

IDENTIFIKASI SENYAWA DENGAN METODE LC-MS DARI EKSTRAK ETANOL 70% BIJI JINTAN HITAM (*Nigella sativa* L.) DAN UJI TOKSISITAS DENGAN METODE BSLT

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INTISARI

Toksisitas adalah sifat relatif dari suatu zat yang dapat menimbulkan efek merugikan dan berbahaya karena dapat menyebabkan kerusakan yang bersifat struktural maupun fungsional, bahkan kematian. Penelitian ini bertujuan untuk mengidentifikasi senyawa metabolit sekunder dalam ekstrak etanol 70% biji jintan hitam (*Nigella sativa* L.) dan menguji toksisitasnya berdasarkan nilai LC_{50} menggunakan metode *Brine Shrimp Lethality Test* (BSLT) terhadap larva *Artemia* sp. Metode *Brine Shrimp Lethality Test* (BSLT) dilakukan dengan konsentrasi 100 ppm, 200 ppm, 300 ppm, 400 ppm, 500 ppm, 600 ppm, 700 ppm, 800 ppm, 900 ppm, 1000 ppm, serta kontrol negatif. Pada setiap konsentrasi, larva didiamkan selama 24 jam dan diamati jumlah larva yang mati selama 10 detik. Selain metode BSLT, penelitian ini juga menggunakan metode Liquid Chromatography–Mass Spectrometry (LC–MS) untuk mengidentifikasi kandungan senyawa metabolit sekunder dalam ekstrak. Hasil identifikasi menunjukkan adanya kandungan senyawa dari golongan alkaloid yang memiliki konsentrasi tertinggi, yaitu *Nigellicine* sebesar 3,14743%, *Higenamine* sebesar 3,01350%, dan dari golongan terpenoid yaitu *Thymoquinone* sebesar 2,80943%, *DiThymoquinone* sebesar 2,73634%, serta *Thymohydroquinone* sebesar 2,62811%. Hasil uji toksisitas menggunakan metode BSLT menunjukkan nilai LC_{50} ekstrak etanol biji jintan hitam sebesar 310,13 ppm berdasarkan analisis probit. Nilai ini berada dalam kategori toksisitas sedang ($100 \leq LC_{50} \leq 500$ ppm). Artinya, pada konsentrasi sekitar 310,13 ppm, ekstrak mampu menyebabkan kematian 50% populasi larva *Artemia* sp. dalam waktu 24 jam. Dengan demikian, perlu dilakukan penelitian lanjutan senyawa *Nigellicine* dengan metode fraksinasi dan isolasi senyawa murni, sehingga dapat mempermudah identifikasi serta pengkajian aktivitas toksisitas yang dimilikinya secara lebih spesifik.

Kata kunci: Biji jintan hitam, BSLT, LC-MS, LC_{50} , toksisitas.

**IDENTIFICATION OF COMPOUNDS USING THE LC-MS
METHOD FROM 70% ETHANOL EXTRACT OF BLACK
CUMIN SEEDS (*Nigella sativa* L.) AND TOXICITY
TEST USING THE BSLT METHOD**

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ABSTRACT

Toxicity refers to the relative property of a substance that can cause harmful and adverse effects, potentially leading to structural or functional damage, and even death. This study aims to identify secondary metabolites in the 70% ethanol extract of black cumin seeds (*Nigella sativa* L.) and to evaluate its toxicity based on the LC_{50} value using the Brine Shrimp Lethality Test (BSLT) method against *Artemia* sp. larvae. The Brine Shrimp Lethality Test (BSLT) was carried out at concentrations of 100 ppm, 200 ppm, 300 ppm, 400 ppm, 500 ppm, 600 ppm, 700 ppm, 800 ppm, 900 ppm, 1000 ppm, along with a negative control. For each concentration, the larvae were left for 24 hours, and the number of dead larvae was observed within 10 seconds. In addition to the BSLT method, the study also employed Liquid Chromatography–Mass Spectrometry (LC–MS) to identify the secondary metabolite compounds present in the extract. The identification results indicated the presence of alkaloid compounds with the highest concentrations, namely Nigellicine at 3.14743%, Higenamine at 3.01350%, and terpenoid compounds such as Thymoquinone at 2.80943%, DiThymoquinone at 2.73634%, and Thymohydroquinone at 2.62811%. The toxicity test results using the BSLT method showed that the LC_{50} value of the ethanol extract of black cumin seeds was 310.13 ppm based on probit analysis. This value falls into the moderate toxicity category ($100 \leq LC_{50} \leq 500$ ppm), meaning that at a concentration of approximately 310.13 ppm, the extract is capable of causing 50% mortality of *Artemia* sp. larvae within 24 hours. Therefore, further research on Nigellicine using fractionation and pure compound isolation methods is needed to facilitate more precise identification and evaluation of its toxicity activity.

Keywords: Black cumin seed, BSLT, LC-MS, LC_{50} , toxicity.