

# **Precambrian stromatolites of South Africa, their morphology, microstructure and associated sediments: A new approach to stromatolite classification and facies analysis**

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To avoid problems in stromatolite classification, as imposed by the formal Linnean and informal binominal nomenclature and by the more practicable, but in detail complicated geometrical classification (e.g. Logan et al., 1964) an attempt is made to classify Precambrian stromatolites accordingly to their morphology on three different scales: mega- >1.0 m, macro- 1.0 cm to 1.0 m and micro- <1cm. The stromatolites were also analysed as to their common sediment association, for interpretation of hydrodynamic and other depositional facies.

The proposed classification scheme is based on the "morpho-group" - a basic form on a scale of 1.0 cm to 1.0 m, easily recognisable in the field. Four morpho-groups are recognised: 1) Cryptozoon are columns with vertically superimposed upward convex, sub-spheroidal laminae. 2) Conophyton are columns of clearly conical lamination, where the conical structures are stacked in each other, and oriented with the acute end upward. 3) Collenia are laterally linked stromatolites of vertically superimposed, upward convex, alternating to downward-concave, sub-spheroidal laminae. 4) Stratifera are all bedding parallel, flat laminated stromatolites where the lamination might be planar or wavy, but the wave length,  $\lambda$ , is smaller than the wave amplitude,  $h$ . These four morpho-groups can construct four "morpho-classes" that build lithostromes or lithoherms on a >1.0 m scale. These morpho-classes are: 1) Columnar stromatolites 2) Cupolar stromatolites 3) Domal stromatolites 4) Strato stromatolites. On the other hand the four morpho-groups can be descriptively subdivided accordingly to their micro structure in the < 1.0 cm scale.