and area of occupancy (AOO: 16 km²) were calculated based on a cell width of 2 km (ref. 10). The species has been provisionally assessed here as ‘Endangered’, following the guidelines of IUCN11. Landslides are frequent in the Anjaw district of Arunachal Pradesh. Developmental activities such as broadening of roads, construction of schools, new settlements and markets, and jhum cultivation are some of the major threats to this species in Arunachal Pradesh.


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KRISHNA CHOWLU1
GOPAL KRISHNA2,*
W. ARISDASON3

1Botanical Survey of India, Arunachal Pradesh Regional Centre, Itanagar 791 111, India
2Botanical Survey of India, Southern Regional Centre, TNAU Campus, Lavley Road, Coimbatore 641 003, India
*For correspondence.

Possible Ediacaran discs from the Paniam Quartzite, Kurnool Group, South India

The Ediacaran Period (635–541 Ma) reveals the appearance of varied life forms, both in animal and plant communities, some of which continued in the Phanerozoic, while a few others disappeared as failed experiments of nature1–3. During this period, the Earth experienced significant changes in the lithosphere, biosphere, atmosphere and hydrosphere. Life forms suddenly became big and complex after the Marinoan 560–550 Ma, with a remarkable diversity around 570 Ma, with a remarkable diversity around 550 Ma in the lithosphere, biosphere, atmosphere and hydrosphere. Life forms suddenly became big and complex after the Marinoan 560–550 Ma, with a remarkable diversity around 570 Ma, with a remarkable diversity around 550 Ma. As of now, Ediacaran discs are found best preserved on the bedding surfaces of siliciclastic sandstone and shale4–10. These discs are generally considered to be of Cnidarians affinity and many to be the holdfast of the soft-bodied metazoans.

Similar discs were reported from the different Ediacaran successions of the Indian subcontinent: Krol Formation, Nainital Syncline, Lesser Himalaya1,11, the Jodhpur Group, Marwar Supergroup12–17, Maihar Sandstone and Bundi Hill Sandstone of the Vindhyan Supergroup18–20. This note discusses the possible Ediacaran discs from the Kurnool Group of peninsular India. Discoid fossils from the Kurnool Group are morphologically well compared with the established forms of the Ediacaran biota. The Kurnool Group is the youngest group of the Cuddapah Supergroup in South India. It is invariably deposed over different parts of the Cuddapah Supergroup and is exposed in the Kundair Valley in the west and the Palnad area in the northeast (Figure 1)12. It has been subdivided into six formations in stratigraphic order. These are: Banganpalle Quartzite, Narji Limestone, Owk Shale, Paniam Quartzite, Koilkuntla Quartzite, and the Palnad area in the northeast (Figure 1)12. It has been subdivided into six formations in stratigraphic order. These are: Banganpalle Quartzite, Narji Limestone, Owk Shale, Paniam Quartzite, Koilkuntla Quartzite, and the Palnad area in the northeast.

Table 1. Generalized lithostratigraphy of the Kurnool Group, Cuddapah Basin, South India (after Nagaraja Rao et al.21).

<table>
<thead>
<tr>
<th>Geological unit</th>
<th>Formation</th>
<th>Thickness of the unit (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurnool Group</td>
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</tr>
<tr>
<td></td>
<td>Koilkuntla Limestone</td>
<td>15–50</td>
</tr>
<tr>
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<td>10–35</td>
<td></td>
</tr>
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<td>10–15</td>
<td></td>
</tr>
<tr>
<td>Narji Limestone</td>
<td>100–200</td>
<td></td>
</tr>
<tr>
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Unconformity

Cuddapah: Srisailam Quartzite

The Kurnool Group is the youngest group of the Cuddapah Supergroup in South India. It is invariably deposed over different parts of the Cuddapah Supergroup and is exposed in the Kundair Valley in the west and the Palnad area in the northeast (Figure 1)12. It has been subdivided into six formations in stratigraphic order. These are: Banganpalle Quartzite, Narji Limestone, Owk Shale, Paniam Quartzite, Koilkuntla Quartzite, and the Palnad area in the northeast. A possible Ediacaran disc was reported from this formation (Table 1). Impression of the discoid is about 40 mm, and the holdfast of the soft-bodied metazoan is preserved on the bedding surface of the sample (Figure 2A). The discoid also has a holdfast (Figure 2B). Impression of the discoid is about 40 mm, and the holdfast of the soft-bodied metazoan is preserved on the bedding surface of the sample (Figure 2A). The discoid also has a holdfast (Figure 2B).

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Limestone and Nandyal Shale, together attaining a thickness of about 450 m (Table 1)\textsuperscript{21}. The age of the Kurnool Group is poorly constrained due to the absence of suitable dating material and rocks for direct radiometric dates. The lowermost unit of the Kurnool Group, i.e. the Banganpalle Quartzite is diamond-bearing, the source of which is considered the Vajrakarur kimberlite dated as 1140 Ma (ref. 22). Thus, the Kurnool Group is considered younger than 1140 Ma; however, the minimum and maximum age for shales of the Kurnool Group is proposed as 500 Ma (K/Ar) and 980 Ma (Rb/Sr) respectively\textsuperscript{23}. A limestone xenolith found in the Siddanpalle kimberlite was studied, considering that the limestone was part of the Kurnool Group. Therefore, the age of the Kurnool Group was suggested to be Late Mesoproterozoic (>1090 Ma)\textsuperscript{24}. The upper age limit of the Kurnool Group was reported to be >1.1 Ga (ref. 25). Palaeobiological data from the Kurnool Group are meagre and consist of macerated material\textsuperscript{26–31}. Gururaja et al.\textsuperscript{27} recommended that the Pc–C boundary lies within the Kurnool Group. Here we report possible Ediacaran discs from the Paniam Quartzite of the Kurnool Group of the Cuddapah Supergroup. They are preserved as epirelief and hyporelief on the Paniam Quartzite. The remnants of Ediacaran affinity are assigned to ?Aspidella terranovica, ?Nimbia dniesteri, ?Charnia sp. The presence of Ediacaran discs is of significance in understanding the megascopic life, multicellularity and evolution of high-grade body organization in the early biosphere. Documented specimens are deposited in the Birbal Sahni Institute of Palaeosciences (BSIP) museum bearing the numbers BSIP-41836 to BSIP-41839, BSIP-42002 to BSIP-42006 with statement no. 1538.

?Aspidella terranovica Billings 1872.

Description: One complete specimen. Rounded form with wide marginal area, sharp outer ring, having 30 mm of diameter, with a central boss of 15 mm diameter, the disc is smooth with a radial groove (Figure 2 a).

?Charnia sp.

Description: One incomplete specimen closely resembling ?Charnia (Figure 2 b). The specimen is ovate having an elongated body that narrows towards the tip; 65 mm in length and 14 mm in width, with a straight central furrow. Head shield U-shaped. Although similar to Charnia, there are no primary branching units, making it difficult to be convincingly established as Charnia.

?Nimbia dniesteri Fedonkin, 1980 (ref. 32).

Description: Three specimens. Small discoidal organism with flat and smooth central...
part and protruding margin <1 mm, rim of 2 mm thickness, which is circular to slightly elliptical in shape (Figure 2 c). The diameter of the specimen is 32 mm. The smaller specimen is simple discoid-shaped having a smooth inner surface with a gentle groove, with a raised outer rim of 13 mm (Figure 2 d, i and j).

The discs reported above reveal the presence of possible Ediacaran fossil assemblage in the southern part of peninsular India and indirectly indicate the age of the fossil-bearing horizon. Although there are uncertainties regarding the exact age of the possible discoid fossils reported from the Paniam Quartzite (Figure 2 e–h), the presence of most of the fossil Aspidella in the terminal Ediacaran helps constraint the age of the Paniam Quartzite to Ediacaran. Previous reports on the presence of worm burrow in the underlying Narji Limestone and Obruchevella, Chuaria, Tavuva and Leiospherids in Okw Shale, and the presence of trace fossils in the Paniam Quartzite also corroborate the Ediacaran age for the Paniam Quartzite. A further collection of specimens is required to strengthen the biostratigraphy of this region. The age of the Kurnool Group, therefore, should be Neoproterozoic and may be bracketed in the Ediacaran Period.

25. King, W., Geol. Surv. India Mem., 1872, 8, 346.

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YOGESH KUMAR1,2
MUKUND SHARMA1,3
SHREEERPUS GOSWAMI1,3

1 Birbal Sahni Institute of Paleosciences, 53 University Road, Lucknow 226 007, India
2 Department of Earth Sciences, Sambalpur University, Jyoti Vihar, Burla, Sambalpur 768 019, India
3Present address: Department of Geology, Utkal University, Vani Vihar, Bhubaneswar 751 004, India
*For correspondence, e-mail: mukund_sharma@bsip.res.in