

## Biochemical evaluation of withania somnifera root powder on adjuvant-induced arthritis in rats / Mahaboobkhan Rasoo, Palaninathan Varalakshmi

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### Abstrak

The present investigation was carried out to evaluate the biochemical effect of *Withania somnifera* Linn. Solanaceae, commonly known as ashwagandha on adjuvant induced arthritic rats. Results were compared to Indomethacin, a non steroidal anti-inflammatory drug. Arthritis was induced by an intra dermal injection of Complete Freund's Adjuvant (0.1 mL) into the right hind paw of Wistar albino rats. *Withania somnifera* root powder (1000 mg/kg/day) and Indomethacin (3 mg/kg/day) were orally administered for 8 days (from 11th to 18th day) after adjuvant injection. After the experimental period, all the animals were sacrificed and serum, liver and spleen samples were collected for further biochemical analysis. A significant increase in the activities of gluconeogenic enzymes, tissue marker enzymes, blood glucose level, WBC, platelet count, erythrocyte sedimentation rate, and acute phase proteins (hyaluronic acid, fibrinogen and ceruloplasmin) was observed in adjuvant-induced arthritic rats, whereas the activities of glycolytic enzymes, body weight, levels of hemoglobin, RBC count, and packed cell volume were found to be decreased. These biochemical alterations observed in arthritic animals were ameliorated significantly after the administration of *Withania somnifera* root powder (1000 mg/kg/b.wt) and Indomethacin (3 mg/kg/b.wt). Our results suggest that *Withania somnifera* root powder is capable of rectifying the above biochemical changes in adjuvant arthritis and it may prove to be useful in treating rheumatoid arthritis.

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Evaluasi Biokimiawi Bubuk Akar *Withania somnifera* pada Tikus yang Diinduksi Adjuvant-Arthritis.

Penelitian

saat ini dilakukan untuk mengevaluasi efek biokimiawi dari *Withania somnifera* Linn. Solanaceae, yang juga dikenal

sebagai ashwagandha, pada tikus yang diinduksi adjuvant-arthritis. Hasil penelitian kemudian dikomparasi terhadap

Indomethacin, yang merupakan obat anti peradangan non-steroid. Arthritis diinduksi dengan menggunakan injeksi Complete Freund's Adjuvant (0,1 mL) secara intra-dermal ke telapak kaki belakang tikus Wistar albino. Akar *Withania somnifera* bubuk (1000 mg/kg/hari) dan Indomethacin (3 mg/kg/hari) diberikan secara oral selama 8 hari (dari hari ke 11-18) pasca dilakukannya injeksi adjuvant. Setelah masa eksperimen, seluruh hewan percobaan dikorbankan, kemudian sampel limpa, hati, dan serum dikumpulkan untuk analisis biokimiawi lebih jauh. Pada tikus-tikus yang diinduksi adjuvant-arthritis, terdapat peningkatan signifikan dalam aktifitas enzim glukoneogenesis, enzim petanda jaringan, level glukosa darah, jumlah sel darah putih (WBC), jumlah keping darah, tingkat sedimentasi eritrosit, dan protein fase akut (asam hyaluronic, fibrinogen dan ceruloplasmin). Sementara itu, terjadi penurunan aktifitas enzim glikolisis, berat tubuh, level hemoglobin, jumlah sel darah merah (RBC), dan volume sel yang dimampatkan (PCV). Kondisi perubahan biokimiawi yang terjadi pada hewan penderita arthritis ini membaik secara signifikan setelah pemberian bubuk akar *Withania somnifera* (1000 mg/kg/b.wt) dan Indomethacin (3 mg/kg/b.wt). Hasil penelitian mengindikasikan bahwa bubuk akar *Withania somnifera* dapat menyembuhkan perubahan biokimiawi pada adjuvant-arthritis yang disebutkan di atas. Hasil ini dapat bermanfaat dalam perawatan kondisi rheumatoid-arthritis.