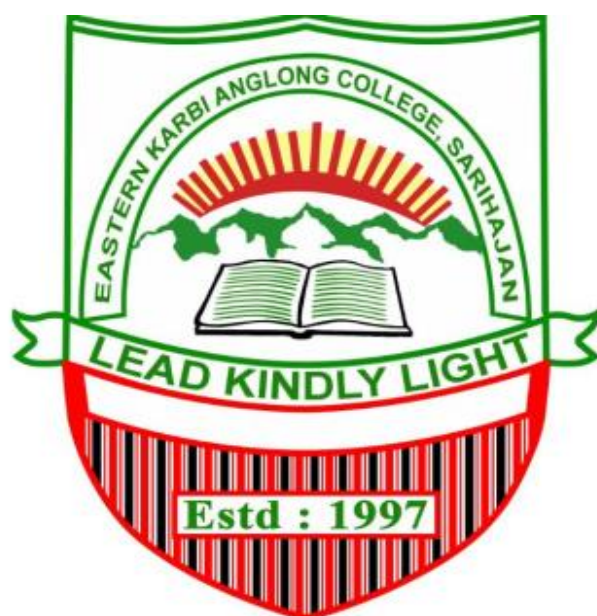


# **EASTERN KARBI ANGLONG COLLEGE**

**Sarihajan, Karbi Anglong, Assam**



## **Key Indicator**

### **3.4- Collaboration (20)**

#### **Metric No. 3.4.1**

Collaborations/linkages for Faculty exchange, Student exchange, Internship, Field trip, On-the- job training, research etc during the year

NORTH-EAST INSTITUTE OF SCIENCE AND TECHNOLOGY  
(Formerly Regional Research Laboratory)  
(Council of Scientific & Industrial Research)  
JORHAT - 785 006, ASSAM, INDIA

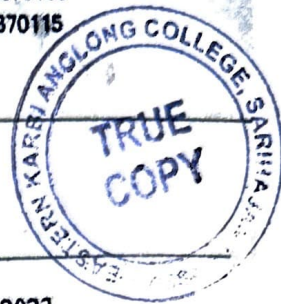


उत्तर-पूर्व विज्ञान तथा प्रौद्योगिकी संस्थान  
(पूर्व क्षेत्रीय अनुसंधान प्रयोगशाला)  
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)  
जोरहाट - 785006 असांम, भारत

Phone : 0376 2370116/ 2370086  
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वेबसाइट : <http://www.neist.res.in>

Dr. Mohan Lal  
Principal Scientist (Plant Breeding & Genetics)  
ARDD, CSIR-NEIST, Jorhat



Dated: 20.04.2023

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

Your Ref No: EKAC/2023/Research/319-320/1168

Respected Dr. Das

I appreciate the idea of research collaboration for CSIR-NEIST and Eastern Karbi Anglong College. I am glad to see that Eastern Karbi Anglong College is gradually taking initiatives to make science and research activities more accessible to students. I would like to extend my cooperation to Dr. Joyashree Baruah, Assistant Professor in the Department of Botany at Eastern Karbi Anglong College in Sarihajan, Karbi Anglong, in this respect. We will be collaborating on research involving collection, characterization, and breeding of different medicinal and aromatic plants as well as other related fields. In addition to offering laboratory facilities, I would be glad to assist Dr. Baruah with her work. I think that both the institutes will benefit from this relationship in terms of research. Finally, I extend my support to help Eastern Karbi Anglong College to improve its academic and research.

Regards

*[Handwritten signature]*  
20/4/2023

Dr. Mohan Lal  
Principal Scientist  
Agrotechnology & Rural Development  
CSIR-North East Institute of Science & Technology  
Jorhat, Assam



Dr. Mohan Lal, Principal Scientist  
आग्रेटेक्नोलॉजी एवं ग्रामीण विकास विभाग  
CSIR-उत्तर पूर्व विज्ञान एवं प्रौद्योगिकी संस्थान  
जोरहाट, असांम

*[Handwritten signature]*  
Dr. Anil Ch. Das, Principal  
Eastern Karbi Anglong College  
Sarhajan, Karbi Anglong

*[Handwritten signature]*

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हम हिंदी में किए गए पत्राचार का स्वागत करते हैं

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





# Estimation of environment stability for fruit yield and capsaicin content by using two models in *Capsicum chinense* Jacq. (Ghost Pepper) with multi-year evaluation

Joyashree Baruah<sup>1,2</sup>, Twahira Begum<sup>2</sup> and Mohan Lal<sup>2</sup>

<sup>1</sup> Department of Botany, Eastern Karbi Anglong College, Assam, India

<sup>2</sup> Agrotechnology and Rural Development Division, CSIR-North East Institute of Science and Technology (NEIST), Assam, India

## ABSTRACT

**Background:** *Capsicum chinense* Jacq. (Ghost Pepper) is well-known for its high pungency and pleasant aroma. The recent years witnessed a significant decline in popularity of this important crop due to the use of inferior planting material and lack of elite lines. To maintain constant performance across a variety of settings, it is crucial to choose stable lines with high yield and capsaicin content, as these are the most promising traits of Ghost Pepper.

**Method:** In this study, 120 high-capsaicin genotypes were subjected to a 3-year (*kharif* 2017, 2018 and 2019) stability investigation utilizing two well-known stability methods: Eberhart-Russell (ER) and additive main effects and multiple interaction (AMMI). Three replications were used following Randomized Complete Block Design for 11 traits. The experiment soil was sandy loam with pH 4.9. Minimum and maximum temperature of 18.5 °C, 17.5 °C, 17.4 °C and 32.2 °C, 31.3 °C, 32.7 °C and rainfall of 1,781, 2,099, 1,972 mm respectively was recorded for the study period.

**Result:** The genotype-environment linear interaction (G×E Lin.) was highly significant for days to 50% flowering, capsaicin content, fruit length and girth, fruit yield per plant and number of fruits per plant at  $p < 0.005$ . G×E interaction for fruit yield and capsaicin content in AMMI-analysis of variance reported 67.07% and 71.51% contribution by IPCA-1 (interactive principal component axis) and 32.76% and 28.49% by IPCA-2, respectively. Eight genotypes were identified to be stable with high yield and capsaicin content. The identified stable lines can be opted for cultivation to reduce the impact of crop failure when grown in different macro-environments. Moreover, the pharmaceutical and spice sectors will also be benefitted from the lines with high capsaicin content. Further research assessing the lines' performance across various regions of India can provide a solid foundation for the crop's evaluation at national level.

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Academic editor

Anshuman Singh

Additional Information and  
Declarations can be found on  
page 14

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OPEN ACCESS

**Subjects** Agricultural Science, Plant Science

**Keywords** Ghost pepper, Pungency, Crop failure, Stability, Macro-environments

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

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# EASTERN KARBI ANGLONG COLLEGE

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Ref No. EKAC/2021/MOU/293-294/402 (A)

Date : 04/12/2021.....

## Memorandum of Understanding on Academic Cooperation between

Diphu Government College, Diphu, Karbi Anglong, Assam  
and

Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam



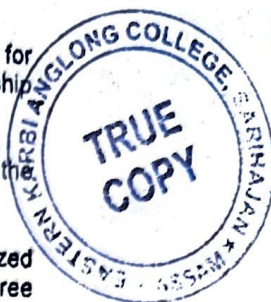
### The Parties;

Diphu Government College, Diphu, Karbi Anglong, Assam (hereinafter "DGC"); and Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam, (hereinafter "EKAC") are the two pioneering not-for-profit institutes of the state of Assam, conclude this Memorandum of Understanding (hereinafter: "MoU").

1. The purpose of this MoU is to develop academic and educational cooperation and to promote mutual understanding between the two Parties.
2. Each Party agrees to develop the following collaborative activities in the academic areas of mutual interest, on a basis of equality and reciprocity.
  - 2.1) Exchange of Teaching-Learning Prospects
  - 2.2) Conducting collaborative research work and projects
  - 2.4) Conducting lectures and organizing symposia
  - 2.5) Exchange of academic information and materials
  - 2.6) Promoting collaboration in fields of mutual interest
  - 2.7) Promoting other academic cooperation as mutually agreed
  - 2.8) Exchange of laboratory facilities as mutually agreed
3. The development and implementation of specific activities based on this MoU will be separately negotiated and agreed between colleges, schools or institutes which carry out the specific projects and will be subject to a separate written agreement. Each Party agrees to carry out these activities in accordance with the laws and regulations of the respective authorities after full consultation and approval.
4. It is understood that the implementation of any of the types of co-operation stated in Clause 2 shall depend upon the availability of resources and financial support of the Parties concerned.
5. Both Parties agree that prior written approval is required before using the other Party's name, logo, or other Intellectual Property rights in any advertising or associated publicity.

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

6. Should the collaborative research activities under this MoU result in any potential for intellectual property, each Party shall seek an equitable and fair agreement as to ownership and other property interests that may arise.
7. This MoU may only be amended or modified by a written agreement signed by the representatives of each Party.
8. This MoU is valid for a period of three years from the date of signing by the authorized signatories of each Party. Each Party shall review the status of the MoU at least three months before the end of the three-year period to determine whether it wishes the MoU to continue and, if so, any necessary modifications that might be incorporated. The period of validity of this MoU may only be extended by the mutual written consent of both Parties.
9. This MoU may, at any time during its period of validity, be terminated by one of the Parties upon prior notice to the other in writing not later than six months before the termination date.
10. The Parties may disclose certain confidential information to the other in relation to any future proposal made under this MoU. Each Party therefore agrees that the contents of this MoU and the negotiations in relation to any future proposal remain strictly confidential and each Party hereby undertakes not to disclose the same to any third Party, save for its professional advisers, without the prior written consent of the other Party except where such disclosure is required by law (including, without limitation, under applicable freedom of information legislation).



Signed for and on behalf of Diphu Government College by:

Signed for and on behalf of Eastern Karbi Anglong College by:

Name: Mr. Abdul Motin

Position: Principal I/C

Date:

*Can Shin*  
Principal  
Diphu Govt. College

Name: Dr. Anil Ch. Das

Position: Principal

Date:

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

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







**Faculty Exchange Programme  
under  
MoU of Eastern Karbi Anglong College with Diphu Govt College**

**Date** : 20/2/2024

**Class taken by** : Dr. Himani Medhi, HOD, Department of Chemistry, EKAC


**Topic taught** : Unit 1: Nitrogen containing functional group,  
Paper CHMHCC402T (Organic Chemistry)

**Class taken for** : TDC 4<sup>th</sup> Semester CBCS students

**Venue** : Department of Chemistry, Diphu Govt. College, Diphu

**No. of students present** : 05

A class of TDC 4<sup>th</sup> Semester CBCS students has been taken by Dr. Himani Medhi on nitrogen containing functional groups (Unit 1 of the Paper CHMHCC402T (Organic Chemistry)) in Department of Chemistry, Diphu Govt. College, Diphu under the MoU signed by Eastern Karbi Anglong College with Diphu Govt. College, Diphu. Five honors students of Department of Chemistry, Diphu Govt. College has actively participated in the class.

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



**Faculty Exchange Programme**  
**under**  
**MoU of Eastern Karbi Anglong College with Diphu Govt College**

**Date** : 20/2/2024

**Class taken by** : Dr. Himani Medhi, HOD, Department of Chemistry, EKAC


**Topic taught** : Unit 1: Nitrogen containing functional group,  
Paper CHMHCC402T (Organic Chemistry)

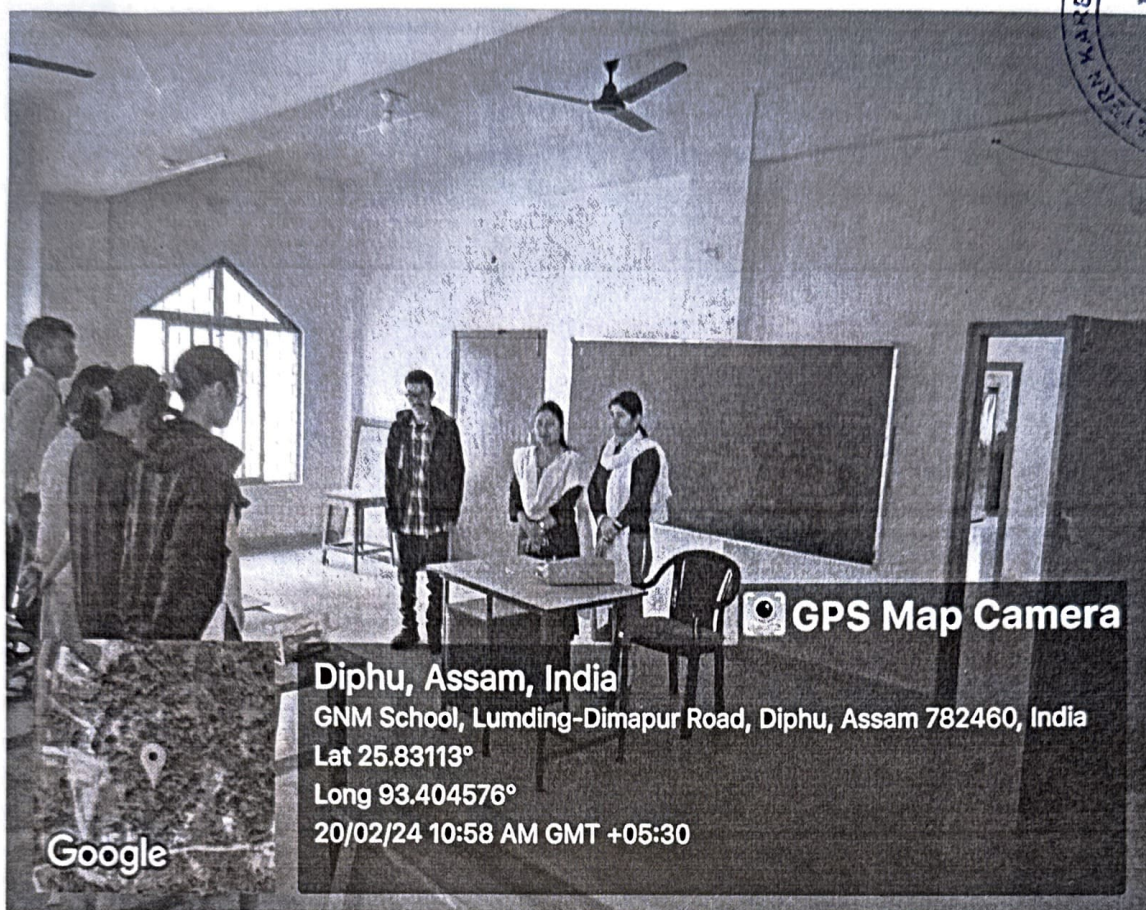
**Class taken for** : TDC 4<sup>th</sup> Semester CBCS students

**Venue** : Department of Chemistry, Diphu Govt. College, Diphu

**No. of students present** : 05

A class of TDC 4<sup>th</sup> Semester CBCS students has been taken by Dr. Himani Medhi on nitrogen containing functional groups (Unit 1 of the Paper CHMHCC402T (Organic Chemistry)) in Department of Chemistry, Diphu Govt. College, Diphu under the MoU signed by Eastern Karbi Anglong College with Diphu Govt. College, Diphu. Five honors students of Department of Chemistry, Diphu Govt. College has actively participated in the class.

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



GPS Map Camera

Diphu, Assam, India

GNM School, Lumding-Dimapur Road, Diphu, Assam 782460, India

Lat 25.83113°

Long 93.404576°

20/02/24 10:58 AM GMT +05:30

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





Date: 20/02/2024.

Programme: Faculty Exchange programme under MoU.

Class taken: TDC 4th Semester.

Topic: Paper. CHHCC 402 T. (Organic Chemistry).

Unit 1: Nitrogen containing Functional group.

Class taken by: Dr. Himani Medhi, HOD, Department of Chemistry  
Eastern Karbi Anglong College.

Venue: Department of Chemistry, Diphu Govt. College,  
Diphu.

Signature of Students:

<u>Name</u>	<u>Class</u>
1. Faingdi Dijoera	4th Sem
2. Mindalim Kropi	4th Sem
3. Hormon Jorag	4th Sem
4. Tamim Alam	4th Sem
5. L. Anchana Singha	4th Sem

Signature:

F. Dijoera.  
Mindalim Kropi  
Hormon Jorag.  
Tamim Alam  
L. Anchana Singha

Signature of Teachers:

1. Rupen Kumar Nargary  
2. Kokil Saikia  
3. Basanti Rongpipi

Head  
Department of Chemistry  
Diphu Govt. College, Diphu  
20/02/2024

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

# विज्ञान एवं प्रौद्योगिकी उच्च अध्ययन संस्थान

(भारत सरकार के विज्ञान एवं प्रौद्योगिकी विभाग के अधीन एक स्वशासी संस्थान)

विज्ञान पथ, पश्चिम बड़ागाँव, गड़चुक, 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

VIGYAN 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

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





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# A novel route to fabricate ZnO nanoparticles using *Xanthium indicum* ethanolic leaf extract: Green nanosynthesis perspective towards photocatalytic and biological applications

Bitopan Boro<sup>a,b,1</sup>, Jayanta S. Boruah<sup>a,c,1</sup>, Chayanika Devi<sup>d</sup>, Alemtoshi<sup>e</sup>, Bhagyudoy Gogoi<sup>e</sup>,  
Pranjal Bharali<sup>e</sup>, P. Vijaya Bhaskar Reddy<sup>d</sup>, Devasish Chowdhury<sup>a,b,\*</sup>, Pankaj Kalita<sup>f,\*</sup>

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<sup>b</sup> Academy of Scientific and Innovative Research (AcSIR), Ghaziabad 201002, India

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## ARTICLE INFO

### Keywords:

Zinc oxide nanoparticle  
*Xanthium indicum*  
Green synthesis  
Photocatalytic activity  
Biological activity

## ABSTRACT

Fabrication of nanoparticles using green synthetic route is always preferred over conventional chemical route owing to reduced toxicity issue required in biomedical application. In fact, it will also develop ecofriendly and cost-effective materials. Generally, a suitable plant leaf extract is applied for this purpose to act as reducing and stabilization agents during green nanoparticle synthesis which offers ease of biomolecule conjugation. Here, we attempted to synthesize Zinc oxide (ZnO) nanoparticles using ethanolic leaf extract of *Xanthium indicum* plant for the first time. The plant is available only in North-East India and has been utilized in different traditional biological practices. So, it might have a great probable pharmaceutical prospect that is yet to explore. The developed ZnO nanoparticles were characterized with different techniques like DLS, TEM, FTIR, UV-Vis and XRD. Furthermore, they were employed to explore the antioxidant, antimicrobial, antifungal, cytotoxicity, and photocatalytic activities. The green synthesized ZnO (GZnO) nanoparticles were compared with conventional chemically synthesized ZnO nanoparticles in all the activities and the effectiveness could be seen for the green synthesized nanoparticles. As a result, the work reveals the use of unexplored *X. indicum* plant leaf extract for the fabrication of nanoparticles and sets up the avenue for further study based on our findings.

## 1. Introduction

Nanobiotechnology is an emerging branch of science initiating a revolutionary change in every branch of science. Nanotechnology plays with the nanoparticles (NPs) which are the atomic or molecular aggregates having the size less than 100 nm [1]. Because of their characteristic and fascinating properties over its bulk counterparts, it has been utilized in various applications including biomedical and agriculture fields [2]. To name a few, nanoparticles originated from carbon sources have been extensively studied in such applications like drug delivery, sensing, toxin removal and nano-bio interaction [3–7]. Further, metal nanoparticles, integrating with a tailored functional characteristic like gold nanoparticles (AuNP), zinc oxide nanoparticles (ZnO NPs) etc.,

explore a precious pioneer for rational design of different nano systems for their advantageous properties and applications [8,9]. Among them, particularly, ZnO NPs serve a promising role in biological field application including in antibacterial field. Potentiality of ZnO NPs to produce reactive oxygen species (ROS) in the biological systems helps to use it as an apoptotic, antibacterial and antifungal agents. Because of the cost effectiveness and environment friendly prospects, the ZnO NPs attract remarkable attention from the nanobiotechnologists towards its use in biomedical and agricultural fields [10]. The inorganic nanomaterials are found to have smart properties because of its high surface area which helps them to enter inside the cells via pores of plasma membrane proteins at nano-size inducing altered biological properties like ROS (reactive oxygen species) production or other molecular

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<sup>1</sup> Equal Contributors.

*Wone*  
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