

ISOLATION, CHARACTERIZATION AND QUANTITATION OF CURCUMINOIDS: NMR studies in turmeric market products and pharmaceutical supplements

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ABSTRACT

Turmeric is the common name for the rhizomatous herb *Curcuma longa* L. (Family: Zingiberaceae), the dried roots of which have been widely used as spice, food coloring (E100) and taste enhancer, as well as in traditional medicine for a great variety of therapeutic purposes. Investigation on turmeric extracts (ethanol, methanol, water, and ethyl acetate) revealed the group of active ingredients, the "curcuminoids", which were responsible for the characteristic yellow color of the rhizome. More importantly, curcuminoids have been as well credited with the pleiotropic pharmaceutical activity ^[1]. The three main curcuminoids accounting for more than 90% of the extract are: curcumin (70-80 %), demethoxycurcumin (15-25 %) and bisdemethoxycurcumin (2.5-6.5 %) ^[2]. In most studies it was this curcuminoid mixture, (while in some other studies it was the individual compounds), that showed to have numerous pharmacological properties, including antioxidant, neuroprotective, anticancer, antifungal, antimicrobial, antiviral, and anti-inflammatory activities ^[3,4].

In the present study, we performed quantitative analysis of the curcuminoids present in the turmeric market products and pharmaceutical supplements. In particular, we have tested the purity and quantitation of compounds by rapid quantitative ¹H NMR (qNMR) using 3,5 bis-trifluoromethyl benzoic acid as an internal standard. The developed qNMR technique could be used as a tool of quality control and standardization of natural products, pharmaceutical and dietary supplements.

REFERENCES

- [1] Amalraj A, Pius A, Gopi S. (2017) *J. Traditional and Complement Med*, 7(2): 205–233.
- [2] Pawar H.A, Gavasane A.J, Choudhary P.D. (2018) *Natural Products Chemistry & Research*, 6(1):1-4.
- [3] Hewlings S.J, Kalman D.S. (2017) *Foods*, 6, 92.
- [4] Priyadarsini K.I. (2014) *Molecules*, 19, 20091-20112.