

***In vitro* study for  
anti-HIV activity  
in extracts from  
fresh water mussel  
(*lamellidens  
marginalis*)**

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**Background:** Human immunodeficiency virus type-1 (HIV-1) is the cause of acquired immune deficiency syndrome (AIDS), a major human viral disease with about 33.2 million people infected worldwide up to now. Failure in anti-AIDS treatment is observed due to the emergence of resistant viruses, cross-resistance to drugs and cell toxicity. The objective of this study is to study the *in vitro* HIV-1 reverse transcriptase activity of fresh water mussel extract.

**Material and Methods:** Live freshwater mussels (*L. marginalis*) were collected from various rivers of Adilabad, Karimnagar and Warangal district of Andhra Pradesh, India. Collected bivalves were washed and de-shelled; tissue and mantle fluids were also collected. The material collected from each animal was divided into two equal parts for the preparation of Phosphate buffer saline (PBS) extract and acid enzyme hydrolysate. These procedures yielded two types of extract from each animal. They were designated as PBS extract and AEH (Acid enzyme hydrolysate) extract. Peripheral blood mononuclear cells (PBMCs) were isolated from HIV-infected individuals (Viswakarma HIV/AIDS care centre, Warangal district, Andhra Pradesh) and healthy blood donors by ficoll-Hypaque density gradient centrifugation method. The extracts (PBS and AEH) prepared from fresh water mussel tested for cytotoxicity on cultured PBMCs. HIV reverse transcriptase (RT) activity was measured. The values are expressed in Mean and SD, performed by SPSS computer software.

**Results:** Different extracts showing significant activity. The cytotoxicity of the PBS extract on the T cells was  $CC_{50} = 6.1 \mu\text{g/ml}$  with a very narrow selectivity index (SI) of 2.7 while the  $CC_{50}$  value of *AEH extract* was  $3.12 \mu\text{g/ml}$  with a very narrow selectivity index of 3.4. The extracts of PBS and AEH of the fresh water mussel are indicated that the anti-HIV-1 replication effects with  $EC_{50}$  values of 2.25 and  $0.93 \mu\text{g/ml}$ , respectively.

**Conclusion:** The present study has shown that crude extracts from the *freshwater mussels* have shown anti-HIV-1 activity. Two extracts (PBS and AEH) showed moderate to mild anti-HIV activities. Hence, there is a need to investigate chemically, the active fractions from these freshwater mussels in order to establish chemical constituents responsible for the cytotoxic and HIV-1 activities.