

ABSTRAK

ARNETA NISA AFRILIANTI, 2023, STUDI *NETWORK PHARMACOLOGY* KANDUNGAN SENYAWA BIJI JINTAN HITAM (*Nigella sativa* L.) DAN RIMPANG JAHE MERAH (*Zingiber officinale* Rosc. var. *rubrum*.) SEBAGAI TERAPI PENGOBATAN ASMA, PROPOSAL SKRIPSI, PROGRAM STUDI S1 FARMASI, FAKULTAS FARMASI, UNIVERSITAS SETIA BUDI, SURAKARTA. Dibimbing oleh Dr. apt. Rina Herowati, M.Si dan apt. Ismi Puspitasari, S.Farm., M.Farm.

Penelitian ini mengeksplorasi potensi pengobatan asma menggunakan tanaman jintan hitam dan jahe merah. Tujuannya untuk mengidentifikasi protein molekuler yang menjadi target terapi asma pada biji jintan hitam dan rimpang jahe merah, serta menganalisis profil *network pharmacology* kandungan tanaman tersebut.

Penelitian ini termasuk penelitian kuantitatif menggunakan metode *Network Pharmacology*. Metode penelitian ini mengumpulkan data senyawa tanaman menggunakan webserver KNApSAcK, IJAH Analytics, serta jurnal penelitian sebelumnya. Kemudian dilakukan skrining aktivitas biologi senyawa tanaman dengan PubChem dan identifikasi protein target melalui DrugCentral dan KEGG pathway. Validasi nama gen dilakukan dengan Uniprot sedangkan interaksi antar protein target dianalisis menggunakan String. Untuk mengidentifikasi prediksi protein target menggunakan webserver Swiss Target Prediction dan SEA kemudian visualisasi *network pharmacology* menggunakan software Cytoscape.

Hasil visualisasi *network pharmacology* menunjukkan bahwa protein target yang terlibat dalam jalur patofisiologi asma yaitu LTC4S, RNASE3, CYSLTR1, ALOX5, dan ALOX5AP. Kandungan senyawa bioaktif tanaman yang berinteraksi dengan protein target sesuai jalur asma pada jintan hitam yaitu quercetin, carvacrol, lauric acid, m-thymol, myristicin, alpha phellandre, oleic acid, linoleic acid, alpha linolenic acid, dan apirole sedangkan pada jahe merah yaitu senyawa 8-shogaol, 10-shogaol, alpha cedrene, alpha terpinolene, alpha farnesene, dan trans citral.

Kata Kunci: *Network pharmacology*, Asma, Jintan Hitam, Jahe Merah.

ABSTRACT

ARNETA NISA AFRILIANTI, 2023, A NETWORK PHARMACOLOGY STUDY COMPOUND OF BLACK CUMIN SEEDS (*Nigella sativa* L.) AND RHIZOMES OF RED GINGER (*Zingiber officinale* Rosc. var. *rubrum*.) AS THERAPY TREATMENT OF ASTHMA, THESIS PROPOSAL, S1 PHARMACY STUDY PROGRAM, FACULTY OF PHARMACY, SETIA BUDI UNIVERSITY, SURAKARTA. Supervised by Dr. apt. Rina Herowati, M.Si and apt. Ismi Puspitasari, S.Farm., M.Farm.

This research explores the potential treatment of asthma using black cumin seeds and red ginger. The aim is to identify molecular proteins that serve as therapeutic targets for asthma in black cumin seeds and red ginger rhizomes, as well as to analyze the network pharmacology profile of these plant constituents.

The study adopts a quantitative approach employing the Network Pharmacology method. Data on plant compounds are collected through the KNApSAcK webserver, IJAH Analytics, and previous research journals. Subsequently, the biological activity of plant compounds is screened using PubChem, and target protein identification is carried out through DrugCentral and KEGG pathways. Gene name validation is performed using Uniprot, while protein-protein interactions are analyzed using String. The prediction of target proteins is identified using the Swiss Target Prediction and SEA webserver, followed by network pharmacology visualization using Cytoscape software.

The results of network pharmacology visualization indicate that the target proteins involved in the asthma pathophysiological pathway are LTC4S, RNASE3, CYSLTR1, ALOX5, and ALOX5AP. Bioactive compound contents in plants interacting with target proteins along the asthma pathway in black cumin include quercetin, carvacrol, lauric acid, m-thymol, myristicin, alpha phellandrene, oleic acid, linoleic acid, alpha linolenic acid, and apiole. In red ginger, the compounds include 8-shogaol, 10-shogaol, alpha cedrene, alpha terpinolene, alpha farnesene, and trans citral.

Keywords: *Network pharmacology, Asthma, Black Cumin, Red Ginger.*