Cave Fauna and Cave Ecosystems in Southern China

Arthur Clarke

ABSTRACT

China has an area of carbonate rocks covering approximately 3.5 million km^2 (almost equal in area to half the size of Australia). Dating from the Pre-Cambrian to Quaternary, the carbonate rock (limestone and dolomite) sequences in China extended to 3000 metres thick, giving potential for some deep cave systems. During recent cave exploration in Chonqing, cavers descended to -920m in Qikeng Dong and expect to break the one kilometre depth mark later in 2002 or early 2003. Although some carbonate rocks areas are still inaccessible, caves have been recorded from almost every province in China and at least a third of the known carbonate rock areas in China contain confirmed karst, situated within a range of climatic zones with abundant annual precipitation. Tectonic activity has resulted in the formation of numerous structurally separated blocks of limestone with locally or regionally defined independent karst drainage patterns, resulting in extensive but ecologically separated and isolated subterranean hydrological systems. Karst is a prominent landform in at least six provinces of southern China, where there are a range of varied structural or solutional forms present. The southern lowland plains of China are dominated by tower karst; cone karst and associated tiankeng collapses are found in the more mountainous areas further north; and "stone-forest" type pinnacles form in the dissected plateau karst of more elevated areas. The most intensely karstified region is situated in three adjoining provinces (of SW China): Guangxi, Guizhou and Yunnan, where the varied subterranean systems comprise large multi-level chambers and passages, active streamways and abandoned upper fossil levels providing hypogean environments and habitats for numerous cavernicolous species.

Combined with the high nutrient inputs in cave ecosystems of southern China, the presence of vast amounts of perennial throughflow water and percolation fed standing waters have promoted the evolution of a diverse hypogean aquatic fauna including a rich troglobitic ichthyofauna (comprising 31 cave-limited fish species), numerous crustacean species (particularly copepods and decapods), aquatic beetles and amphipods. The troglobitic terrestrial fauna of Chinese caves is mainly composed of diplopoda, collembola and coleoptera (dominated by 40 trechine carabid species), plus a few cave adapted spiders, crickets and isopods. Some of the troglobites found during recent caving expeditions in China, are from animal groups new to science, including species of a possible new family of decapod shrimps and two new genera of beetles: *Guizhaphaenops* (*Guiaphaenops*) *lingyunensis* and *Giraffaphaenops clarkei*. Apart from the troglobitic invertebrates and the true cavefish, the ecosystems of Chinese caves include an abundance of epigean species (often washed in by floodwaters), plus vertebrate trogloxenes such as bats and birds. There is increasing evidence to show that many cave ecosystems are now being impacted by regional developmental pressures such as dam construction and associated works including diversion tunnels and a number of both vertebrate and invertebrate species appear to be diminishing from cave sites, due to the foraging habits or culinary preferences of local Chinese villagers.