

Abstract

Taxus wallichiana Zucc. (synonym *Taxus baccata* subsp. *wallichiana* (Zucc.) Pilg.) or Himalayan yew, has drawn a lot of interest globally. This is mostly attributed to its remarkable abundance of paclitaxel, an exceptionally potent anti-cancer drug, as well as various other significant secondary metabolites. Paclitaxel, commercially known as Taxol®, has demonstrated efficacy in treating several types of cancers including breast, cervical, head, lung, neck, ovarian, urothelial carcinoma. All taxa under the genus *Taxus*, including *T. wallichiana*, have slow growth rate over annually. Consequently, the extraction and isolation of paclitaxel from Himalayan yew for industrial applications pose significant challenges due to its limited presence in the bark, stem, and needles. The cost of paclitaxel has increased due to a combination of factors including its limited availability and growing demand in cancer therapy. The major goal of this research is to quantify the marker component, paclitaxel, which is extracted from Himalayan yew samples obtained from different locations. The goal is to find the most effective chemotypes of Himalayan yew based on different altitude in the Himalayan region. Furthermore, the current study aims to find other phytochemical compounds. The aim of this research is to establish a standardized and verified HPTLC (high performance thin layer chromatography) procedure for the quantitative measurement of marker anticancer compound paclitaxel. Furthermore, the study also encompasses a comprehensive analysis of antioxidant and toxicological study of various plant extracts. This investigation conducted in the selected region will significantly contribute to the scientific application and exploitation of these findings.