



ABSTRACT

Nerium oleander is an ornamental plant which is recognized as highly poisonous due to its toxic metabolites. It produces serious toxicologies that may cause death. Present study was carried out to determine cellular structure and patterns of leaf and stem of *Nerium oleander* using staining methods and toxic metabolites of different parts using GC-MS. The plant specimens were collected from Botanical Garden of GC University, Lahore. GC-MS results showed the presence of many toxic metabolites. Methanol extract of leaves (ML) contains high percentage of Oleic Acid, n-Octadecanoic acid and 1,4-Dioxane-2,6-dione (22.77%, 22.42 and 14.35%, respectively). Methanol extract of stem (MS) of *Nerium oleander* showed 3-O-Methyl Hexose in high percentage (72.26%) and n-Tetraoctane (10.23%). Extracts of leaves extracted through n-Hexane (NHL) showed peaks of Trans-Squalene (18.75%), Hexadecanoic Acid (18.69%) and 2-CycloHexane-1-one (14.18%) in spectrogram. Likewise, extract of stem obtained through n-Hexane (NHS) showed peaks of 1,7-Hexadecanoic Acid with high percentage (43.66%) and 9-Octadecenal (25.56%) in spectrogram. Leaves extract obtained through Ethyl Acetate (EAL) showed peaks in spectrogram in which Diisooctyl Phthalate (56.70%) was in high percentage. β -sitosterol and n Hexadecanoic Acid were also present almost in same concentrations (6.39% and 6.55%, respectively). In the end, extract of stem of *Nerium oleander* was also extracted through Ethyl Acetate (EAS) which indicated 15-Octadecanoic Acid, 13-Tetradecenal and 1,2-Benzenedicarboxylic Acid (33.26%, 27.21% and 10.43%, respectively). Results of present study provide a convenient method for detection of *Nerium oleander* that may be recommended for crime investigation.