Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 280-282
Received: 13-05-2019
Accepted: 15-06-2019

Daba Tine
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Alioune Dior Fall
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Serigne Ibra Mbacké Dieng
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Abdou Sarr
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Kady Diatta
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

William Diatta
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Emmanuel Bassene
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Correspondence
Serigne Ibra Mbacké Dieng
Department of Pharmacognosy and Botany, Faculty of Medicine, Pharmacy and Odontology, Cheikh Anta Diop University, Dakar, Senegal

Total polyphenols content and the antiradical activity leaves extracts of *Combretum micranthum* G. don harvested from different regions of Senegal (Diass, Sandiara and Essyl)

Daba Tine, Alioune Dior Fall, Serigne Ibra Mbacké Dieng, Abdou Sarr, Kady Diatta, William Diatta and Emmanuel Bassene

Abstract
This study examines the total polyphenol content and the antiradical properties of extract from *Combretum micranthum* leaves harvested in Diass, Sandiara in west-central Senegal and in Essyl in the south, during the rainy season versus the after-rainy season. The total polyphenol content expressed in tannic acid equivalent per 100 g of dry matter during the rainy season and the after-rainy season are respectively: Sandiara: 8.5 ± 1.31% vs 10.44 ± 2.19%; Essyl: 10.53 ± 4.6% vs 17.17 ± 0.73%; Diass: 13.57 ± 1.7% vs 16.37 ± 0.69%. The IC50 of Diass, Sandiara and Essyl leaf extracts are in rainy versus after-season periods respectively 117.83 ± 8.93 µg / ml vs 59.5 ± 4.13 µg / ml; 155 ± 4.6 µg / ml vs 119.9 ± 10.78 µl / ml; 150.5 ± 3.36 µg/ml vs 136.17 ± 6.54 µg / ml. The antiradical power is in favor of the after-rain season.

Keywords: *Combretum micranthum*, kinkéliba, antiradical activity, total polyphenols, harvest period

Introduction
Polyphenols are a family of organic molecules widely present in the plant kingdom. They are becoming increasingly important, particularly because of their beneficial effects on health. Indeed, their role as natural antioxidants that help fight against the damage caused by free radicals is attracting more and more interest in the prevention and treatment of certain diseases [1]. This role of shield to prevent the oxidation of cells, led us to study the relationship between the total polyphenols content and the antiradical activity of the leaves extracts of *Combretum micranthum* named locally kinkeliba, a plant widely used in traditional medicine in Senegal [2]. This plant is found throughout the country from north to south. This work aims to compare the samples collected at different sites: Diass and Sandiara (Thiés Region) in the center of the country and Essyl (Ziguinchor Region) in the extreme south. Two harvest periods were observed: in the rainy season (RS) and in the after-rain season (ARS).

Material and Methods
Plant Material
Series of harvests were carried out during the RS and ARS at the different sites: Sandiara: 2016 RS (July, August, September); ARS 2016-2017 (October, December, January); Diass: RS 2016 (July and September), ARS 2017 (January); Essyl: RS 2016 (August), **ARS** 2017 (January). The leaves are then dried in the shade and then reduced to powder. The water content is evaluated by loss on drying.

Polyphenol Content
The polyphenol content is estimated by the Folin-Denis method [3]. 20 g of leaf powder are extracted by decoction with three times 250 ml of ethanol for 15 min at 95 ° C. The extract thus obtained is completed to 1 liter and then diluted to 1/100. To 10 ml of this diluted solution is added 2 ml of the Folin-Denis reagent and 3 minutes later 2 ml of a saturated solution of sodium carbonate (Na_2CO_3). After centrifugation of the tubes for 4 minutes at 4000 rpm, reading of the absorbance is made at 670 nm.

DPPH Test
The determination of the antiradical activity by the DPPH test (2, 2-diphenyl-1-picrylhydrazyl) was carried out using the method of Molyneux [4].

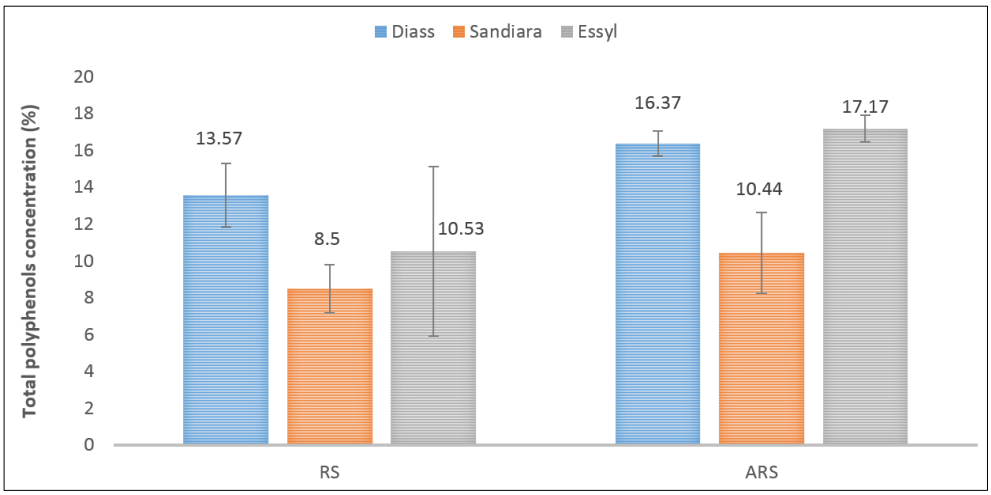
Prepare the DPPH$^{\bullet+}$ radical by dissolving 4 mg of the DPPH reagent in 100 ml of 95 ° ethanol. After complete dissolution, the solution is stored in the dark at 4 ° C for at least 16 hours. Measure the absorbance at 517 nm of the DPPH solution thus prepared before testing. If the absorbance value is over 1, make dilutions so that to obtain values under 1. It corresponds to the value of the absorbance at time To (A0). Prepare a stock solution of 250 µg / ml of each drug then a dilution series will be made to obtain the following concentrations: 250 - 125 - 62.5 - 31.25 - 15.62 - 7.81µg / ml. In each test tube containing 50 µl of extract at a given concentration, 950 µl of the previously diluted DPPH solution is added. Incubate the tubes for 30 minutes, protected from light and at room temperature. Measure the absorbances at 517 nm. The determination of IC50 (concentration of extract required to trap 50% of free radicals) is performed using the Statgraphics software.

Statistical Analyzes

Significance tests are performed by the Fisher test using the Stat View software. A value of $p<0.0001$ is considered statistically significant.

Results

The total polyphenol contents expressed in tannic acid equivalent per 100 g of dry matter (TDS / 100 g) during the RS versus the ARS are respectively: Sandiara 8.5 ± 1.31% vs 10.44 ± 2.19%; Essyl 10.53 ± 4.6% vs 17.17 ± 0.73%; Diass 13.57 ± 1.7% vs 16.37 ± 0.69% (see Figure 1).

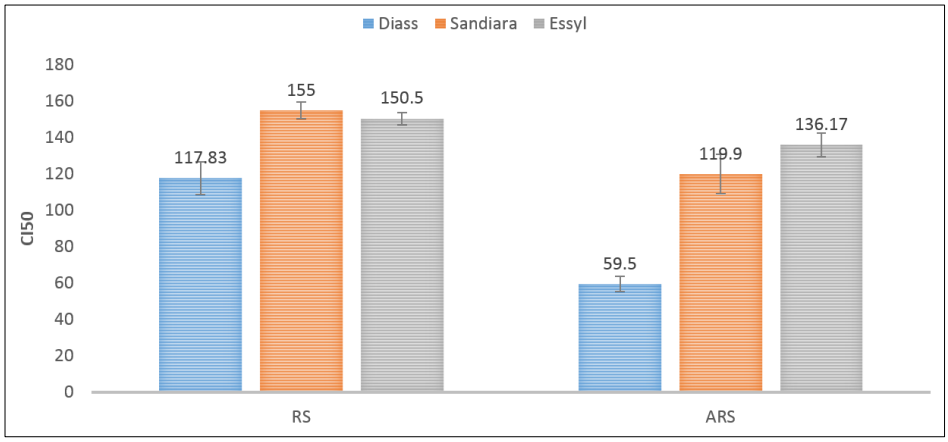


RS: Rainy season; **ARS:** After Rainy Season

Fig 1: Variation of total polyphenol content according season in Diass, Sandiara and Essyl.

The polyphenol concentrations of the different samples is obtained from the equation of the regression line of the tannic acid standard curve: y = 47.433x - 0.0158; R2 = 0.9911.

The IC50 of the leaves harvested in Diass, Sandiara and Essyl during the RS versus the ARS are respectively 117.83 ± 8.93 µg / ml vs 59.5 ± 4.13 µg / ml; 155 ± 4.6 µg / ml vs 119.9 ± 10.78 µl / ml; 150.5 ± 3.36 µg / ml vs 136.17 ± 6.54 µg / ml (see Figure 2).



RS: Rainy Season; **ARS:** After Rainy Season.

Fig 2: Evaluation of the IC50 of DPPH on *C. micranthum* leaves extracts acording to season in Diass, Sandiara and Essyl.

Discussions

According to Bidie *et al*. [5], any biological activity is a function of the presence of certain metabolites within the tissues of the plant. Thus they showed that *Distemonanthus benthamianus*, *Chrysophyllum perpulchrum*, *Mitragyna ciliata*, *Trichilia prieuriana*, *Sherboumia bignoniifollia*, *Parquetina nigrescens*, *Ageratum conyzoides* and *Millettia zechiana* contain polyphenols and flavonoids, metabolites responsible for antioxidant and antiradical activity. They found that the two plants with the highest levels of total phenols: *Chrysophyllum perpulchrum* (74.08 ± 1.8 mg / g) and *Distemonanthus benthamianus* (70.17 ± 0.84 mg / g) had the strongest antiradical activities expressed in IC50 which are respectively 4.00 ± 0.288 µg / ml and 4.50 ± 0.288 µg /

ml). The results obtained with *Millettia zechiana* and *Ageratum conyzoides* with IC50 respectively equal to 96 ± 0.577 µg / ml and 76 ± 0.577 µg / ml, are closer to those obtained for kinkeliba leaves; with total polyphenol contents below 30 mg / gms. Similarly, a correlation between total phenol contents and antiradical activity has been shown by Hatano *et al*. [6], and later by Chen and Ho [7]. According to the latter the functional groups present in phenolic compounds in general can easily give up an electron or a proton to neutralize free radicals.

Conclusion

This study will allow us to choose the best period of harvesting kinkeliba leaves so to enjoy the benefits of antioxidant properties of their high polyphenols level.

Reference

1. Bensakhria A. Toxicologie Générale; chapitre IX: *Stress oxydatif*, université Alger, 2018.
2. Kerharo J, Adam JG. La pharmacopée sénégalaise traditionnelle. Plantes médicinales et toxiques. Ed. VIGOT et Frères, PARIS, 1974.
3. Hua-Bin Li, Ka-Wing Cheng, Chi-Chun Wong, King-Wai Fan, Feng Chen, Yue Jiang. Evaluation of antioxidant capacity and total phenolic content of different fractions of selected microalgae. Food Chem. 2007; 102:771-776.
4. Molyneux P. The use of the stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity. Songklanakarin J Sci. Technol. 2004; 26(2):211-219.
5. Bidie AP, N' Guessan BB, Yapo AF, N'Guessan JD, Djaman AJ. Activités antioxydantes de dix plantes médicinales de la pharmacopée ivoirienne. Sciences et Nature. 2011; 8(1):1-11.
6. Chen CW, Ho CT. Antioxidant properties of polyphenols extracted from green tea and black tea. J Lipids. 1995; 2:35-46.
7. Tsutomu Hatano, Rei Edamatsu, Midori Hiramatsu, Akitane MORI, Yuzaburo Fujita, Taeko Yasuhara *et al*. Effects of the Interaction of Tannins with Co-existing Substances. VI. Effects of Tannins and Related Polyphenols on Superoxide Anion Radical, and on 1, 1-Diphenyl-2-picrylhydrazyl Radical, Chem. Pharm. Bull. 1989; 37(8):2016-2021.