

Ecological and Pathological Study of *T. gondii* Egyptian Rat Isolates Reference to Biological & Genetic Typescripts

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Abstract: *Toxoplasma gondii* is zoonotic opportunistic protozoan of public health impact. It has usual clonal population of three virulent human and animal types: I, II, and III. The commercial rats are frequently harboring the dormant *T. gondii* tissue cysts in their tissues. So, rats consider the major prey for outdoor cats that regularly stimulating it to shed and contaminate the environment with oocysts infective stage which maximizes human and animals' toxoplasmosis. The aim of the present study is to identify the biological and molecular typescripts of naturally infected commercial rats along with serological, mice viability and histo-pathological assays for clarifying to how extent the indirect zoonotic bio-hazards sequence to rats harboring *T. gondii* virulent types. A total number of 278 commercial rats were recognized as *R. norvegicus* (n=74), *Rattus rattus rattus* (n=108) and *Rattus rattus frugivorus* (n=96), were collected from different rural and urban sites from Cairo and Giza governorates. Blood and tissue samples were exposed to serological and mice viability test along with histo-pathological exam. Also, the tissues of inoculated mice were exposed to kitten's viability test for detecting oocyst shedding characters of rat isolates. Parasite load, LD50 and LD100 of the rat isolates were detected for bio-typing. Plus to geno-typing via SAG2 PCR amplification products by electrophoresis analysis using tissue digest from inoculated mice. The results of microscopic and histo-pathological exam of rat tissues and inoculated mice were recorded. The percentages of successes rat isolates through mice inoculation were; (14.9), (3.7), (2.1). while, the overall prevalent of biological and genetic typescripts were; type I (17.6%), type II (52.9%) and type III (29.4%) corresponding to *R. norvegicus*, *Rattus rattus rattus* and *Rattus rattus frugivorus*. We were concluded that the examined commercial rats often were holding *T. gondii* tissue cysts corresponding to the human virulent strains I, II, and III, reflecting their role in toxoplasmosis ecology through indirect human hazard via recurrently exciting oocysts shedder cats.

Keywords: Biological & Genetic typescripts- *T. gondii* -Egyptian Rat Isolates, PCR detection; SAG2 genotype.