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Antiviral effect of natural plant extracts against alphahepesvirus infections

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The caprine herpesvirus type 1 (CpHV-1) is distributed throughout the world where there is production of goats, in Argentina it was reported in different regions with seroprevalences between 27% and 43%. It causes systemic and genital disease (abortions). There is no specific treatment, although the application of Acyclovir interfere with viral replication with different degrees of efficacy has been reported. Due to the costs and side effects produce, the search for new chemotherapeutic agents is essential. This is how the objective of the work arises, which is to evaluate the in vitro effectiveness of native plant extracts as antiviral treatment. Larrea divaricata (Jarilla, family Zygophyllaceae), Mintostachys verticilata (or peppermint, family Lamiaceae) and Parastrephia lepidoephylla (or tola, family Asteraceae) in comparison with Aciclovir effect were evaluated. The in vitro characterization of the antiviral effect of the extracts was evaluated by assays of maximum non-cytotoxic concentration, cytotoxic concentration 50, inhibitory concentration 50, lysis plaques and viral replication kinetics on MBDK cells. Jarilla, peppermint and Tola are not cytotoxic at a concentration of 1.04 mg/ml. The Tola extracts obtained in different years (T1 and T2) presented the highest values of cytoxicity, CC50= 0.57 mg/ml and 0.9 mg/ml respectively; peppermint extract presented CC50= 1.6 mg/ml. Jarilla extract was the best tolerated, presenting CC50= 2.4 mg/ml. Peppermint and Tola 2 presented the best antiviral activity with IC50= 0.16 mg/ml, Jarilla an IC50= 0.26 mg/ml and Tola 1 with IC50= 0.32 mg/ml. The average plaque lysis of peppermint and Tola was similar (177,170) and Jarilla (21,174). Jarilla's selectivity index (CC50/IC50) was 9.2, peppermint 10, Tola 1 1.78, Tola 2 5.6. In Jarilla's kinetics, a viral titer of 5 was obtained in the extracellular fraction at 24 h and 475 in the intracellular. The extracts show antiviral activity which offers possibilities of finding active compounds against CpHV-1.

1. What is your pathogen? Multiple options possible (e.g. if working on coinfections)

Other viruses: Caprine herpesvirus 1, subfamily Alphaherpesvirinae, family Herpesviridae

2. On a scale of 1-5 is your work mostly eco/epidemiological or evolutionary? 4

3. On a scale of 1-5 is your work mostly theoretical or experimental/empirical? 5 (100% empirical)