

The Identification of the Natural Habitat of *Rhinosporidium seeberi* with *R. seeberi*-Specific in situ Hybridization Probes

**Kumara Kaluarachchi, Ph.D.,
Saranga Sumathipala, MBBS,
Navaratne Eriyagama,
Dhammika Atapattu, Ph.D.,
Sarath Arseculeratne, DPhil**

ABSTRACT

The disease rhinosporidiosis, caused by *Rhinosporidium seeberi*, has been described in humans and animals since 1892 in at least 70 countries including Europe, North America, South America, Asia, and Africa. South Asia is a known hyper-endemic region. Two persisting enigmas have been the inability to culture *R. seeberi* in vitro and to establish experimental rhinosporidiosis in animals. The natural habitat of *R. seeberi* remains unknown, although there is evidence for an aquatic habitat.

A *R. seeberi*-specific, fluorescein isothiocyanate (FITC)-labelled probe, and a complement of the *R. seeberi*-specific probe as a control probe, were used to investigate, by in situ hybridization, the putative ground-water habitat of *R. seeberi*. Sections of paraffin wax-embedded, purified rhinosporidial endospores, and human nasal, rhinosporidial tissue, served as positive controls. A human nasal, non-rhinosporidial polyp was used as a negative control.

Entities were identified, with 15-30 µm diameters, compatible morphologically with endospores and juvenile sporangia of *R. seeberi*. These entities were positively labelled with the FITC-labelled *R. seeberi*-specific probe, in four replicated experiments, in paraffin wax-embedded deposits of lake water. No labelling with the same *R. seeberi*-specific probe was seen on the human, non-rhinosporidial polyp, or on the background (non-rhinosporidial) areas of the rhinosporidial polyp. Spicules of sand particles in this water deposit were identified as possible causes of injury to the ocular and nasal mucosae that could initiate colonization by the aquatic *R. seeberi*.

This, as far as we are aware, is the first specific demonstration of the aquatic habitat of *Rhinosporidium seeberi*. (*J Infect Dis Antimicrob Agents* 2008;25:25-32.)