

## Pharmacovigilance 2019: Study and comparison of the chemical profiles of the pulp and the seed of *Citrullus colocynthis* by UHPLC-HRMS

F.D. Drissi<sup>1</sup>, F. Lahfa<sup>1</sup>, N. Fabre<sup>2</sup>

<sup>1</sup>Antibiotics Antifungal Laboratory: Physical-Chemistry, Synthesis and Biological Activity, Department of Biology, Faculty of Sciences, B.P 119, Tlemcen University, Tlemcen, Algeria.

<sup>2</sup>UMR 152 Pharma Dev, Université de Toulouse, IRD, UPS, France.

### Introduction:

*Citrullus colocynthis* Schrad, conjointly referred to as colocynth, could be a quite common fruit in ancient drugs; it's recognized by totally different medical specialty activities in ancient Algerian medicine (i.e., purgative, medicinal drug, medicament, analgesic, and medicine. a number of these activities were confirmed in trendy herbal therapy many scientific studies applied on crude extracts of pulp and seed of colocynth have incontestable the antimitotic impact medicamen antiparasitic larvicidal moreover as a preventive impact against fatness. However, the bioactive chemicals compounds accountable of these activities don't seem to be isolated and known nonetheless.

This is perennial herbs sometimes trailing, usually found wild within the sandy lands of North West, the Punjab, Sind, and Central and southern Asian nation, and coromandal coast. conjointly found autochthonal in peninsula, West Asia, and Tropical continent and within the Mediterranean region. usually dicot genus colocynthis referred to as - Indravaruni (Sanskrit), Chitrapala or Bitter apple. Medicinally root, bark and leaves square measure used. dicot genus colocynthis shows gentle viscus, bitter tonic, water pill and antilithic property. As per Ayurveda and Siddha system of drugs it's Tikta-rasam, ushna-veeryam and katu vipakam and used as purgative, diuretic, lagu, kapharam and abortifacient. Fruit is bitter, pungent and used as purgative, anthelmintic, antipyretic, carminative, cures tumors, leucoderma, ulcers, asthma, etc. Root is helpful in jaundice, ascites, urinary sickness, rheumatism.

### Fruit

Each bitter apple plant produces around fifteen to thirty globose fruits having a diameter of just about seven to ten centimeters. The outer portion of the fruit is roofed with a inexperienced skin having yellow stripes. The fruits can also be yellow in color. The ripe fruits square measure characterised by a skinny however onerous rind. The fruits have a soft, white pulp that is crammed with varied ovate compressed seeds.

### Seed

The seeds square measure around half-dozen millimeter in size, smooth, compressed and ovoid-shaped. they're settled on the membrane bone placenta. The seeds square measure lightweight yellowish-orange to dark brown in color.

### Flower

The yellow-colored flowers seem separately at leaf axils. they're monoecious; the pistils and stamens square measure gift in numerous flowers of the same plant. they need long peduncles.

Each flower is additionally comprised of a yellow campanulate. The corolla has 5 lobes and the ringlet is compound 5 ways that. The female flowers square measure simply known from the males by their villous ovary.

### Medicinal value of *Citrullus colocynthis*

1. The fruits square measure bitter, pungent, cooling, purgative, anthelmintic, antipyretic, carminative, cures tumors, ascites, leucoderma, ulcers, asthma, bronchitis, urinary discharges, jaundice, enlargement of spleen, infectious disease glands of the neck, dyspepsia, constipation, anemia, throat diseases, hypertrophy, joints pain.

2. Root is helpful in jaundice, ascites, urinary diseases, rheumatism and given in abdominal enlargements and in cough and wheezing attacks of youngsters. A poultice of root helpful in inflammation of the breast.

3. Fruit or root with or while not nux-vomica is rubbed into a paste with water and applied to boils and pimples.

4. Paste of the foundation is applied to the enlargement of abdomen of youngsters

Starting from 2 fractions of ester from pulp and seed obtained at the Lapsaab laboratory in Tlemcen (Algeria), our objective at the PharmaDev laboratory was 1st to higher understand the chemical composition in cucurbitacins of those a pair of extracts and second to match the chemical profiles of the seed and also the pulp. we have a tendency to were then ready to isolate and establish five molecules probably to be accountable for one in every of the activities mentioned antecedently.

### Materials and methods:

The dereplication half was applied employing a UHPLC-HRMS chain and also the raw formulas were obtained via the software Xcalibur three.0. The isolation of the molecules was done by totally different chromatographical methods: SPE, CC, MPLC and HPLC. Isolated molecules were known by MS and 300MHz magnetic resonance.

UHPLC Technology facilitates enhancements of resolution, sensitivity and speed to be achieved, while not compromise. whether or not the separation goal is to realize ultra-fast analysis, increase outturn whereas maintaining resolution, rising resolution whereas decreasing analysis time or reach ultra-high resolution, the flexibility of the ACQUITY UHPLC System permits technique needs to be met.

This technology primer is meant to produce new, existing and

potential UHPLC users the power to know however UHPLC Technology works, the way to achieve success with it, and the way it will give impactful results among their organization.

### Results

The LC-MS and tending results showed that the chemical profiles of the seed and pulp ester extracts square measure similar, that will justify why each square measure active on identical targets. we've conjointly incontestable the nonuniformity of the cucurbitacins, around twenty cucurbitacins are known in every fraction and a few of them have not been delineated in *C. colocynthis*.

The major compound isolated from the 2 extracts is elaterinid. alternative cucurbitacins and a carboxylic acid by-product are isolated and identified: cucurbitacin E, cucurbitacin I, glycosylated cucurbitacin I and 4-hydroxybenzaldehyde.

### Chemical content of dicot genus *colocynthis*

#### 1. Seed

a) Fatty acid like lipide, Myristic, Palmitic, oleic, Linoleic, omega-6 fatty acid.

b) Protein eight.25 attempt to wealthy content wealthy in essential amino acid, leucin and sulfo aminoalkanoic acid

c) Vitamin B1 , B2 and B vitamin

d) Mineral like Ca, Mg, K, Mn, Fe, P and Zn

#### 2. Aerial half and fruit

Flavonoid organic compound quercetin, Flavone- 3- glycoside viz iso-vitexin, iso-orentine and isoorentine -3-methyl ether.

#### 3. Fruit

a) Cucurbitane sort triterpen organic compound viz colocynthoside A & B.

b) Cucurbitane sort triterpen organic compound viz cucurbitacin E 2-O-beta-D-glucoside and its

c) aglycone Cucurbitacin E.

d) 2-O-beta-D-glucopyranosyl-16alpha-20R-dihydroxy-cucurbita-1,5,23E,25(26)-

e) teraen-3,11,22-trione.

f) 2-O-beta-D-glucopyranosyl-cucurbitacin B and a pair of, 25-di-o-beta-D-glucopyranosylcucurbitacin L.

### Conclusion

Our information 1st demonstrate the similarity within the cucurbitacin composition of the seed and also the pulp. These results counsel that the assorted biological activities of the colocynth might be because of the action of 1 or several cucurbitacins.

### References

1. Alhawiti, N.M. (2018). Antiplatelets and profibrinolytic activity of *Citrullus colocynthis* in control and high-fat diet-induced obese rats: mechanisms of action. *Arch. Physiol. Biochem.* 124, 156–166.
2. Cheraghi Niroumand, M., Farzaei, M.H., Karimpour Razkenari, E., Amin, G., Khanavi, M., Akbarzadeh, T., and Shams-Ardekani, M.R. (2016). An Evidence-Based Review on Medicinal Plants Used as Insecticide and Insect Repellent in Traditional Iranian Medicine. *Iran Red Crescent Med J* 18.
3. Ebrahimi, E., Bahramzadeh, S., Hashemitabar, M., Mohammadzadeh, G., Shirali, S., and Jodat, J. (2016). Effect of hydroalcoholic leaves extract of *Citrullus colocynthis* on induction of insulin secretion from isolated rat islets of Langerhans. *Asian Pacific Journal of Tropical Disease* 6, 638–641.
4. Hamid, N.S., Kahil, M.A., and Ibrahim, N.A. (2016). Larvicidal activity of ethanol extract of *Citrullus colocynthis* Seed and fruit pulp against *Anopheles arabiensis* and *Culex quinquefasciatus*. *Journal of Medicinal Plants Studies* 4, 252–255.
5. Sari-Hassoun, M., Clement, M.-J., Hamdi, I., Bollot, G., Bauvais, C., Joshi, V., Toma, F., Burgo, A., Cailleret, M., Rosales-hernández, M.C., et al. (2016). Cucurbitacin I elicits the formation of actin/phospho-myosin II co-aggregates by stimulation of the RhoA/ROCK pathway and inhibition of LIM-kinase. *Biochemical Pharmacology* 102, 45–63.
6. Shaheen, H., Qureshi, R., Akram, A., and Gulfranz, M. (2014). Inventory of Medicinal Flora from Thal Desert, Punjab, Pakistan. *African Journal of Traditional, Complementary and Alternative Medicines* 11, 282-290–290.