PLENARY PRESENTATIONS

ALKALOID PROFILING OF *Thalictrum minus* L. ROOTS AND *IN VIVO* ASSESSMENT OF TOXICOLOGICAL, BIOCHEMICAL, HEMATOLOGICAL, AND ULTRASTRUCTURAL EFFECTS FOLLOWING SUBACUTE EXPOSURE

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Representatives of the genus *Thalictrum* (Ranunculaceae) have a long history of use in Asian folk medicine and this plant recognized as a rich source of isoquinoline alkaloids. Systematic *in vivo* safety data for *Thalictrum minus* L., a species native to the Caucasus, remain unavailable, and no such work has previously been carried out on its Azerbaijani populations. Here, an alkaloid-rich extract (AE) from roots of *T. minus* L. collected in the Altiaghaj National Park was characterized by thin-layer chromatography and one- and two-dimensional NMR (COSY, HSQC, HMBC, NOESY). The dominant alkaloid was isolated in pure form and identified as berberine ($C_{20}H_{18}NO_4^+$, CAS 2086-83-1) on this spectral basis, corroborated by high-resolution ESI-MS (*m/z* 336 $[M]^+$; fragments at *m/z* 320 and 292). This compound then served as the reference standard for quantifying tissue-level accumulation of the extract by HPLC-MS/MS.

To characterize the sub-acute toxicity of AE, healthy white male rats were assigned either to an untreated control group (n=10) or to a treatment group (n=9) receiving daily intraperitoneal injections of the extract (20 mg/kg) for two weeks. By the end of the exposure period, hepatic enzyme activity had risen markedly relative to control values, with alanine and aspartate aminotransferases increasing by roughly 60% and 78%, gamma-glutamyltransferase more than doubling (+127%), and total bilirubin rising by over three-quarters (all $p<0.05$), consistent with combined hepatocellular and cholestatic damage. Hepatic oxidative-stress markers rose in parallel (diene conjugates nearly tripled; malondialdehyde and medium-molecular-weight peptides roughly doubled), while catalase activity fell by close to a fifth. Complete blood counts showed a marked rise in platelets (+76%) and a fall in lymphocytes (−29%), consistent with an acute-phase response and immunosuppression (spleen weight down 46%). Daily urinalysis showed persistent proteinuria, an alkaline pH shift, and isosthenuria, indicating renal injury.

Chromatographic mapping of berberine across organs and excreta showed the highest concentrations in furred skin, feces, and large-intestinal contents, consistent with biliary/fecal elimination, whereas hepatic and cerebral levels remained comparatively low despite the severity of the hepatic lesions observed. Light- and transmission electron-microscopic examination of liver tissue revealed extensive ultrastructural injury, including sinusoidal wall disruption, bile-canalicular microvillus loss, and hepatocellular membrane damage, changes essentially absent in controls. These findings indicate that repeated subacute exposure to the root alkaloid extract of *T. minus* L. produces a hepato-renal toxic syndrome, warranting caution regarding its traditional use and further mechanistic investigation.