Indian Statistical Institute

Director's Report (Edited Version)

5th Meeting of the Council (2016-2018)

September 16, 2017

PCM 125 – Inauguration on June 29, 2017

PCM 125 – Afternoon Session

- Afternoon program at Headquarter: Chief Guests – RB Barman, Chairman, National Statistical Commission, Secretary Ministry of Statistics and Programme Implementation, Prof. RL Brahmachary
- Talks by
  - Prof. K. VijayRaghavan, FRS
    - Taking Control of the Runaway Train: Data, Fact and Action on Climate
  - Prof. MS Raghunathan, FRS
    - Mathematics – Art that Would Rather be Science?

Afternoon talks at ISI Delhi Centre

- **Prof. Rajeeva L. Karandikar**
- **Dr. Arvind Subramanian**

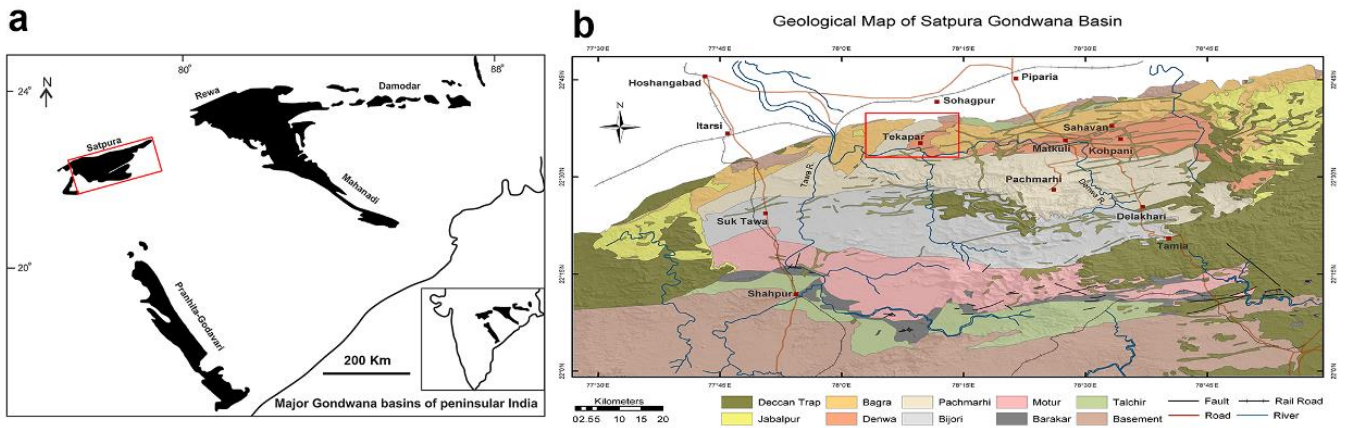
Some Updates

- Two new faculty members of joined
  - Kingshook Biswas (SMU Kolkata)
    - PhD: University Paris XIII
  - Mathew Joseph (SMU Bangalore)
    - PhD: University of Wisconsin
- Eight faculty and two non-faculty positions have been sanctioned for RCBose Centre for Cryptology and Security
- Recruitment of faculty and non-faculty positions across the Institute are underway
  - Challenges: Too few faculty vacancies
  - Need for posting faculty members in Tezpur, Chennai and Giridih
  - Course running in Hyderabad
- Documents being moved for post creation for Chennai and Tezpur Centres

Highlights

Shringasaurus Indicus: A Recent Discovery by Prof. Saswati Bandyopadhyay and Her Team

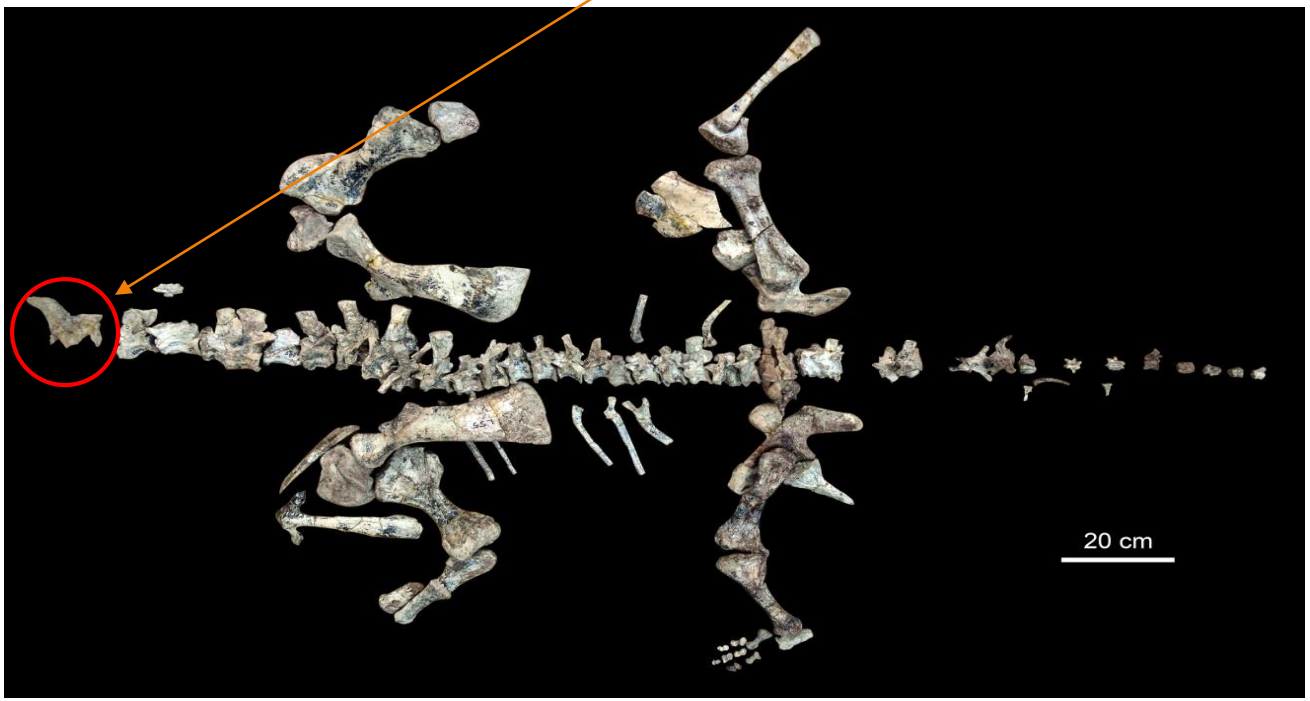
- Fossils of a New Horned Reptile of Middle Triassic Age
  - approximately 245 million years old
  - Discovered for the first time from Satpura Gondwana Basin in Madhya Pradesh



Shringasaurus locality

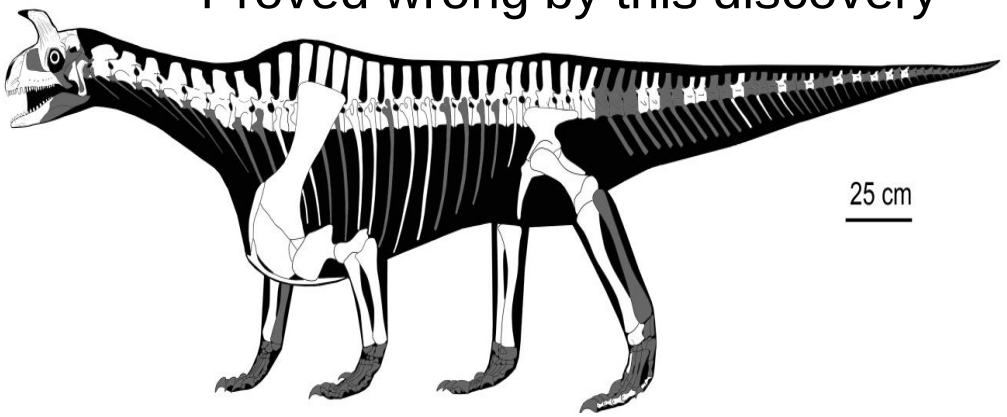
Disarticulated Skeletons of about Seven Animals Unearthed from the Red Mudstone

Śṛṅga (Shringa) →horn
Saurus → lizard



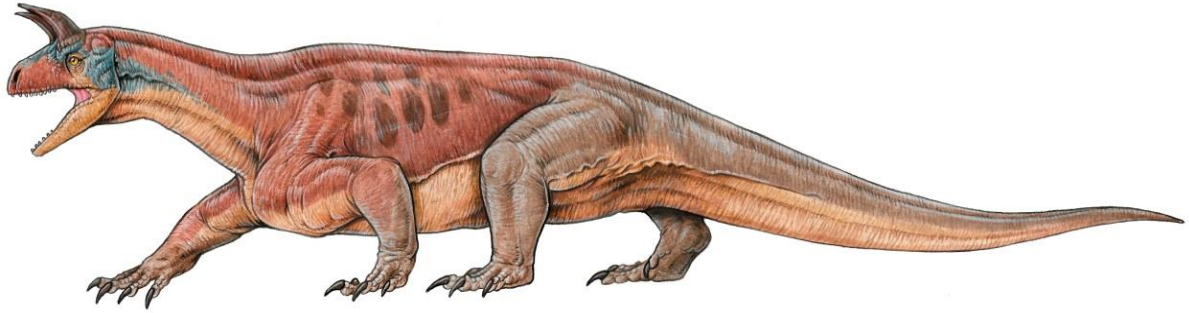
Composite skeleton of *Shringasaurus Indicus* formed by the preserved bones of different similar-sized individuals

- Earlier concept
  - horned reptilian species were restricted to dinosaurs of the cretaceous period (140 million years ago).
  - Proved wrong by this discovery



Reconstruction of the skeleton of *Shringasaurus indicus*.

Live reconstruction



Publication

www.nature.com/scientificreports

SCIENTIFIC REPORTS

OPEN

A new horned and long-necked herbivorous stem-archosaur from the Middle Triassic of India

Received: 21 April 2017
Accepted: 17 July 2017
Published online: 16 August 2017

Saradee Sengupta[1,2], Martín D. Ezcurra[3] & Saswati Bandyopadhyay[1]

The early evolution of archosauromorphs (bird- and crocodile-line archosaurs and stem-archosaurs) represents an important case of adaptive radiation that occurred in the aftermath of the Permo-Triassic mass extinction. Here we enrich the early archosauromorph record with the description of a moderately large (3–4 m in total length), herbivorous new allokotosaurian, *Shringasaurus indicus*, from the early Middle Triassic of India. The most striking feature of *Shringasaurus indicus* is the presence of a pair of large supraorbital horns that resemble those of some ceratopsid dinosaurs. The presence of horns in the new species is dimorphic and, as occurs in horned extant bovid mammals, these structures were probably sexually selected and used as weapons in intraspecific combats. The relatively large size and unusual anatomy of *Shringasaurus indicus* broadens the morphological diversity of Early–Middle Triassic tetrapods and complements the understanding of the evolutionary mechanisms involved in the early archosauromorph diversification.

Article metrics for:
A new horned and long-necked herbivorous stem-archosaur from the
Middle Triassic of India

Altmetric score
•Tweeted by **611,** Blogged by **2,** On **11** Facebook pages
•Mentioned in **4** Google+ posts, Picked up by **2** news outlets

This Altmetric score means that the article is:
•in the 99th percentile (ranked 605th) of the 132,804 tracked articles of a similar age in all journals
•in the 99th percentile (ranked 14th) of the 3,058 tracked articles of a similar age in *Scientific Reports*

Media Attention

বঙ্গতনয়ার হাত ধরে ২৫ কোটির শৃঙ্গসরাস

জাগরী বন্দ্যোপাধ্যায়
কলকাতা |২৪ অগস্ট, ২০১৭, ০৫:০৪:২৭
শেষ আপডেট: ২৪ অগস্ট, ২০১৭, ০৭:৩৭:৩৪

1.9K 50

বয়স তার কম নয়। আন্দাজ ২৪ কোটি ৪৫ লক্ষ প্রায়। মাথায় দু'টি শিং। এই ভারতীয় শৃঙ্গধারীকে নিয়েই এখন হইচই পুরাজীববিদ্যার আঙিনায়। কেননা এর আগে তার সমসাময়িক কোনও শিংওয়ালা প্রাণীর খোঁজ মেলেনি। ভারতে তো নয়ই, সারা পৃথিবীতেও নয়।

শৃঙ্গসরাস ইন্ডিকাস নামে এই সম্পূর্ণ নতুন প্রাণীটির হদিস পেয়েছেন যে গবেষকরা, তাঁদের মধ্যে দু'জন বাঙালি মেয়ে। ইন্ডিয়ান স্ট্যাটিস্টিকাল ইনস্টিটিউটের পুরাজীববিদ্যার অধ্যাপক শাশ্বতী বন্দ্যোপাধ্যায় এবং আইএসআই–প্রাক্তনী, বর্তমানে দুর্গাপুর কলেজের শিক্ষক শারদী সেনগুপ্ত। তাঁদের সঙ্গে ছিলেন আর্জেন্তিনার গবেষক মার্টিন ডি এজকুরা। তাঁদের গবেষণাপত্রটি নেচার গোষ্ঠীর সায়েন্টিফিক রিপোর্টস জার্নালে প্রকাশিত হয়েছে সম্প্রতি।

Hindusthan Times

Horned reptile that roamed in India 250mn years ago found

Joydeep Thakur
...@hindustantimes.com

NEW DELHI: A team of researchers from India and Argentina has identified a new species of horned herbivorous reptile that used to roam in the forests of central India more than 250 million years ago. This distant relative of the dinosaurs was extinct nearly 200 million years ago.

The latest finding becomes important as it challenges the notion that horned species were restricted to dinosaurs of the Cretaceous period (140 million years ago) of Mesozoic era.

"Our finding changes the idea that the horns were exclusive for dinosaurs during the Mesozoic era (about 252 to 66 million years ago). The finding proves that horns had already developed in a distantly related group at least 100 million year earlier than the first horned dinosaur" said Saswati Bandyopadhyay, a professor of Kolkata's Indian Statistical Institute (ISI) who led the project.

The researchers have named the new species Shringasaurus indicus. The name 'Shringasaurus' was derived from ancient Sanskrit and Greek roots and refers to the horns on its skull ('Shringa' which means horn and 'sauros' which means reptile). 'Indicus' (Indian) refers to its country of discovery.

RESEARCHERS HAVE NAMED THE SPECIES SHRINGASAURUS INDICUS, WHICH REFERS TO THE HORNS ON THE REPTILE'S SKULL

The study was carried out by two researchers from ISI and a scientist from Museo Argentino de Ciencias Naturales in Buenos Aires. The findings have been published in Scientific Reports—a journal of the Nature Publishing Group on August 21, 2017.

"The animal was around 4-metres long, quadruped and was about 1.25-1.50 metres tall at the hip, with a relatively long neck and small head. The most striking feature of this animal is its pair of large horns in the skull, directly above the orbits. It had leaf-shaped teeth with small cusps, suggesting that it was herbivore," said Saradee Sengupta, a former senior research fellow of ISI.

The researchers, during the excavations in the Satpura-Gondwana basin in central India over the last one decade, had collected several bones and fossils of prehistoric animals. The discovery was made when the three-member team was analysing the bones. "The discovery of an animal like Shringasaurus is outstanding because its pair of large horns on the skulls constitutes a characteristic that was completely unexpected for this group of reptiles," said Martin D Ezcurra, the Argentine scientist.

The researchers claimed that Shringasaurus probably used its horns as weapons with other individuals of the same sex to get access to mates. Researchers believe that after the Permian-Triassic mass extinction, often known as the Great Dying about 252 million years ago, nearly 95% species became extinct. But later archosauromorphs (crocodiles, dinosaurs — including their descendants — birds and their ancestors) became progressively the dominant animals on land.

9/8/2017 Horned reptiles predate horned dinosaurs by 100 million years - The Hindu

THE HINDU

This reptile beat dinos by 100m yrs

Fossils Found By Experts From ISI

TIMES NEWS NETWORK

Kolkata: The fossilised remains of a horned herbivorous reptile that roamed the Satpura-Gondwana basin of central India more than 245 million years ago have been unearthed by a team of palaeontologists and researchers from the Indian Statistical Institute (ISI), Kolkata, and abroad.

Belonging to the Triassic period that lasted between 251 million and 199 million years ago and preceded the Jurassic age when dinosaurs roamed the earth, the discovery could shed new light on the history of evolution. This is the oldest fossil of a horned-reptile to be unearthed anywhere in the world and reveals that they existed 100 million years prior to dinosaurs. It has been named *Shringasaurus indicus* — referring to its distinctive horns and the place of discovery.

HERE COMES SHRINGASAURUS INDICUS

- 4-metre-long herbivorous quadruped; was 1.25 to 1.5 metre tall at the hip
- It roamed central India's Satpura-Gondwana basin 245 million years ago
- Had a long neck and a small head with a pair of large horns directly above the orbits
- Is the oldest fossil of a horned-reptile to be unearthed anywhere in the world

An artist's impression based on the fossilised remains found

The study was done by Saswati Bandopadhyay — palaeontologist and a professor at ISI — and her team from the premier institute. The researchers published their findings in Scientific Reports — a journal of the Nature group — this week. It has already been ranked among the top five scientific papers to have been published by the journal. Saradee Sengupta, a former ISI research fellow and a teacher at Durgapur Government College, and Martin D Ezcurra of Argentina co-authored the paper along with Bandopadhyay.

The Shringasaurus fossil show that the group acquired an anatomical diversity earlier than that observed in dinosaurs of the Cretaceous period, according to Bandyopadhyay. "Shringasaurus is unique as this is the only Triassic archosauromorph with a pair of horns on its skull and the rare animal from the Middle Triassic age has been found only in India," she said.

▶Plant diet, P 7

Times of India

SCIENCE

Horned reptiles predate horned dinosaurs by 100 million years

R. Prasad
AUGUST 28, 2017 17:52 IST
UPDATED: AUGUST 28, 2017 17:54 IST

The discovery of adult reptile fossil bones without horns indicates sexual dimorphism

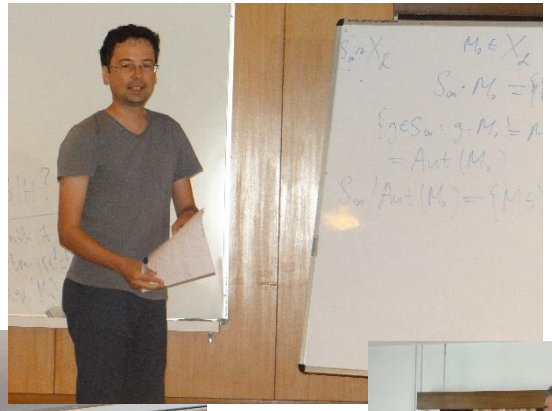
Scientists at the Kolkata-based Indian Statistical Institute have discovered fossil remains of horned reptiles about 245 million years old (early Middle Triassic) from the Satpura Gondwana basin in Madhya Pradesh. The reptile is a new genus and has been named *Shringasaurus indicus*. The results were published in the journal *Scientific Reports*.

Glimpses into Some Other Activities (not exhaustive)

- Ritabrata Munshi
  - Rare distinction to be invited to the Intl Congress of Mathematicians
- Nikhil Pal
  - Honorary Professor of University of Petroleum China
- Training for RBI officials
  - With no back ground in Statistics
  - Led by Nachiketa Chattopadhyay, SOSU
- Training of Research Personnel of Doordarshan
  - on methods of sample survey
  - before distribution of set top boxes in the North Eastern region
  - Led by Manoranjan Pal, ERU and Sumitra Purakayastha, ASU
- Weekend Training Program on Business Analytics
  - Led by: Abhijit Gupta and Arup Das, SQC&OR

Glimpses into Some Other Activities (not exhaustive)

- ISI-IASP (Indian Association for the Study of Populations) Conference
  - Title: "Population and Development in Eastern and North Eastern (NE) Regions of India"
  - Led by Prashanta Pathak, Population Studies Unit
- Workshop and Conference on Set Theoretic and Topological Methods in Model Theory
  - ISI Tezpur, leading experts in the area from Argentina, USA, UK, Germany, Poland, France, Bulgaria, South Korea and India
  - Led by SM Srivastava, Stat-Math Unit Kolkata



Sponsored Projects/Consultancy

- Amitava Banerjee and team
  - contract signed with the 5 ordnance factories for improving the quality of weapons and ammunitions made by the ordnance factories
  - working with inspection wing of Indian Army
    - To introduce modern methods of testing ammunitions using statistical methods
    - so that they have increased confidence on the products.

Sponsored Projects/Consultancy/ Service

contd...

- Antar Bandyopadhyay & Deepayan Sarkar
  - MoU with AAI and ISI - renewed for two years term
    - May 16, 2017 till May 15, 2019
    - Safety Assessment of Indian Oceanic Airspace
    - India designated as *En-route Monitoring Agency*
      - because of the indigenous statistical work done in ISI
- Smarajit Bose and Utpal Garain
  - MoU with Capital One (3 years)
    - Collaborative Research Project
    - Consultancy Project
    - Sponsored Postgraduate and Doctoral Program
    - Training Programs and Short Term Courses
- Ayanendra Nath Basu:
  - Helping the Government Agency with statistical analysis related to data on malpractices during examination

Some More Initiatives

- Antar Bandyopadhyay
  - Normalization of marks/grades across boards (JEE-Main)
  - Normalization across exams (AIIMS)
- E. Somanathan:
  - Proposal to NITI Aayog on “Studying the impact of Pradhan Mantri Ujjwala Yojana”
  - Funded project with University of Gothenberg
- Mudit Kapoor
  - Advising NITI Aayog on Health Related Project
- Co-Publishing Agreement with Springer
  - Books published under this agreement
    - Logo of ISI and Springer
- Agreements under consideration with Pricewater House Coopers, Wipro, ISRO
- Talks on with Tamil Nadu Government
  - Visit by Principal Secretary Mr. Krishnan, Planning and Development

GIAN Program at ISI

- Prof. Blaz Zupan, University of Ljubljana
  - *Interactive and Visual Approaches to Data Mining*
  - October 30-Nov 03, 2017
  - Organizers
    - S Bandyopadhyay
    - SS Ray
    - S. Das
  - http://www.isical.ac.in/~scc/GIAN-IVADM/

Construction at Tezpur – Plan Sanctioned

Construction at Chennai


ThankYou!!!