INTRODUCTION: *Toxoplasma gondii* persistently infects over two billion people worldwide. It can cause substantial morbidity and mortality. Pyrimethamine and sulfadiazine are the gold-standard medicines used to treat toxoplasmosis. Although highly effective against tachyzoites, these medicines may cause hematological side effects. Furthermore, no medicines are effective in eliminating *T. gondii* encysted bradyzoites. Since the needs of a more specific and less destructive drug, small molecules and transductive peptides would be a possibility. OBJECTIVE: The objective of this study was to investigate the parasiticidal activity of low molecular weight components, isolated from castor seed extracts, on mammalian cells (Vero cells) infected with *T. gondii*. METHODS: Castor seeds extracts were submitted to gel filtration chromatography (Sephadex G-50). Three fractions were isolated, re-purified by RP-chromatography and were incubated on uninfected or infected Vero cells in concentrations ranging from 1-100 mg/mL (12, 24 and 48 h). The viability of the Vero cells and the *T. gondii* destruction were analyzed by optical microscopy. The major fraction, with parasiticidal activity, isolated by RP-HPLC, was analyzed by mass spectrometry (Synapty G2 SI). RESULTS: The two fractions with Molecular weight > 10.000Da was extremely toxic at all concentrations (24h) to uninfected cells and then were not tested against *T. gondii*. Only the low molecular fraction presented low cytotoxicity and was exposed to infected cells. This fraction significantly destroyed the parasite in a peptide-dependent concentration and time (12, 24 and 48 h) and preserved the viability of Vero cells. The data obtained by mass spectrometry were inconclusive and will be redone. Conclusion: Although castor seeds peptides can cause severe toxicity to Vero cells, there is a fraction that plays an important role in reducing cellular infection. This is the first report showing that castor seeds peptides lead to *Toxoplasma* destruction and elimination.

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Key words; Castor seed extract; *R. communis*; anti-Toxoplasma *gondii* activity