Inhibition of CYP1 family enzymes by Unani Medicinal Plants from Pakistan
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Cancer chemoprevention can be dealt with a variety of approaches including inhibition of the activation of procarcinogens to carcinogens, a process defined as chemical carcinogenesis. Multiple forms of human cytochrome P450 (CYP) contribute significantly to the metabolic activation of a number of procarcinogenic chemicals to their proximate reactive species that covalently bind to DNA producing carcinogenicity. Among the cytochrome P450 families, the CYP1 family comprising of three members, CYP1A1, CYP1A2, and CYP1B1 have been studied extensively because of their prominent roles in chemical carcinogenesis. CYP1 enzymes are active towards the metabolic activation of large number of chemical carcinogens including polyaromatic hydrocarbons, polycyclic arylamines, and endogenous hormones. Thus the inhibition of CYP1 family enzymes usually confers cancer chemoprotection in the course of chemical mutagenesis and carcinogenesis.

In the present study, we have examined the inhibitory effects of Unani medicinal plants from Pakistan on the catalytic activity of cDNA-expressed CYP1 family enzymes. The activity was performed by means of high-throughput fluorometric assay conducted in 96-well plates using 7-ethoxyresorufin as a substrate for CYP1A1 and CYP1B1 while 3-cyano-7-ethoxycoumarin for CYP1A2. Whereas α-naphthoflavone (CYP1A1, CYP1B1) and furafylline (CYP1A2) were used as positive controls. From the screening result, eleven plants showed more than 90% inhibition in either of the three enzymes tested. Among them, six plants (Berberis aristata, Piper longum, Piper nigrum, Oligochaeta ramosa, Psoralea corylifolia, and Vitex negundo) showed strong inhibition on CYP1A1 and CYP1B1. However four plants (Curcuma amada, Curcuma longa, Mallotus philippinensis, and Myristica fragrans) exhibited inhibitory action on CYP1A1 and CYP1A2, and Terminalia chebula showed potent inhibition on CYP1A2.