

Secondary phosphate mineralization in a karstic environment in central Sri Lanka

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Abstract. At Eppawala in central Sri Lanka secondary phosphate mineralization is intimately associated with laminated fabrics within depressions (sinkholes and smaller cavities) formed in the thick weathering profiles of a hilly terrain underlain by a Precambrian apatite-bearing formation. The lowermost levels of the profile show extensive zones of leaching where derived apatite crystals occur within fine-grained, laminated stromatolite sequences. The stromatolitic groundmass, which diagenetically formed by percolating oxygenated phosphate and carbonate-rich groundwaters, is impregnated by the phosphate minerals francolite and collophane. Scanning electron microscopy (SEM) reveals that fine filaments, characteristic of microorganisms, are associated with the secondary phosphate mineralization. Continuous degradation and fragmentation of the stromatolitic mat has produced pellets, peloids, and intraclasts all enriched in secondary apatite. Degrading recrystallization around the edges of the primary apatite crystals has developed coated grains. The widespread occurrence of phosphate-enriched allochems in stromatolitic groundmasses is a unique development of a modern phosphorite in a karstic environment.
