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Peganum harmala* exhibit potent activity against *Acanthamoeba* adhesion and cytotoxicity to human corneal epithelial cells *in vitro

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Acanthamoeba is an opportunistic protozoan pathogen and ubiquitous in nature. It plays a pivotal role in ecosystem and recognized to cause blinding keratitis and fatal granulomatous encephalitis involving the central nervous system with a very poor prognosis. This is due to limited availability of effective anti-*Acanthamoeba* drugs. The objective of the present study was to determine the efficacy of plant extracts derived by various methods (ethanol, methanol, acetone and aqueous) on *Acanthamoeba* binding and its cytotoxic effect on human brain microvascular endothelial cells (HCEC) *In vitro*. Using HCEC it was observed that *Acanthamoeba* (T4 genotype) exhibited binding (>85%) and cytotoxicity (>70%) to host cells. However, plant extracts remarkably inhibited more than 70% and 60% of *Acanthamoeba* binding and cytotoxicity to HCEC respectively. It is worth mentioning that methanolic extract showed maximum activity as compared to other extracts. It was further confirmed that extracts (ranging from 0.1 to 1.5mg/ml) exhibited amoebicidal effects, i.e. >50% of trophozoites were killed at maximum dose (1.5mg/ml) within one hour incubation. However the residual subpopulation remained static over longer incubations. Furthermore growth assay demonstrated crude extracts inhibited >50% *Acanthamoeba* numbers up to seven days. Our results confirmed that plant extracts has inhibitory effects on *Acanthamoeba* growth and viability. Overall, these findings revealed that tested plant extracts is inhibitory to *Acanthamoeba* properties associated with pathogenesis. To the best of our knowledge, our findings demonstrated for the first time that selected plant crude extracts exhibits inhibitory effects on biological properties of *Acanthamoeba* without any toxic effects on HCEC cells *In vitro*.

Biography

Abdul Matin has completed his PhD from Birkbeck, University of London and Postdoctoral Fellowship from School of Medicine, Southampton University Hospital, Southampton, United Kingdom. He has long-standing research interests includes the epidemiology and pathogenic mechanism of emerging parasitic diseases with special interest on role of blood-brain barrier in central nervous system infections. Using multi-disciplinary approach he is looking for potential novel synthesized compounds or nanoparticles or/and obtained from plants or insects to discover potential drug candidates for drug delivery system to alleviate the burden of life threatening infections. He was honored with a specialty award and prize titled "The Best Researcher in the UK" by Medical Research Society (MRS), one of the most prestigious research societies in the country; for his outstanding contribution in human brain research in 2007 at Royal College of Physicians, London, UK. He is currently Associate Professor and Head of Medical Lab Technology & Public Health Departments at University of Haripur, Pakistan. He has published more than 25 papers in reputed journals and has been serving as an Editorial Board Member and reviewer of reputed journals.

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