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Abstract

Traditional medicine is broadly used for various human ailments. Standard drugs and formulations are essential for assessing drug quality based on botanical concentration, physicochemical, phytochemical, in vitro and in vivo parameters. For acceptability in modern system of medicine, proper quality evaluation, validation and standardization of medicinal plant and its formulation is mandatory. Three medicinal plants native to India named *Andrographis paniculata*, *Piper nigrum*, and *Embllica officinalis* are used as medicine in India traditionally to treat diseases. The individual plant extracts were prepared with hydroalcohol using the soxhlet method. Quality evaluation and standardization of plant extracts were performed through suitable marker compound through HPLC, HPTLC and NIRs, in both qualitative and quantitative manner and the probable antidiabetic activity were performed through in-vivo study. The HPTLC and RP-HPLC profile shows that there are no similarities of retention factor (R_f) and retention time (R_t) values among the plant extracts which means all three plants contain different chemical compounds. These reproducible, accurate, and specific HPLC and HPTLC methods can be useful for quality evaluation and validation of medicinal plants or products/formulation in industrial aspect. The uses of NIR spectroscopy to the medicinal plant extracts analysis was confirmed and demonstrated in combination with chemometric analysis as a suitable method for the detection, quantification and prediction of gallic acid. A handheld short-range NIR instrument serves as a field lab-scale tool for industry to detect and predict gallic acid content in medicinal plants. In this study, *P. nigrum* and *E. officinalis* were evaluated for the antidiabetic potential. Some literature evidences were found for the antidiabetic property of the plant extracts. The results suggest that the hydroalcoholic extracts of both plants may effectively normalize the hyperglycaemic status in STZ induced diabetes.

Keywords: Quality control, Standardization, RP-HPLC, HPTLC, NIR, Antidiabetic.