

MOLECULAR DETECTION AND PHYLOGENETIC TREE ANALYSIS OF *ENTEROBIUS VERMICULARIS* BASED ON CYTOCHROME C OXIDASE I (*COXI*) GENE FROM CHILDREN IN WASIT PROVINCE

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ABSTRACT : The current investigation was conducted to detect and characterize *Enterobius vermicularis* isolated from children in Wasit province using molecular techniques that targeted the cytochrome c oxidase I (*coxI*) gene. The work was performed by examining 50 fecal samples employed as 16 samples in a polymerase chain reaction (PCR) method and 10 PCR positive samples in a partial gene sequencing (PGS) approach. The findings demonstrated that 16 fecal samples were positively (464bp) amplified after performing the PCR. Moreover, the PGS and the phylogenetic tree indicated that four local strains were strongly aligned to a Japanese strain isolated from a chimpanzee affected by lethal hemorrhagic colitis. The current study presents informational facts about the presence of *E. vermicularis* in children of Wasit province. Moreover, it ensures the current evolutionary history of the local strains and their links to global isolates from countries such as Japan.

Key words : Cox1, *Enterobiusvermicularis*, PCR, sequencing.

INTRODUCTION

Enterobius vermicularis is one member of the very widespread nematode pathogens on the planet and is also named as pinworms, previously known as *Oxyuris vermicularis*. Human beings are this nematode's only known hosts. The disease can occur among people living in crowded conditions, especially due to contaminated communication within infected families. The pinworms are very small white thread-like organisms. The nematodes are called "pinworms" after the standard pin located in the female tail. School-aged children and tropical region living people are most often infected; however, any person is vulnerable to the infection by pinworms. The accidental ingestion of the nematode eggs triggers the disease via the common fecal-oral route (Rawla and Sharma, 2019).

E. vermicularis is a nematode that resides mainly in ileum and cecum. When the eggs of the organism are accidentally oral-route-taken, they require around 1 to 2 months for developing into adult pinworms. Commonly, the ileocecal region presence of the worms does not cause any symptoms. The adult nematodes and their ova travel mainly at night to the anal zone, depositing hundreds of eggs in the perianal region. This travel creates much

pruritus and itching. Anal region has hatching eggs that induce scratching and perianal pruritus. The presence of the *E. vermicularis* eggs in the intestines of some patients may present clinical symptoms of inflammatory bowel diseases such as Crohns' disease; however, biopsies may ensure the infection by those pinworms (Johansson *et al*, 2013; Al-Saffar *et al*, 2015; Fan *et al*, 2019a; Wendt *et al*, 2019a).

The use of molecular techniques in the detection and characterization of microorganisms such as *E. vermicularis* has been followed in many studies. Targeting land-mark genes for this purpose like the cytochrome c oxidase I (*coxI*) gene enhances the fulfillment of this aim. *CoxI* has been successfully employed in estimating the presence status of those pinworms in Denmark as it has been found that the pinworms were homogenous populations (FERRERO *et al*, 2013).

The current investigation was conducted to detect and characterize *Enterobius vermicularis* isolated from children in Wasit province using molecular techniques that targeted the cytochrome c oxidase I (*coxI*) gene.