

THE TSINGY DE BEMARAHA PINNACLE KARST OF WESTERN MADAGASCAR

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PHOTO: ARTHUR CLARKE

View towards Belvedere, Tsingy de Bemaraha, western Madagascar.

Photo Competition Second Prize for a Digital photograph in the Entrance and Other Surface Features category.

Originally part of the African mainland and super continent of Gondwanaland, Madagascar is now an island country - the fourth largest island of the world - located 400km east of Mozambique (in Africa) and around 400km west of the small islands of Mauritius and Reunion. Known for its amazing biology, particularly the diverse mix of arid and wet zone flora with many unique animals (50 species of chameleons and 22 species of lemurs), Madagascar also has some world-renowned areas of unique limestone pinnacle karst.

Pinnacle karst is a form of tropical or equatorial karst characterised by near vertical rock blades, fretted and sharpened by dissolution. Principally dissolved by rainwater there are three described forms or varieties of pinnacle karst: shilin (in China), the arete karst in Mulu (Sarawak) and the New Guinea Highlands and the most acute form: the tsingy karst of Madagascar.

The Tsingy de Bemaraha Parc Nationale is one of two large areas of extensively eroded pinnacle karst located in the arid parts of Madagascar; Bemaraha is in the west and Ankarana in northern Madagascar. The 152,000 hectare Tsingy de Bemaraha Parc Nationale contains two separate areas of limestone: the low relief "Petits Tsingy" adjacent to the Manambolo River and the more extensive higher relief "Grands Tsingy" further north where the limestone

pinnacles are in excess of 100m high. Formed as a plateau, this pinnacle karst area features bare reticulated saw-topped ridges with almost vertical slopes rising above forest-covered depressions, fault graben canyons and solution joint corridors.

The surface vegetation in the Tsingy itself is quite unique with many endemic xerophytic and/ or water storage plants. Although the Tsingy receives torrential downpours in the wet season, very little water remains on the surface and in the dry season, the only moisture for 6-7 months is the nightly dew, so it is essentially an arid environment.

The limestone has been structurally altered over time, as evidenced by faulted sections (uplifted massifs of limestone and down-faulted grabens) and strong jointing, giving rise to the presence of maze structures with many narrow fissures. There are three types of caves and correspondingly different cave ecosystems: diacalse maze canyon rifts (essentially 'roofless caves') with many tree roots and a predominance of epigeal species; caves with intermittent streams containing occasional tree roots and a mix of hypogean and epigeal species and the more extensive caves with speleothem deposits, white walled maze passages and large chambers, sometimes containing thousands of bats and a predominance of hypogean species including guanophiles. ■