Morphologic and Molecular Characterization of *Isospora belli* Oocysts from Patients in Thailand

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To investigate the extent of genetic heterogeneity in the genus *Isospora* infecting patients in Thailand, a total of 38 fecal samples containing *Isospora* oocysts from human immunodeficiency virus/acquired immunodeficiency syndrome patients (n = 30), corticosteroid-treated patients (n = 3) and immunocompetent individuals (n = 5) were recruited for analysis. Remarkable variation in the maximum width and length of oocysts both within and between isolates was observed. However, the average length-width ratio of oocysts was within the range for *I. belli* (> 1.2). *Ex vivo* sporogonic development of freshly passed oocysts in feces from three of these isolates was observed longitudinally, showing that 27% of these oocysts underwent complete sporulation. Interestingly, 95% of sporulated oocysts contained two sporocysts in an oocyst with four sporozoites in each sporocyst, and *Caryospora*-like oocysts, characterized by eight sporozoites enclosed by a single sporocyst, were also detected (5%). The small subunit ribosomal RNA (rRNA), 5.8S rRNA, internal transcribed spacer 1 (ITS-1), and ITS-2 were highly conserved, indicating that there were no cryptic species or extensive strain variation.

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