

SHORT COMMUNICATIONS

Occurrence of *Planolites* from the Nagarjuna Sagar Area, Northwestern Cuddapah Basin

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This note records the presence and systematics of ichnogenus *Planolites* Nicholson from the Cuddapah Basin. The host sandstones are exposed in the Nalgonda district of Andhra Pradesh, on the border between Palnad and Srisailem subbasins of the Cuddapah Basin. *Planolites* is known to occur in strata of Neoproterozoic and younger ages.

Introduction: Geological investigations were carried out north of Nagarjuna Sagar Dam in the Nalgonda district of Andhra Pradesh, in an area bounded by 16°35'N and 16°38'N latitudes and 79°07' E to 79°18'E longitudes, on the northwestern flank of the Cuddapah Basin (see Inset Fig.1). The Basement Complex (comprising gneisses, schists, granites, and basic dykes) is unconformably overlain by sandstone and siltstone with minor interbedded shale and limestone. Their stratigraphy is uncertain (Meijerink et al. 1984).

The road section north of the Nagarjuna Sagar Hill Colony (Fig.1) exposes a suite of interbedded sandy, silty and minor gritty horizons (Fig.2). Sandstone beds occurring approximately 2.75 m from the base of this section are thickly, parallel bedded with silty parting laminations. They have a medium to coarse clastic framework with a matrix supported texture. Quartz is a dominant framework constituent, cemented by ferruginous material. Tubular casts of burrows have been preserved on several bedding planes of this sandstone unit. A loose specimen with three distinct burrowed bedding planes was collected from an adjoining quarry (Fig.3).

Systematic Paleontology :

Planolites Nicholson, 1872.

P. articulatus and *P. granosus* Nicholson, 1872 (c.f. Benton and Trewin, 1978)

P. vulgaris Nicholson and Hinde, 1874 (c.f. Nicholson, 1978; pp.28-31).

P. ballandus sp. nov. Webby, 1970; pp.95-96; Fig.14.

Planolites Nicholson: Benton and Trewin, 1978; p: 5-6.

Planolites Nicholson: Nicholson, 1978; p:26-28.

Material: Specimen No: 4328 lodged in the Museum of the Department of Geology, Agharkar Research Institute, Pune. (Fig.3); with dimensions of about 50 cm x 25 cm x 7 cm. Three bedding planes with burrow casts are present in this slab.

Description: The cast of burrows are endichnial unbranched with convex epirelief and concave hyporelief (Frey 1975). The tubes are cylindrical, few of which are gently sinuous.

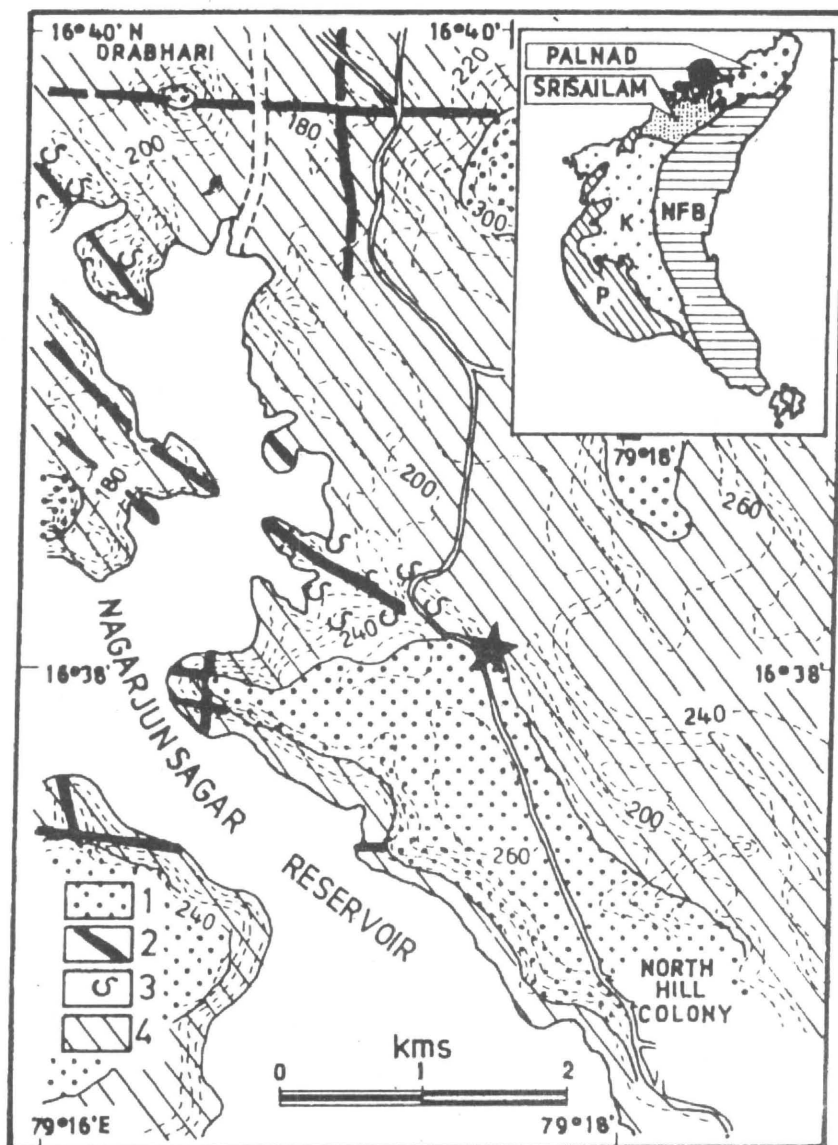


Fig.1. Outline geological map of the Nagarjuna Sagar area. The star marks the location of the measured section given in Fig.2. Inset depicts the location of the study area (filled circle) within the Cuddapah Basin.

They are essentially horizontal and with a smooth surface. These tubes are composed of coarser sand grains as compared to the host sediment.

Along the length of these tubes is a purplish red lining of iron oxide. The geometric dimensions of these tubular casts were measured on this slab to quantify their dimensions (Table I). The topmost bedding plane of the type specimen (Fig. 3) gives 71 mm as the average length of the tubes ($n=34$; range 126-33 mm), with an average width of 6 mm (varying between

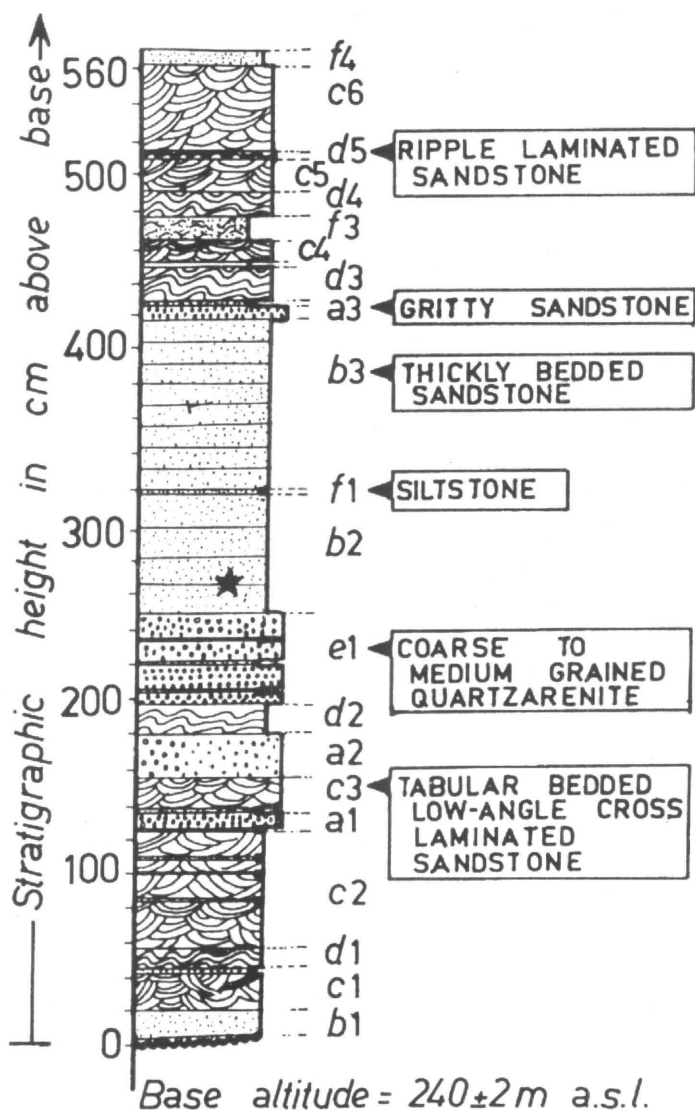


Fig.2. Composite lithology of the sediments exposed at the location marked in Fig.1. The location of the horizons containing *Planolites* is marked by a star.

8.8 -2.5 mm). On a lower bedding plane, 17 casts have an average length of 48 mm (range 82 -17 mm) and an average width of 6.8 mm (range 10.5 - 3.3 mm).

Remarks: *Planolites* Nicholson and *Paleophycus* Hall, display several similar features, making their identification difficult at times. On the basis of their original descriptions by Nicholson and Hall respectively, Pemberton and Frey (1982) distinguished between them by the absence or presence of collapse structure, respectively. The present forms do not show any collapse structure. The present form satisfies all the physical criteria listed by Benton

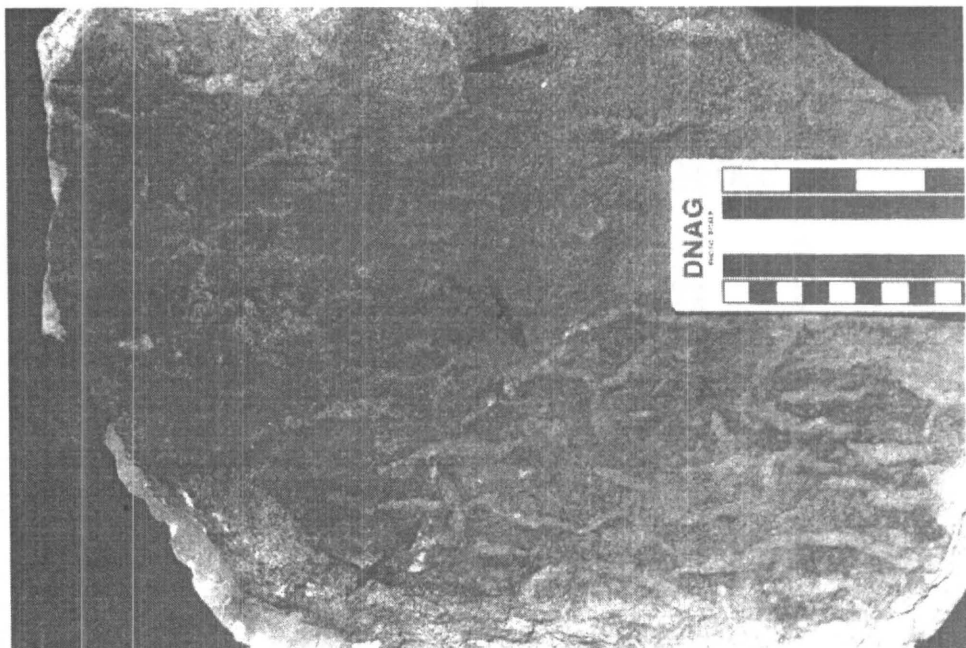


Fig.3 (a). Photograph of the top bedding plane of the type-specimen of *Planolites* reported here, on which several of the horizontal burrows are preserved with a concave epirelief. The cross over observed near the arrows is clearly indicative of their biogenic origin and would not be normally expected in syneresis crack-fills formed by abiotic processes.



Fig.3 (b). Close up of a part of the specimen depicted in Fig.3(a) showing the arcuate and tortuous geometry of the individual burrows. Note the terminal pinching out and sharp outlines.

Table 1. Measured Values of dimensions of the reported *Planolites* from Lambapur Area, Cuddapah Basin.**(a) Top Surface**

Tube No.	Length in cm	Diameters in cm				Average Diameter
		d1	d2	d3	d4	
1	5.4	0.7	0.6	0.7	0.7	0.675
2	4.5	0.8	0.8	1.0	0.8	0.850
3	3.4	0.4	0.5	0.5	0.5	0.475
4	11.5	0.7	0.7	1.0	0.7	0.775
5	7.4	0.7	0.8	0.5	0.7	0.675
6	7.8	0.7	0.6	0.7	0.7	0.675
7	4.0	0.5	0.4	0.5	0.5	0.475
8	5.5	0.7	0.6	0.7	0.5	0.625
9	4.5	0.5	0.8	0.8	0.5	0.650
10	3.3	0.3	0.3	0.2	0.2	0.250
11	7.5	0.5	0.5	0.4	0.4	0.450
12	10.5	0.3	0.5	0.4	0.5	0.425
13	7.0	0.9	0.7	0.8	0.7	0.775
14	4.5	0.3	0.3	0.3	0.4	0.325
15	9.0	0.3	0.4	0.4	0.4	0.375
16	9.6	0.7	0.4	0.5	0.7	0.575
17	5.2	0.6	0.7	0.8	0.7	0.700
18	11.5	0.3	0.3	0.2	0.2	0.250
19	9.0	0.5	0.4	0.5	0.4	0.450
20	9.3	0.3	0.3	0.2	0.3	0.275
21	9.4	0.7	1.4	0.8	1.0	0.875
22	12.6	0.6	0.6	0.7	0.8	0.775
23	7.2	0.7	0.8	0.8	1.0	0.825
24	4.2	0.4	0.8	0.8	1.0	0.750
25	9.5	0.5	0.7	0.5	0.8	0.625
26	4.5	0.5	0.6	0.5	0.6	0.550
27	6.6	0.5	0.5	0.6	0.4	0.500
28	7.2	0.7	0.9	0.8	1.0	0.850
29	6.0	0.6	0.5	0.7	0.8	0.650
30	7.2	0.6	0.5	0.6	0.7	0.600
31	8.5	0.4	0.7	0.8	0.9	0.725
32	5.3	0.7	0.8	0.7	0.8	0.750
33	5.3	0.7	0.8	0.8	0.8	0.750
34	7.6	0.5	0.7	0.7	0.5	0.600

(b) Bottom Surface

1	3.7	0.6	0.9	0.8	0.7	0.750
2	3.0	0.7	0.7	0.5	0.7	0.650
3	2.5	0.3	0.3	0.4	0.3	0.325
4	3.0	0.4	0.6	0.4	0.4	0.450
5	2.7	1.0	1.0	1.0	1.0	1.000
6	6.6	0.5	0.9	0.7	0.7	0.700
7	1.7	0.3	0.5	0.2	0.4	0.350
8	6.6	0.4	0.5	0.4	0.4	0.425
9	9.0	0.6	0.6	0.9	0.6	0.675
10	4.9	0.5	0.6	0.5	0.5	0.525
11	4.0	0.6	0.9	0.6	0.6	0.675
12	5.6	0.7	0.8	0.7	0.8	0.725
13	5.3	0.6	0.8	1.0	0.8	0.800
14	5.5	0.9	1.0	1.2	1.1	1.050
15	2.9	0.9	1.0	0.9	0.9	0.925
16	6.5	0.6	1.0	0.6	0.6	0.700
17	8.2	0.7	0.9	1.1	0.9	0.900

and Trewin (1978; p.6) for the recognition of *Planolites* Nicholson. Their size and occurrence limits their identification to generic level only.

Range & Occurrence: The ichnofossil genus *Planolites* has been reported to occur in the sediments ranging in age from very Late Precambrian (= Neoproterozoic) to Recent. (Hantzschel 1975, Vidal et al. 1994).

In India *Planolites* has been reported from the Mesozoic Wadhwan Formation of Kutch by Borkar and Kulkarni (1992). Unidentified ichnofossils comparable to the present form, but palaeontologically undesignated, have also been reported from horizons in the Krol-Tal successions of the Lesser Himalayas (Rai, 1987); and the Bhander and Rewa Groups from the Vindhyaachal basin (Chakrabarty, 1990). This ichnofossil has not so far been reported from the Cuddapah Basin; although other suspected ichnofossil genera have been reported from the Gulcheru Quartzite Formation of the Papaghni Group (Mukherjee, et al. 1987).

Discussion: This is the first report of the ichnofossil genus *Planolites* Nicholson from the Cuddapah Basin. Although ichnofossils have been reported from the Purana Basins of Peninsular India, their systematic descriptions are as yet far and few (Kale & Phansalkar, 1991). The solitary report of ichnofossil assemblage from the Cuddapah Basin by Mukherjee et al. (1987) covers the occurrences in the older Gulcheru Quartzite Formation of Papaghni Group.

Planolites forms are ichnofossils of wormlike deposit feeders, which graze upon the loose unconsolidated sediments and represent horizontal, bedding plane parallel burrow fills of faecal pellets (Nicholson 1878). They are generally attributed to annelid-type soft bodied organisms which survives in very shallow or intertidal marine water environments. Based on the primary sedimentary structures and petrological characters, the host sandstones have been interpreted to represent delta-front sand bar or beach sand deposits which were episodically submerged. The occurrence of *Planolites* in them further reinforces this interpretation of their deposition under tidal influence.

The assignment of this sequence to the Srisailem Quartzite Formation of the Nallamalai Group by earlier workers is however open to query in the light of the presence of *Planolites*, which is not known from sequences older than Neoproterozoic. The Nallamalai Group is known to be a Mesoproterozoic sequence (Nagaraja Rao et al. 1987; Kale and Phansalkar, 1991). On the other hand, the Kurnool Group is generally accepted to belong to the Neoproterozoic. Significantly this sequence also contains interbedded limestones and calcareous shales, which are unknown from the Srisailem Quartzites, but present in the Kurnool Group. The present report of *Planolites* therefore indicates that this sequence may perhaps be more appropriately assigned to the Banganapalle Sandstone Formation of the Kurnool Group.

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ANNOUNCEMENT

The **Annual Convention of the Geological Society of India** will be held at **Chennai** between **5th and 8th November 1997** at the invitation of the Department of Geology, Anna University, Chennai. A National Symposium on "Sustainable Ground Water Development and Management" will be held at the same time. The last day is devoted to field visit. The symposium will cover the following aspects :

1. Recent techniques in ground water exploration
2. Status of present exploitation
3. Necessity for ground water recharge
4. Pollution of ground water and its prevention
5. Water conservation
6. Recommended measures for sustainable development.

Earth Scientists interested in participating in the symposium are requested to contact : Prof. C. Mohana Doss, Department of Geology, Anna University, Chennai - 600 025
Phone : 91-44-2351723 Fax : 91-44-2350397
Email : annalib@sinetm.ernet.in

During the annual convention it is customary to hold a session on presentation of recent research. Earth Scientists who have material to present are requested to contact : S.V. Srikantia, Hon. Secretary, Geological Society of India, P.B.No. 1922, Gavipuram P.O., Bangalore - 560 019 Tele-Fax : 080-6613352