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(Comment on the paper, 'An Unusual Evaporite Association from the Papaghní Group, Cuddapah Basin'. By V. G. Phansalkar, Anand S. Kale, Nitin R. Karmalkar and Vivek S. Kale, Published in the Journal of the Geological Society of India, Vol. 37 (1), pp. 75-79.)

I congratulate the authors of the paper entitled 'An Unusual Evaporite Association from the Papaghní Group, Cuddapah Basin, published in esteemed Journal Volume No. 37, January 1991, pp. 75-79, rendering substantial support to my ideas about the existence of *Evaporite sub-basin* within the Cuddapah basin itself. Since 1986, in different National (six in number) and International (IGC 89, Washington) Seminars, I have been projecting that evaporite facies occur in the western margin of the basin and all baryte deposits in the sedimentaries (dolomites and shales) are strictly restricted to this part only. The eastern margin of the basin marks the conspicuous absence of any baryte deposits. Lithological characters (total absence of any coarse to medium clastic) thinly bedded nature, organisation sequence and persistent association of gypsum clearly indicated the confined character of the sediments. Absence of any syn-sedimentary features, igneous activity and presence of 'sand bar' around these evaporite basins, which cut-off the oceanic connection, further corroborate such ideas.

I had given sound reasoning for such selective development of 'evaporite facies' in the western margin of the basin. Uneven bottom topography in this part of the basin was responsible for the formation of physical barriers which might have created obstacles in the free circulation of sea-water and resulted in the formation of isolated evaporite basins at different places. Such environment was considered congenial for the formation of bedded barytes in sedimentaries. Vempalle dolomites which hosted numerous baryte deposits are gypsiferous, oolitic and stromatolitic in nature. They were not affected by any igneous activities either during sedimentation or in post Cuddapah period. This carbonate rock is thinly bedded and rhythmically deposited with chemical silica in chert. Clastic units are totally absent and the facies occur as discontinuous body. The whole character of the rock implied its formation under supra-tidal condition. This dolomite gradually grades into shale further south of Cuddapah which hosted the largest bedded baryte deposits in the basin near Mangampeta.

These dolomite/shale facies rest over basic volcanics (basalt) containing numerous baryte veins. The surface of the basic volcanics are wavy, producing synformal and antiformal structures, while the synformal parts were filled with supra-tidal sediments, the antiformal parts remain as rigid high bodies which are seen to-day as parallel bands surrounded on both sides by the Cuddapah sediments with sub-horizontal stratification. These bodies were earlier described as 'basic sills' within the Vempalle dolomites and were considered as basic source of hydrothermal solution for the formation of barytes within it. But I have clearly established that there was no igneous activity at all during sedimentation in post-Cuddapah period. Moreover, the rock is not dolerite but basalt. I have postulated evaporite origin for bedded barytes in sediments and I have suggested that such evaporite basin had developed in the structural high areas. Regarding the source of Ba^{++} , I conceived that it was derived from the baryte veins in the basement rock during

chemical weathering and was added to the depositional site. Authors' claim that 'the hitherto unreported' is, therefore, not correct.

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Reply

We thank Dr. P. K. Basu for his kind comment on our note. We have not at any point claimed that we are presenting a first report or interpretation of the presence of an evaporite facies in the Cuddapah basin. Several authors, including Dr. Basu himself have earlier predicted the presence of such a facies in the Cuddapah basin (*see*: Kale and Phansalkar, 1991). We do, however, claim that to the best of our knowledge (and we are open to correction on this), this report is the first direct evidence of the presence of halite and gypsum in the Papaghni Group. Both halite and gypsum are the most common and also the diagnostic minerals in an evaporite sequence. On the other hand, "barytes" is not listed as a common evaporite mineral (Hardie, 1984; Schreiber *et al.* 1986; and Tucker, 1988). It is gratifying for us to have been able to validate with very concrete and diagnostic evidence, the earlier inferences of the development of an evaporite facies in the Papaghni Group.

Dr. Basu has inferred the presence of an evaporite facies in the Vempalle Formation on the basis of his studies on the baryte deposits in this Formation. Our finding corroborates what had been predicted by several earlier workers. We have, however, not come across any report of the occurrence of any of the diagnostic evaporite minerals in the Papaghni Group, nor do we find any such mention in Dr. Basu's papers. If he has indeed reported such occurrences of halite and gypsum in the Cuddapah sediments (not predictions but actual presence) then obviously our contention of 'hitherto unreported' needs to be corrected. Not otherwise.

We agree that the unevenness of the floor on which these sediments rest, could be one of the controls – not the only one – on the development of the evaporite facies. Dr. Basu further mentions in his comment that ‘there was no igneous activity at all during sedimentation or in post-Cuddapah times’. It is likely that some of the basic igneous rocks studied by him may not be associated with the Cuddapah sediments. However, such a general statement is not acceptable to us. The literature on the Cuddapah basin, ever since King (1872) up to Nagaraja Rao *et al.* (1987) and Reddy (1988) contains ample evidence of igneous activity associated with these sediments.

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