

## INVESTIGATION OF SNAIL POPULATION DYNAMICS FOR SCHISTOSOMIASIS TRANSMISSION CONTROL USING STRONTIUM ISOTOPE TRACERS

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Schistosomiasis, which is the second-most prevalent tropical disease affecting two-hundred million people annually world-wide, is caused by infections of parasitic worms of the genus *Schistosoma*, which use snails of the genus *Oncomelania* as intermediate hosts for maturation before contaminating freshwater. Lake and marshland regions of China continue to have problems with human schistosomiasis infection, which can be partially attributed to the inability to control snail populations in an environmentally sensitive manner. The parasite maturation process in a snail is required for the schistosomes to be capable of penetrating a mammalian host. The study and control of snail populations, therefore, is a key aspect for reducing human infection rates. This research project focuses on snail population dynamics (specifically population origin) using strontium isotopes in snail shells as a tracing mechanism. Strontium isotope ratios ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) are commonly used as a tracer for water-rock interactions because the ratio observed in a water is inherited from the source rocks with which it contacts. Studies that have been conducted on tracking the movement patterns of fish using  $^{87}\text{Sr}/^{86}\text{Sr}$  in otoliths (ear bones) indicate that the use of strontium isotopes as a tracer for snails would be valid because of the composition and formation similarities between snail shells and fish otoliths, coupled with significant variations of  $^{87}\text{Sr}/^{86}\text{Sr}$  in the source waters throughout the region. The goals of this research are (1) to prove a relationship exists between strontium isotopes in water and snail shells by sampling from locations of varying  $^{87}\text{Sr}/^{86}\text{Sr}$ , and then testing the most recent formed shell material (shell aperture) for  $^{87}\text{Sr}/^{86}\text{Sr}$  and comparing to the water where the sample was collected, and (2) to determine the origin of snail populations in the Chinese Lakes of Poyang and Dongting (known for endemic schistosomiasis) by testing shell samples from the lakes for  $^{87}\text{Sr}/^{86}\text{Sr}$  in the oldest shell material (shell apex) and comparing to different source waters in the region. This talk will present the preliminary research findings, including the relationships between  $^{87}\text{Sr}/^{86}\text{Sr}$  in snail shells and source waters.

Keywords: schistosomiasis, strontium isotopes