



LILI'S NEW CHEM

ON RED COLORED PIGMENTS/DYES FROM QUERCETIN, QUERAËLLE GJ RED¹ ACCORDING TO LILI'S PENDING PATENTS²

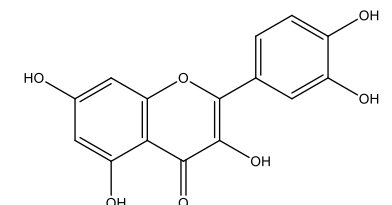
*I'm going to a place where the love can thrive
I'm going to a place where the cancer dies
I'm going to a place where there is no shame
And I can feel no pain
Yeah, this is where I'll stay
Cause I'll be so much more than under oak trees"*

Oak trees by Daniel Nunnelee

Daniel Nunnelee calls the song himself “my happy song about death”. Today, lili would like to present lili's new red complexes based on quercetin. Quercetin is found in oak trees (i.e. *Quercus tentoria* or *quercus velutina* or quercitron) and was imported to England by Bancroft around 1775 from America. The first documented extraction (Chevreul, 1829?) —according to L Rigaud in a *temporary notice on the yellow colorant from the quercitron bark* (in German) on 1853— was performed by boiling a yellow wood (quercitron?) with 10 parts of water for fifteen minutes. Then, yellow crystals (quercetrin?) were found after the extract was left standing for some days according to M. Chevreul. Mr Ragaud managed to mention the name Chevreul (without any further details) in the provisional and final publication *on Quercetrin* (in German) (L. Rigaud, 1854) one year later.

Lili wonders why Rigaud did downplay Chevreul's work?...

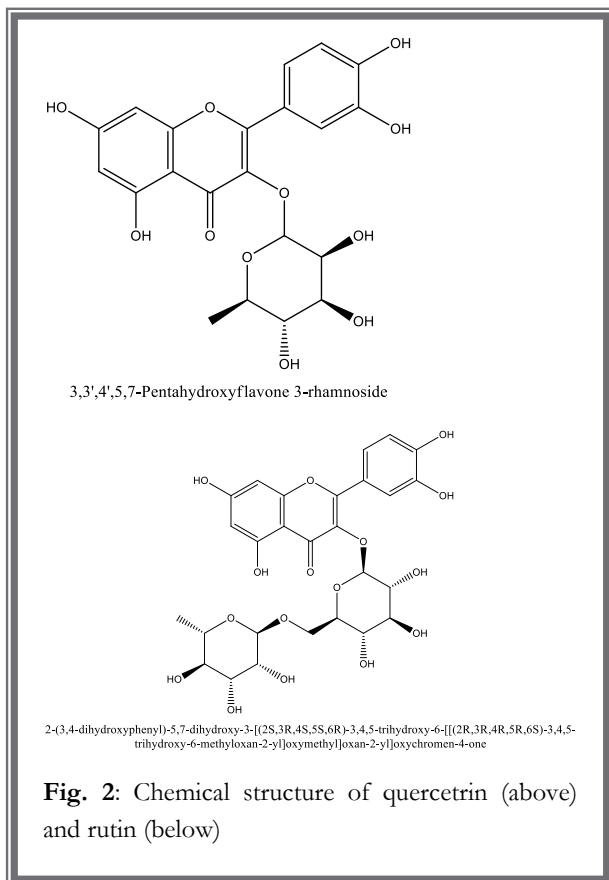
Queraëlle GJ Red is named as a memorial to G elle van Merendonk, n e Pichon, who was my first wonderful partner and the first who was asking for license agreements.



2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one

Fig. 1: Chemical structure of quercetin

Quercetin is a polyphenol of the family of the flavonoids (IUPAC Name: 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one, Fig. 1), and is considered the major flavonoid in the human diet and can also be found in many vegetables and fruits, e.g. outer dry layers of onions—a byproduct of onion crop *Allium Cepa* L.—buckwheat, hops, apples, grapes, etc. It occurs commonly as a mixture of several polyphenols or is conjugated with sugar such as quercitrin and rutin (Fig. 2).



Quercetin is a nutritional supplement and is supposed to be a cure of many cancers and other diseases. However, according to FDA, there is no evidence that quercetin has benefits against any disease. Thus, do not trust the labels regarding anti-anything for products comprising quercetin.

In addition, quercetin like many polyphenols (see Fig. 3) suffers from scandals from research misconduct or fraud as explained in Glimpse #1 and #3.

In the meantime, metal complexes of polyphenols such as quercetin are produced by mechanochemical reaction of at least one polyphenol with at least one metal alkoxide according to lili's pending patents.¹

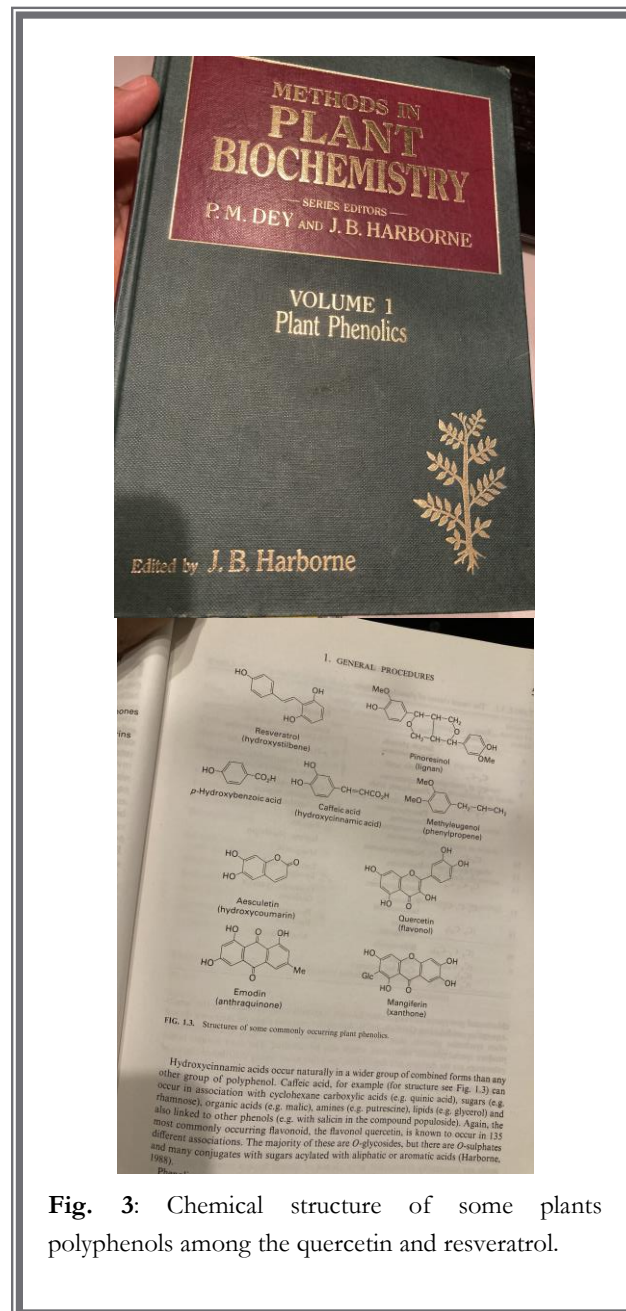


Fig. 3: Chemical structure of some plants polyphenols among the quercetin and resveratrol.

Introduction

In lili's opinion many polyphenols can be presumed to have many benefits for humankind. However, most of studies are not convincing at all and do not provide any evidence of those effects on human health since the substances are only tested in vitro or in some animals. Moreover, most studies are done without taken into account that polyphenols in general are very unstable to environmental conditions such as solvents, light, air, temperature, additives and so on.

In addition, formulations comprising polyphenols typically contain many of them, commonly as an emulsion or suspension without paying attention to the stabilization of the whole system. The stabilization of these formulations commonly is challenging as lili explained in her pending patents,¹ and therefore the chance of having discouraging results in clinical trials is elevated.

Today, lili would like to present to you one of her

metal alkoxide by mechanochemistry according to lili's pending patents¹ and to show that these complexes can be used as cosmetics without other ingredients or with less ingredients in the formulation, since they present different physicochemical properties in comparison to the original polyphenols.

Quercetin is a yellow powder (Fig. 4, left) that it is very unstable in aqueous environments, like all polyphenols.

Lili believes that so far studies involving quercetin have been performed using original quercetin without changes (or minor changes) in the structure and thus, so once the formulation containing quercetin is delivered to the body the chances of non-desirable interactions are higher.

Here, lili would like to show that her quercetin metal complex is stable and has enhanced properties in comparison with quercetin alone. Furthermore this new complex can act as a physical and chemical absorber/filter since titanium is present in the aromatic structure and any other appropriate metal such as zinc can be used as a source of metal from the metal alkoxide.

Results and Discussion

The metal complex of quercetin has an astonishing red color that is very stable in several solvents. If rutin is used, i.e., a glycoside of quercetin, a beautiful orange is obtained using the same metal alkoxide.

Lili's cosmetic formulations comprising the metal complexes of her invention are also very stable against light, storage and solvents, among others.

The supramolecular and/or polymeric structure of this novel quercetin metal complex is produced by a self and/or forced assembly by the mechanochemical process according to my pending patents. Since the structure of my metal quercetin complex is bigger than the neat quercetin (proof thereof is the change in color (see Fig. 4 and 5), there is less chance of this novel quercetin complex being destroyed in the body before it can act.



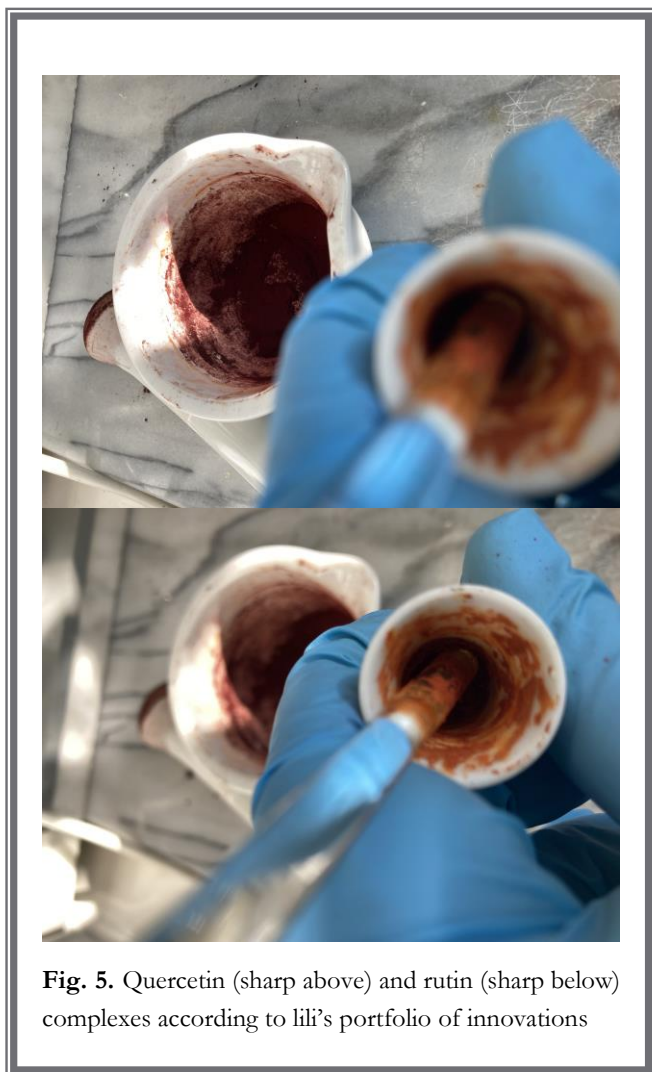
Fig. 4: Lili's new material based on quercetin, Queraëlle GJ Red. The color is more spectacular if you see directly in a sunny day. Lili's iphone does not reveal the beauty of this color.

pigments/dyes based on one of the most abundant polyphenolic flavonoids (natural or synthetic) in the market, e.g. quercetin—a polyphenol (see Fig. 1) and/or their glycan derivatives (e.g., see Fig 2) with at least one

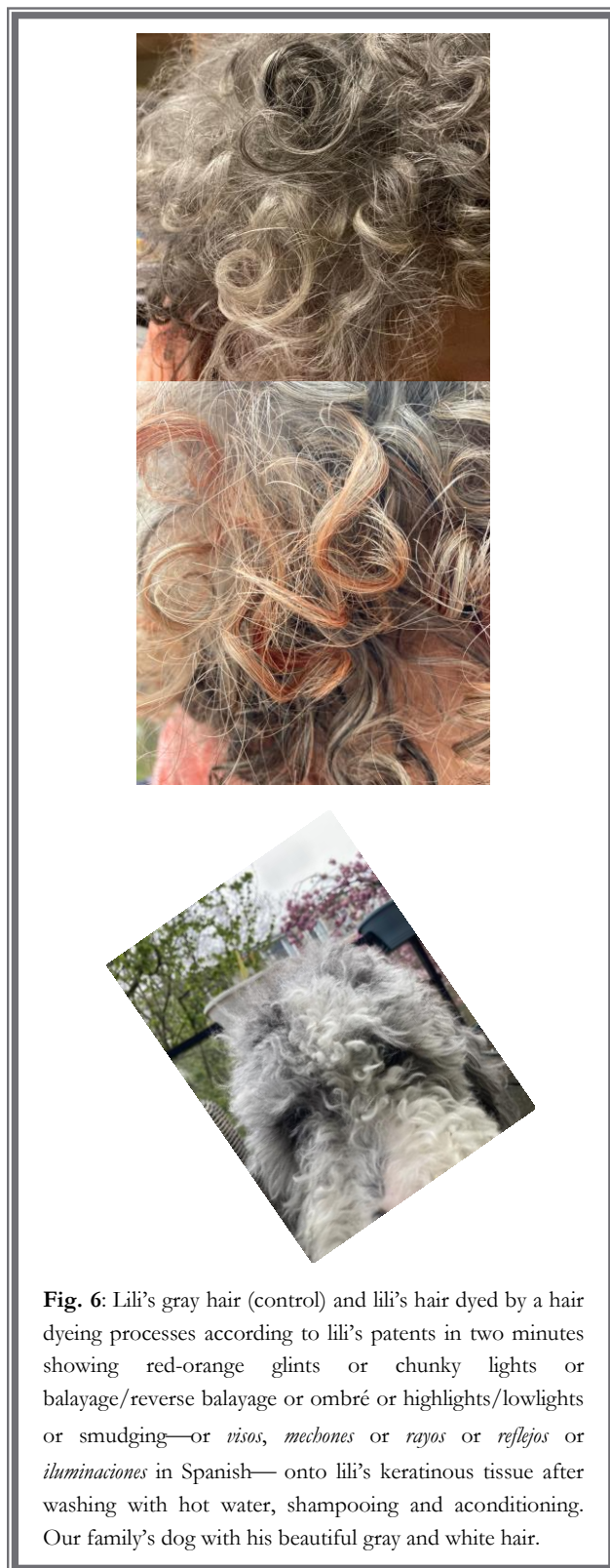
Lili can conveniently design the appropriate color (i.e., the structure) of my complex by using the processes according to lili's pending patents.

Lili's new colored pigment/dye based on the simple

in only a few minutes with several applications, for instance, for replacing many toxic red dyes containing toxic metals such as lead, chromium, cadmium, arsenic



quercetin—neither protecting groups nor leaving groups nor directing groups nor any other working groups are intentionally created or designed—is very stable to light, storage, temperature, to solvent, e.g. water. The way to produce this new red pigment/dye is very simple, rapid and environment-friendly, since no toxic organic or aqueous solvents are added and no waste or (toxic) byproducts are produced. The scale-up is also ready. Just imagine that hundreds of tons of quercetin that many companies are producing or extracting from nature can be converted to a gorgeous red pigment/dye



or tin.

In addition, this new quercetin metal complex can be used as a dye or pigment to paint people's creations in different substrates.

Quercetin and rutin among many polyphenols can be extracted from many parts of neophytes and/or "potential" invasive plants such as *Syphnolobium japonicum* or *Sophora japonica* originally from China. In some places these plants are not invasive: however, some countries such as Austria, are afraid of this risk due to the climate change and the increase in temperatures.

Conclusions

Lili's metal complexes have the potential to be used as a food supplement or additive after the corresponding risk assessments have been done. With subtle changes in the production or the formulation of this complex, the color can be changed according to the color of the skin or to people's favorite color. If another metal (or no metal) alkoxide is used to perform the mechanochemical reaction with quercetin, different materials can be obtained with a diversity of colors. The sustainable product and production and the enhanced properties, such as solubility and color, make my novel compounds very apt to be used in cosmetics. My novel compound will impart a red tone to the cosmetics, which is markedly different from the yellow color of quercetin.

Outlook

The process to produce metal quercetin complexes deserves some attention, as it is well known that complexation reduce the toxicity of many compounds and it is recognized as a strategy to reduce safety issues, such as in the case of toxic azo dyes. Major companies can conduct studies without hesitation regarding toxicity to humans. Lili believes that her portfolio of innovations on **doctora liliana cosmetics** regarding

new materials can contribute to the problem generated by invasive plants without the use of herbicides and, moreover, with financial rewards.

Thanks Gaëlle for believing in me.

*Stand like an oak
An aspen
An alder
It's in you, don't falter
And if so than I got you
Fake it, walk taller
Anything that makes you feel smaller
Leave it by the angels of the water
Push'em up push'em up
Put away your cares
Fold them, fold them
Fold up your fears
He said come to this river
Give me your arms
Lean back
There's nothing to be alarmed of
He said the more I know
The more I dig
And the more I return to myself
Around every bend
Push'em up push'em up
Put away your cares
Fold them, fold them
Fold up your fears*

Stand like an oak by Rising Appalachia

¹ The Colour Index™ colour-index.com published online by Society of Dyers and Colourists and American Association of Textile Chemists and Colorists.

² **WO2021121647** - Metal complexes of macrocycles and/or isoprenoids and/or linear tetrapyrroles by mechanochemistry (grinding or milling), preparation method thereof, sunscreen/concealer/uv absorber thereof, self-assembled coating material thereof, superamphiphilic material or surfaces thereof, hair dyeing thereof and other uses thereof. **Priority Data** 18.12.2019

WO2019238261 - Metal complexes of β -diketones and/or polyphenols by green chemistry, preparation method thereof, sunscreen thereof, skin or hair tone concealer thereof, hair dyeing thereof and other uses thereof. **Priority Data:** 15.06.2018

RAMIREZ RIOS L. P., on red colored pigments/dyes from quercetin, Queraëlle GJ Red, according to lili's pending patents, lili's new chem, 04/21/2023.

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