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POSITIVE IMPACTS OF "MERVO CINNAMON LEMON TEA" FROM THE COMPANY "LES GOUTS DE PENIELLE" ON HEALTH

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ABSTRACT

Spices are classified among the medicinal plants that are used in small quantities in cuisine as conservatives, flavoring or colorant and also for its medicinal values. The aim of this study is the estimation in vitro of the anti-oxidant, anti diabetic and anti fungal properties of the aqueous extracts obtained from the constitutive spices mixed in MERVO TEAS. Those spices studied are *Zingiber officinal* (Ginger), *Cinnamomum verum* (Cinnamon), *citrus limon* (Lemon) and *Syzygium aromaticum* (Clove). In order to succeed in this valuation, a phyto-chemical screening of an aqueous extract of the tea and each of its components has been realized; the aqueous extract as infusion of the components to study. The qualitative analysis of the extracts has revealed the richness of these spices in polyphenols, in flavonoids, in alkaloids and in reducing compounds. The different extracts of spices have shows some good anti-oxidant properties. These results show that the consumption of spices rich in anti-oxidants like cinnamon, ginger and clove can significantly prevent several diseases like cancer, cataract, acute respiratory distress syndrome, as well as accelerated aging. So, the MERVO TEAS represent an excellent source of anti-oxydants.

KEYWORDS: Spices, MERVO TEAS, polyphenols, flavonoids, anti-oxidant activity, anti fungal activity.

INTRODUCTION

Medicinal plants represent the first source of raw materials essential for the discovery of news molecules necessary to the production of future medicines.[1] Resting sometimes on an empirical approach, the biological properties of plants and natural substances they contain, are actually the object of many works.[2]

The spices are classified among the medicinal plants, these spices are parts of aromatic plants with strong flavor. Spice is a « substance of plant origin, aromatic or piquant, used to sweet en food »; the condiment is a: « substance with strong flavor destined to raise the taste of aliments », aromatics are: « odorous substance of plant origin » and seasoning is an: « action, a way to accommodate a food with ingredients » ([3]; [4]). Spices contain many active ingredients which are widely used in therapeutics, as preventive anti-oxidants agents, antimicrobial, anti-inflammatory.[5]

Spices are used in small quantities in cookery as conservatives, seasoning or colorant. A large number of them were formerly employed in medecine.

Several authors have studied the virtues of spices in Africa, highlighting their medicinal and culinary properties. For example, Mohammed Ibn Al-Baytar (1197-1248), a botanist and pharmacologist, conducted extensive research on medicinal plants, including African spices. Ibn al-Qayyim (1292-1350), an Arab philosopher and physician, wrote about the use of spices in traditional medicine. Additionally, Jean-Baptiste Du Tertre (1610-1687), a French missionary and naturalist, spent several years in the Caribbean, where he studied medicinal plants, including African spices introduced to the region by slaves. Finally, Fernand Lamaze (1891-1957), a French anthropologist and physician, conducted research on medicinal plants in West Africa, including spices. These authors have provided valuable insights into the virtues of African spices, highlighting their role in the health and culinary culture of the region.

Spices contain numerous benefits for cuisine and agri-food, as well as active principles or secondary metabolites widely used in therapeutics as preventive antioxidants, anti-

inflammatory, anticancer (turmeric), anti diabetic (cinnamon), etc. The cosmetic industry also utilizes spices for their antiseptic, antioxidant, and fragrant properties.([6] ; [7] ; [8] ; [9]).

Various spice blends are used in gastronomy and therapy. "Mervo cinnamon lemon teas" are one such therapeutic blend traditionally prepared and expanding in Benin and especially in the North. The spices used in this blend include cinnamon, ginger, cloves, and dried lemon. As these spices are widely used in Africa, specifically in Benin, it would be beneficial to introduce consumers to another use of spices for human health. This aligns with our overall objective, which is the POSITIVE IMPACTS OF "MERVO CINNAMON LEMON TEA" FROM THE COMPANY "LES GOUTS DE PENIELLE" ON HEALTH.

Specifically, it will involve

- Conducting a phyto chemical screening of the "Mervo cinnamon lemon tea"
- Studying the results of the analysis
- Studying the impacts of this tea on health.

I- MATERIALS AND METHODS

1.1.Plant Material

For our study, we used dried and ground cinnamon sticks, dried ginger, dried cloves, and ground dried lemon.

1.2.Chemical Material

Concentrated hydrochloric acid (HCl) and diluted to 2M; Ferric chloride (FeCl3) at 1% and 3%; STIASNY reagent; Sodium acetate (CH3COONa); Magnesium powder; 96° ethanol; 2% sulfuric acid (H2SO4); 10% sodium hydroxide (NaOH); Fehling's solution; Dragendorff reagent; Wagner's reagent.

1.3.Sampling

The production of Mervo cinnamon lemon teas follows very strict steps.

- Cinnamon and cloves are purchased from a spice vendor at the Parakou Depot market. Visually inspected, we detect any mold or discoloration beforehand.
- Ginger, on the other hand, is purchased in Atacora, Benin, from ginger producers. Visually inspected, we detect any mold, rot, or possible discoloration beforehand. They are then washed, cleaned, and dried by us.

- Lemons are harvested at the producer's residence, who has lemon trees. Washing, cutting, and drying are also done by us.

The composition of "Mervo cinnamon lemon tea" is very strict. The tea bag of cinnamon lemon tea consists of.

- 1g of ground Ceylon cinnamon
- 1g of ground dried lemon
- 1/2g of ground cloves
- 1/2g of ground ginger.

The ginger and lemon were sun-dried for three days and stored in previously cleaned and dried plastic jars before packaging.

After selecting our raw materials, we dry and grind them finely.

1.4.Analytical Methods

"Mervo cinnamon lemon tea" is obtained by infusion in warm water, 150ml per tea bag. We made an infusion of this tea to obtain the mother solution used for all analyses. The presence of tannins (catechins and gallates), flavonoids, alkaloids, and reducing compounds was analyzed.

Table 1: Experimental protocol for the presence or absence of polyphenols, tannins, alkaloids, flavonoids, and reducing compounds.

Classes of active ingredients		Specific reagents and reactions
Polyphenols		$FeCl_3$ at 1%: intense green, purple, blue, or black colorations depending on the extract.
Tannins	Catechic tannins	- Stiasny reagent: pink precipitate
	Gallic tannins	- Saturation of Na+ acetate with a few drops of 1% $FeCl_3$: blue or black hue
Alkaloids		- Dragendorff (potassium iodobismuthate): red precipitate - Wagner (iodine and potassium iodide): formed brown color
Flavonoids		- Shinoda (reaction to cyanidine): coloration - NaOH: Coloration that disappears upon addition of a few drops of diluted acid
Reducing compounds		Hot Fehling's solution: brick-red precipitate

II- RESULTS AND DISCUSSIONS

Phytochemical investigations conducted on the four (04) spices and their mixtures have identified certain chemical compounds (bioactives).

Indeed, polyphenols and tannins were not identified in the aqueous extract of lemon. Moreover, no presence of alkaloids was found in the aqueous extract of lemon and cloves.

However, a strong presence of gallic tannin was noted in the aqueous extract of cloves.

As for the aqueous extract of tea, the tests reveal a strong presence of polyphenols, reducing compounds, flavonoids, catechin and gallic tannins, and alkaloids.

Table 2: Results of tests effected.

		Cinnammonbark *(Cinnamom-umverum)*	**Clove *(Syzygiumar-omaticum)***	**Ginger root (*Zinziger officinale)***	**Lemon *(Citrus limon L.)***	**MERVO TEA**
Polyphenols		++	++	++	--	++
Tannins	Catechic tannins	++	--	++	--	++
	Gallic tannins	--	++	--	--	++
Flavonoids		++	++	++	++	++
Alkaloids		++	--	++	--	++
Reducting compounds		++	++	--	++	++

Positive test (+) ; Negative test (-)

The literature has reported several studies on the phytochemistry of cinnamon.[10], in their work on the antimicrobial activity of cinnamon, indicated an absence of phenolic compounds in the aqueous extract. Our study showed that these phenolic compounds such as tannins and flavonoids could be extracted by infusing cinnamon bark.

Furthermore,[11], in the hot aqueous extract of ginger root, showed the presence of reducing compounds, unlike our extract.

The variation of different major chemical compounds in phytochemical studies of plants, spices could be explained by biological and environmental factors. These factors can influence the genetic variability and production of secondary metabolites of a given species[12], leading to plants of different chemical composition and sometimes different uses depending on the collection region.[13]

Furthermore, the type of extraction, duration, nature of solvent, and temperature quantitatively and qualitatively affect the composition of secondary metabolism in an extract.[14]

The mixture of these different spices presents an advantage. Indeed, a strong presence of polyphenols, reducing compounds, flavonoids, catechin and gallic tannins, and alkaloids has been reported in the blend. This presence could be due to a synergistic effect of the composition of each of the spices.

The "Mervo cinnamon lemon tea," which is expanding in the Northern region of Benin and consists of four spices (cinnamon, dried lime, cloves, ginger), would have beneficial biological properties for health; properties related to the presence of certain major chemical compounds (bioactives) such as polyphenols, reducing compounds, flavonoids, catechin and gallic tannins, and alkaloids; specifically triple antioxidant properties, antidepressant properties, beneficial properties for the human brain, anti-cardiac properties, and significantly reducing oxidative stress.

CONCLUSION

Medicinal plants are an endless source of substances and bioactive compounds known for their therapeutic properties.

The valorization of the Mervo tea mixture consisting of *Zingiber officinale* (Ginger), *Cinnamomum verum* (Cinnamon), *Citrus limon* (lemon), and *Syzygium aromaticum* (clove) is the ultimate goal of this work, which consisted of studying the physico-chemical and biological characteristics of said mixture.

The separation of chemical substances from the extract prepared by infusion technique, and the phytochemical screening tests performed show that the ingredients are rich in phenolic compounds, including primarily: flavonoids, tannins, and are also rich in antioxidants.

The results of the present study show that the consumption of spices rich in antioxidants such as cinnamon, ginger, and cloves can significantly prevent oxidative stress.

Thus, Mervo teas represent an excellent source of antioxidants.

In conclusion, given that our country has immense biodiversity, each plant is characterized by a significant reservoir of secondary metabolites with particular therapeutic and pharmacological characteristics that require exploration through research. It is also proposed to direct scientific research towards conducting in-depth and complementary studies of the biological activities of plants (essential oils, polyphenolic compounds, and flavonoids) in

general and to open avenues in understanding the structure-activity relationship in particular, in order to determine new natural bioactive substances that can address various health problems and serve as an alternative to synthetic drugs.

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