

# VIRTUAL Biotechnology CONFERENCE

**DATE: 14 DEC  
2022**

**THEME:  
Accelerating Industrialization  
Through Modern Technology,  
Innovation & Research**

## **SUB THEMES:**

1. Innovations in Bioinformatics, AI and Big Data
2. Chemical and Food Process Technologies for an integrated bio-economy
3. Application of innovative biomedical technologies for diagnosis and therapy
4. Sustainable utilisation of natural products for health
5. Advances in environmental management technologies
6. Growing an integrated bio-economy from land to lakes
7. Regulation, national security and limitations of biotechnology innovation

## **CALL FOR PAPERS**

Original research, white papers, brief reviews and position papers are welcome for submission. All manuscripts will be subject to expert peer review prior to acceptance for publication in the HIT Journal of Biotechnology (HITJoB).



**Submission Deadline: 10 Nov 2022**  
**Acceptance Notification: 17 Nov 2022**



**Final Paper Submission: 01 Dec 2022**  
**HITJOB 2nd Ed Release: 14 Dec 2022**

## **CALL FOR ABSTRACTS**

Research findings not intended for publication but desired to be presented during the conference require submission of abstract only (maximum 300 words).



**Send All Abstracts & Full Papers To:**  
**biotech@hit.ac.zw**  
**cc: pdhliway@yahoo.com,**  
**wmavengere@hit.ac.zw**





## ABOUT THE VIRTUAL BIOTECHNOLOGY CONFERENCE

This virtual conference hosted by the Biotechnology department at the Harare Institute of Technology brings a chance to share and discuss all the inventions in Biotechnology. It mainly targets all the scientists, young researchers and industrialists globally, to interchange their knowledge and share their experiences, enhancements in technology, practical challenges, and advanced instrumentation and analysis results.

*Biotechnology* is the activity of deriving human benefit from living systems<sup>1</sup>. This word is derived from the Greek prefix *bio* (life) being added to the term *Technologiae*, which in itself is a construct of the Greek words *techno* (art, craft or skill) and *logos* (word, reason or plan). Biotechnology is grouped into specialisations according to the sector of human culture that derives benefit from the activity, as shown in table 1 below:

**Table 1.** Biotechnology specialisations and the corresponding colour codes<sup>2</sup>

Colour	Branch	Description
Green	Agricultural	Agriculture / Postharvest Management / Biofuels Technology
Red	Pharmaceutical	Pharmaceutical / Medical Biotechnology
Yellow	Nutritional	Food Process Biotechnology
Grey	Environmental	Bioremediation / Biomining / Conservation Biotechnology
Blue	Aquatic	Hydroponics / Aquacultural Biotechnology
Brown	Arid	Desert / Dryland / Arid Biotechnology
Gold	Computational	Bioinformatics / Artificial Intelligence / Data Analytics
Dark	Bioterrorism	Issues relating to Biological weapons, biosafety and defence
Purple	Philosophical	Issues relating to Bioethics, Biotechnology Policy and Law
White	Industrial	Biotechnology of Industrial Production

Biotechnology addresses the following *Government of Zimbabwe Priority Programmes on Innovation, Science and Technology (2019 – 2030)*:

- i) Biotechnology and Genomic Technology
- ii) Pharmaceutical veterinary medicines and vaccines manufacturing
- iii) Value addition of indigenous trees, herbs and grasses for food processing
- iv) Agricultural research and development.

Biotechnology also addresses the national priorities articulated in the *Government of Zimbabwe National Development Strategy 1 (2021-2025)* listed as follows:

- i) Health and Well-being
- ii) Food security and nutrition security
- iii) Environmental protection, climate resilience and natural resources management.

In addition, the *Doctrine for modernisation and industrialisation of Zimbabwe through Education, Science and Technology development to achieve Vision 2030* defines Heritage as the ‘*natural endowment of Zimbabwe; flora, fauna, water, mineral and human resources. The underlying principle is an education, science and technology system that produces goods and services useful to the economy based on heritage.*’ As such, the Biotechnology-related challenges to be addressed under the heritage-based philosophy includes:

- i) Effective treatment of HIV
- ii) New-born screening of inherited diseases
- iii) Forensic DNA for crime investigation
- iv) Plant tissue culture technologies
- v) Cattle reproductive technologies for the improvement and restocking of the national herd

In a bid to promote an alignment between the different specialisations as well as national policy, The Harare Institute of Technology Journal of Biotechnology (HITJoB) was developed as a service for the Zimbabwean research community. The HITJoB launch has been designed to coincide with a virtual conference organised by the HIT Biotechnology department.



## Objectives

The objectives of the HITJoB journal and virtual conference are:

1. To prioritise **Biotechnology** research over **Bioscience** research in Zimbabwe.  
*Technology* is “the collection of techniques and processes used in the production of goods or services or the accomplishment of objectives” whereas *Science* is “a systematic enterprise that builds and organizes knowledge in the form of explanations and predictions about nature and the universe”. Furthermore, *Technology* involves the development of “methods, systems, and devices which are the result of scientific knowledge being used for practical purposes” whereas *Science* involves the “observation, identification, description, experimental, investigation, and theoretical explanation of natural phenomena”<sup>3</sup>
2. To provide a vehicle for training local honours, masters and doctoral students to convert their dissertations into peer-reviewed articles, in addition to presenting their work at a national conference
3. To provide local researchers with an opportunity to design, publish and present position papers of national significance, which may not suit the agenda and research trends of international journals and conferences.
4. To strengthen local professional associations by providing them with a ISSN-listed journal to publish their symposia and conference proceedings
5. To provide Tertiary Institution Departmental Chairs, Academic and Industrial Research Leaders with an avenue for their subordinates to present their work and interact with the wider research community.

## Themes and sub-themes

The Biotechnology Virtual Conference theme is “**Accelerating Industrialization Through Modern Technology, Innovation & Research**”. The aim of this theme is to galvanise Biotechnologists in Academia and Industry to address the commercialisation of Biotechnology in Zimbabwe. Furthermore, the sub-themes were crafted so as to leverage the expertise of i) Food Process Technologists, ii) Allied Health Scientists iii) Engineers and Technologists iv) Information Scientists and Technologists as well as v) Business and Management Scientists to develop transdisciplinary solutions to problems in the Biotechnology field. The following are the conference subthemes:

1. **Innovations in Bioinformatics, AI and Big Data**
2. **Chemical and Food Process Technologies for an integrated bio-economy**
3. **Application of innovative biomedical technologies for diagnosis and therapy**
4. **Sustainable utilisation of natural products for health**
5. **Advances in environmental management technologies**
6. **Growing an integrated bio-economy from land to lakes**
7. **Regulation, national security and limitations of biotechnology innovation**

## References

1. [https://en.wikipedia.org/wiki/K%C3%A1rly\\_Ereký](https://en.wikipedia.org/wiki/K%C3%A1rly_Ereký)
2. <http://www.ejbiotechnology.info/index.php/ejbiotechnology/article/view/1114/1496>
3. [https://en.wikipedia.org/wiki/Science\\_and\\_technology](https://en.wikipedia.org/wiki/Science_and_technology)

## Instructions to Authors

### Manuscript Submission

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. All papers are and will be refereed through an expert peer review process. Only manuscripts submitted for publication or abstracts submitted for oral presentation within the specified timeframe will be accepted. Manuscripts shall be submitted to the editorial office at [biotech@hit.ac.zw](mailto:biotech@hit.ac.zw) cc [wmavengere@hit.ac.zw](mailto:wmavengere@hit.ac.zw); [pdhliway@yahoo.com](mailto:pdhliway@yahoo.com). The email subject must be titled “Abstract Submission” or “Full Paper Submission” where relevant.



## Language

The journal's language is English – either British English or American English is acceptable. However authors please note that the spelling and terminology used must be consistent throughout the article.

## Manuscript Presentation

Manuscript should contain appropriate titles:

1. Abstract with five to seven key words
2. Introduction
3. Materials and Methods
4. Results and Discussion
5. Recommendations or Conclusion
6. Acknowledgements
7. and References.

Manuscripts should be typed in Times New Roman of 12 pt., 1.5 spacing, with justified margins. The length of paper including text, tables and figures should not exceed 15 pages. Tables and figures may not be placed within the text. A template has been attached at the end of this section for guidance.

### 1. Title

The title phrase should be brief. Under the title, a list containing the following must be included;

1. Authors' full names (first-name, middle-name, and last-name)
2. Affiliations of authors
3. and emails and phone numbers of the corresponding author.

### 2. Abstract

Authors are required to provide a short abstract of 250 to 300 words. The abstract should not contain any undefined abbreviations or references.

### 3. Key words

Please provide five to seven key words. However these key words may not include words appearing in the title of the manuscript.

### 4. Abbreviations

Words with abbreviations must be written in full on first mention and may only be used for terms that are either unusually long or non-standard.

### 5. Introduction

The introduction must be clear and concise and should capture the statement of the problem in simple and unambiguous terms. In this section authors should also clearly state the objectives of the work being presented.

### 6. Materials and methods

Materials and methods should be clearly presented to allow the reproduction of the experiments accurately.

### 7. Results and discussion

Results and discussion maybe combined into a single section or separately when necessary. This section must be comprehensively written.



## 8. Recommendations and or Conclusions

Recommendations and Conclusions may also be combined into one section or written separately when appropriate. The section presents the authors' own scientific recommendations and conclusions to the work presented.

## 9. Acknowledgments

Any acknowledgements of people who contributed to the work other than the authors and sources of funding etc. are stated in this section but must be brief.

## 10. Tables and Figures

The following applies to tables and figures;

1. They must be numbered consecutively
2. They should be appropriately referred to in the manuscript.
3. Should be kept to a minimum.
4. Should have a short descriptive title.
5. The units of measurement used should be clearly stated.
6. Should be organized in Microsoft Word
7. Figures/Graphics should be prepared in GIF, TIFF, JPEG or PowerPoint.

## 11. References

Every written article is required to have a reference section. This is a list of any article, journal, textbook or internet source that was consulted for the purposes of writing the article and appears, separately, at the back of the manuscript. All textual sources that are consulted must appear in this section.

### I. General Requirements

All textual sources must be listed in alphabetical order, according to authors' surnames at the end of the paper. DOIs, PubMed IDs and links to referenced articles should be stated wherever available. Please view suggested format below.

### II. System of referencing

The HIT Journal of Biotechnology shall use the Harvard System of Referencing. Authors please visit any appropriate website for guidance.

### Template – January 2017.

Source; Dhliwayo-Chiunzi, P.D., Matimati, I., Kachigunda, L., and Hove, L., 2014. Collection and Evaluation of Superior Phenotypes of *Uaparcia kirkiana* an indigenous fruit tree of Zimbabwe. *International Science and Technology Journal of Namibia (ISTJN)*, 4(1), pp7-22.



**Collection and Evaluation of Superior Phenotypes of *Uapaca Kirkiana* Muell Arg. (Euphorbiaceae), A Priority Indigenous Fruit Tree of Zimbabwe [Times New Roman, size 12, Bold]**

**Patient D. Dhliwayo-Chiunzi<sup>1</sup>, Ignatious Matimati<sup>2</sup> and Barbara Kachigunda<sup>3</sup>**

**[Times New Roman, Size 12, Bold]**

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**Abstract [Times New Roman, Size 12, Bold, 1.5 spacing]**

The International Centre for Research in Agroforestry (ICRAF now known as the World Agroforestry Centre) initiated research and development work on at least 20 priority indigenous fruit trees in 5 countries in Southern Africa including Zimbabwe. The long term objective of this work was to improve food security and income generating capacities of local communities through domestication, marketing and commercialisation of indigenous fruit trees. Country specific priority species were identified based on consultations with a wide range of users. **[Times New Roman, Size 12, 1.5 spacing]**



## **Introduction [Times New Roman, Size 12, Bold 1.5 spacing]**

*Uapaca kirkiana* Muell Arg. (Euphorbiaceae) is one of the most important fruit trees native to the Miombo ecological zone of Southern Africa (Ngulube, et al., 1995). The tree is reported as a priority species in Zimbabwe, Zambia, Malawi and Tanzania. *U. kirkiana* is a small to medium sized tree of up to 5 – 12m height. It has a characteristic rounded crown and mainly occurs at medium altitudes in open woodland. It is dominant on gravelly soils. The stem bears short and thick branches with simple alternating leaves arranged in clusters. *U. kirkiana* is a dioecious that bears male and female flowers on separate plants. The male and female flowers are yellow green in colour and globose in shape (Ramadhani, 2002; Ngulube, et al., 1997). The fruits of *U. kirkiana* known as mazhanje or mashuku in Shona are spherical in shape with a rather hard skin surrounding an edible pulp. Flowers and fruits are set during the rainy season, and fruits mature from September to December (FAO, 1986). Fruits are collected for utilisation around the month of October to around February. **[Times New Roman, Size 12, 1.5 spacing]**

## **Methodology**

### **Identification of *U. kirkiana* growing areas [Times New Roman, Size 12, 1.5 spacing]**

In order to identify major *U. kirkiana* natural stands, consultations were held with extension workers, Forestry Commission, farmer key informants, school children, vendors and traders. Information about source areas and desirable traits for fresh consumption and for processing into various products were collected from workshop participants using a checklist and a structured survey questionnaire administered during village workshops and interviews held in the respective areas.

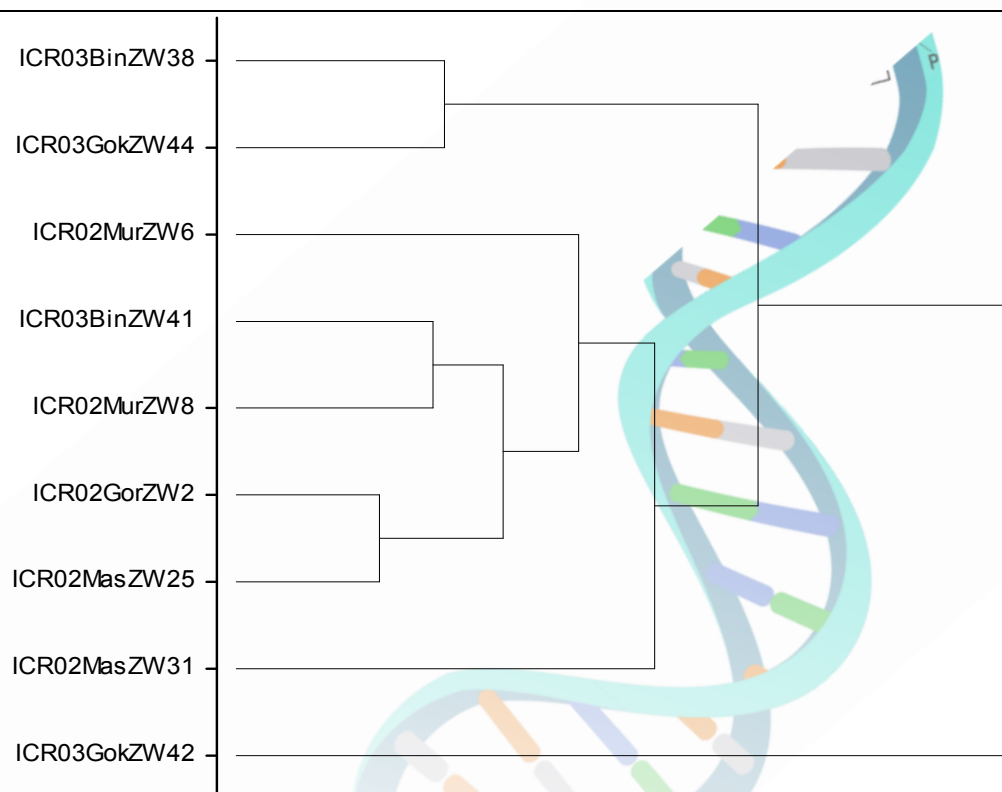
## **References**

- Akinnifesi, F., 2004. Indigenous Fruits and Livelihood Security in Southern Africa. In: Mbozi P, ed. 2004. *Living with trees in Southern Africa*. ICRAF – Southern Programme, Harare, Zimbabwe pp.5-10.
- Campbell, B.M., 1987. The use of wild fruits in Zimbabwe. *Economic Botany* 41 pp.375-385.
- Campbell, B.M., Clarke, J.M., and Gumbo., D.J., 1991. Traditional Agroforestry Practices in *Zimbabwe Agroforestry Systems* 14 pp.99-111.



**Table 5. Characteristics of the trees selected for multiple criteria [Times New Roman, Size 12, Bold, 1.5 spacing]**

District	Tree ID	Village	Fresh weight (g)	Pulp content (%)	TSS (% brix)
Bindura	ICR03BinZW38	Nyava	25.0	41.8	22.8
Bindura	ICR03BinZW41	Nyava	29.8	52.9	22.5
Goromonzi	ICR02GorZW2	Ngazimbi	28.6	53.6	21.6
Gokwe	ICR03GokZW42	Mafa	24.9	59.9	20.0
Gokwe	ICR03GokZW44	Mafa	21.3	45.9	21.9
Masvingo	ICR02MasZW25	Chikume	26.0	56.3	22.5
Masvingo	ICR020MasZW31	Uranda	20.9	54.4	24.9
Murehwa	ICR02MurZW6	Chadenga	23.5	55.0	22.8
Murehwa	ICR02MurZW8	Chimani	33.0	52.9	24.0
<b>Mean</b>			<b>25.89</b>	<b>52.52</b>	<b>22.56</b>
<b>Variance</b>			<b>15.83</b>	<b>29.83</b>	<b>1.95</b>
<b>cv%</b>			<b>15.369</b>	<b>10.399</b>	<b>6.188</b>



**Figure 3: Dendrogram of the cluster analysis of superior phenotypes. [Times New Roman, Size 12, 1.5 spacing]**