



Evaluation of some medicinal plants effect on Rhodamine 123 accumulation and efflux in Caco-2 cell line by flowcytometry

S.N. Sadati Lamardi^{1,2*}, N. Golbashirzadeh³, M.R. Shams Ardekani^{2,4}, G. Amin⁴, S.N. Ostad⁵

¹Department of Traditional Pharmacy, School of Traditional Medicine, Tehran University of Medical Sciences, Tehran, Iran.

²Persian Medicine and Pharmacy Research Center, Tehran University of Medical Sciences, Tehran, Iran.

³Department of Pharmacognosy, Islamic Azad University-Pharmaceutical Sciences Branch, (IAUPS), Tehran, Iran.

⁴Department of Pharmacognosy, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran.

⁵Department of Toxicology & Pharmacology, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran.

Background and objectives: In review of traditional Persian medicine (TPM) literature concerning multi drug therapy, a group of medicinal plants that are called "convoy drugs", agents which penetrate fast into whole or specific part of the body and accelerate delivery of drugs into specific target has been mentioned. In this study, the inhibitory effect of the aqueous extracts of some selected medicinal plants on P-glycoprotein (P-gp) was assessed in order to determine the possibility of herb-drug interactions. **Methods:** P-gp inhibitory effect of aqueous extracts (250 µg/mL) from some medicinal plants and verapamile (5 µg/mL) was measured using flow cytometry by Rhodamine 123 (Rh123) in Caco2 cell line. Inhibition percent of each sample (%) was compared with a control group (Caco-2 cell with Rh 123). **Results:** According to the results pennyroyal, aniseed ($p<0.001$), celery seed, melon seed and white agaric extract ($p<0.01$) exhibited the highest Rh123 percent in Caco-2 cells that could be associated with inhibitory effect on P-gp efflux activity. **Conclusion:** Considering that pennyroyal and aniseed showed the highest inhibitory effect on P- glycoprotein, pharmacokinetic interactions of these plants and P-gp substrates should be planned in future. Further studies about the effects of these plants on the pharmacokinetics of oral drugs should be considered.

Keywords: Caco-2 cell line, medicinal plant, P-glycoprotein (P-gp), Rhodamine123, traditional Persian medicine (TPM)