

Antioxidant activity and antiherpetic effects of a *Solanum melongena* L. genotype

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Herpes Simplex Virus type 1 (HSV-1) is a recurrent human virus, which develops quickly resistance to drugs commercially available, so increasing the need to study new sources of bioactive antiviral agents. To this end, extracts from medicinal plants, essential oils or fruits with antiviral properties are widely investigated in order to found the bioactive compounds. Among them, flavonoids and anthocyanins have been shown to inhibit the HSV-1, due to a probable virucidal action, likely antioxidant mechanisms (Khan et al., 2005). Besides, it is generally accepted that oxidative stress plays an important role in the pathogenesis of viral diseases (Peterhans, 1997). Also Solanaceae glycoalkaloids were found to be active against HSV-1 (Ikeda et al., 2000). On the basis of these evidences, in the present study, the antioxidant and antiherpetic properties of a DR2 eggplant (*Solanum melongena* L.) genotype (Mennella et al., 2012) were studied. Eggplant fruit is one of the most common vegetable consumed all around the world and an important source of both polyphenols and glycoalkaloids, including delphinidin, nasunin, chlorogenic acid and solamargine (Mennella et al., 2010). To perform the experiments, a 70% ethanol extract (pH 3) from the peel of the DR2 eggplant fruit, at both the commercial (B) and physiological (C) stage of ripeness, was prepared. The polyphenolic content was evaluated by high-performance thin-layer chromatography (HPTLC) and determined colorimetrically. Different antioxidant mechanisms, among which the radical scavenging power and the ability to block the ROS generation (by reducing and/or chelating mechanisms) were studied (Di Sotto et al., 2013). The antiherpetic activity of the extracts (DR2-B and DR2-C) was evaluated by the plaque assay in monkey kidney epithelial (Vero) cells, after infection with HSV-1 (Civitelli et al., 2014). In agreement with the colorimetric determinations, the HPTLC analysis showed the presence of different polyphenols in both the extracts, particularly the anthocyanin, delphinidin 3-O- β -rutinoside. The samples possessed antioxidant properties, being able to scavenge different radical species and to block the ROS generation by chelating mechanisms. As regard the antiherpetic activity, in spite of a null effect of DR2-B, the extract DR2-C inhibited the HSV-1 replication in a dose-dependent manner, reaching a 93% inhibition at concentration of 500 μ g/ml. When administered during different phases of the virus life-cycle, DR2-C inhibited the viral replication of about 50% during the adsorption period: these data were confirmed by the immunoblotting analysis, in which several herpetic proteins resulted inhibited. Present data highlight that DR2-C extract possess antiherpetic properties, likely due to an impairment of specific steps of the virus life-cycle. Taking into account that the HSV-1 replication requires an impairment of the intracellular redox status, the antioxidant properties of DR2-C extract, likely due to the presence of different polyphenolic compounds, could be involved in the antiviral effects found. In conclusion, the beneficial antioxidant and antiherpetic properties of DR2-C suggest a possible application of *S. melongena* as dietary supplement, or included in topical formulations, to treat the herpetic skin symptomatic lesions.

References

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