



Specific Detection of *Fasciola hepatica* and *F. gigantica* in Infected Domesticated Animals Using High-Resolution Melting Analysis (HRM)

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Abstract

Background: It is difficult to make an exact morphological distinction between *Fasciola hepatica* and *Fasciola gigantica*. We used High Resolution Melting analysis (HRM) method to differentiate the *F. hepatica* species from *F. gigantica* in order to differentiate them.

Methods: Overall, 80 adult liver flukes were collected from infected slaughtered animals including cattle, sheep and goats from Lorestan Province, western Iran from Sep 2015 to Aug 2017. Genomic DNA was extracted using commercial DNA extraction kit. The multilocus sequences of mDNA including COX1, COX3 and ND6 were amplified employing real-time PCR & HRM analysis. Specific and universal primer pairs were designed for differentiation *Fasciola* spp.

Results: Universal primers cannot be used to distinguish between these two species, but in the contrary, specific primer pairs of each species could differentiate them properly. Molecular identification using specific primer pairs were consistent.

Conclusion: HRM is a simple, fast and reliable method for detecting and differentiating *F. hepatica* from *F. gigantica* and can be used for diagnostic and epidemiological purposes.

Keywords: *Fasciola hepatica*; *Fasciola gigantica*; Fasciolosis; Polymerase chain reaction (PCR)

Introduction

Fascioliasis emerges as a parasitic disease of human and animal and considers as a neglected worldwide disease (1). Fascioliasis can be transmitted through contaminated foods and is among the most dangerous parasitic diseases (2). It has been observed an increase in human infection with fascioliasis for four decades that predicts the number of 2.400.000 people in 61 counties with populations 180 million at fascioliasis risk (3).

Human and animal infections can occur by two species of fascioliasis including *Fasciola hepatica* and *F. gigantica*. The latter appears to be a more serious causative infection agent rather than the former. This can be due to the size of parasite in *F. gigantica* (4). Both species, however, show some overlaps across geographical areas (5).

It is of concern to distinguish between species of fascioliasis according to different environmental