Antimalarial Activity of Nigella sativa L. Seed Extracts and Selection of Resistance in Plasmodium berghei ANKA in a Mouse Model

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abstract	Chemotherapy plays a crucial role in malaria control. However, the main obstacle to treatment has been the rise of parasite resistance to most antimalarial drugs. Artemisinin-based combination therapies (ACTs) remain the most effective antimalarial medicines available today. However, malaria parasite tolerance to ACTs is now increasingly prevalent especially in Southeast Asia presenting the danger of the spread of ACTs resistance to other parts of the world. Consequently, this creates the need for alternative effective antimalarials. (erefore, this study sought out to determine antimalarial potential, safety, and resistance development of the extracts in a mouse model. Method. Methanolic and ethyl acetate extracts were obtained by solvent extraction. (e extracts were assayed for acute toxicity in vivo. Additionally, the two extracts were evaluated for antimalarial activity in vivo against Plasmodium berghei ANKA strain by the 4-day suppressive test at 500, 250, and 125 mg/kg/day. Packed cell volume was evaluated to determine anemia manifestation. Finally, continuous drug pressure experiment at 500 mg/kg and DNA amplification via PCR were conducted. (e amplicons underwent through Sanger sequencing. Results. (ere was no toxicity realized in the animals at 2000 mg/kg. Importantly, high parasitemia suppression of 75.52% and 75.30% using a dose of 500 mg/kg of methanolic and ethyl acetate extracts, respectively, was noted. (e extracts were able to reverse packed cell volume reduction. Nigella sativa-resistant phenotype was selected as delayed parasite clearance. However, there was no change in the nucleotide sequences of PbMDR1 and PbCRT genes. Conclusion. (e results provide room for future exploitation of the plant as an antimalarial

Keywords.

Malaria,malaria control,treatment