4'-methoxyflavanone-5-β-D-glucopyranosyl-(1→2)-β-D-glucopyranoside (**1**) and 5,5'-dihydroxy-4',7-dimethoxyflavanone-5,5'-di-O-β-D-glucopyranoside (**2**) on cotton fabric using stem bark of *Myrica esculenta* as natural mordant whereas $SnCl_2$ and $FeCl_3$ as synthetic mordants for the first time.

S6: General experimental information

Melting points: Perfit. UV: Perkin-Elmer, Lambda-25 (MeOH); IR: Perkin-Elmer, Spectrum RX I FT-IR (KBr discs). NMR: Bruker Avance, auto sampler (400 MHz for ^{1}H & 100 MHz for ^{13}C in DMSO-d6, TMS as int. standard). MS: JEOL JMS-DX 303. CC: Silica gel (Merck, India 60-120 mesh); TLC: Aluminum backed precoated with silica gel (Merck, India); Spraying reagents: I_2 vapours and 7% H_2SO_4 followed by heating. The bark of *M. esculenta* was used as natural mordant whereas $SnCl_2$ and $FeCl_3$ (both from Merck, India) as synthetic mordants.



S7: Color imparted by *B. monosperma* dye and isolated compounds. **A** (pure dye), **B** (dye + *M. esculenta*), **C** (dye + $FeCl_3$), **D** (dye + $SnCl_2$), **E** (**1**) and **F** (**2**)

S8: Concludary remarks

The flavonoids have been recognized as good dye molecules due to their chromophore (conjugated double bonds) as well as their auxochrome (hydroxyl groups), and the same are responsible for the yellow dye of *B. monosperma*. Although, flavanones isolated from the plant showed good dyeing property but the fastness properties were not found substantial. Therefore, a need of mordant is must to improve the bond between dye and cotton. However, in present study the isolated compounds were used without mordants due to their insufficient quantity. The cotton dyed with natural dyes and natural mordant showed excellent fastness properties against light and washing whereas some variations in color fastness were observed with synthetic mordants. The use of natural dyes and natural mordants are safer and eco-friendly and might be a better substitute for textile industry using synthetic dyes and mordants.