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Ethnopharmacological uses, biological activities, chemistry and toxicological aspects of *Ocimum americanum* var. *americanum* (Lamiaceae)

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ABSTRACT

The rationale for the use of *Ocimum americanum* var. *americanum* in herbal medicine is largely based on the longstanding experience of traditional medicine practitioners. The genus *Ocimum* is extensively used in Eastern Africa in folkloric practice against a wide range of illnesses. The present paper intends to bring a comprehensive overview of *O. americanum* var. *americanum* in regard to its biological activities, ethnopharmacological uses, phytochemical and toxicological effects. The literature search was conducted using Google, Google Scholar, Chemical abstracts, Sciverse; JSTOR, Medline, PubMed, Science Direct, Scopus and Springer Link. *O. americanum* var. *americanum* extracts have been shown to have antimicrobial, antioxidant, antiproliferative, insecticidal, and repellent activities. Literature on the activity of *O. americanum* var. *americanum* extracts against metabolic syndromes such as diabetes, hyperlipidaemias and hypertension is scanty. Toxicological data is also limited; however, the accessible information indicates non-toxicity of *O. americanum* var. *americanum* extracts. Substantial variations in phytochemical constituents of this particular species are observed, which may be attributed to edaphic differences as well as ecoclimatic regions.

Keywords: *Ocimum americanum* var. *americanum*, Ethnopharmacology, Phytochemistry, Toxicology, Traditional uses.

INTRODUCTION

Whilst it is often acknowledged that folkloric medicine works, there still exists gaps in the scientific study of the natural products from such traditions. Such is the challenge that faces ethnopharmacology even though it is increasingly being acknowledged that many types of diseases, including such common ones as vector-borne diseases; diarrhea or tuberculosis are still commonly treated and/or managed with herbal medicines [1]. African Traditional Medicine (ATM) have passed down through generations via oral tradition with very little documentation or none at all [2]. Traditional practice and phytomedicines of proven efficacy and safety, contribute to the primary healthcare goal and guarantees access to all people. The World Health Organization (WHO) estimates for millions of people, traditional herbal medicine is the main source of healthcare, and most often the only source of healthcare service. This is due to easy of accessibility, acceptability and affordability by millions of people. The cost factor of most phytomedicines makes them all the more agreeable at a time of spiralling healthcare expenses and nearly widespread austerity [3].

Africa is naturally endowed with abundance of flora, estimated to thousands of species. Botanists approximate that about 10% of Africa's flora is of medicinal significance and some of the herbal plants have been scientifically evaluated and folkloric role ascertained [1]. The herbal plant *Ocimum americanum* var. *americanum* (Lamiaceae) is indigenous to tropical Africa and India. The genus *Ocimum* contains about 50 to 150 species of shrubs and aromatic herbs [4]. *Ocimum americanum* var. *americanum* is a small branched erect, aromatic annual perennial shrub which grows up to 1m high. Stems are quadrangular or somewhat rounded, woody near the base, hairy and appressed. Leaves are narrowly elliptic, up to 2.5cm long, mostly hairless [5, 6]. The medicinal plant has a very wide geographical distribution in East Africa, making it the most popular ethnobotanical plant in the region [7]. In Kenya, it is widely distributed in the forest margins, secondary bushland and grassland, riverine sites and in dry areas, mainly in the hills [8].

Ocimum americanum var. *americanum* (Syn. *O. canum* Sims) is a high variable, polymorphic species with numerous forms, many of which have previously been treated as different species and subspecies. Three chemo-types are common; camphoraceous, floral-lemony and spicy. The tropical shrub from the mint family Labiate (Lamiaceae) is commonly known as American basil, hoary basil or mosquito plant [9,10]. American basil is an extensively scattered species in the tropical and subtropical regions of the globe, and

differing to its name it is not native to America but widely distributed in Africa and Asia [11, 12]. It is not frequently used as a culinary herb, unlike the *O. basilicum*, but more commonly as a herbal medicine. The volatile oils found in this genus have strong chemotherapeutic activities against plants pathogens. In Africa *O. americanum* var. *americanum* leaves are used as insecticides for the protection of postharvest infestation, particularly that by bruchid beetles [13].

The Swahili people of Eastern Africa refer to basil as *Mvumbani/Kivumbani* depending on the local variation of the tongue [14, 15]. Some species from the genus *Ocimum* have significant therapeutic properties that have potential for bioprospecting. Most of the species native to Eastern Africa are used in herbal medicine and some of their pharmacological activities have been evaluated. American basil is used for medicinal and non-medicinal purposes in different local communities in Eastern Africa [11, 14]. The primary significant properties of the mint family is attached to its contents of essential oils. Essential oils sourced from the aromatic plants are a natural mix of organic compounds with strong aroma; they are products of secondary metabolism. Also referred to as volatile oils due to their high volatile property, they are a rich blend with extensive spectrum of biological activities [12, 16]. *Ocimum americanum* var. *americanum* has a broad range of pharmacologically active compounds in the form of essential oils. These include eugenol, methyl eugenol, flavonoids and polyphenols [11]. The current paper reviews; ethnomedicinal uses, pharmacological activities, phytochemical composition and toxicity of *Ocimum americanum* var. *americanum*. The literature was sourced from Google, Google Scholar, Chemical abstracts, Sciverse, JSTOR, Medline, PubMed, Science Direct, Scopus and Springer Link.

Taxonomic Tree

Domain: Eukaryota

Kingdom: Plantae

Phylum: Tracheophyta

Subphylum: Angiospermae

Clade: Eudicots

Class: Asteridae

Order: Lamiales

Family: Lamiaceae

Genus: *Ocimum*

Species: *Ocimum americanum* var. *americanum*

Family name: Labiatae (Lamiaceae)

Synonyms: *Ocimum canum* Sims

(a) *Ocimum album* Roxb

(b) *Ocimum africanum* Lour.

(c) *Ocimum brachiatum* Blume

(d) *Ocimum dichotomum* Hochst.ex



Figure 1: Aerial parts of *Ocimum americanum* var. *americanum* obtained from Pate village, Lamu County and voucher specimen deposited at National Museums of Kenya herbarium.

Traditional uses

Ocimum americanum var. *americanum* (American basil) is used for medicinal and non-medicinal purposes in different local communities in Eastern Africa. Extracts from the plant are used as mint for tea, flavouring of tobacco and as a body fragrance. Its branches and leaves are commonly used as insecticides and repellents against bees, mosquitoes, flies and other insects. The branches or leaves are burned or placed on the roof to give the repellent effect. Leaves from the aromatic herb are either crushed between the palms of the hands and sniffed, or hot aqueous vapour inhaled to unblock nostrils as well as treatment for bronchial catarrh [6, 17]. Decoctions from the plant are used for treating coughs, ear, eye complaints, haemorrhoids, tuberculosis and stomach pains [18]. *Ocimum americanum* var. *americanum* extracts are used to treat ulcers and also as anticathartic agent in East Africa. The Swahilis use aerial parts of the plant for lowering high blood pressure, to treat stomach ache and as mint in tea [15]. In Tamil Nadu (India) it is locally referred as *Nai thulasi* and its leaf extract decoction is traditionally used to treat constipation, diabetes, dysentery, diarrhoea and piles (haemorrhoids) [18].

Phytochemistry

Phytochemical profile

Zengin *et al.*, evaluated the phytochemical profile of *O. americanum* with several solvents and aqueous was one of them [19]. The aqueous extracts of leaves and flowers were found to possess phenolics, flavonoids, saponins and tannins while alkaloids and glycosides were absent. The flowers extracts had significantly higher contents of the identified secondary metabolites except the saponins which were higher in the leaf extracts [18, 19]. Mustafa & El-kamali also found saponins and tannins in the Sudan samples of *O. americanum* [20]. Secondary metabolites including; alkaloids, flavonoids, phenolics, tannins, terpenes, saponins, steroids and glycosides have been reported [18]. However, phenolics, tannins and saponins were found only in the less polar solvent, ethyl acetate leaf extracts [18]. Moreover, the steroids and glycosides were detected in the methanolic extracts which were not found in crude extracts reported earlier [18, 19].

Phytochemical compounds isolated from *Ocimum americanum* var. *americanum*

O. americanum var. *americanum* extracts have exhibited varying phytochemical composition depending on the solvent system used. From this consideration, it appears very intricate to utilize a standard solvent for the extraction of all bioactive molecules. Consequently, the extraction solvent must be chosen according to the chemical nature of the targeted bioactive compound [19].

In the analysis of *Ocimum americanum* var. *americanum* essential oil composition Shadia *et al.*, found 17 compounds with the major constituent being eugenol and methyl chavicol from Egyptian samples [10]. Carovic-Stanko *et al.*, reported E & Z isomers of citral (geranial and neral) as well as three monoterpenoid; geraniol, linalool and nerol as the major compounds in the essential oils of *O. americanum* var. *americanum* [21]. Sutli *et al.*, described 14 constituents from the *O. americanum* var. *americanum* essential oils with major compounds being linalool (33.54%), eugenol (18.23%), 1,8 cineole (12.89%) and camphor (12.52%) [12], while Mustafa & El-kamali showed that n-hexane extracts of aerial parts had a total of 22 compounds with alcohol (39.09%) and fatty acids (38.87%) as major constituents, monoterpenes and sesquiterpenes 7.94% and 4.08% respectively [20]. These variability in constituents composition may be due to geographical distribution, edaphic differences, phenology, species physiological stage and the solvents/extraction methods employed [22].

Pharmacological activities

Ocimum americanum var. *americanum* have been shown to possess antimicrobial activity [12, 18, 19, 21], antifungal activity [12, 18, 19], activity against acute gastric ulcer as well as gastric cytoprotective antiulcer effects [12], insecticidal and larvicidal activity [10] and wound healing effects [19]. *O. americanum* var. *americanum* has a range of pharmacologically active compounds in the form of essential oils. These include eugenol, methyl eugenol, flavonoids and polyphenols. Eugenol possesses a spectra of activities ranging from antimicrobial [23] and cytotoxic properties [24], as well as being an effective mosquito repellent [25, 26]. The antioxidant activities of the phenolics compounds have been reported from several species of genus *Ocimum* [27].

Bionanotechnology

Biogenic synthesis of metallic nanoparticles is a swiftly developing research area, owing to their non-toxicity and broad spectrum of applications in the field of biomedical technology [28, 29]. Zinc oxide nanoparticles (ZnONPs) have been found to have significant antimicrobial and antifungal activity [28]. Other reports have observed antibacterial, antifungal, antioxidant and antiproliferative activity from *Ocimum americanum* var. *americanum* silver nanoparticle (AgNPs) [29].

Larvicidal and repellent activity

Madhiyazhagan *et al.*, reported that methanolic leaf extracts of *O. americanum* var. *americanum* had repellent and larvicidal effects against dengue and malarial vectors [26].

Antibacterial effects

Carovic-Stanko *et al.*, observed that the volatile oil from *O. americanum* var. *americanum* had activity against *Enterococcus faecalis*, *Enterococcus faecium*, *Proteus vulgaris*, *Staphylococcus*

aureus and *Staphylococcus epidermis* with minimum inhibition concentration (MIC) values ranging from 200 to 500 ppm compared to six other taxa of the genus *Ocimum* [21]. Vidhya *et al.*, reported the effectiveness of aqueous extracts of *O. americanum* var. *americanum* exhibiting maximum inhibition against *Escherichia coli* (8 mm), *Bacillus cereus* and *Salmonella paratyphi* (7 mm) [18]. Minimum inhibition zone was observed against *Klebsiella pneumonia* (5 mm) using the disc diffusion method. However for agar diffusion method, maximum inhibition zone was reported against *Bacillus cereus* (11 mm) and *Escherichia coli* (10 mm) whereas minimum inhibition was observed against *Clostridium penfringens* (7 mm) [18].

Antifungal effects

The antifungal activity of volatile oils from the genus *Ocimum* was assessed against *Candida albicans*, *Candida tropicalis*, *Candida parapsilosis*, *Candida glabrata* and *Candida krusei* by the broth microdilution technique. *O. americanum* var. *americanum* demonstrated efficacy against *C. parapsilosis* (MIC 2500 $\mu\text{g mL}^{-1}$), *C. albicans* and *C. tropicalis* (MIC 5000 $\mu\text{g mL}^{-1}$) [30]. Vidhya *et al.*, demonstrated that *O. americanum* var. *americanum* aqueous extracts had maximum inhibition zone of 7 mm against *C. albicans* while maximum inhibition zone of 10 mm was observed against *Aspergillus niger* and *C. albicans* [18].

Antioxidants activity

Quantitative phytochemical studies demonstrated that aqueous extracts of *O. americanum* var. *americanum* showed significant radical scavenging activity. The aqueous extracts had high levels of phenolics compounds compared to other less polar solvents [19, 31]. *O. americanum* var. *americanum* essential oils are rich in bioactive compounds with antioxidants and immunomodulatory properties in animals. Subjects fed on linalool rich diets of essential oils showed higher SOD (superoxide dismutase) activity and additional antioxidants enzymes in different organ tissues. SOD is the major antioxidant enzyme in the catabolism of reactive oxygen species (ROS), eliminating superoxide (O_2^-) and averting the formation of ROS [12].

Antihypertensive effects

The high prevalence of hypertension can be associated with exposure to persistent stress, physical inertness, high Body Mass Index (BMI) and ageing [32]. Oxidative stress is also one of the risk factors for hypertension. Reactive oxygen species (ROS) are correlated with many cardiovascular risk factors, including hypertension [22]. Blood pressure elevation maybe correlated with nitric oxide (NO) deficit and alteration in several blood pressure regulation mechanisms. Graciano *et al.*, observed that chronic obstruction of NO synthesis can lead to endothelial dysfunction, substantial elevation in blood pressure, resulting in reno-cardiovascular systems injuries and subsequently aggravating hypertension [33]. Adjokè *et al.*, reported that chronic administration of oral doses of *O. americanum* var. *americanum* ethanolic extracts in rat significantly reduced the mean blood pressure (MBP), systolic blood pressure (SBP) and diastolic blood pressure (DBP) [34]. The reduction in blood pressure by the extracts maybe correlated to the control of oxidative stress accompanying the endothelial dysfunction. Consequently, the reduction of MBP maybe correlated to the flavonoids and phenolic acids identified in the ethanolic extracts. The extracts constituent, ferulic acid (phenolic compound) endowed with several physiological functions such as antioxidants, free radical scavenging activity, increased NO synthesis and vasodilatory effects could be associated with the antihypertensive

activity of the extract, while chrysin inhibits synthesis of superoxide and hydroxyl free radicals in enzymatic and nonenzymatic systems, resulting in better antioxidant status and effective decrease of blood pressure and lipid peroxides. Moreover, the blood pressure lowering effects of the extracts could be correlated to the response of balance between vasoconstriction and vasorelaxation of the vascular tree due to attenuation of renin-angiotensin system and elevated sympathetic innervation [34].

Toxicological effects

Essential oils of *O. americanum* var. *americanum* which are rich in phenolics have been shown to disrupt physiological membranes, leading to rupture and leakage of cytoplasmic contents [12]. Consequently, these plants extracts presents dual properties, both disruptive and protective on the plasma cells depending on their specific chemical nature and the level of stress the organism is undergoing [12].

CONCLUSIONS AND FUTURE DIRECTIONS

The present review has demonstrated that the genus *Ocimum* is a popular aromatic herb for culinary and in particular, ethnophytotherapy. Numerous scientific studies carried out on *O. americanum* var. *americanum* extracts validates its use in traditional medicine. However pharmacological studies aimed at validating its anecdotal efficacy against pain alleviation, diabetes, hypertension and pyrexia are certainly scanty. Lastly information on the acute, subacute and chronic toxicity of the extracts and essential oils is lacking, which is paramount in establishing the safety profile and validation of its local use.

REFERENCES

- Gurib-Fakim A, Mahomoodally MF. African flora as potential sources of medicinal plants: Towards the chemotherapy of major parasitic and other infectious diseases-a review. *Jordan Journal of Biological Sciences*. 2013; 6(2):77-84.
- Okigbo R, Mmeko EC. An appraisal of phytomedicine in africa. *KMITL Current Applied Science And Technology*. 2006; 6(2):83-94.
- WHO. WHO traditional medicine strategy: 2014-2023. In: WHO Press; 2013.
- Simon JE, Morales MR, Phippen WB, Vieira RF, Hao Z. Basil: A source of aroma compounds and a popular culinary and ornamental herb. *Perspectives on new crops and new uses*. 1999; (16) 499-505.
- Sarma DSK, Babu AVS. Pharmacognostic and phytochemical studies of *Ocimum americanum*. *Journal of Chemical and Pharmaceutical Research* 2011; 3(3):337-347.
- Pattnaik S, Chand PK. *In vitro* propagation of the medicinal herbs *Ocimum americanum* L. syn. *O. canum* Sims.(hoary basil) and *Ocimum sanctum* L.(holy basil). *Plant Cell Reports* 1996; 15(11):846-850.
- Kokwaro J. *Medicinal Plants of East Africa*. Third Edition. University Of Nairobi Press; 2009.
- Beentje H, Adamson J, Bhanderi D. *Kenya trees, shrubs, and lianas*. First Edition. National Museums of Kenya; 1994.
- Matasyoh JC, Bendera MM, Ogendo JO, Omollo EO, Deng AL. Volatile leaf oil constituents of *Ocimum americanum* L. occurring in Western Kenya. *Bulletin of the Chemical Society of Ethiopia* 2006; 20(1) 177-180
- Shadia E, El-Aziz A, Omer EA, Sabra AS. Chemical composition of *Ocimum americanum* essential oil and its biological effects against *Agrotis ipsilon* (Lepidoptera: Noctuidae). *Research Journal of Agriculture and Biological Sciences* 2007; 3(6):740-747.
- Paton A, Harley RM, Harley MM. *Ocimum-an overview of relationships and classification*. *Ocimum Aromat Plants-Industrial Profiles* Amsterdam Harwood Acad. Published online 1999.
- Sutili FJ, Velasquez A, Pinheiro CG, Heinzmann BM, Gatlin III DM, Baldisserotto B. Evaluation of *Ocimum americanum* essential oil as an additive in red drum (*Sciaenops ocellatus*) diets. *Fish and Shellfish Immunology* 2016; 56:155-161.
- Vieira RF, Grayer RJ, Paton AJ. Chemical profiling of *Ocimum americanum* using external flavonoids. *Phytochemistry*. 2003; 63(5):555-567.
- Hiltunen R, Holm Y. *Basil: The Genus Ocimum*. Harwood Academic Publishers, Amsterdam, 1999. 182 pp.
- Watt JM, Gerdinat M, Breyer-Brandwijk K. *Medicinal and poisonous plants of southern and eastern africa.*, Second Edition. E & S Lwinstone Ltd; 1962.
- Githinji CW, Kokwaro JO. Ethnomedicinal study of major species in the family Labiatae from Kenya. *Journal of Ethnopharmacology* 1993; 39(3):197-203.
- Kokwaro J. *Medicinal Plants of East Africa*. Second Edition. Kenya Literature Bureau; 1993.
- Vidhya E, Vijayakumar S, Rajalakshmi S, Kalaiselvi S, Pandiyan P. Antimicrobial activity and phytochemical screening of *Ocimum americanum* L extracts against pathogenic microorganisms. *Acta Ecologica Sinica* 2020; 40(3):214-220.
- Zengin G, Ferrante C, Gnapi DE, et al. Comprehensive approaches on the chemical constituents and pharmacological properties of flowers and leaves of American basil (*Ocimum americanum* L). *Food Research International* 2019; 125:108610.
- Mustafa A, El-kamali H. Chemical composition of *Ocimum americanum* In Sudan. *Research in Pharmacy and Health Sciences* 2019; 05:172-178.
- Carović-Stanko K, Orlić S, Politeo O, et al. Composition and antibacterial activities of essential oils of seven *Ocimum* taxa. *Food Chemistry* 2010; 119(1):196-201.
- Amoussa AMO, Sanni A, Lagnika L. Antioxidant activity and total phenolic, flavonoid and flavonol contents of the bark extracts of *Acacia ataxacantha*. *Journal of Pharmacognosy and Phytochemistry*. 2015; 4(2).
- Runyoro D, Ngassapa O, Vagionas K, Aligiannis N, Graikou K, Chinou I. Chemical composition and antimicrobial activity of the essential oils of four *Ocimum* species growing in Tanzania. *Food Chemistry*. 2010; 119(1):311-316.
- Tajo A, Thoppil J. Cytotoxic properties of *Ocimum americanum* L. 1998; 17 B:49-53.
- Chokechajaroenporn O, Bunyapraphatsara N, Kongchuensin S. Mosquito repellent activities of *Ocimum* volatile oils. *Phytomedicine*. 1994; 1(2):135-139.
- Madhiyazhagan P, Murugan K, Kumar AN, Nataraj T. Extraction of mosquitocidals from *Ocimum canum* leaves for the control of dengue and malarial vectors. *Asian Pacific Journal of Tropical Disease*. 2014; 4:S549-S555.
- Javanmardi J, Stushnoff C, Locke E, Vivanco J.M. Antioxidant activity and total phenolic content of Iranian *Ocimum* accessions. *Food Chemistry*. 2003; 83(4):547-550.
- Kumar HKN, Mohana NC, Nuthan BR, et al. Phyto-mediated synthesis of zinc oxide nanoparticles using aqueous plant extract of *Ocimum americanum* and evaluation of its bioactivity. *SN Applied Sciences*. 2019; 1(6):651.
- Manikandan DB, Sridhar A, Sekar RK, et al. Green fabrication, characterization of silver nanoparticles using aqueous leaf extract of *Ocimum americanum* (Hoary Basil) and investigation of its in vitro antibacterial, antioxidant, anticancer and photocatalytic reduction. *Journal of Environmental Chemical Engineering*. 2020; 10:4845.
- Vieira PRN, de Moraes SM, Bezerra FHQ, Ferreira PAT, Oliveira ÍR, Silva MG V. Chemical composition and antifungal activity of essential oils from *Ocimum* species. *Industrial Crops and Products*. 2014; 55:267-271.
- Aluko BT, Oloyede OI, Afolayan AJ. Polyphenolic contents and free radical scavenging potential of extracts from leaves of *Ocimum americanum* L. *Pakistan Journal of Biological Sciences*. 2013; 16(1):22-30.
- Halder R. Global Brief on Hypertension: Silent Killer, Global Public Health Crisis. *Indian Journal of Physical Medicine and Rehabilitation*. 2013 24(1) 2-2.
- Graciano ML, de Cassia Cavaglieri R, Dellê H, et al. Intrarenal renin-angiotensin system is upregulated in experimental model of progressive renal disease induced by chronic inhibition of nitric oxide synthesis. *Journal of the American Society of Nephrology*. 2004; 15(7):1805-1815.

34. Adjokè ARA, Olatounde AAM, Adamou R, Bonaventure A, Anatole L, Latifou L. UHPLC-DAD characterization of bioactive secondary metabolites from *Ocimum americanum* and *Pupalia lappacea* extracts: Antioxidant activity and antihypertensive effects on L-NAME-induced hypertensive rats. *Journal of Pharmacognosy and Phytotherapy*. 2019; 11(2):17-27.

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