



CRIN Herald

A MONTHLY PUBLICATION OF COCOA RESEARCH INSTITUTE OF NIGERIA (CRIN), IBADAN.

ISSUE: 45 (October, 2024)

Four Years of Outstanding Success



It has been four years of outstanding achievements piloting the affairs of the Cocoa Research Institute of Nigeria (CRIN) since the mantle of leadership fell on Dr. Patrick Olusanmi Adebola as the Executive Director (ED) of the Institute. It was a great task of rebuilding and repositioning the Institute, considering the deep seated animosity and acrimony that embroiled the system when he took over the reins of affairs. Dr Adebola, like an experienced craftsman, repaired the defragmented parts of the Institute, renovated the Administrative Office Complex of CRIN Headquarters to a befitting standard for the first time in a very long time. Additionally, the ED upgraded the Institute's Website (<https://crin.gov.ng/>) and the Internet bandwidth from 4Mbps to 100Mbps; Renovated the Value Addition Research Offices and Laboratory; Upgraded Flavour Quality Laboratory; Established Gymnastic Centre; Constructed the Fermentary and the Perimeter fencing of the Institute. The modernisation of the Institute's gate is beauty to behold coupled with several other developmental works like drilling of boreholes

and installation of 250KVA Perkins Generator amongst others. The calming peace that is reigning in the Institute is a testament of excellent leadership style of Dr. Adebola.



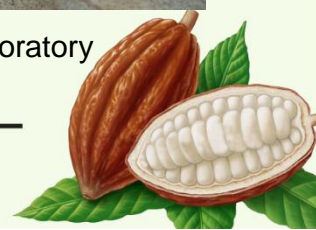
Renovated ED's Office



Walkway of the Renovated Directorate Block



Renovated Flavour Quality Laboratory





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Renovated Value Addition Research Offices and Laboratory



Installation of the 250KVA Perkins Soundproof Generator



Remodelled CRIN Frontage and Gate



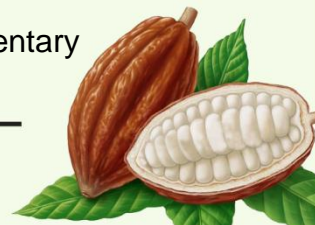
Ultramodern Perimeter Fence with Visitors' Car Park



Front View of the Central Laboratory



The Rebranded Cocoa Fermentary





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The doldrums of inactivity, industrial unrest and dwindling research activities foisted on the Institute by a number of factors over one decade ago is now a thing of the past; kudos to the positive radiation of the ED, Dr. Patrick Adebola. Prior to his assumption of office, various administrations of the institute have been distracted by internal industrial unrests, agitations amid dwindling research culture and poor funding, and this as in no small measure reflects on the cocoa productivity in the country. At the moment, internal industrial crises and de-motivation have been overcome as the administration of Dr. Adebola has adopted some collaborative strategies since assumption of office which undoubtedly affected the value chain of CRIN mandate crops positively.

The forward-looking, stylistically innovative works and aggressive developmental fund drive of Dr. Adebola has yielded a huge chunk of dividend as the Institute partners with stakeholders to win grants and awards, with a keenly contested 22 million United States Dollars (USD) award as an example.

Hearty congratulations to our ED! Wishing him a successful finishing of tenure!

IARSA Visits ED CRIN

The International Association of Research Scholars and Administrators (IARSA) management team visited CRIN on October 18, 2024 to extend their hand of fellowship to the Institute and particularly to express their intention to induct the Executive Director, Dr. Patrick Adebola, as a Fellow of the Association. The IARSA team was led by the President/Chairman of the Council, Prof. Akin Ogunsakin, DFRA and other members comprising of the 2nd Vice President, Mr. Temitayo Oseni-ope, DFRA and the Executive Director of the Association, Prof. Babatunde Akinsanya, DFRA.



The honour was as a result of the ED's achievements, professional contributions and recognition. The investiture ceremony will be coming up in November at the Association's 9th Annual Conference in Lagos. IARSA is a superior scholarly Association that is characterised by certain commitments in diversified areas of study. The Association demarcates a particular space in the landscape of research in Nigeria and across the globe by repositioning scholars and research Administrators to increase their achievements and take them





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beyond the obvious. The goal is to offer a worldwide connection between teachers, students, researchers and lecturers, from a wide range of academic fields, interested in exploring and giving their contribution in educational issues and to illustrate developments and new ways of thinking in various fields of science and technology.

CRIN Holds Monthly Seminar

The 10th in the series of the 2024 monthly seminar was held on October 14, 2024 at the Lawrence Opeke Conference Hall of the Institute. The program featured presentations from Dr. C.F. Odey, Dr. A.O. Ogunsowo and Mr. J. O. Gidiga of Plant Breeding, Value Addition Research and Audit Divisions, respectively. The seminar was chaired by Dr. S. B. Orisajo, Director and Cocoa Programme Leader of the Institute.

Genetic diversity and metabolomic profile of *cofea* species in Nigeria

- C. F. Odey, PhD



Coffea species is an important crop largely consumed for its cup quality. Coffee quality, determined by its bioactive compounds, varies with species. *Coffea canephora* is more predominantly cultivated in Nigeria but low in cup quality

compared to *C. arabica*. Low genetic diversity had been reported in conserved *C. canephora*, however, information on the extent of the diversity among landraces in Nigeria is scanty. Combination of genomic and metabolomic analyses can help in the selection of genotypes with high cup quality traits in Nigerian coffee. A total of 48 coffee accessions comprising 14 genotypes from six *C. canephora* accessions, one genotype each

from *C. arabica*, *C. liberica*, *C. abeokutae* and *C. stenophylla* from *ex situ* of Cocoa Research Institute of Nigeria; and 30 unknown accessions from Ekiti and Kogi states. The Single Nucleotide Polymorphism (SNP) of the samples was determined using Genotyping by Sequencing (GBS). The SNP data were analysed to determine genetic distance, relatedness and population structure using Identity by State (IBS), Hierarchical Clustering (HC) and Structure. Thirty matured beans from Java, Kouilou and Landrace based on GBS and abundance were profiled for metabolites on GC-MS using five replicates. The peak values (mz) from GC-MS were recorded and metabolite identified on National Institute of Standard Technology (NIST) database. Data were analyzed with Principal Component Analysis and ANOVA at $\alpha_{0.05}$.

A total of 433,676 SNP markers were detected. There was high genetic distance (0.2552) between T1049 and M10 and high similarity between M10 and landraces with low genetic distance (0.1194). The HC grouped the *C. canephora* accessions into four genetic units. The Structure formed three clusters. Three hundred and forty metabolites were detected and classified into amines, amino acids, sugars, polyphenols, sugar derivatives, organic acids and vitamins. Sixty-six metabolites differed across the groups (landrace, Kouilou and Java). Caffeine and sucrose were the most abundant among the accessions. Two metabolite groups were formed separating landraces and Java/Kouilou. However, the most discriminating metabolites were citramalic acid, tryptophan and threonine. Low genetic diversity in the *Coffea* spp. dominated by *C. canephora* with corresponding low metabolite diversity were observed. Unique metabolites profile of farmers' accessions in Nigeria was revealed. Accessions with high and low sucrose and caffeine contents were found among farmers' accessions. The farmers accession "Niaouli" is a





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promising genotype for further genetic improvement because it harbors favourable traits for coffee quality. By combining good traits of Niaouli and Java, breeding for enhanced cup quality in Nigerian coffee will be made possible. Variation in genetic diversity of *Coffea* species and metabolite levels of *C. canephora* accessions in Nigeria is low. High genetic uniformity occurs among the landraces.

Antihyperglycaemic activity of fractions of aqueous extract of *Cola acuminata* seed on some glucose-metabolizing parameters in streptozotocin-induced hyperglycaemic rats

- A. O. Ogunsowo, PhD



Diabetes mellitus is a serious decade-long metabolic disease symptomised by high fasting blood glucose concentration (FBG) i.e. hyperglycaemia and has posed a major health challenge globally. *Cola acuminata* seed

(CAS) is known, according to some folk laws, to be effective in alleviating diabetes. However, its scientific validation has not been established. This research investigated the antihyperglycaemic effect of fractions of aqueous extract of *Cola acuminata* seed (AECAS) on some glucose-metabolizing parameters of streptozotocin-induced hyperglycaemic rats (SHR). Effect of AECAS, its fractions and sub-fractions were investigated on: (i) FBG of SHR; (ii) concentrations of serum insulin and hepatic glycogen of SHR; (iii) hepatic activities of glucose-6-phosphatase (G6P), fructose-1,6-bisphosphatase (F16BP), glycogen phosphorylase (GP), hexokinase (HK) and glucose-6-phosphate dehydrogenase

(G6PD). AECAS was partitioned into fractions with n-hexane (AECAS-NHF), ethylacetate (AECAS-EAF) and n-butanol (AECAS-NBF). Remaining residual fraction (AECAS-RF) was also obtained. AECAS-EAF was separated into sub-fractions by column chromatography. AECAS, its fractions and sub-fractions were screened for their effects on FBG, serum insulin and hepatic glycogen concentrations in SHR as well as on G6P, F16BP, GP, HK and G6PD activities. Data were analysed using one-way analysis of variance and separated by Duncan Multiple Range Test at $P < 0.05$.

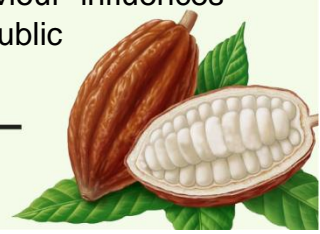
The results revealed that treatment of SHR with AECAS, AECAS-NHF, AECAS-EAF, AECAS-NBF and AECAS-RF and sub-fractions of AECAS-EAF significantly ($P < 0.05$) decreased the elevated FBG, G6P, F16BP and GP activities while HK, G6PD activities; hepatic glycogen and serum insulin concentrations were significantly ($P < 0.05$) increased. This study then concluded that AECAS, its fractions and sub-fractions demonstrated antihyperglycaemic efficacy.

Behavioural audit: any need for MDAs?

- J. O. Gidiga



Audit involves examination of accounting records, to verify transactions originality, authenticity and genuineness. Audits are performed to evaluate information validity, reliability and internal controls. The goal is to express an opinion on the subject based on test work. Behavioural audit examines how human behaviour influences the audit process. A rational public servant will pursue his or her





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personal interest alongside organisational interest. However, the behavioural view of the subject is a matter of concern, Hence the need for a proper sensitization on what a true audit entails. The expectation gap between the auditor and the auditee needs to be reduced. Human behaviour, emotion, and social factor impact a great deal on audit recommendations. The overall goal of the institute should be more paramount to self-driven objectives. Audit engagement is a collective engagement that begins with you and me.

CRIN/GIZ-MOVE on Capacity Building in Cashew Production

A cashew technical training on production was organized by GIZ-MOVE in Osun State targeted at officers of the Ministry of Agriculture and Food Security, Agricultural Development Programmes (ADP), Agric. Extension Officers and Lead Cashew Farmers. The objective of the training was to enhance the skills and knowledge of stakeholders in cashew industry with a focus on improved techniques and best practices in the development of cashew plantation. As part of the MoU between CRIN and GIZ-MOVE, the training was implemented by resource team from CRIN as facilitators and subject matter experts. The training was held at the Royal Premium Hotel, Iwo Osun State between 7th to 10th October 2024. The opening ceremony on 7th October 2024 was graced and training declared open by the Honorable Commissioner of Agriculture and Food Security, Hon. Tola Faseru, represented by a Director in the Ministry. The Opening Speech was delivered by the Executive Director of CRIN, Dr. Patrick Adebola, ably represented by the Director of Research Operations, Dr Sunday Agbeniyi, while the Chairman of NCAN and also Chairman of AFAN in Osun State, Alhaji S. O. Aremu gave the goodwill message. The

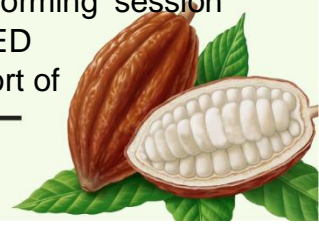
technical training was targeted on key modules in cashew production such as planting material development, nursery set up and management, cashew agroforestry, conservation and farming systems, pest management, postharvest and occupational health and safety procedures and gender transformative approach in agriculture. The training was a continuation of the earlier one held at Talking Drum Apartment and Hotel at Ikoase Ogbomoso in September 2024.



Group photograph of the participants

Summit University and FoodPro Paid Courtesy Visit to CRIN

The Executive Director of CRIN, Dr Patrick Adebola, on October 14, 2024 played host to the Vice Chancellor of Summit University Offa, Prof. Abiodun Musa Aibinu and his team with the consultant to FoodPro, Mr Wale Ogunsola a cashew processing facility located in Ilorin. The visit was a familiarization visit to CRIN as follow up to the MoU between CRIN and Summit University and in furtherance of the application for the Cashew Matching Grant Fund brainstorming session that was just concluded. The ED assured the team of the support of





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CRIN management to developing a concrete working relation with the University and private sector to enhance the desired development in the cashew sector. He gave his directive to representative of CRIN on the task to deliver their best to the consortium and ensure the grant is won by the team. The Vice Chancellor thanked the Executive Director for hosting them on a short notice and was elated to be in CRIN again after his first visit to the Institute in 1991. The VC extends the warm regards of the Pro-Chancellor of the University, Alhaji Rafiu Adisa Ebiti, and assured that their part of the MoU will be implemented to the letter and both parties will be better off and Nigeria Cashew Sector will receive the required boost. The team of the Vice Chancellor and FoodPro had earlier visited the Department of Value Addition Research for a tour of the Institute. The CRIN team were Dr Patrick Adebola, Dr Sunday Agbeniyi, Dr Oluwatosin Adeigbe and Dr Dele Adeniyi, while the team from Summit University and FoodPro were Prof Abiodun Aibinu, Dr Nurat Akinlabi-Babalola, Dr Usman Okene, Dr Akeem Akinfenwa, Mr Ibrahim Salawu and Mr Lukman Odusanya.



Group photograph with the Executive Director, Dr. Patrick Adebola, CRIN team and the Summit University and FoodPro delegates

Health News

Food Poisoning – Mrs. Bosede Famaye



Food poisoning, a type of food borne illness, is a sickness people get from something they ate or drank. The causes are germs or other harmful things in the food or beverage. Food can be contaminated with any of the following: Bacteria, Parasites that can live in

the intestines, viruses, poisons, also called toxins, Bacteria that carry or make toxins, molds that make toxins. Food can be contaminated at any point from the farm or fishery to the table. The problem can begin during growing, harvesting, processing, storing, shipping, or preparing. Food can be contaminated at any place due to poor handling, which include: Poor hand washing after visiting the toilet, not disinfecting or eating with unwashed knives, cutting boards or other kitchen tools can spread contaminants. Food left out for too long at room temperature can become contaminated. Food stored in the refrigerator for too long can spoil. Bacteria that cause food borne illnesses can also be found in swimming pool, lakes, ponds, rivers, and sea water. Some bacteria, such as *E. coli*, may be spread by exposure to animals carrying the disease.

Symptoms of food poisoning vary depending on what is causing the illness. They may begin within a few hours or a few weeks depending on the cause. Common symptoms are: Stomach upset, Vomiting, Diarrhea with bloody stools, Stomach pain and cramps, Fever and Headache. Less often food poisoning affects the nervous





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system and can cause severe disease with these symptoms; Blurred or double vision, Headache, Loss of movement in limbs, Problems with swallowing, Tingling or numbness of skin, Weakness and Changes in sound of the voice. In severe cases, adults experiencing any of the following symptoms should seek immediate emergency care: Nervous system symptoms, such as blurry vision, muscle weakness and tingling of skin, Fever above 39.4°, Vomiting often, Diarrhoea that lasts more than 3 days.

The diagnosis is based on a physical examination and a review of things that may be causing vomiting, diarrhoea or other symptoms. Stool sample testing to name the bacteria, viruses, parasite or toxin. Blood tests to name a cause of illness, rule out other conditions or identify complications. The treatment depends on how severe the symptoms are and what caused the illness. Fluid replacement. Fluids and electrolytes, maintain the balance of fluids in the body. These includes sodium, potassium and calcium. Fluid replacement is important to prevent dehydration. This may be given intravenously. Antibiotics - If illness is caused by bacterial, Anti-parasites - usually prescribed for parasitic infections.

To prevent food poisoning at home: Wash hands with soaps and water for at least 20 seconds, especially after using the toilet, before eating, and before and after handling food. Wash fruits and vegetables under running water before eating, peeling or preparing, Wash kitchen utensils thoroughly especially after contact with raw meats or unwashed fruits and vegetables, Don't eat raw or under cooked meat or fish, Refrigerate or freeze left over food, Cook leftovers safely. Throw out moldy food, fruits and vegetables, such as tomatoes or berries. Clean your refrigerator every few months with bleach solution.

Market Survey

Price Report for October 2024

This report provides an overview of local cocoa prices in selected states for October 2024. Data were collected from various production areas within the states, and the average prices per state were calculated accordingly. In October, Cocoa prices declined in all surveyed states except Oyo, where the average price remained unchanged from September, 2024. Abia State experienced the steepest decline, with price drop by approximately 9.5% compared to the previous month. Cross River and Ondo States recorded the highest average cocoa price at ₦11,250, while Abia had the lowest at ₦9,500. Additionally, it is important to mention that cashew is currently off-season and hence, no price data available for this commodity in October.

Cocoa cost per kg (local price) for October, 2024			
State	Minimum price(₦)	Maximum price (₦)	Average price (₦)
Abia	9000	10000	9500
Cross River	11000	11500	11250
Kogi	11000	11000	11000
Kwara	9500	10000	9750
Ondo	11000	11500	11250
Osun	10000	10500	10250
Oyo	10500	11000	10750

Source: CRIN Survey, 2024 by Economics and Statistics Sections





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Staff of the Month: Mr. Adegbindin Abel Olukayode



Mr. Adegbindin Abel Olukayode was born on 26 August, 1980. He is a native of Fiditi in Oyo State. He attended First Baptist Primary School, Fiditi for his Primary Education and Fiditi Grammar

School, Fiditi for his Post Primary Education. He later proceeded to Osun State Polytechnic, Iree for his National Diploma and Higher National Diploma in Business Administration in the year 2003 and 2006, respectively. In pursuance of higher studies, he attended National Open University of Nigeria where he bagged Master of Business Administration (MBA) in 2015. He is a Member of Nigeria Institute of Management (Chartered). Mr. Abel Adegbindin joined the service of the Cocoa Research Institute of Nigeria in December 2011 as Higher Executive Officer and rose to the rank of Senior Admin. Officer (SAO) in 2022. He has served meritoriously in various committees in the Institute. As a way of capacity building, he attended Administrative Staff College of Nigeria (ASCON) for a workshop on Administrative Communication Skills (CRIN sponsored) in order to enhance efficiency in the workplace. He has passion for success and he is a great lover of peace. He is happily married with children.

Joyous Convocation



October 22, 2024 was a momentous day for the Institute as Dr. Akintobi Olutoye Ogunsowo convoked at the University of Ilorin, Kwara State. He bagged the prestigious Doctor of Philosophy (PhD) in Biochemistry from the University. As is customary with the Institute, the staff felicitated with the celebrant.

November Birthday Galore

Hearty birthday celebrations to the members of staff that will be celebrating their birthdays this month. Wishing you all the very best in your life endeavours. Congratulations!



Rilwanu Safiyanu A.	01-November
Olaosebikan Agnes	01-November
Adebiyi Solomon	02-November
Ezeorah Loveth U.	02-November
Ganiyu Saidi	02-November
Sanni Abdullahi	03-November
Bakare Abiola A.	04-November





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Ajayi Joseph O.	05-November	Ogolowa Faith E.	15-November
Asua Ime S.	05-November	Okoro Emmanuel	15-November
Babalola Bayo	05-November	Akinola Christianah	16-November
Omoleye Margret	05-November	Yahaya Mufuliat O.	16-November
Christopher Uwakwe	06-November	Lawal Kazeem	17-November
Ajayeoba Olanipekun	07-November	Onipe Module	17-November
Odonmorayo Modupe	07-November	Okunade A.F.	18-November
Ekemube Alex R.	08-November	Ganiyu Ibrahim	18-November
Mofolasayo Adewale S.	08-November	Ibiremo Omolade B.	19-November
Ebiale Benjamin	08-November	Oyewale Samson	19-November
Olaniyi Olayinka O.	09-November	Oyediran U. O.	20-November
James Musa N.	09-November	Adeleke Olaoye A.	21-November
Olorunkalu Gbenga	09-November	Aremu-Dele Olufemi	22-November
Mallam Dada B.	10-November	Ojo Olubunmi	22-November
Olagunju Nurudeen	10-November	Oladoja Olaolu	22-November
Ajala Akeem O.	10-November	Adesokan Mutairu A.	23-November
Bolarinde Folake A.	10-November	Adeyanju Segun O.	23-November
Akinwande O.O.	11-November	Ele Andrew Chidi	23-November
Sorinolu O. E.	11-November	Adeogun Muyiwa	23-November
Fabowale Folasayo	11-November	Adegoke Funke	23-November
Joshua Paul N.	11-November	Taiwo Nnenna	24-November
Iseoluwa Samuel	11-November	Omitade Oluwatoyin	25-November
Adeyemo Solomon	11-November	Abdulahi Usman M.	25-November
Akintoroye Oladunni	12-November	Mohammed Shaib	25-November
Bolarinwa Felix	12-November	Oloruntomi Isaac A.	25-November
Ugwuoke Joseph C.	13-November	Aikpokpodion P.A.	26-November
Adeyemi O. R.	14-November	Mapayi Elizabeth F.	26-November
Fakeye Joke	14-November	Akele Oni O.	26-November
Abdullahi Musa	15-November	Samuel Abraham I.	26-November
Adeniyi Dele O.	15-November	Babatunde Maria O.	27-November
Ogiugo Phillip I.	15-November	Joseph Temitayo	27-November
		Oluwadare Sarah E.	28-November







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Okeniyi Temitope S.	28-November
Nwajei Maureen N.	28-November
Akinbola Temilorun	28-November
Famuyiwa S. B.	29-November
Abiade Suleiman	29-November
Adeyemi Adedeji	31-November




 **COCOA RESEARCH INSTITUTE OF NIGERIA (CRIN)** 

60th
Anniversary
9TH DEC. 2024



**Research & Development Mandate for
COCOA, KOLA, COFFEE, CASHEW & TEA**


Km 14, Ibadan - Ijebu - Ode Road,
Idi-Ayunre, Ibadan, Oyo State





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60th Anniversary &



18TH RIGAN GAMES CRIN'24



18TH RIGAN GAMES



EDITORS: DR P.O. ADEBOLA | DR. S.B. ORISAJO | DR (MRS) T.E. OGUNJOBI | DR. A.V. OYEDOKUN | DR. OSITA IBE | MR. O.O. OGUNKUA

08039784154

directorcrin@yahoo.com

www.crin.gov.ng

