

Geological Excursion to Belum Caves & adjoining places, Kurnool District, Andhra Pradesh, India

P.R.C.Phani

The geology of the state of Andhra Pradesh in India offers many sites that are worth visiting. The Geological Survey of India has unveiled many such sites; one such geosite is described in this article which is situated at Belum, Kurnool District, Andhra Pradesh. This site is situated close to two other important cultural and geological sites viz., Yaganti, a Shaivite Shrine and the other Banaganapalli which is famous for diamondiferous conglomerates.



1. Location & Accessibility:

A location map extracted from Google Earth is shown hereunder. The area falls with Kurnool district, Andhra Pradesh. The nearest Railway station is Dhone (70 Km) which lies on Guntakal- Hyderabad line. The place can also be reached from Kurnool (80Km), or Gooty (72Km). Reasonably good budget hotels are available at all these places. A brief description of these three places, viz., Belum, Yaganti and Banaganapalli, is described hereunder.

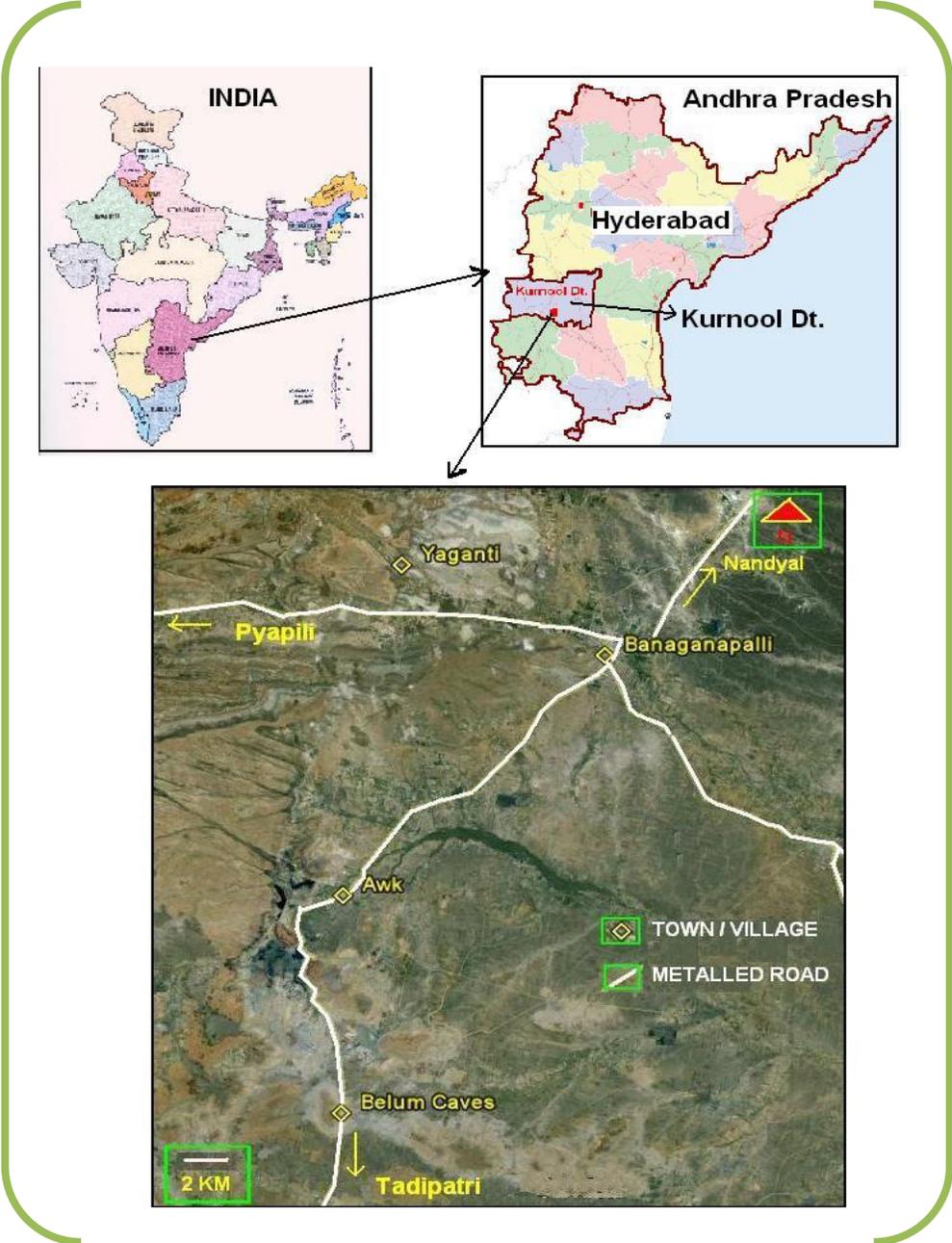


Fig.1: Google Earth Image showing location, roads and geological contact.

2. History & Cultural Aspects

Belum Caves: These caves are the second largest cave in Indian subcontinent and the longest caves (3.23 Km) in plains of Indian Subcontinent, known for its stalactite and stalagmite formations developed in karst terrain. The caves reach its deepest point (120 feet from entrance level) at the point known as *Pataalaganga (subsurface spring)*. The name 'Belum Caves' is derived from "Bilum" Sanskrit word for caves. In Telugu language, they are called *Belum Guhalu (caves)*. Originally these caves were discovered in 1884 by a British surveyor/geologist Robert Bruce Foote, later in 1982-84, a team of German speleologists headed by H Daniel Gebauer conducted a detailed exploration of the caves. Thereafter in 1988, the state government declared them protected, and Andhra Pradesh Tourism Development Corporation (APTDC) developed the caves as a tourist attraction in February 2002. Today, 3.5 km of the cave has been successfully explored, though only 1.5 km is open to tourists. APTDC is running decent cottages for the visitors.



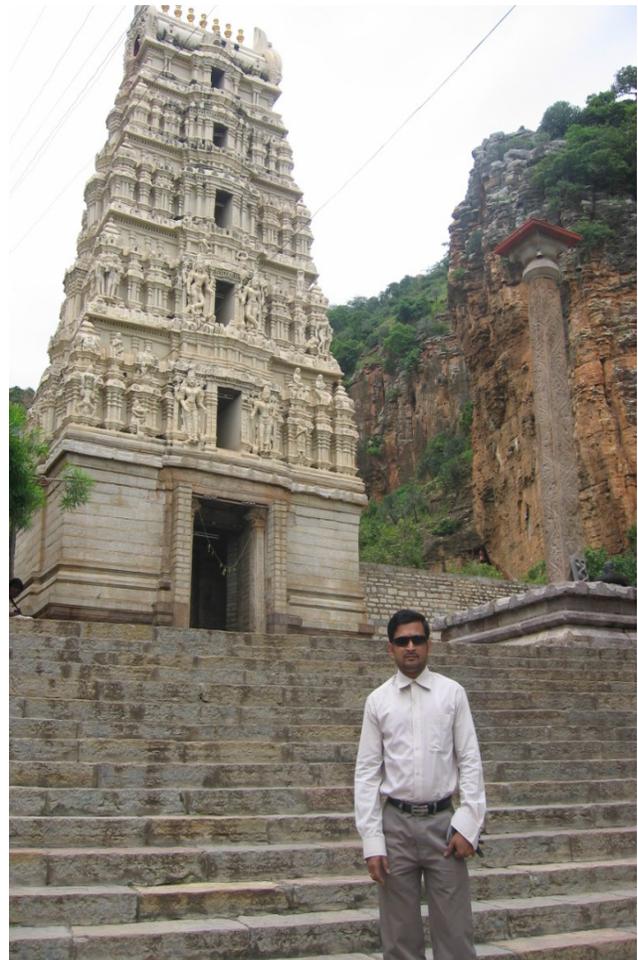
Stalagmites



Stalactites

Yaganti: Yaganti is located (north of Belum; 15Km) in the Kurnool District, Andhra Pradesh approximately 100 km from the city of Kurnool. Sri Yaganti Uma Maheswara Temple is one of the few temples patronized by one of the great dynasties of India, the Sangama Dynasty of the Vijayanagara Empire in the 15th century and was constructed by King Harihara Bukka Rayalu. Every year Maha Shivaratri is celebrated and a large number of devotees from all over Andhra Pradesh visit. Shiva, Parvati and Nandi are the main deities in this temple. Though it is a temple of Lord Shiva, it was built according to Vaishnavite traditions.

Geologically, this site is located within Kurnool Group of rocks. The following photographs show a cave in quartzites and temple premises.



Banaganapalli: The significance of this area lies in the occurrence of diamondiferous conglomerate in and around Banaganapalli. Diamondiferous conglomerate outliers occur as detached outcrops and extend for 30km long and 200m to 2km in width between Banaganapalli ($15^{\circ}19' 78^{\circ}13'$; $57I/2$) in the east to Nereducherla ($15^{\circ}12'$; $77^{\circ}14'$; $57E/16$). Easily accessible by Banaganapalli- Pyapili metalled road and fair weathered roads, about 90Km from Kurnool. Regionally the formation with conglomerate occurring as

detached outliers is well developed over a length of 225Km along the western margin of the Kurnool basin and for over 120Km along the northern margin of the Palnadu basin, both located in the Cuddapah Basin.

Climate:

The climate is tropical with temperatures ranging from 26°C to 45°C in the summer and 12°C to 31°C in the winter. The average annual rainfall is about 30 inches (762 mm). This part of the district observes highly hot and humid climate and best time to visit the place is between the months of October to February. November-December (*Kārtik mās*) period is well celebrated with religious fervor at Temple of Lord Shiva, Yaganti.

Geological Setting:

The location falls within Kurnool Group of rocks comprising quartzite, shale, limestone/dolomite and conglomerate (Table-1). The general geological map of Cuddapah Basin is shown in Fig.2 with the geographic location of the site.

The general geological succession of the area is given hereunder.

Group	Formation	Lithology
Kurnool	Panyam	Quartzite
	Awk	Shale (variegated)
	Narji	Limestone
	Banaganapalli	Quartzite, Sandstone, Grit & Minor Conglomerate (diamondiferous)
-----Unconformity-----		
Lower Cuddapah Supergroup	Cumbhum	Shales/Slate
	Tadipatri	Dolomite/Limestone/Shale
	Vempalle	Dolomites, Shale
----- Eparchaeon Unconformity (Nonconformity) -----		
Archaean gneisses/greenstones/mafic- ultramafic dykes		

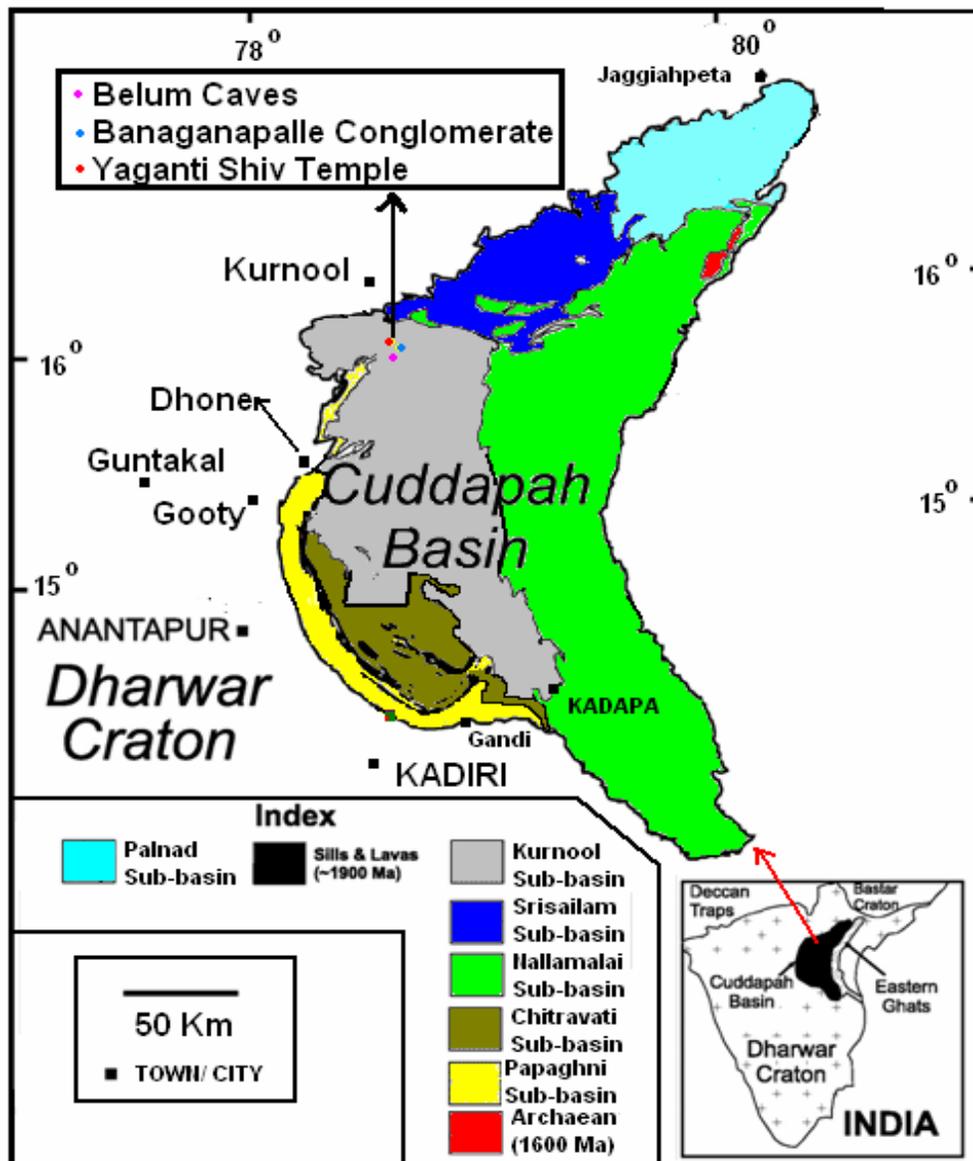


Fig.2: Geological Map of Cuddapah basin showing different sub-basins & location of the site.

The area falls within Kurnool formations. Archeans are exposed in the Dharwar Craton area to the west; no exposure of Eparchæan Unconformity is present.

Belum Caves are developed in karst terrain of Narji Limestone. Typical and huge stalactites & stalagmites can be observed here. Belum Caves have long passages, spacious chambers, fresh water galleries and siphons. Huge dolines (large caverns formed by coalescence of two or more caves) can also be observed.

At **Yaganti**, lofty hills of Banaganapalli quartzites, with or without intervening shale beds, standing as escarpments can be seen. Wide caves are also developed within these quartzites.

The Neoproterozoic conglomerates associated with the **Banaganapalli Quartzite** formation occurring at the base of Kurnool Group of rocks is a potential source for diamond. This is an interesting place to visit and the visitors can have a glimpse of

old diamond workings and also huge excavation pits made during the exploration for diamonds by GSI.

Exploration Activities:

During the period 1980-1987 GSI has carried out extensive exploration including geological mapping, drilling to assess the diamond potentiality of Banaganapalli in conjunction with NMDC & MECL. Exploratory pits made by old workers and also GSI can be visited now. However diamond incidence was reported to be insignificant. The GSI exploratory excavations can be seen at villages Baaganapalli-Nereducherla Munimadudgu, Allahabad, Racherla, Lingambadi, Rallakotturu, Ramallakota, Yambai and Vajragiri (15°18'33.36"N; 78°5'19.38"E 15°12'N 77°50'-78°15' E Toposheet No. 57I/2 & E/16). Recently GSI, (Southern Region) has published a detailed geological map of Banaganapalli summarizing the exploration carried out previously in which several cross-sections of diamond bearing zones within Banaganapalli Formation were included.

Conclusion:

The site can suite for a short geological trip. Belum caves may be of interest to students who like speleological expedition. As the conglomerates at Banaganapalli are reported to be diamondiferous, it may attract students, sedimentologists, diamond hunters, academicians etc. Visitors may find Yaganti as a peaceful, pollution-free and appropriate place for meditation and spiritualism.

*P.R.C.Phani is Manager (Geology), MSPL Limited, Hospet,
Karnataka, India.*

Email: prcphani@rediffmail.com

Further Readings:

Ramam, P.K. (1999) Geology of Andhra Pradesh, Text Book Series, Geological Society of India, Bangalore.

<http://en.wikipedia.org/wiki/Yaganti>

http://en.wikipedia.org/wiki/Belum_Caves

Detailed Information Dossier on Diamonds in India. Geological Survey of India www.portal.gsi.gov.in.