
Powder X-ray diffraction (PXRD) analysis of usnic acid in five selected lichen species from Sri Lanka

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Cancer remains a global health problem despite the continuous development of anticancer therapies. The discovery of anticancer drugs from diverse natural sources has recently gained a focus. Lichens are a widespread symbiotic association between fungal and photosynthetic partners, and they are known to produce a diverse array of secondary metabolites with promising anticancer effects. Usnic acid (UA), a dibenzofuran derivative, is a key secondary metabolite found only in lichens and has shown anticarcinogenic effects on a variety of human cancer cell types. This study was conducted to investigate the presence of UA in five selected lichen species, which has previously been detected by thin layer chromatography (TLC), using a powder X-ray diffraction data analysis (PXRD) approach. Lichen samples representing *Lepraria* sp., *Physcia* sp., *Lecanora* sp., *Parmotrema* sp. and *Graphis* sp. were collected from Peradeniya, Sri Lanka, and crude acetone extracts for PXRD analysis were prepared following a standard protocol. In the diffractograms of *Lepraria*, *Physcia*, *Lecanora* and *Parmotrema*, peaks were observed at 10.54°, 10.34°, 10.4° and 12.84° of 2 θ position, respectively, which could be slightly overlapped with one of the main peaks of UA (10.24° or 12.73°). However, a similar correspondence was not observed for the peak pattern of *Graphis* sp. The current study confirmed the findings of our previous TLC detections of UA in *Lepraria*, *Physcia*, *Lecanora*, and *Parmotrema* spp. Further investigations are underway to confirm the presence of UA in lichens and to determine their effect on different human cancer cell lines for elucidating their therapeutic anticancer potential.

Keywords: Anticancer compounds, Lichen secondary metabolites, PXRD, Usnic acid

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