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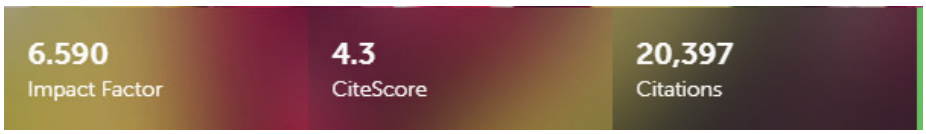




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# Deciphering the impact and mechanism of Trikatu, a spices-based formulation on alcoholic liver disease employing network pharmacology analysis and *in vivo* validation

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*Trikatu Churna* (*TC*) comprising *Zingiber officinale* rhizome, *Piper longum*, and *Piper nigrum* fruit, is effective in treating liver diseases and has high nutraceutical values. However, the efficacy of *TC* in treating alcoholic liver disease (ALD) and its mechanism remain largely unknown. This study evaluated the hepatoprotective effects of different doses of *TC* as well as to identify the bioactive components and determine their mechanism of action against ethanol-induced ALD. A compound-target network analysis model of *TC* was established to identify its potential bioactive compounds and pathways that might regulate its hepatoprotective effects. Further, *in-vivo* studies were performed to validate the potential of *TC* (200 mg/kg and 400 mg/kg b.w.) in the treatment and management of ALD. The study revealed that both the dosages of *TC* demonstrate significant ($p > 0.0001$) hepatoprotective effects by improving body weight, total bilirubin, serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (SGPT), serum alkaline phosphate (ALP), total cholesterol, total protein, globulin, albumin, and liver morphology. The High-performance thin-layer chromatography (HPTLC) fingerprinting of *TC* showed the presence of piperine. Network pharmacology identifies the role of *TC* in regulating various signaling processes including Advanced glycation end products-receptor for advanced