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## Toranja Burarama (*Citrus maxima* (Burm.) Merr): *in vitro* antioxidant activity and Induction of NAD(P)H:quinone reductase 1(QR1).

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Several *Citrus* fruits provide benefits for human health, either in juices, peels or leaves. The aim of this study was to evaluate the cancer chemoprevention capacity through induction of Quinone reductase system (QR1) in murine hepatoma cells and the antioxidant capacity of new *Citrus maxima*, from Sooretama –ES – Brazil. The radical scavenging activity of the fractions of the *C. maxima* peel was assessed by different *in vitro* assays.<sup>1</sup> The activity of the QR1 of the fractions was assessed using Hepa 1c1c7, as described by Pezzuto *et al.*<sup>2</sup> The analysis of the ethyl acetate extracts of peels were performed by ESI(-) FT-ICR MS.<sup>3</sup> In all antioxidant assays performed the ethyl acetate extract of the peels is considered the most promising extract, possessing the highest activities. These results imply that toranja peels are a better source of antioxidants than the juice, as mentioned in the literature. According to Castro-Vasquez *et al.*,<sup>4</sup> grapefruit peel wastes are a natural source of bioactive flavonoids, that could be incorporated as food ingredients or as therapeutic agents as a part of pharmacological strategies. In all the extracts tested in the quinone reductase induction assay, the Induction Ratio (IR) of QR activity for the hexane and ethyl acetate extracts were higher than 2.0, considering that these extracts are true activators of QR1. A chemopreventive index (CI) was obtained by dividing the IC<sub>50</sub> values by the respective double induction CD values as indicated by Kang and Pezzuto.<sup>5</sup> These extracts presented CD values of 13.13 µg/mL and 3.07 µg/mL, respectively. Therefore, ethyl acetate extracts yielded a CI higher than 6.5. The induction of QR activity in Hepa1c1c7 cells is a well-defined and important tool for the screening of novel phytochemicals with chemopreventive potential.<sup>6</sup> It is well established that induction of QR can offer protection against toxic and reactive chemical species. Therefore, the results presented indicate that Toranja peel has a potential use for cancer prevention and its consumption should be incentivized included as ingredient of juice, for example. It is worth mention that several flavonoids were identified in ethyl acetate extract like naringin, naringerin, apigenin, epicatechin, poncirin, and others. But further *in vivo* studies are needed to determine the molecular mechanisms of antioxidant and chemopreventive activities.

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