



Variation in phytochemical composition of *Chromolaena odorata* (L.) King and Robinson (Asteraceae) across climatic zone in Benin (West Africa)

Judicaël Dandjlessa^{a,*}, Bénédict Ezin^a, Fidèle M. Assogba^b, Norliette Zossou^a, Bienvenu Glinma^c, Eléonore Yayi Ladékan^{b,c}, Joachim D. Gbénou^b, Aliou Saïdou^d, Adam Ahanchede^a

^aUnité de Recherche en Malherbologie et Phytopharmacie, Faculté des Sciences Agronomiques, Université d'Abomey-Calavi, 01 BP : 526, Cotonou (Bénin)

^bLaboratoire de Pharmacognosie et des huiles Essentielles, Faculté des Sciences et Techniques, université d'Abomey-Calavi, 01 BP : 918 ISBA Cotonou (Bénin)

^cLaboratoire de Chimie Organique, Physique et de Synthèse, Faculté des Sciences et Techniques, Université d'Abomey-Calavi, 01 BP : 4521 Cotonou (Bénin)

^dUnité de Gestion Intégrée des Sols et des Cultures, Laboratoire des Sciences du Sol, Faculté des Sciences Agronomiques, Université d'Abomey-Calavi, 03 BP 2819 Cotonou (Bénin)

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ABSTRACT

Chromolaena odorata (L.) King and Robinson (Asteraceae) is a tropical shrub with interesting chemical potential widely used in agriculture and medical science and which can be affected by several geographic and climatic conditions. Therefore, we investigated the phytochemical composition of this plant across climatic zones in Benin. The plant material collected from different locations was phytochemically screened by staining and precipitation tests. The total phenolic, flavonoid and tannin contents were determined using the colorimetric method of Folin-Ciocalteu, the method of aluminum chloride and the method of vanillin, respectively, then the obtained data were subjected to analysis of variance. The phytochemical analysis revealed the presence of the main chemical groups such as alkaloids, free anthracene, coumarins, flavonoids, mucilage, tannins, reducing compounds, saponins, quinone derivatives, steroids. There was a significant difference ($P < 0.05$) in the phytochemical contents across geographical sites. In comparing the levels of phytochemicals among geographical locations, the raw material collected from the north climatic zone contained the highest phenolic and flavonoid contents, 147.59 ± 3.04 mg/g and 17.17 ± 0.31 mg/g, respectively, compared to others. Overall, the study highlighted the potential of *C. odorata* as source of natural products. There was no difference in the phytochemical markers whereas the phytochemical contents vary across climatic zones. These results can be of use in the development of biopesticides from the raw material of *C. odorata*.

1. Introduction

Siam weed, botanically referred to as *Chromolaena odorata* (L.) R. M. King and Robinson, is an invasive plant native to South America and widely distributed in the tropical regions of the world [1]. It is an allelopathic species used in many fields of activities, such as agriculture and phytotherapy, due to its chemical potential [2]. Allelopathy is a biological process by which a plant produces and releases biochemicals that

affect the growth, the development and the survival of other plants [3]. These chemical compounds are commonly called allelochemicals with either valuable or deleterious effects on target/receiver organisms [4]. Allelochemicals can be released by plants into environment by root exudates in soil, volatilization in air and decomposition of plant residues [5]. The Asian-West-African biotype of *C. odorata* is known to contain major allelochemicals such as alkaloids, tannins, flavonoids, saponins and phenolics [6]. These chemical

* Corresponding author.; e-mail: dandjlessa94@yahoo.com