LIFE12 ENV/IT/000352 “BIONAD“
Naturalised dyes replacing commercial colorants for environmentally friendly leather dyeing and water recycle

Action C.2 of the project.
Degradation of dye effluent with *Escherichia coli* at laboratory level.

Beneficiary responsible for implementation:
UNIFI

Duration
01.01.2014 to 30.06.2016

Total Budget
€ 1,469,056.00

EU contribution
€ 725,713,00

Dye wastewaters have been long recognized one of the major impacting waste of tanneries, because of the unpredictable content of dye and auxiliary chemicals carried into the environment. Efforts to confine all effluents of a production site in one specific place have led to water plant infrastructures, that are demanded for waste collection, treatment and disposal. The environmentally friendly profile of the lactose naturalized dyes encourages the application of bioremediation for effluent treatment before disposal. Bacterium *Escherichia coli* DH5α of wild type was used in a view to integrating the ongoing activated sludge tools or simply facilitating the job of established water plants.

Coordinating beneficiary

Chemical Institute of organometallic compounds of CNR (IT)

Associated beneficiaries

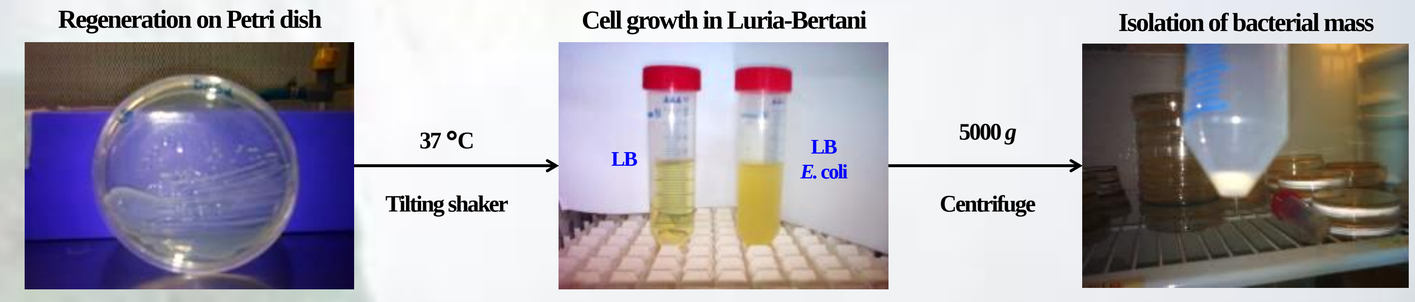
Chemical Department "Ugo Schiff" Florence University (IT)

Serichim Srl (IT)

Asociación de Investigación para la industria del calzado (ES)

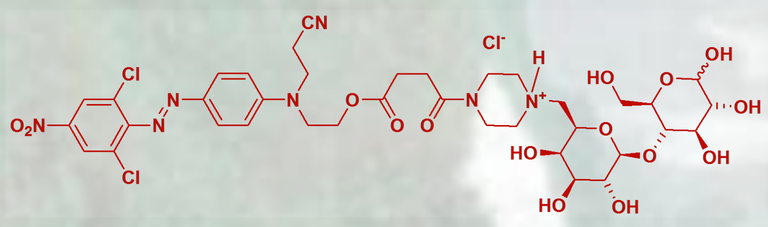
Biokimica Group (IT)

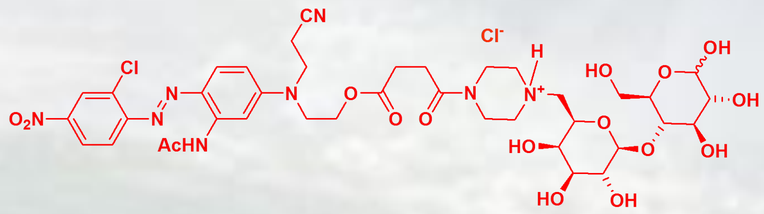
Preparation of *Escherichia coli*

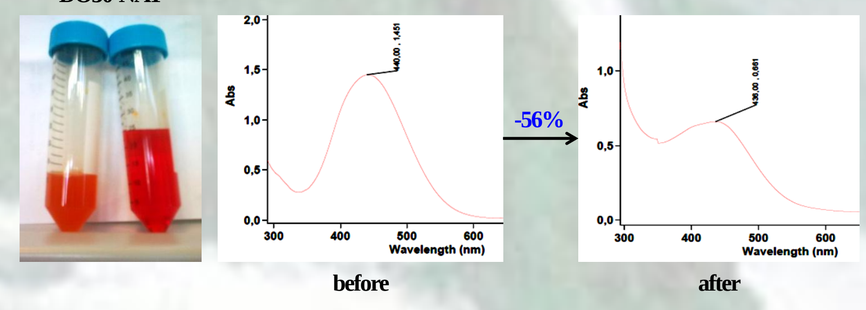


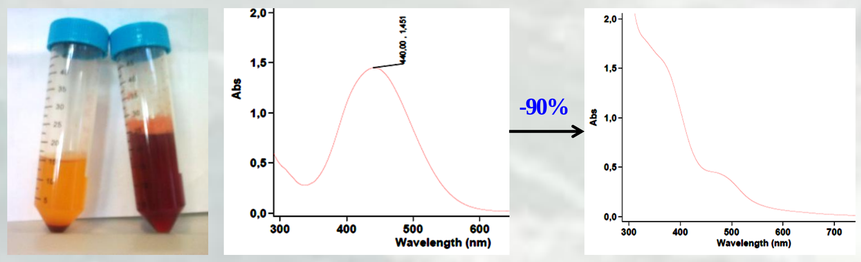
The decolorization of naturalized dyes

Preliminary tests

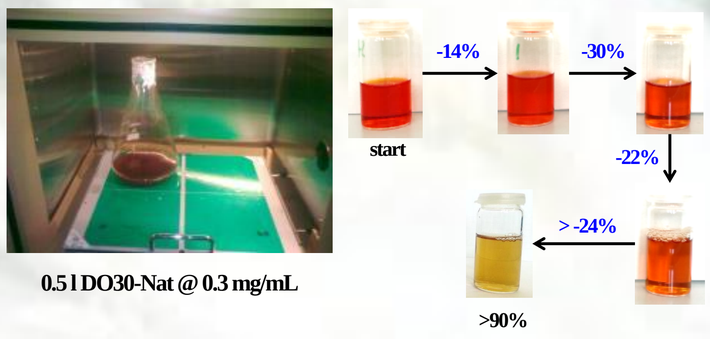




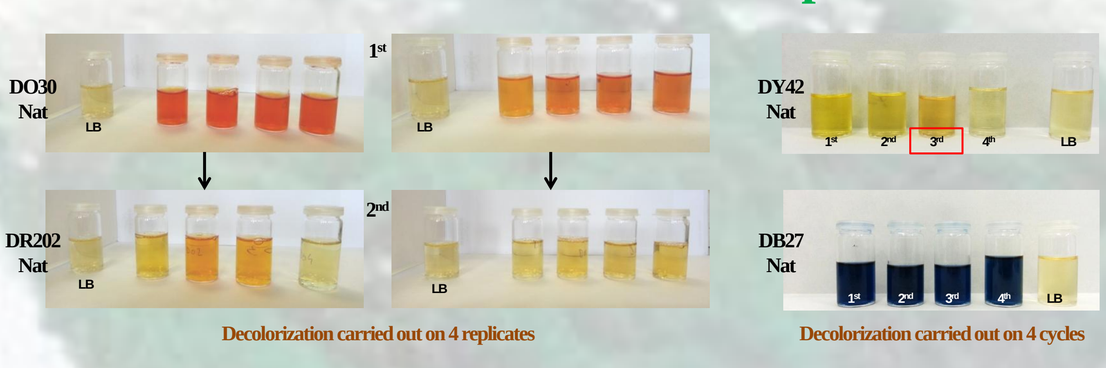




Decoloration *via* biomass recycle



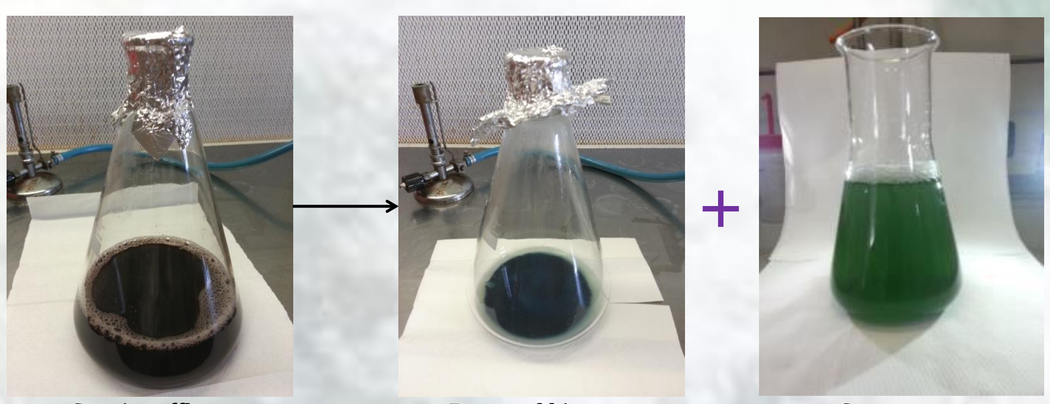
Decoloration *via* biomass adaptation



Decolorization carried out on 4 replicates

Decolorization carried out on 4 cycles

Decoloration on mixed dyes



Conclusions

***Escherichia coli* DH5α demonstrated the ability to metabolize azo and aniline type naturalized dyes, whilst being ineffective towards anthraquinone chromophores.**

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