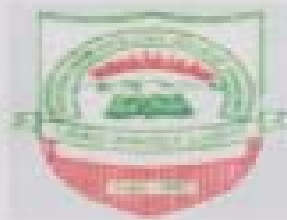


EASTERN KARBI ANGLONG COLLEGE

Affiliated to Assam University



CRITERIA 3- RESEARCH, INNOVATIONS AND EXTENSION

3.4.1 The Institution has several collaborations/linkages for Faculty exchange, Student exchange, Internship, Field trip, On-the- job training, research etc during the last five years (10)

Dr. Aril Ch. Das
Principal
Eastern Karbi Anglong College
Sarkhajn, Karbi Anglong

Documentary evidences for criteria 3.4.1

3.4.1 The Institution has several collaborations/linkages for Faculty exchange, Student exchange, Internship, Field trip, On-the- job training, research etc during the last five years (10)


The documentary evidences of the programme conducted during last five years under this criteria are as follows.

During 2016-2017:

1. Faculty exchange:

A few of the faculties of the college took part under this programme, and taught different subjects in nearby school, Sarihajan H.S. School. Under this programme, the college fraternity tried to offer helping hand to nearby school. Some of the evidences are listed below.




25/1/22
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarihajan, Karbi Anglong



Faculty during the class



certificate given from the school

Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College,
Sarimjan, Karbi Anglong

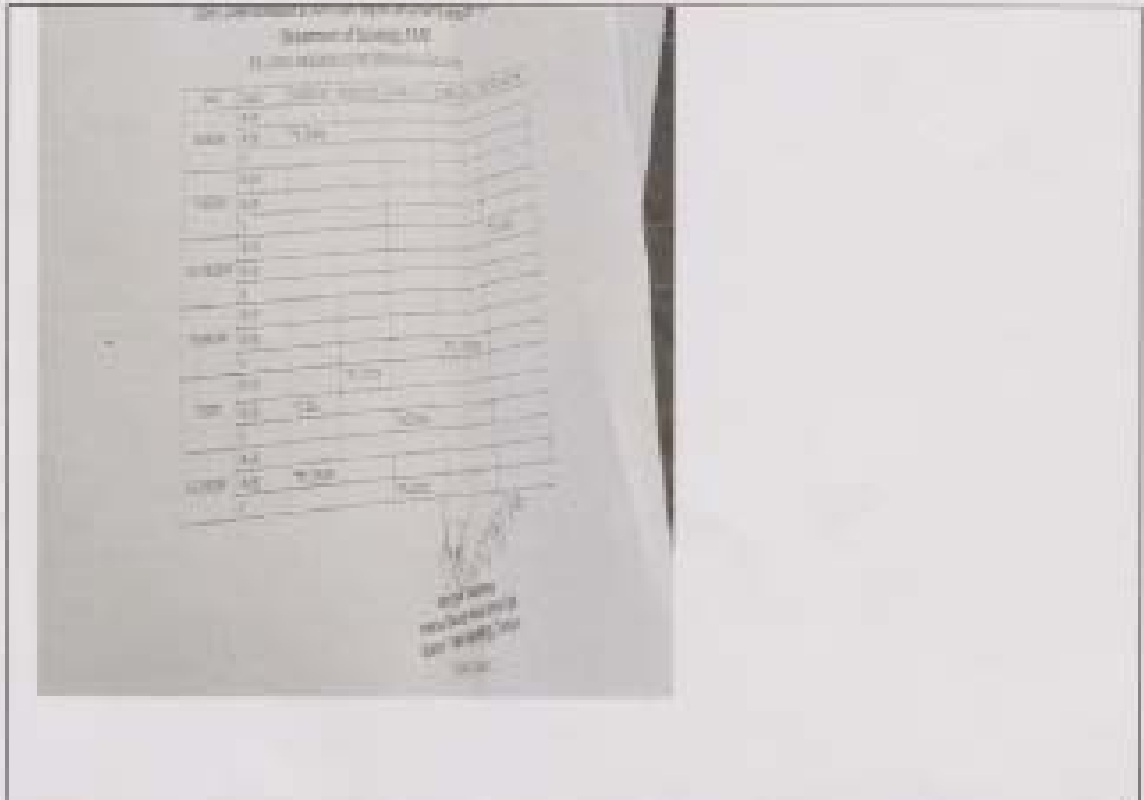
Day	Class	M	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00
Mon	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music
Tue	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music
Wed	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music
Thu	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music
Fri	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music
Sat	1	1	English	Maths	Science	History	Geography	Art	Music
	2	2	English	Maths	Science	History	Geography	Art	Music
	3	3	English	Maths	Science	History	Geography	Art	Music
	4	4	English	Maths	Science	History	Geography	Art	Music

B
R
E
A
K

Class routine



Anita
28/1/22
Dr. Anita Ch. Das, Principal
Eastern Karbi Anglong College
Sankhapur, Karbi Anglong



2. Field Trip:

A Field trip was successfully conducted by Dept of Political Science and Economics, EKAC on 06/03/2017 with a total of 10 students accompanied by two faculties in collaboration with the government of Assam Secretariat house. The aim of this visit was to give the student practical knowledge about the function of government and the complete overview of legislature. The proof of the event is attached in the form of pics as attached below:


Dr. Anil Ch. Das, Faculty
Eastern Karbi Anglong College
Sarbajan, Karbi Anglong.



Inauguration letter from Chief Minister of Assam

Dr. Anil Ch. Das, Principal Eastern Karbi Anglong College Sarhajan, Karbi Anglong





Students with faculty members


Dr. Anil Ch. Das, Principal
Eastern Karta Angiang College
Sarihajan, Karta Angiang




Certificate from CM, Assam



The names of students participated in the programme are


1. Roshan Sharma
2. Ropring Tokbi
3. Jemson Rongphar
4. Puja Singh
5. Anjali Lama
6. Parveen Sultana
- 7.


Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sakhajan, Karbi Anglong

3. **Field Trip to Rongphar Gaon:** One field trip was organised by department of Assamese to one nearby village Rongphar village in collaboration with assamese department, Sarupathar college. The main objective of this visit was to study the socio-cultural, socio-economic and religious differences of the tribes resided in the village. Total number of students participated in the field trip was 10 along accompanied by three faculties of Assamese Department. Some of the documental evidences are

The name of student participants are listed below:

1. Deepjyoti Saha
2. Neha Gupta
3. Saraswati Dey
4. Anisha Chauhan
5. Mamta Rai
6. Samu Lama
7. Tanusherr Baruah
8. Preety Rajbanshi
9. Menaka Bhujel
10. Gina Lama
11. Gitanjali Terangpi
12. Joya Guddle


Dr. Anil Ch. Das, Principal
Eastern Khasi Anglong College
Serhajan, Karu Anglong

LIST OF STUDENTS & PROFESSOR INCHARGE FOR FIELD STUDY TO RONGPHAR GAON,
SARIHAJAN, KARBI ANGLONG
ASSAM ON 08/02/2023


NAME OF THE STUDENTS:

SL NO	NAME OF THE STUDENTS	SEX	CLASS
1	Deepjyoti Saha	M	5 th Sem
2	Neha Gupta	F	5 th Sem
3	Saraswati Dey	F	5 th Sem
4	Anisha Chauhan	F	1 st Sem
5	Mamta Bar	F	1 st Sem
6	Sanu Lama	F	1 st Sem
7	Tanushree Baruah	F	3 rd Sem
8	Preety Rajsonshi	F	3 rd sem
9	Menaka Bhujel	F	3 rd Sem
10	Gina Lama	F	3 rd sem
11	Gitanjali Tarangpi	F	3 rd Sem
12	Joya Guddel	F	3 rd Sem

PROFESSOR IN CHARGE:

- 1. Khimchalindi Saikia Sonowal
- 2. Anamika Acharyya
- 3. Dr. Noyanmomi Medhi
- 4. Dr. Ratnajit Gogoi

Principal
Eastern Karbi Anglong College
Sarihajan, K/A


Dr. Anu Ch. Das, Principal
Eastern Karbi Anglong College
Sarihajan, Karbi Anglong



Moments during the visit

AMS
2021/22
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sankhjan, Karbi Anglong.

4. Field Trip:


On the 11th of November 2021, a group of 15 students including faculty members of the department of Sociology, Eastern Karbi Anglong College made a sociological case study on the socio-economic status of the Karbi women residing at Kuligaon village. the objective of the study is to have a first-hand knowledge about what way economic constraints have impacted the life style of karbi women or what steps these downtrodden women have taken to rise above the hardships inflicted by economic poverty.

No. Of participant students: 15

Programme outcome: This sociological case study made visiting selected household of kuligaon has brought to surface the stark reality that financial hardship has very badly crippled these women as they depend entirely on daily wages but during the period of covid-19 induced lockdowns, they suffered tremendously due to prolonged closure of every avenue of their livelihoods. The study has brought to light another worrying facet of karbi women in general that they have to shoulder the responsibility of providing economic impetus to their households but in matters of decision making, they remain subdued and are grossly side-lined. The study has diagnosed that unless these women are economically empowered, their position in the society would remain vulnerable.

Some evidences are:



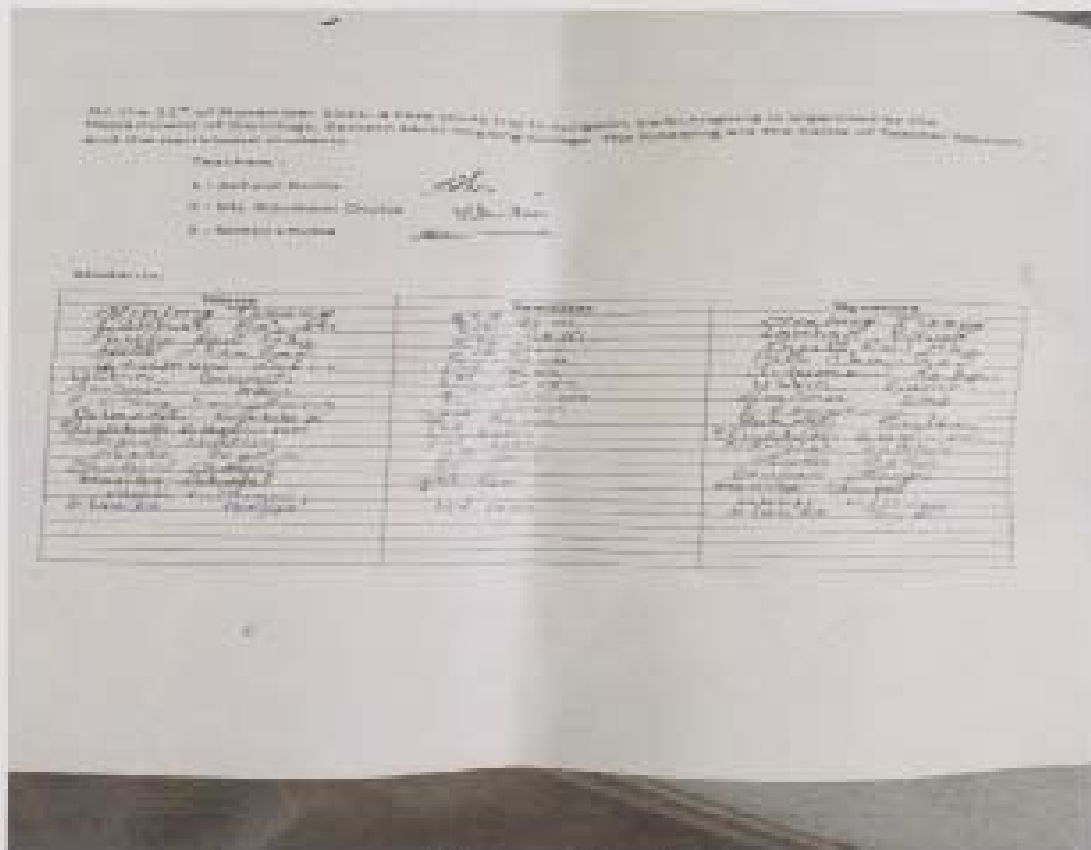

11/11/21
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sanhjan, Karbi Anglong



Moments during the programme

Dr. Anil Ch. Das
Dr. Anil Ch. Das, Principal
 Eastern Karbi Anglong College
 Serhajan, Karbi Anglong

Students with faculty members

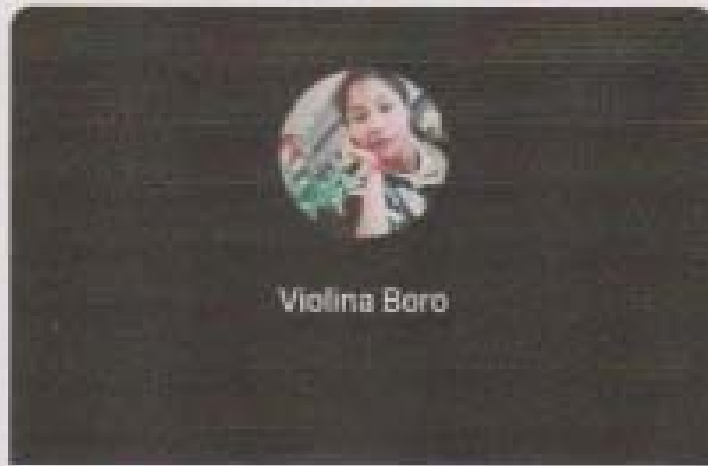


Signatures of the students

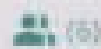

Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sathgajan, Karbi Anglong

5. **Teacher exchange:** Dr Pankaj Kalita, Assistant Professor, Department of Zoology taught computational biology in the Department of Zoology on in online mode. This kind of exchange in teaching learning process makes the process more fruitful. Documental evidences are given below:


28/1/22
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sanhojan, Karbi Anglong.



Violina Boro



Dr. Pankaj (You)



Priyanka Kumari



Gamma Das



Meeting URL: <https://meet.google.com/rog-pjwu-not>

The google meet link for the class...

Date: 29-11-2021

1:14 pm

Meeting URL: <https://meet.google.com/bfc-zyov-xpz>

Date: 09-12-2021

1:15 pm



None
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sathajan, Karbi Anglong

6. **Teacher exchange:** A community Teaching service for the students of the adopted village of EKAC, Janget Guon has been initiated on 14th December 2021. Presently the subject of English, Science and Maths of Class IX and X, are planned to be taught by our faculty experts. In the opening class, total number of six students were attended in the English Class.

The objective of the programme was to find out the weakness of students in the aforesaid subjects and try to create an interest as well as to rectify their loopholes.

A few teachers of the college have participated in the programme. They had taught mainly Science, Mathematics, English to the students of class IX and X. Some of the documentary proof and photographs were attached herewith.




Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarajan, Karbi Anglong



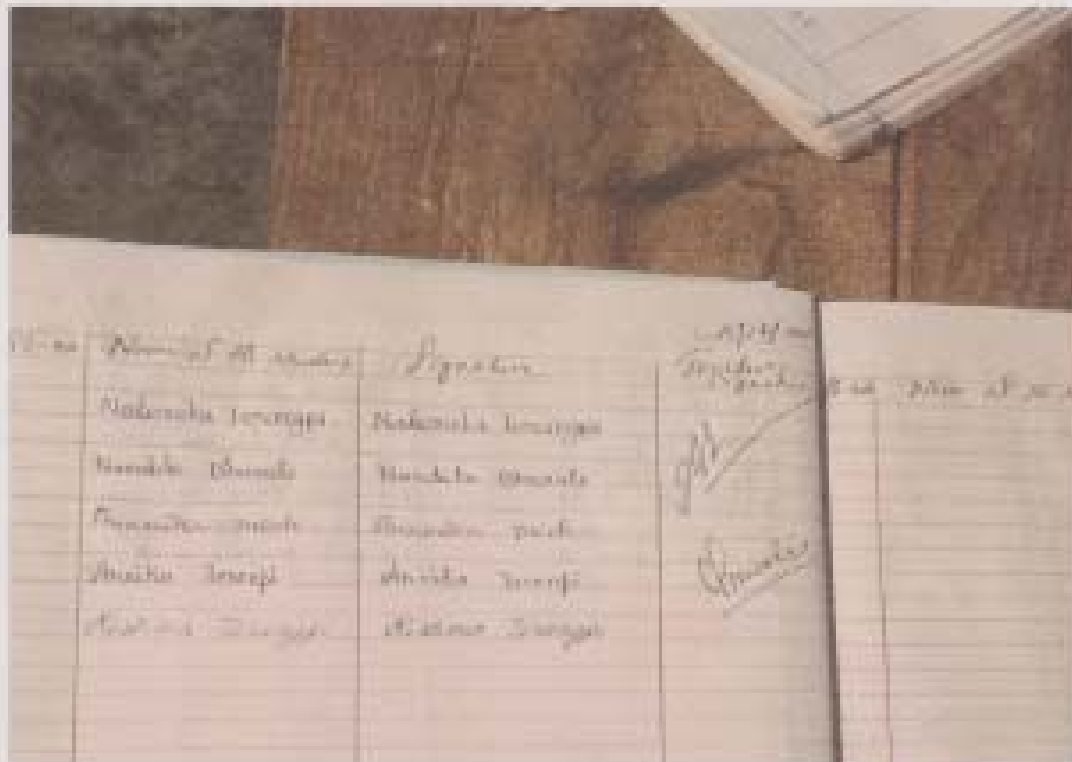
Moments during the programme




 Dr. Anil Ch. Das, Principal
 Eastern Karbi Anglong College
 Sarhajan, Karbi Anglong



Mathematic class by our Faculty



[Signature]
 Dr. Anil Ch. Das, Principal
 Eastern Karbi Anglong College
 Sariajan, Karbi Anglong



[Signature]
25/1/22
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sariajan, Karbi Anglong.





*Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sariajan, Karbi Anglong*




WOM
25/11/22
Dr. Anli Ch. Das, Principal
Eastern Karbi Anglong College
Sariajan, Karbi Anglong.



1	Sujata Das	Sujata Das	<u>Das</u>
2	Anjali Bhaswati	Anjali	
3	Nabonika Terangpi	Nabonika Terangpi	<u>NT</u> 14/12/2009
4	Nandita Bhasuli	Nandita Bhasuli	
5	Anamika Mech.	Anamika Mech.	

Das
Dr. Anil Ch. Das
Eastern Karol Academy College
Sambalpur, Karol Academy

Sl. No	Name of the student	Signature	Teacher's Signature
1	Sabrina Begum	Sabrina Begum	
2	Sujata Das	Sujata Das	
3	Ibrahim Ali	Ibrahim Ali	
4	paraggsati' pater	paraggsati' pater	
5	Neharika Teranga	Neharika Teranga	
6	Nandita Bhanali	Nandita Bhanali	
7	Anamika mech.	Anamika mech.	


 Dr. Anil Ch. Das, Principal
 Eastern Karbi Anglong College
 Sibsagan, Karbi Anglong

CLASS - X

Sl. No.	Name of the students.	Signature	Teacher's signature.
1	Sajata Das	Sajata Das	
2	Sabina Begum	Sabina Begum	
3	Ibrahim Ali	Ibrahim Ali	
4	Paraggyoti Patan	Paraggyoti Patan	
5	Nabanika Terangpi	Nabanika Terangpi	
6	Nandita Bhawal	Nandita Bhawal	
7	Anamika Mech.	Anamika Mech.	


28/1/22

Dr. Anil Ch. Das, Principal
Eastern Kabi Anglong College
Sanhajan, Kabi Anglong.

17/12/2011

Sl. no	Name of the student	Signature	Teacher's Signature
1	Nabonika Terangpi	Nabonika Terangpi	
2			
3	Nandita Bhawali	Nandita Bhawali	
4	Ananika mech.	Ananika mech.	
5	Anika Terangi	Anika Terangi	
6	Reshma Terangi	Reshma Terangi	
7	Anika Terangi	Anika Terangi	
8	Reshma Terangi	Reshma Terangi	


Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sankhajan, Karbi Anglong

S. No	Name of the student	Signature	Teacher's Signature
-------	---------------------	-----------	---------------------

	Nandita Bhalali	Nandita Bhalali	
--	-----------------	-----------------	--

	Nobunika Terangga		
--	-------------------	--	--

2	Anamika Mech	Anamika Mech.	
---	--------------	---------------	--


 Dr. Anil Ch. Das, Principal
 Eastern Karbi Anglong College
 Sarisjan, Karbi Anglong.

Teacher Signat

Sl. No	Name of the student	Signature
1	Nabonika Terangpi	Nabonika Terangpi
2	Nandita Bhasali	Nandita Bhasali
3	Ananika medh.	Ananika medh.
4	Ibrani Ali	Ibrani Ali
5	Peraggasati patar	peraggasati patar
6	Sajata Das	Sajata Das
7	Sabina Begum	Sabina Begum
8	Angkita Basumaty	Angkita Basumaty
9	Priyanka Bainsay	Priyanka Bainsay
10	Manjuri khaklam	Manjuri khaklam
11	Manju Rakha	Manju Rakha

~~Handwritten signature~~


Handwritten signature





 Dr. Anil Ch. Das, Principal

 Eastern Karbi Anglong College

 Sakhari, Karbi Anglong

Sl. no	Names of the students	Signature	Teacher's signature
	Nandita Bhorali	Nandita Bhorali	
	Neerika Terreyas		
	Anamika Mech	Anamika Mech	
	Ankita Banumatory		



 Dr. Ankita Das, Principal
 Eastern Kanya Angling College
 Samajpur, Kalyanpore

Sl. No	Name of the student	Signature	Teacher's Signature
1	Nabonika Terangpi.	Nabonika Terangpi.	
2	Nandita Bharali.	Nandita Bharali.	
3	Anamika Mech.	Anamika Mech.	
4	Angkita Basumatary	Angkita Basumatary	
5	Monjuri Khaklary	Monjuri Khaklary	
6	Pratibha Bajirao	Pratibha Bajirao	
7	Rashmi Patil	Rashmi Patil	
8	Sujata Das	Sujata Das	
9	Monju Rabho	Monju Rabho	
10	Sabina Begum	Sabina Begum	
11	Rashmi Patil	Rashmi Patil	
12	Angkita Basumatary	Angkita Basumatary	
13	Monjuri Khaklary	Monjuri Khaklary	


 Dr. Anil Ch. Das, Principal
 Eastern Kashi Anglong College
 Barhaganj, Kashi Anglong.

22.12.2021

Sl no	Name of Her student	Signature	Teacher's Signature
1	Nabonika Terangpi	Nabonika Terangpi	
2	Nandita Bhosale	Nandita Bhosale	
3	Anamika mech.	Anamika mech.	
4	Rashmi Patil	Rashmi Patil	Patil
5	monjuri Khaklary	monjuri Khaklary	
6	Arkhita Barumatory	Arkhita Barumatory	
7	Sajata Das	Sajata Das	
8	Ibrahim Ali	Ibrahim Ali	
9	paragysali patar	paragysali patar	
10	Sahina Begum	Sahina Begum	
11	Meelu Pabla	Meelu Pabla	
12	Murara Begum	Murara Begum	


75/11/22
Dr. Anil Ch. Das, Principal
Eastern Kazi Anglad College
Sanhagan, Kazi Angling


23/12/2022

Sl No	Name of the student	Signature	Teacher's Sign
	Class IX		
1	Nobonika Terangpi	Nobonika Terangpi	<u>Hemanth Reddy</u>
2	Priyanka Baysarab.	Priyanka Baysarab.	
3	Mondira Baygi	Mondira Baygi	
4	monjurei khaklarey	monjurei khaklarey.	
5	Nandita Bharali	Nandita Bharali	
6	Anasika mech.	Anasika mech.	
7	anghita Barumataray	anghita Barumataray	

Hemanth Reddy
 Dr. Anil Ch. Das, Principal
 Eastern Karnataka Angling College
 Benhalpet, Karnataka

Class X			
1	Paragysati paton	Paragysati paton	<u>Hemanth Reddy</u>
2	Sobina Begum	Sobina Begum	
3	Monju Rakha	Monju Rakha	
4	Ibrahim Ali	Ibrahim Ali	
5	Sujata Das	Sujata Das	
6	Anjali Badumataray	Anjali Badumataray	


29/10/2021

Sl no	Student's Name	Signature	Teacher's Signature
	Ankita Banamatory		
	Manguni Khaklari	Manguni Khaklari	
	Nandita Bhosali	Nandita Bhosali	
	Anamika Mech	Anamika Mech	
	Neharika Terangpi	Neharika Terangpi	


Dr. Ami Ch. Das, Principal
Eastern Karol Bagh College
Sanhayan, Kanti, Agartala

04/01/2022

Sl No	Name	Signature	Teacher's Sign
	Nobonika Terangpi	Nobonika Terangpi	
	Nandita Bharali	Nandita Bharali	
	Anamika Mech	Anamika Mech	
	Sujata Das		17th 4/1/2022
	Roshmi Patre	Roshmi Patre	
	Priyanka Vaishnav		
	Priyanka Patre	Priyanka Patre	
	Sujata Das	Sujata Das	17th 4/1/2022
	Roshmi Patre	Roshmi Patre	
	Paragjyoti Patre	Paragjyoti Patre	


Dr. Anil Ch. Das, Principal
Eastern Karfi Angang College
Sardar, Karfi Angang

03/11/2022

Sl No	Name	Signature	Teacher Sign
	Nobanika Teranggi	Nobanika Teranggi	
	Nandita Bharali	Nandita Bharali	
	Anamika Mech	Anamika Mech	
	Sujata Das		
	Rashmi Patra	Rashmi Patra	
	Paragya Patra	Paragya Patra	
	Priyanka Dasgupta	Priyanka Dasgupta	
	Sujata Das	Sujata Das	

Anamika
03/11/22

Priyanka
03/11/22

Anil Ch. Das
Dr. Anil Ch. Das, Principal
Eastern Kazi Anjani College
Serhanj, Kuzibingling


06/1/20

Name


Signature

Teacher's
Sign

Neharika Teranga
Nandita Bhargali
Anamika Meek
Akhita Basumaty


Dr. Anil Ch. Das, Principal
Eastern Koro Academy College
Serikwan, Koro, Aizawl

Sl. no	Name	Sign	Teacher's Sign
	Ankita Basumaty	Ankita Basumaty	
	Nandita Bharali	Nandita Bharali	
	Anamika Mesh	Anamika Mesh	
	Nobonika Terangpi	Nobonika Terangpi	
		Mangalika Khaklang	


 28/1/22
 Dr. Anil Ch. Patil
 Eastern Kadamba College
 Sanjap, Karangolga

9/1/2022

Sl no

Name


Signature

Teacher's
Sign

Nandita Bharali

Anasika Medhi

Nobonika Teriangpi


Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sairapan, Karbi Anglong

10/1/2022

Sl no	Name of the students	Signature	Teacher's Sign
	Nandita Bhawali		
	Anamika Mechi		Trisha
	Nobanika Terangpi		Dutta
	Manguta Khaklang		Prerna Das
	Parithimi Engtipi		Prerna Das 17/1/2022
	Rangbala Engtipi		

Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sankajan, Karbi Anglong


11/1/2022

Sl NO	Name of the student	Signature	Teacher Signature
	Nandita Phorali	Nandita Phorali	
	Anamika Mech	Anamika Mech	Anamika Dutta
	Nobonika Terangpi	Nobonika Terangpi	
	Ankita Barumatary	Ankita Barumatary	Mamika
		monjuri khaklary	
		Purethimi Engipi	
		Rangbasa Ingkiri	


Dr. Kail Ch. Das, Ph.D.
Eastern Karbi Anglong College
Sambagan, Karbi Anglong

12/1/2021

Sl-no	Name of the student	Signature	Teacher's signature
	Nandita Bhorati		
	Anamika Meek		
	Nubanka Terangpi		
	Arkita Parametary		
	Manjuri Khaklary		
	Purthimi Engkpi		Rajesh prasad
	Rangbasa Ingkpi		


Dr. Anil Ch. Das, Principal
Eastern Khasi Anglong College
Sanejan, Jaintia Anglong

7. Collaboration between Dr. Pankaj Kalita, Assistant Professor, Department of Zoology, Eastern Karbi Anglong College and Dr. Devasish Chowdhury, Associate Professor, Institute of Advanced Studies in Science and Technology (A DST institute).



विज्ञान एवं प्रौद्योगिकी उच्च अध्ययन संस्थान
(भारत सरकार के विज्ञान एवं प्रौद्योगिकी विभाग के अधीन एक स्वायत्त संस्थान)
विज्ञान पथ, पश्चिम बोरगाँव, गुरुचुक, गुवाहाटी -781035, असम : भारत
INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY
AN AUTONOMOUS R & D INSTITUTE OF DEPARTMENT OF SCIENCE & TECHNOLOGY, GOVT. OF INDIA
VIEYAN PATH, PASCHIM BORAGAON, GARCHUK, GUWAHATI-781035, ASSAM, INDIA.



To,
Dr. Anil Ch. Das,
Principal
Eastern Karbi Anglong College
Karbi Anglong, Assam, India

Ref: EKAC/2021/Linkage/259-260/362 dt. 18.11.2021

Dear Dr. Das,

Thank you so much for your letter. I am extremely happy to know the Eastern Karbi Anglong College is slowly building its stature in the region and taking a lead in popularizing science by introducing science stream in the college. It is also heartening to know that Eastern Karbi Anglong College is inviting NAAC team soon. I am sure the college's efforts will be recognized in years to come. Through this letter I would like to state the following.

- (1) Dr. Pankaj Kalita, Assistant Professor, Department of Zoology, Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam, India has collaborated with me and working on nanobiotechnology related field.
- (2) I am mentoring Dr. Pankaj Kalita for his research and have helped him with the sophisticated instrumentation facilities related to his research.
- (3) The collaboration also bore fruits and we could publish few papers together in *RSC Advances* (Published by Royal Society of Chemistry, London) and *Materials Today (Proceedings)* published by Elsevier.

I wish Eastern Karbi Anglong College will achieve great height in future. I extend my full support in helping the college in its academic upliftment.

With Best Wishes,

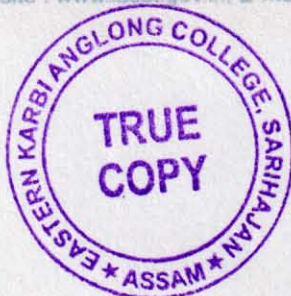
Dr. Devasish Chowdhury
Associate Professor

November 30, 2021



Dr. Devasish Chowdhury
Associate Professor
IASST, Garchuk, Guwahati-781035, India

Phone : +91-361-2270095, 2273054 Fax : +91-361-2273062
Website : www.iasst.gov.in; E-mail : registrar@iasst.gov.in ; registrar@iasst@gmail.com



29/11/22
Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarihajan, Karbi Anglong.



Cite this: RSC Adv., 2021, 11, 28029

Green synthesis of gold nanoparticles using an antiepileptic plant extract: *in vitro* biological and photo-catalytic activities†

Jayanta S. Boruah,^{†ab} Chayanika Devi,^{†c} Upasana Hazarika,^d P. Vijaya Bhaskar Reddy,^c Devasish Chowdhury,^{ab} Manash Barthakur^{de} and Pankaj Kalita^{de†}

Gold nanoparticles are one of the widely used metallic nanoparticle having unique surface plasmon characteristic, offers major utility in biomedical and therapeutic fields. However, chemically synthesized nanoparticle creates toxicity in the living organisms and contradicts the eco-friendly and cost-effective nature. So, developing greener synthetic route for synthesis of gold nanoparticle using natural materials is an enthralling field of research for its effectiveness in synthesizing eco-friendly, non-toxic materials. Moreover, biological components attached as stabilizing agent can exert its own effect along with the advantages of nanoparticle conjugation. In this work, we used for the first time methanolic leaf extract of *Moringa oleifera* as this fraction of *M. oleifera* exerts a neuroactive modulation against seizure as evidenced by earlier literature. The green gold nanoparticles synthesized were characterized by different characterization tools, dynamic light scattering and transmission electron microscopy techniques etc. Prepared nanoparticles were biologically (antioxidant, antimicrobial and blood cytotoxicity) characterized to screen their further utility in therapeutic strategies. Characteristics and activities of green gold nanoparticles were compared with conventional citrate stabilized gold nanoparticles. It was observed that green gold nanoparticles prepared using *M. oleifera* show less cytotoxicity and helps in regeneration of neuronal cells in animal model study. It establishes the fact that conjugation of different plant extract fraction for stabilization of gold nanoparticle may be responsible factor for enhancement of bioactive nature of green gold nanoparticle. In addition, the green gold nanoparticle show efficient photo-catalytic efficiency. Development of such bioactive gold nanoparticles will lead to functional materials for biomedical and therapeutic applications.

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rsc.li/rsc-advances

1 Introduction

The nanoparticle plays a fascinating role in modern biological science researches, mainly in the field of catalysis,¹ sensory probes^{2–4} as well as in diverse field of medical science such as therapeutic agents, drug delivery,^{5,6} very recently in toxin removal⁷ etc. Nanoparticles show higher level of performance in compared to its parent bulk material because of its high surface

to volume ratio, size, shape and charge characteristics along with its high reactivity.⁸ Metallic nanoparticles, like gold nanoparticle (AuNP), with integration of tailored functional properties, present a valuable precursor for rational design of innovative nanodevices and nanosystems.⁹ The optical characteristic offered by the characteristic Surface Plasmon Resonance (SPR) of AuNP leads to its multiple usability in bioscience and biomedical applications, like bioinstrumentation, disease diagnosis, drug delivery, gene therapy, as biosensor etc.^{9–11} Although, there are several standardized methods of gold nanoparticle synthesis using different stabilizing agents but chemically synthesized nanoparticle have some drawbacks like biological toxicity, ecological imbalance and moreover, the cost involving in its synthesis. Moreover, in such procedures, traces of unreacted reagents or unwanted by-products remain in the gold colloidal solution interpreting the chemically synthesized AuNPs unsuitable and problematic for its further biological applications.¹² In recent years, green chemistry pathway by utilizing plant extract for the biosynthesis of AuNPs has gained importance over chemical routes of AuNP synthesis due to its simplicity for rapid synthesis during reduction of their parent.¹³

^aMaterial Nanochemistry Laboratory, Physical Sciences Division, Institute of Advanced Study in Science and Technology, Paschim Buragun, Gurchak, Gauhati, 781035, India. E-mail: devasish@iastt.ac.in

^bDepartment of Chemistry, Cotton University, Assam, India

^cDepartment of Life Science and Bioinformatics, Assam University, Diphu Campus, Diphu, Assam, India

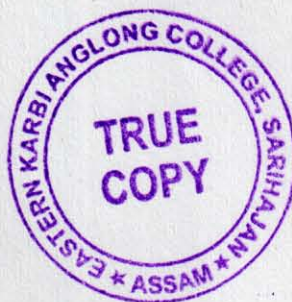
^dDepartment of Biophysics, Pab Kamrup College, Bakhata Chariali, Assam, India

^eDepartment of Zoology, Eastern Karbi Anglong College, Bahuta Chariali, Assam, India

† E-mail: kalita.pankaj@gmail.com

† Electronic supplementary information (ESI) available. See DOI: 10.1039/d1ra02669k

‡ Both the authors have equal contribution.

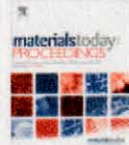


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Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarhajan, Karbi Anglong.



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Formulation of nanoparticle-based fluorescence dye for detection of excitable cell

Jayanta Sarmah Boruah^{a,b,1}, Pankaj Kalita^{c,1}, Devasish Chowdhury^a, Manash Barthakur^{d,*}

^a Material Nanochemistry Laboratory, Institute of Advanced Study in Science and Technology, Guwahati 781035, India

^b Department of Chemistry, Cotton University, Assam, India

^c Department of Zoology, Eastern Karbi Anglong College, Karbi Anglong, Assam, India

^d Department of Zoology, Pub Kamrup College, Baihata Chariali, Kamrup, Assam 781381, India

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ABSTRACT

Biosensor is a device used to detect the presence and function of bio-molecules in different biological fluid. In the field of biosensor development gold nanoparticle attracts great attention due to unique properties and surface charges. Different gold nanoparticle (gnp) based biosensors are now in use for clinical application. Gold nanoparticles can be conjugated with the fluorescence chemicals easily and can be used for detection of different charged biological tissues. Negatively charged gold nanoparticles were prepared and conjugated with fluorescence dye methylene blue. Surface charge, fluorescence characteristics and size of the methylene blue gold nanoparticles and the conjugates were studied. The shifting peak of absorption of gold nanoparticles in the UV-Vis spectroscopic study indicated the possibility of the gold nanoparticles methylene blue conjugate formation. The conjugate can be used for identification of excitable cells from excitable and non-excitable cells containing tissues.

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1. Introduction

Identification of cells based on electrical properties has physiological importance. Fluorescence property of an element is used for detection and identification of biochemical component of cell and sub cellular component [1]. Fluorescence chemicals are widely used in research and diagnosis. Some chemicals show weak fluorescence characteristic but becomes highly fluorescence after conjugation with nanoparticles. Even chemicals become fluorescence after conjugation with gold nanoparticle (gnp) [2]. Use of surface plasmon resonance of gold nanoparticles in case of biosensor is well known [3]. Methylene blue (MB) is a blue colour dye used to stain the nuclear part of a cell. This dye has wide applicability in biological field including therapeutic field [4]. Methylene blue is a membrane permeant dye and can cross the cell membrane [5]. The intracellular localization of the dye in normal and cancerous cell was investigated earlier and reported that in cancerous cell

the dye accumulated in mitochondria and the life time of the fluorescence was found lower in cancerous cell when compared with the normal cell [6]. It was also reported that methylene blue can be degraded in presence of gold nanoparticles [7]. Intracellular distribution of different biomolecules can be possible by use of different fluoroprobe as reported [8]. The surface charge of methylene blue is almost neutral so, the dye can cross the plasma membrane. Methylene blue has fluorescence characteristic and can be used as a fluorescence dye to stain the positively charged plasma membrane after charge modification. Previously, gold nanoparticles and methylene blue conjugate was prepared and used as photodynamic therapy agent to treat cancer cells [9]. It is believed that charge of methylene blue can be modulated with negatively charged gold nanoparticles and can be used as fluorescence dye to detect excitable cell with positive charge plasma membrane. Excitable cells can generate tiny electrical current after stimulation. The generation of electrical current is due to change of membrane potential of the cells. The opening of some channels and the movement of charged molecules to and fro through the plasma membrane is the fact behind the change of membrane potential. In the organ system like nervous system, both excitable and non-

* Corresponding author at: Department of Zoology, Pub Kamrup College, Baihata Chariali, Kamrup, Assam 781381, India (M. Barthakur)

E-mail address: researchpkc@gmail.com (M. Barthakur).

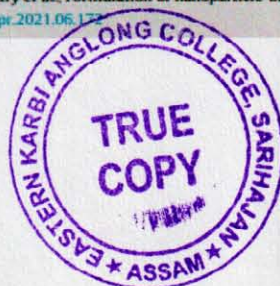
¹ Authors contributed equally.

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Eastern Karbi Anglong College
Sarhajan, Karbi Anglong.

8. Collaboration between Dr. Pankaj Kalita, Assistant Professor, Department of Zoology, Eastern Karbi Anglong College and Dr. Chadipiralla Kiranmai, Assistant Professor, Department of Biotechnology, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India.

**VIKRAMA SIMHAPURI UNIVERSITY
NELLORE-524324, AP, INDIA**

Dr. Chadipiralla Kiranmai
Assistant Professor
Department of Biotechnology



Phone No: +91 861 – 2352365
Mobile: +91-9701943986
Email: cdpkiranmai@gmail.com

Date: 19/3/2021

The Principal
Eastern Karbi Anglong college,
Sarihajan, Karbi Anglong,
Assam


Ref: /2021/Linkage/258-259/361 dt. 16/03/2021

Dear Sir,

With reference to your letter EKAC/2021/Linkage/258-259/361 dated 16/03/2021 intending to have scientific collaboration of Dr. Pankaj Kalita my laboratory, I express my willingness for the same. I shall be able to provide Dr. Kalita with any scientific inputs under my capacity and guide/mentor him as per as and when needed. Further I assure that he will be allowed to use any scientific equipment and other facilities in my laboratory for the purpose of performing any research experiments. You are also welcome to seek my help in case I am of any use to you or towards the upliftment of your college.

Looking forward to work with you

Sincerely


Dr. Chadipiralla Kiranmai

DR. CHADIPIRALLA KIRANMAI
Assistant Professor
Department of Biotechnology
College of Science & Technology
VIKRAMA SIMHAPURI UNIVERSITY
NELLORE-524 324, A.P. INDIA

Dr. Kiranmai is a renowned researcher in the field of plant biotechnology and phytochemistry having abroad Post-Doctoral experiences in years. She has already been got sanctioned different research of different funding agency. She has been facilitating Dr. Kalita in different phytochemical research activities. Till now, we have been able to publish two research papers in scopus indexed journals and one international conference presentation.




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Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarihajan, Karbi Anglong.

Traditional Rice Beer of Assam, North East India: Traditionalism, Ethnobiology and its Pharmacomedicinal Trends

Pankaj Kalita^{1#}, Chayanika Devi^{2#}, Dipak Konwar³, Chadipiralla Kiranmai⁴, Ajit K. Tamuli², Uday Sankar Allam⁴, Kota Neela Manikanta⁵, Pichili Vijaya Bhaskar Reddy^{2*}

¹Department of Zoology, Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam, India

²Dept. of Life Science & Bioinformatics, Assam University, Diphu Campus, Diphu, Karbi Anglong, Assam, India

³Department of Botany, Pub Kamrup College, Baihata Chariali, Kamrup, Assam, India

⁴Department of Biotechnology, Vikrama Simhapuri University, Nellore, AP, India

⁵Department of Tourism Management, Vikrama Simhapuri University, Nellore, AP, India

Denotes Equal Authorship *Corresponding author Dr. Pichili Vijaya Bhaskar Reddy, Dept. of Life Science & Bioinformatics, Assam University, Diphu Campus, Diphu, Karbi Anglong, Assam, India
vbreddyasuh@yahoo.com; vpichili@gmail.com

Abstract

Assam which is an integral part of the North East India, well recognized for its tribal ethnicity. Several tribal communities reside in Assam and also in other parts of North East India. The major ethnic groups and tribes are Ahom, Bodo, Mishing, Karbi, Rabha etc. Among various practices that are followed by the tribes, the preparation of traditional rice beer is considered as a spiritual practice and plays an important role in their socio-economic development. Although rice is the primary ingredient used in the preparation of the rice beer, the method of preparation, the herbal components used during the preparation process vary among the various tribes. These traditional rice beers that are prepared are reported to be possessed with diverse medicinal properties and therapeutic values and hence, are considered as nutraceuticals. Owing to the uniqueness in their preparation, the type of herbal components present and the subtle differences that lie among the methods of preparation, traditional rice beer brewing techniques, have gained scientific attention. This review article focuses on documentation of the differential methodologies and the type of the plant products that are used in the preparation of the rice beer.

Key words: Nutraceuticals, Ethnic groups and tribes, traditional rice beer, North-east India

Functional Characterization of traditional rice based alcoholic beverages of Assam, North East India

Chayanika Devi^{1*}, Pankaj Kalita^{2*}, Himashri Deka¹, Himjyoti Dutta³, Ajit K Tamuli¹,
Dipak Konwar⁴, Chadipiralla Kiranmai^{5*}, Pichili Vijaya Bhaskar Reddy^{1*}

¹Department. of Life Science & Bioinformatics, Assam University, Diphu Campus, Diphu, Karbi Anglong, Assam, India

²Department of Zoology, Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam, India

³Department of Food Technology, Mizoram University, Aizwal, Mizoram, India

⁴Department of Botany, Pub Kamrup College, Baihata Chariali, Kamrup, Assam, India

⁵Department of Biotechnology, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India

Denotes Equal Authorship *Corresponding authors

Dr. Pichili Vijaya Bhaskar Reddy, Dept. of Life Science & Bioinformatics,
Assam University, Diphu Campus, Diphu, Karbi Anglong, Assam, India

vbreddyasuh@yahoo.com, vpichili@gmail.com


Dr. Kiranmai Chadipiralla Department of Biotechnology, Vikrama
Simhapuri University, Nellore, Andhra Pradesh, India

cdpkiranmai@gmail.com

Abstract:

In North-East India, different types of alcoholic beverages hor arak, horalank, jou, jougwan, xaajpani, noginapong, sai mod and choko are traditionally prepared by tribal people viz., Karbi, Mishing, Bodo, Rabha, Ahom. They use it in a traditional manner and also play an important role in contributing to livelihoods by enhancing their income generation. Rice and certain selected medicinal plants are used as substrates in preparation of these beverages and hence possess high value among the tribal communities. Present study was aimed at determining the nutritional, nutraceutical and biochemical properties of various beverages prepared by different tribal communities. Qualitative and quantitative screening was performed using standard protocols. Phenolic and flavonoid contents were estimated spectrophotometrically using Folin-ciocalteu and aluminium chloride method, respectively. Alcohol content was determined using pycnometer. Electrolytes were calorimetrically estimated using electrolyte kit. The sai mod of Mishing community was found to be the sweetest. A blended sweet and sour taste was sensed in horalank and noginapong. Sai mod was found to contain highest carbohydrate content and electrolytes, such as sodium, potassium and chlorine. Titratable acidity was highest for horalank. Jougwan showed highest amount of reducing sugar and protein content. Glucose and ascorbic acid were highest in noginapong. Traditional use of medicinal plants during the preparation of these beverages could be attributed to their bioactive potential and health promoting properties.

Keywords: Traditional Rice Beer, Assam, ethnic, bioactive, characterization, health effect


Dr. Anil Ch. Das, Principal
Eastern Karbi Anglong College
Sarihajan, Karbi Anglong.