

sinensis), native to China, stands out as one of the most widely consumed beverages globally. In terms of chemical composition, it contains polyphenols, alkaloids, amino acids, polysaccharides, lipids, proteins, vitamins and trace elements (Wang et al., 2022). Notably, polyphenols, particularly flavonoids and catechins, which make up approximately 33% of tea's composition, have been consistently highlighted in various studies as the primary contributors to its significant health benefits (Khan and Mukhtar, 2018). Several studies have demonstrated the diverse therapeutic potential of tea, including its ability to restore sperm quality in heat-exposed mice (Mahmoudi et al., 2018), its dual anti- β -secretase and anti-cholinesterase activities relevant for dementia treatment (Suttisansanee et al., 2019), and its protective role in preventing DNA oxidative damage and inhibiting colorectal cancer cell proliferation (Wang et al., 2020).

This study aims to explore the potential therapeutic effects of tea seed oil (TSO) in modulating blood pressure, oxidative stress, and lipid profiles in an L-NAME-induced hypertensive rat model.

2 Methods

2.1 Plant material and sample preparation

Tea seeds were gathered from the Mambilla substation, Cocoa Research Institute of Nigeria (CRIN), Kusuku, Taraba state, Nigeria. The seeds were thoroughly cleaned under running tap water for 3 minutes to eliminate any adhering dirt. Subsequently, the seeds were sun-dried until a consistent weight was achieved, mechanically crushed, and ground to increase the surface area. A 100 g sample of the finely ground tea seeds was introduced into the thimble of a Soxhlet apparatus and then extracted with 500 ml of n-hexane for 8 hours, following the AOCS guidelines (Irving, 1958). After the extraction, the solvent was eliminated through rotary evaporation at 60°C under a nitrogen stream. The resulting TSO extract was then oven-dried until a solvent free extract was achieved.

2.2 Drugs and chemicals

Enalapril Maleate and NG-nitro-L-arginine methyl ester (L-NAME) were obtained from Honeywell Research Chemicals (Morris Plains, New Jersey). All other chemicals used were obtained from local suppliers and were of analytical grade.

2.3 Animals and experimental design

A total of forty (40) male Wistar albino rats, with weights ranging from 140 to 200 g, were sourced from the Experimental Animal Unit, Faculty of Veterinary Medicine, University of Ibadan, Nigeria. All experimental protocols were carried out in accordance with the guidelines approved by the Animal Care and Use Research Ethics Committee (ACUREC), University of Ibadan, Nigeria. These rats were accommodated in adequately ventilated plastic cages and allowed to acclimatize for 14 days prior to the initiation of the experiment. Throughout this acclimatization phase, the rats were provided with commercial rat feed and had unrestricted access to water.

The rats were distributed into five (5) groups of eight rats each. Group A, designated as the control, received 5 ml/kg of normal saline. Groups B-E were subjected to oral administration of 40 mg/kg L-NAME (Metchi Donfack et al., 2021) once daily. Furthermore, animals in groups C and D were concurrently administered 0.45 and 0.6 ml/kg of TSO, respectively, while group E received 2mg/kg Enalapril Maleate (Tawfeek et al., 2018) for a duration of 28 days.

2.4 Blood pressure measurement

Before blood pressure measurements, each animal was placed in a restraining holder for 10-15 minutes to allow for proper acclimatization. Systolic (SBP), diastolic (DBP), and mean arterial pressure (MAP) were non-invasively assessed using tail-cuff plethysmography with an electrospigmomanometer (CODA, Kent Scientific, USA). At least nine readings were taken per animal, and the average was calculated.

2.5 Blood and tissue samples collection

Following an overnight fasting period, the rats were euthanized using cervical dislocation. Blood was then obtained from each rat via cardiac puncture and collected in sterile plain tubes. The collected blood samples were