

**PRELIMINARY PHYTOCHEMICAL SCREENING OF *CONYZA ALBIDA* AND *LEUCAS MARTINICENSIS* HERBS OF MASHONALAND PROVINCE, ZIMBABWE**

**Masimba Tapera<sup>1\*</sup>, Felix Tarwireyi<sup>2</sup> and Danisa Matebesi<sup>3</sup>**

<sup>1</sup>Department of Physical Sciences, Science Technology Division, Harare Polytechnic, Harare, Zimbabwe.

<sup>2,3</sup>Department of Life Sciences, Science Technology Division, Harare Polytechnic, Harare, Zimbabwe.

Article Received on  
07 Sept. 2017,

Revised on 28 Sept. 2017,  
Accepted on 19 Oct. 2017,

DOI: 10.20959/wjpps201711-10346

**\*Corresponding Author**

**Masimba Tapera**

Department of Physical  
Sciences, Science  
Technology Division,  
Harare Polytechnic, Harare,  
Zimbabwe.

**ABSTRACT**

Phytochemicals were extracted from *Conyza albida* and *Leucas martinicensis* using ethanol, acetone and ethyl acetate as extraction solvents. All the extracts were screened for flavanoids, steroids, saponins, glycosides, tannins and alkaloids using known methods. *Conyza albida* extracts were found to contain flavanoids, steroids, saponins, glycosides, tannins and alkaloids in all the three solvent extracts except for glycosides which were absent in the ethanol and acetone extracts. All the *Leucas martinicensis* extracts were found to contain flavonoids, steroids, saponins, glycosides, tannins and alkaloids. Only the acetone extract of *L. martinicensis* showed a negative result for steroids. The results revealed the presents of vital

phytochemicals in both herbs. The presents of these phytochemicals helps to explain the medicinal properties of these herbs. The herbs can be used as good sources of natural medicine and have potential applications in food, cosmetic, plastic and pharmaceutical industries. There is need for cultivation and preservation of the two herbs in Zimbabwe and abroad.

**KEYWORDS:** Herbs, Phytochemicals, Extracts, Medicine.

## BACKGROUND

Since long back, medicinal plants and their derivatives have been recognised as important sources of medicines.<sup>[8]</sup> Interest in plant derived substances has recently increased owing to their versatile applications. Medical plants have been reported to be the richest bio-resource of drugs, traditional medicines, modern medicines, pharmaceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities.<sup>[9]</sup> Medicinal properties of plants are largely depended on their phytochemical constituents. Phytochemicals are secondary metabolites of plants which possess medicinal properties. Phytochemicals are also considered to be non-nutritive plant chemicals that have protective or disease preventive properties.<sup>[12]</sup> There are many secondary metabolites and each works differently. These secondary metabolites as chemical compounds have complex structures with more restricted distribution than primary metabolites.<sup>[11]</sup> The most important secondary metabolites include alkaloids, glucosides, glycosides, steroids, flavonoids, fatty oils, phenols, resins, phosphorus and calcium for cell growth, replacement and body building.<sup>[9]</sup> According to estimates of the World Health Organization,<sup>[15]</sup> over 80% of the world population, especially in developing countries use traditional treatments to meet their health needs and primary health care. The present study focussed on two medicinal herbs found in Zimbabwe namely *Conyza albida* and *Leucas martinicensis*.

### *Conyza albida*

*Conyza albida* species is a member of annual or perennial herbaceous plants, rarely shrubs, growing up to 1-2 m tall. The stems are erect, branched, with alternate leaves. The flowers are produced in inflorescences, with several inflorescences loosely clustered on each stem. *Conyza albida* is amongst the most common and widespread weeds in Zimbabwe, found in undisturbed bushes, undisturbed sites such as road verges and contours in farming areas. *Conyza albida* is relatively palatable to livestock and native browsers. Since long back *Conyza albida* has been used as a traditional remedy for both clean and shallow septic wounds. It is believed to facilitate wound healing. Fig 1 below is a pictorial view of *Conyza albida* herb.



**Figure 1: *Conyza albida* herb.**

### ***Leucas martinicensis***

*Leucas martinicensis* is an erect annual herb, which grows up to 1m. *Leucas martinicensis* is found widely distributed in South America, West Indies and Africa.<sup>[4]</sup> It is found habitable in undisturbed places and exist as a weed in arable lands. This herb is found in grassy area as well as in waste land near habitation. Some reports suggest that *Leucas martinicensis* is usually found in the tropical parts of the world.<sup>[1]</sup> *Leucas martinicensis* is commonly used as a mosquito repellent due to its minty odour.<sup>[7]</sup> According to S. Muhammad, 2012,<sup>[7]</sup> the volatile oil from *Leucas martinicensis* was reported by a chemical study to be suitable for use in pharmaceuticals, cosmetic and food products such as lotions, creams, mosquito repellents, soaps, shampoos, rinses, gargles and candies. Antibacterial and antifungal properties have also been reported in *Leucas martinicensis*.<sup>[7]</sup> Most Zimbabweans commonly use the herb to treat stomach problems, diarrhoea and wounds. The plant is also well known for its medicinal value by the communities around Yabello town in Ethiopia, it's taken mainly to prevent diarrhoea.<sup>[7]</sup> Fig 2 below is a pictorial view of *Leucas martinicensis* herb.



**Fig 2: *Leucas martinicensis* herb.**

In spite of the various uses of *Conyza albida* and *Leucas martinicensis* in Zimbabwean herbal medicine, their phytoconstituents have not been fully documented. Only the phytochemical components of *Leucas martinicensis* that cause repellence of adult mosquito have been studied by S. Muhammad, 2012 in Nigeria.<sup>[7]</sup> However, According to Warring et al. (1985),<sup>[14]</sup> the chemical composition of plant species can differ significantly depending upon the prevailing conditions under which the plants grow. The chemical composition of wild plant species is also believed to differ depending on the rates at which the plants grow.<sup>[10]</sup> The present works aimed at extracting the active components from *Conyza albida* and *Leucas martinicensis* herbs of Mashonaland Province, Zimbabwe, detecting the presence of certain secondary metabolites from the herb extracts and better understand the pharmacodynamic properties of the extracts.

## MATERIALS AND METHODS

### Chemicals

All chemicals and reagents used in the experiments were analytical reagent grade procured from Skylabs (South Africa), Glassworld (South Africa) and Associated Chemical Enterprises (South Africa).

### Plant material

*Conyza albida* and *Leucas martinicensis* herbs were obtained from local forests and arable fields in Harare and Bindura. Both herbs were taken to Harare Polytechnic's Horticultural Section for identification and authentication. The herbs were thoroughly washed using clean water to remove dirt, dripped under sunlight, and shed dried for fourteen days in a dark room.

### Extraction of Phytochemicals

Extraction procedure was performed by the method described by Lekganyane MA, (2012).<sup>[6]</sup> The ground herbs (10g) were separately extracted with 100 ml of ethyl acetate, acetone and ethanol, using 500 ml conical flasks on a mechanical shaker for 24 hours. Extraction was performed three times per herb sample. The extracts were filtered through Whatman No. 1 filter paper into universal bottles. The solvents were driven off using a rotary evaporator to minimum quantity. The remaining solvents were evaporated by placing the filtrates under a fan. Extracts were dissolved in 10ml ethanol before tests were performed.

**Phytochemical Screening**

Chemical tests on methanol, ethanol and ethyl acetate extracts of both *Conyza albida* and *Leucas martinicensis* herbs were performed. Standard procedures to identify the constituents were used as described by Firdouse and Alam<sup>[3]</sup> and Uddin et al.<sup>[13]</sup>

**Test for flavonoids**

About 2ml of the extracts were mixed with concentrated sulphuric acid (1ml) and 0.5g of Magnesium separately. A pink or red coloration that appears on standing (3 min) indicates the presence of flavonoids.

**Test for steroids**

Each of the extracts (2ml) was dissolved in 2ml of acetic anhydride and 2ml of concentrated sulphuric acid was added. A colour change from violet to blue or green indicates the presence of steroids.

**Test for saponins**

The extracts (2ml) were shaken with an equal volume of water. A copious lather formation indicates the presents of saponins.

**Tests for glycosides**

To the extracts (1ml), 5% hydrochloric acid (1ml) was added. The mixture was boiled in a water bath and then filtered. The filtrate was shaken with an equal volume of chloroform and kept to stand for 5min. The lower chloroform was shaken with half of its volume with dilute ammonia. The formation of rose pink to red colour of the ammoniacal layer gives indication of glycosides.

**Test for tannins**

1ml of each of the extracts was added in 2ml of water in a test tube. 2 to 3 drops of diluted ferric chloride solution was added and observed for green to blue-green coloration.

**Test for Alkaloids**

The extracts (2ml) were mixed with a little amount of dilute sulphuric acid and Mayer's reagent. Formation of a white precipitate indicates the presence of alkaloids.

## RESULTS

Phytochemical screening results for *Conzya albida* and *Leucas martnicensis* are shown in Table 1 and Table II respectively.

**Table I: Phytochemical screening results for *Conzya albida*.**

Phytochemical	Ethanol extract	Acetone extract	Ethyl acetate extract
Flavonoids	+	+	+
Steroids	+	+	+
Saponins	+	+	+
Glycosides	-	-	+
Tannins	+	+	+
Alkaloids	+	+	-

**Key:** + indicates present, - indicates absent

**Table II: Phytochemical screening results for *Leucas martnicensis*.**

Phytochemical	Ethanol extract	Acetone extract	Ethyl acetate extract
Flavonoids	+	+	+
Steroids	+	-	+
Saponins	+	+	+
Glycosides	+	+	+
Tannins	+	+	+
Alkaloids	+	+	-

**Key:** + indicate present, - indicate absent

## DISCUSSION

Phytochemical screening was conducted with appropriate tests carried out to determine the presence of flavonoids, steroids, saponins, glycosides and tannins. For *Conzya albida* extracts, flavonoids, steroids, saponins, glycosides, tannins and alkaloids were found to be present in all the three solvents used. Only the acetone extract (*Conzya albida*) showed a negative result for glycosides. For *Leucas martinicensis* extracts, flavonoids, steroids, saponins, glycosides, tannins and alkaloids were also found to be present in all the three solvents used. However, the acetone extract of *L. martinicensis* showed a negative result for steroids. Ethanol and ethyl acetate have proved to be better solvents for extracting phytochemicals as compared to acetone.

## CONCLUSION

*Conzya Albida* and *Leucas martinicensis* herbs were screened for phytochemicals using simple laboratory tests. Six groups of phytochemicals were screened for in the two herb extracts. It was clearly established that *Conzya albida* and *Leucas martinicensis* herbs have a

number of phytochemicals. The availability of a significant number of phytochemicals in *Conyza albida* and *Leucas martinicensis* herbs that impart medicinal potential for alleviation of body disorders is clear evidence that the herbs could be an additional and superior source of natural medicine. Due to the presence of a number of phytochemicals, *Conyza albida* and *Leucas martinicensis* herbs have potential applications in food, cosmetic, plastic and pharmaceutical industries. There is need for preservation of *Conyza albida* and *Leucas martinicensis* herbs through cultivation and domestication.

### ACKNOWLEDGEMENTS

Authors appreciate research support from Harare Polytechnic Principal, Engineer Tafadzwa Mudondo. Authors also appreciate the practical role played by the following Applied Chemical Technology (HND) students at Harare Polytechnic: Blessing Mafurati, Ngoni Maposa, Wendy Matake, Pearlyshells Mudakureve, Moreblessing Nyamakope, Linia Mukani, Tinashe Dzirutsva and Memory Chipomho.

### REFERENCES

1. Brown R, *Linopodium Martinicensis*, J. Acqum, Enumeration System, 1960; 125.
2. Chidambara K, Vanitha A, Mahadeva M, Ravishankar G, Antioxidant and antimicrobial activity of *Cissusquadrangularis* L J. Med. Food, 2003; 36: 2.
3. Firdouse S, Alam P, Phytochemical investigation of extract of *Amorphophallus campanulatus* tubers. Int J Phytomed, 2011; 3: 32-35.
4. Hyde MA and Wurstem B, Flora of Zimbabwe, Information on *Leucas martinicensis*, 2009; 149300.
5. Idayat Shade Ijaiya, Samira Arzika, Musliu Abdulkadir, Extraction and Phytochemical Screening of the Root and Leave of *Annona Senegalesis* (Wild Custad Apple) , Academic Journal of Interdisciplinary Studies MCSER Publishing, Rome-Italy, 2014; 3(7): E-ISSN 2281-4612 ISSN 2281-3993.
6. Lekganyane MA, Matsebatlela TM, Howard RL, Shai LJ and MasokoP, The phytochemical, antibacterial and antioxidant activity of five medicinal plants against the wound infecting bacteria, African Journal of Biotechnology, 2012; 11(68): 13210-13219.
7. Nanna R, Talari S, Penchala S and Rudroju SC, Phytochemical screening and TLC studies of leaves and petioles of *Oroxylum indicum* (L.) Kurz an endangered ethno medicinal tree, Int. J. of Pharm. & Life Sci. (IJPLS), 2013; 2306-2313, 2306.

8. Ncube NS, Afolayan AJ and Okoh AL, Assessment techniques of antimicrobial properties of natural compounds of plantorigin: current methods and future trends. *African Journal Biotechnology*, 2008; 7(12): 1797-1806.
9. Poorter H, Bergkotte M, Chemical composition of 24 wild species differing in relative growth rate. *Plant Cell Environ*, 1992; 15: 221-229.
10. Muhammad S, Fatima A, Yahaya M, The Phytochemical Components of *Leucas Martinicensis* that Cause Repellence of Adult Mosquito, *International Journal of Modern Botany*, 2012; 2(1): 1-5.
11. Sabri Fatima Zohra, Belarbi Meriem<sup>1</sup>, Sabri Samira, Alsayadi Muneer, Phytochemical Screening and identification of some compounds from Mallow *J. Nat. Prod. Plant Resource.*, 2012; 2(4): 512-516.
12. Tapera M and Machacha S, Matrix Solid Phase Dispersion Extraction and Screening of Phytochemicals from *Dioscorea steriscus* Tubers of Mashonaland Central Province, Zimbabwe, *Der Chemica Sinica*, 2017; 8(1): ISSN: 0976-8505.
13. Uddin G, Rauf A, Siddiqui BS, Shah SQ, Preliminary comparative phytochemical screening of *Diospyros lotus* Stewart. *Middle-East. J Sci Res*, 2011; 1: 78-81.
14. Waring RH, McDonald AJS, Larson S, Ericson T, Wiren A, Differences in chemical composition of plants grown at constant relative growth rates with stable mineral nutrition. *J Oecologia*, 1985; 66: 157-160.
15. World Health Organization (WHO). Report of the Inter- Regional Workshop WHO on the use of traditional medicine in primary health care, Ulanbator-Mongolia: WHO, 2007; 82.