Rhamnogalacturonan from *Ilex paraguariensis*: a Potential Adjuvant in Sepsis Treatment


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**Introduction:** Beverages from *Ilex paraguariensis* (maté) have been widely consumed in Brazil, Argentina, Paraguay, and Uruguay and many therapeutic effects have been associated with this plant. Currently, the secondary metabolites from maté are the main focus of investigations, lacking information about its primary metabolites, which include polysaccharides, during ingestion. **Material and Methods:** A polysaccharide from maté (SPI) was obtained via hot aqueous extraction followed by fractionation and evaluated for the anti-inflammatory activity using a cecal ligation and puncture (CLP) model in mice, and its effects on lethality, neutrophil migration and levels of expression of proinflammatory enzymes (iNOS and COX-2) were determined. **Results and Discussion:** On the basis of chemical data, the polysaccharide SPI consists of a rhamnogalacturonan formed by a long sequence of →4)-6-OMe-α-D-GalpA-(1→ units, interspersed by some α-L-Rhap residues, substituted by side chains of type I arabinogalactans. SPI was tested against induced-polymicrobial sepsis, at doses of 3, 7 and 10 mg/kg. The latter, on oral administration prevented the late mortality of infected mice by a rate of 60%, in comparison with untreated mice. This beneficial effect seems to be, at least in part, due to a reduction in neutrophil migration, as observed using the MPO assay, in which the enzyme inhibition was up to 68%. Furthermore, SPI decreased the levels of the proinflammatory enzymes, iNOS and COX-2, whose role in the pathophysiology of inflammatory states such as sepsis is being increasingly recognized. **Conclusion:** Sepsis remains a potentially deadly condition requiring treatment in intensive care units. However, there is a growing need for alternative interventions employing natural non-aggressive products. In this context, maté is a potential nutraceutical, and its polysaccharide a promising adjuvant for sepsis treatment, being consumed as tea-like beverages with no reported adverse effects.

**Keywords:** Anti-inflammatory, *Ilex paraguariensis*, Rhamnogalacturonan, Sepsis