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## ANTI-INFLAMMATORY PROPERTIES OF PHYTOCONSTITUENTS IN MANAGING RHEUMATOID ARTHRITIS

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Combining phytochemicals with conventional therapy may create a synergistic, anti-inflammatory and anti-arthritis effect in treating rheumatoid arthritis (RA), while potentially mitigating the associated toxicity [2]. Resveratrol being a naturally occurring non-flavonoid polyphenol significantly reduced clinical markers and serum biochemical indicators of RA among 50 patients who received a daily resveratrol capsule, which may be attributed to resveratrol reducing the serum levels of TNF- $\alpha$  and IL-6 [1]. Aconitine, a diterpene alkaloid, actively reduces the activation of nuclear factor kappa B (NF- $\kappa$ B) and lowers the levels of inflammatory transcription factor NF- $\kappa$ B, TNF- $\alpha$ , IL-6, and IL-1 $\beta$ . Colchicine, an organic amine alkaloid, has been considered for gouty arthritis treatment by inhibiting neutrophil aggregation in joints, thereby regulating the inflammatory response [3]. Asperosaponin VI (AVI) has demonstrated effective inhibition of the

receptor activator of NF- $\kappa$ B ligand (RANKL) *in vitro*, a key regulator of osteoclast formation and activation. AVI also suppresses osteoclast signaling pathways and exhibits arthritis protection in collagen-induced arthritis (CIA) mice. [4]. Ginsenoside monomers (active compounds in ginseng, 15 mg/kg every two days) notably reduced arthritis index scores and relieved joint swelling in CIA mice. These ginsenosides downregulated protein expression of TNF- $\alpha$  and IL-6 and reduced activated CD4<sup>+</sup>T cells and pro-inflammatory M1-macrophages in the diseased mice's joints. ginsenosides didn't reveal observable morphological or structural changes, indicating minimal toxicity to normal cells [7]. The *Nyctanthes arbor-tristis* Linn plant is rich in various compounds like alkaloids, phenols, saponins, steroids, proteins, tannins, and flavonoids. A plant extract at a concentration of 1 mg/mL exhibits considerable inhibition of protein denaturation and notably stabilises Human Red Blood Cell Membrane *in vitro*. Docking simulations show a significant binding affinity of the plant's bioactive compounds to target proteins such as cyclooxygenase 2 and TNF- $\alpha$ , effectively inhibiting their activity [6]. The immunomodulatory properties of polyphenols, alkaloids, and saponins found in plants suggest these compounds are attractive candidates for the treatment of RA.

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