



Inhibitory Actions of a Medicinal Plants' Extract on SARS-CoV-2 and COVID-19

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Abstract: Background: We reported in a previous investigation the possible exploration of the use of the alcohol extract of a combination of *Garcinia kola* seeds and *Zingiber officinale* leaves as a potential therapeutic application for COVID-19 (Adejuwon *et al.* (2020). *Advances in Bioscience and Bioengineering*, Infinity Press Volume 8, Number 2). **Investigation:** 150g each of *Philenoptera cyanescens* roots, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, 200g each of *Ageratum conyzoides* leaves, *Moringa oleifera* leaves were ground. 500 ml each of *Citrus aurantiifolia* juice and honey was added. These were soaked in 1Litre of absolute alcohol (Sigma-Aldrich) and left overnight for 24 hr. The extract was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30°C under low vacuum pressure and low evaporation. 50ml of the extract was given orally to fifty (males n = 20, females n = 30) human subjects including five female patients diagnosed with stage 1b cervical carcinoma. The fifty subjects were diagnosed positive for SARS-CoV-2 using Real-Time Reverse Transcriptase (RT)-Polymerase Chain Reaction. Oral application was immediately after meal on a daily basis for a period of ten days. **Observation:** Symptoms of acute respiratory syndrome reduced in all fifty subjects within six days of oral application of extract. All subjects tested negative for SARS-CoV-2 after the tenth day. **Conclusion:** The concentrated alcohol extract of a combination of *Philenoptera cyanescens* roots, *Ageratum conyzoides* leaves, *Moringa oleifera* leaves, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, *Citrus aurantiifolia* juice and honey have SARS-CoV-2 and COVID-19 inhibitory effects even on certain adult females with stage 1b cervical carcinoma.

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Keywords: COVID-19; SARS-CoV-2; Medicinal Plants; Cervical Carcinoma

1. Introduction

COVID-19 caused by SARS-CoV-2 has become pandemic [1]. It was first discovered in Wuhan, China [1]. Till date, no vaccine nor curative has been discovered to be effective on SARS-CoV-2/COVID-19 [2]. Mortality caused by COVID-19 in Nigeria, West Africa has not been as high as observed in the United States of America [3, 4, 5]. The need to discover and develop a vaccine and curative for SARS-CoV-2/COVID-19 has now become imperative.

In this investigation, a concentrated alcohol extract of a combination of *Philenoptera cyanescens* roots, *Ageratum conyzoides* leaves, *Moringa oleifera* leaves, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, *Citrus aurantiifolia* juice and honey was given orally to fifty human subjects including five females with stage 1b cervical carcinoma with the view to determining its SARS-CoV-2/COVID-19 inhibitory effect.

2. Materials and Methods

Identification of Samples for Research

Philenoptera cyanescens roots, *Ageratum conyzoides* leaves, *Moringa oleifera* leaves, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, *Citrus aurantiifolia* juice and honey were bought from Oje Market, Ibadan, Nigeria. They were identified in the Herbarium of the Department of Botany, University of Ibadan, Ibadan, Nigeria by Professor Taiye R. Fasola of the same department. The roots, stems and leaves were stored in air-tight containers for analysis. The honey and juice were kept at -10°C in a refrigerator until needed for analysis.

Extraction Using Alcohol

A combination of 150g each of *Philenoptera cyanescens* roots, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, 200g each of *Ageratum conyzoides* leaves, *Moringa oleifera* leaves were ground. 500 ml each of *Citrus aurantiifolia* juice and honey was added. These were soaked in 1 litre of absolute alcohol (Sigma-Aldrich) and left overnight for 24 hr. The extract was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30°C under low vacuum pressure and low evaporation [6].

Study Population

The study population spanned one hundred adult individuals within the age range of 25 years – 65 years in Ibadan metropolis, Ibadan, Nigeria, West Africa. Five of the patients (females, within the age range of 60 years – 65 years) were diagnosed with stage 1b cervical carcinoma at the Department of Obstetrics

and Gynaecology, University College Hospital, Ibadan, Nigeria. All the one hundred patients were diagnosed positive for SARS-CoV-2 at the University College Hospital, Ibadan, Nigeria Diagnostic Centre using the Real-Time Reverse Transcriptase (RT)-Polymerase Chain Reaction [7].

Anti-SARS-Cov-2 Activity

Fifty (50) adult human subjects (including the five female patients with stage 1b cervical carcinoma) (males n = 20, females n = 30) diagnosed positive for SARS-COV-2 using Polymerase Chain Reaction participated in this research investigation after obtaining their consent and ethical approval from the University College Hospital Research Committee. 50ml of extract was given orally to the human subjects immediately after meal on a daily basis for a period of ten days. Thereafter, their blood samples were collected and assayed for the presence of SARS-Cov-2 using the Real-Time Reverse Transcriptase (RT)-Polymerase Chain Reaction.

3. Results

All the fifty (50) human subjects (including certain five adult female patients diagnosed with stage 1b cervical carcinoma), who participated in this research study, diagnosed positive for SARS-CoV-2, were administered the plants' extract for the period of ten days. All subjects tested negative for SARS-CoV-2 after the tenth day of administration of the plants' extract.

4. Discussion

COVID-19 caused by SARS-CoV-2 has become pandemic [2]. The adventure into the discovery of a curative and vaccine has become an herculean task [8, 9]. In this recent investigation, we have discovered that the concentrated alcohol extract of the combination of *Philenoptera cyanescens* roots, *Ageratum conyzoides* leaves, *Moringa oleifera* leaves, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, *Citrus aurantiifolia* juice and honey have SARS-CoV-2/COVID-19 inhibitory effects even on certain adult females with stage 1b cervical carcinoma.

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Publons:

<https://publons.com/researcher/1487222/adekunle>

References

1. Wikipedia (2020a). *Coronavirus Disease 2019*. Wikipedia, 2020. https://en.wikipedia.org/wiki/Coronavirus_disease_2019 Retrieved 9th July, 2020.
2. World Health Organization (WHO) (2020). *Coronavirus Disease (COVID-19) Outbreak*. World Health Organization, 2020. https://www.who.int/health-topics/coronavirus#tab=tab_1 Retrieved 9th of July, 2020.
3. Nigerian Centre for Disease Control (CDC) (2020). *Nigerian Centre for Disease Control: Protecting the Health of Nigerians. First Case of Corona Virus Confirmed in Nigeria*. Nigerian Centre for Disease Control, Nigeria, 2020. <https://ncdc.gov.ng/news/227/first-case-of-corona-virus-disease-confirmed-in-nigeria> Retrieved 9th of July, 2020.
4. Wikipedia (2020b). *COVID-19 Pandemic in Nigeria*. Wikipedia, 2020. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Nigeria Retrieved 9th of July, 2020.
5. Wikipedia (2020c). *COVID-19 Pandemic in the United States*. Wikipedia, 2020. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_States Retrieved 9th of July, 2020.
6. Adejuwon, A.O., Obayemi, O.S., Odeleye, O.D. and Tsygankova, V.A. (2020). COVID-19 in Nigeria, West Africa: An update. *Advances in Bioscience and Bioengineering (Edgecliff, New South Wales, Australia)* 8(2): 1-12.
7. Wang, W., Xu, Y., Gao, R., Lu, R., Han, K., Wu, G. and Tan, W. (2020). Detection of SARS-CoV-2 in different types of clinical specimens. *JAMA* 323(18): 1843-1844. <https://jamanetwork.com/journals/jama/fullarticle/2762997> Retrieved 9th of July, 2020.
8. Wikipedia (2020d). *COVID-19 Vaccine*. Wikipedia, 2020. https://en.wikipedia.org/wiki/COVID-19_vaccine Retrieved 9th of July, 2020.
9. Bergman, S.J., Cennimo, D.J., Miller, M.M. and Olsen, K.M. (2020). Treatment of coronavirus disease 2019 (COVID-19): Investigational drugs and other therapies. *Medscape* 2020. <https://emedicine.medscape.com/article/2500116-overview> Retrieved 9th of July, 2020.

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