



## A Medicinal Plant's Extract Effective on Tuberculosis in Cases of Neoplastic Transformation in Tropical Nigeria

Adekunle Odunayo Adejuwon <sup>1,2,3,4,5\*</sup>, Victoria Anatolyivna Tsygankova <sup>6</sup>, Marina V. Donova <sup>7</sup>, Olaleke Odeleye <sup>8</sup>

<sup>1</sup> Department of Biological and Chemical Sciences, Faculty of Natural and Applied Science, Atiba University, Oyo, Nigeria

<sup>2</sup> Office of the Dean, Faculty of Health Sciences, Atiba University, Oyo, Nigeria

<sup>3</sup> National Research Foundation of Ukraine (NRFU), Maksymovych Scientific Library of The Taras Shevchenko Kyiv National University Kyiv, Volodymyrska Street 58, Office Number 38 Ukraine, East Europe, <sup>4</sup>The European Science Foundation College of Expert Reviewers (The European Union (EU)); and The European Science Foundation College of Review Panel Members (The European Union (EU)), Offices: 1, Quai Lezay-Marnésia - BP 90015, 67008 Strasbourg Cedex, France, Western Europe

<sup>5</sup> Medwave Company Limited, Istanbul, Istanbul Province, Republic of Turkey, Southeastern Europe/Western Asia

<sup>6</sup> Department for Chemistry of Bioactive Nitrogen-Containing Heterocyclic Compounds, Institute of Bioorganic Chemistry and Petrochemistry of the National Academy of Sciences of Ukraine, 1, Murmanskaya Str., 02660, Kyiv, Ukraine

<sup>7</sup> G.K. Skryabin Institute of Biochemistry and Physiology of Microorganisms of the Russian Academy of Sciences, Pushchino, 5, 142290, Moscow, Russian Federation, East Europe

<sup>8</sup> Department of Microbiology, Lead City University, Ibadan, Nigeria

### Corresponding Author:

Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), Department of Biological and Chemical Sciences, Faculty of Natural and Applied Sciences, Atiba University, Oyo, Nigeria; and The Office of the Dean, Faculty of Health Sciences, Atiba University, Oyo, Nigeria; And Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws) (Voluntary International Referee – Professor of Microbiology), National Research Foundation of Ukraine (NRFU), Maksymovych Scientific Library of The Taras Shevchenko Kyiv National University Kyiv, Volodymyrska Street 58, Office Number 38 Ukraine, East Europe; Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), The European Science Foundation College of Expert Reviewers (The European Union (EU)); and Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), The European Science Foundation College of Review Panel Members (The European Union (EU)), Offices: 1, Quai Lezay-Marnésia - BP 90015, 67008 Strasbourg, Cedex, France, Western Europe

e-mail address: [ao\\_adejuwon@yahoo.ca](mailto:ao_adejuwon@yahoo.ca)

ORCID Identifier: <https://orcid.org/0000-0001-9404-874X>

Loop Profile: 1019729, <https://loop.frontiersin.org/people/1019729/overview>

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

**Abstract: Background:** Infection with tuberculosis is rampant in the tropics especially in crowded environments. It is also a nosocomial disease that can be managed if detected early. **Investigation:** 500g each of *Ocimum gratissimum* L. leaves, bark of *Psidium guajava* L., bark of *Psychanthus angolensis* (Welw) warb and leaves of *Spondias mombin* L. were ground and added to 2L of 95% alcohol (Sigma-Aldrich). The extract was 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 concentrated extract was given orally to twenty human subjects (n= 10 males; n=10 females) with neoplastic transformation diagnosed with tuberculosis at the General Out-Patient clinic of the University College Hospital, Ibadan, Nigeria. Oral application of extract to subjects was immediately before meal on a daily basis for a period of ten days. **Observation:** All subjects tested negative for tuberculosis within a period of fifteen days after end of therapy. **Conclusion:** The concentrated alcohol extract was effective on tuberculosis.

[Adekunle Odunayo Adejuwon , Victoria Anatolyivna Tsygankova, Marina V. Donova, Olaleke Odeleye. **A Medici**

**nal Plant's Extract Effective on Tuberculosis in Cases of Neoplastic Transformation in Tropical Nigeria 2021;** 11(2):106-108]. ISSN:2150-1041 (print); ISSN:2150-105X (online). [http://www.cancerbio.net\\_3](http://www.cancerbio.net_3). doi:10.7537/marscbj110221.03.

**Keywords:** *Ocimum gratissimum* L.; *Psidium guajava* L.; *Psychanthus angolensis* (Welw); *Spondias mombin* L.; Leaves; Root bark; Alcohol extract; Tuberculosis; Neoplastic transformation

## 1. Introduction

Tuberculosis is caused by the bacterium *Mycobacterium* [1]. It is rampant in the tropics especially Nigeria whenever we have a crowded environment [2]. It is mainly presently predominant in the Nigerian rural setting [3] and is an indicator disease for HIV/AIDS [4]. Plants of medicinal value are used locally in Nigeria, West Africa for the treatment of tuberculosis [5].

In this investigation, a concentrated alcohol extract of *Ocimum gratissimum* L. leaves, bark of *Psidium guajava* L., bark of *Psychanthus angolensis* (Welw) warb and leaves of *Spondias mombin* L. was given orally to twenty adult human subjects diagnosed with tuberculosis. This was with the view to determining the extract's potential on *Mycobacterium* in the subjects.

## 2. Materials and Methods

### Identification of Plant Sample

*Ocimum gratissimum* L. leaves, bark of *Psidium guajava* L., bark of *Psychanthus angolensis* (Welw) warb and leaves of *Spondias mombin* L. were sourced and obtained at the environ of the University of Ibadan, 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. They were kept in cellophane bags at room temperature prior to start of analysis.

### Preparation of Extract

500g each of *Ocimum gratissimum* L. leaves, bark of *Psidium guajava* L., bark of *Psychanthus angolensis* (Welw) warb and leaves of *Spondias mombin* L. were ground and added to 2L of 95% alcohol (Sigma-Aldrich). The extract was 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 included twenty adult individuals (n= 10 males; n=10 females) with neoplastic transformation within the age range of 25 years – 50 years within Ibadan metropolis, Ibadan, Nigeria diagnosed with tuberculosis at the Medical Out-Patient Unit of the University College Hospital, Ibadan, Nigeria. All the patients presented cough and weight loss.

## Oral Application of Extract

Twenty (20) adult human subjects with neoplastic transformation diagnosed with tuberculosis participated in this research investigation. Their consent to participate in the investigation was obtained after ethical approval from the University College Hospital Research Committee. 100ml of the concentrated extract was given orally to the twenty subjects. Oral application of extract to subjects was immediately before meal on a daily basis for a period of fifteen days.

## 3. Results

All the human subjects were diagnosed negative for tuberculosis after the period of oral application of the extract.

## 4. Discussion

Tuberculosis is a predominant disease in the tropics especially tropical Nigeria [5]. Risk factors to the disease include immunosuppression and exposure to the causal bacterium [5]. Tuberculosis is highly prevalent in the United States of America and around the globe. It is a leading indicator disease for HIV/AIDS. HIV is a retrovirus associated with cancers like the Kaposi's sarcoma [7, 8]. Infection with bacteria can lead to acute or chronic weight loss [7]. In Nigeria, West Africa, medicinal plants are used locally in the treatment of tuberculosis [5]. It was observed in this research investigation that the concentrated alcohol extract of *Ocimum gratissimum* L. leaves, bark of *Psidium guajava* L., bark of *Psychanthus angolensis* (Welw) warb and leaves of *Spondias mombin* L. was effective on *Mycobacterium* the causal bacterium of tuberculosis in cases of neoplastic transformation.

## Acknowledgements:

Professor Adekunle Odunayo Adejuwon and Professor Victoria Anatolyivna Tsygankova are grateful to the Institute of Bioorganic Chemistry and Petrochemistry (IBOPC) of the National Academy of Sciences of Ukraine (NAS), Ukraine, East Europe; and the European Science Foundation (ESF), Cedex, France, Western Europe for research supports.

## Corresponding Author:

Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), Department of Biological Sciences,

Faculty of Science, Kings University, Ode-Omu, Osun State, Nigeria; And Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws) (Voluntary International Referee – Professor of Microbiology), National Research Foundation of Ukraine (NRFU), Maksymovych Scientific Library of The Taras Shevchenko Kyiv National University Kyiv, Volodymyrska Street 58, Office Number 38 Ukraine, East Europe; Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), The European Science Foundation College of Expert Reviewers (The European Union (EU)); and Professor Adekunle Odunayo Adejuwon, B.Sc., M.Sc., Ph.D. (Microbiology – Microbial Physiology and Metabolism – Microbial Enzymology), LL.Dip. (Diploma in Laws), The European Science Foundation College of Review Panel Members (The European Union (EU)), Offices: 1, Quai Lezay-Marnésia - BP 90015, 67008 Strasbourg, Cedex, France, Western Europe

e-mail address: [ao\\_adejuwon@yahoo.ca](mailto:ao_adejuwon@yahoo.ca)

ORCID Identifier: <https://orcid.org/0000-0001-9404-874X>

Loop Profile: 1019729

<https://loop.frontiersin.org/people/1019729/overview>

Publons:

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

## References

- [1] Nester, E.W., Anderson, D.G., Roberts, C.E., Pearsall, N.N., Nester, M.T. and Hurley, D. (2004). *Microbiology: A Human Perspective*. McGraw Hill Companies Inc. 817pp.
- [2] Adejuwon, A.O. (1990). Effects of sodium chloride on microbial deterioration of vegetable oil. B.Sc. Dissertation. Obafemi Awolowo University, Ile-Ife, Nigeria. 45pp.
- [3] Adejuwon, A. (2013). *Alpha Amylases from Fungi: Species of Aspergilli and Penicilli*. LAP Lambert Academic Publishing, Saarbrücken, Deutschland/Germany. 85pp.
- [4] Okonko, I.O., Okerentugba, P.O., Adejuwon, A.O. & Onoh, C.C. (2012). Prevalence of sexually transmitted infections (STIs) among attendees of Lead City University Medical Centre in Ibadan, Southwestern Nigeria. *Archives of Applied Science Research (India)* 4(2): 980-987.
- [5] Adejuwon, A.O., Obayemi, O.S., Tsygankova, V.A., Adeogun, A. & Abdulfatai, A.I. (2021). Level of awareness of tuberculosis amongst women in Ido Local Government, Oyo State, Nigeria. Oral Presentation at Webinar on Infectious Diseases Virtual: COVID-19. Theme: Global Impact on COVID-19 and Viral Infectious Diseases. Hosted by Phronesis, LLC – Researcher’s World, 5, Great Valley Pkwy, STE 235, Malvern, Pennsylvania PA 19355, United States of America. Live Stream 10AM – 3PM GMT from 19<sup>th</sup> – 20<sup>th</sup> March, 2021
- [6] Adejuwon, A.O., Odeleye, O.D., Odewale, O.A., Tsygankova, V.A. & Donova, M.V. (2021). A medicinal plant’s extract effective on osteoarthritis. *Biomedicine and Nursing (Manhattan, New York, United States of America)* 7(1): 26-28.
- [7] Okonko, I.O., Adejuwon, O.A., Okerentugba, P.O. & Innocent-Adiele, H.C. (2012). Circulating *Plasmodium falciparum* and HIV1/2 as co-infections among blood donors in Ibadan, Southwestern Nigeria. *Nature and Science (Manhattan, New York, United States of America)* 10(9): 42-47.
- [8] Okonko, I.O., Adejuwon, A.O., Okerentugba, P.O. & Frank-Peterside, N. (2012). *Plasmodium falciparum* and HIV-1/2 co-infection among children presenting at the out-patient clinic of Oni Memorial Children Hospital in Ibadan, Southwestern Nigeria. *Nature and Science (Manhattan, New York, United States of America)* 10(8): 94-100.

6/22/2021