Exploration of the Antioxidant and Anti-inflammatory Potential of *Cassia sieberiana* DC and *Piliostigma thonningii* (Schumach.) Milne-Redh, Traditionally Used in the Treatment of Hepatitis in the Hauts-Bassins region of Burkina Faso

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Abstract

Inflammation is the supreme biological response to illness. In the Hauts-Bassins region, in traditional medicine, all parts of *Cassia sieberiana* and *Piliostigma thonningii* are used to treat hepatitis and inflammation. The aim of this study was to evaluate the in vitro antioxidant and anti-inflammatory activities of their aqueous extracts. High performance liquid chromatography with photodiode array (HPLC-DAD) and ultra-high-performance liquid chromatography coupled with high-resolution mass spectrometry (UHPLC-MS/MS) analyses highlighted the presence of polyphenols and flavonoids. Antioxidant and anti-inflammatory activities were measured by various methods such as DPPH (2,2-diphenyl-1-picrylhydrazyl), ABTS 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid), TAC (total antioxidant capacity), anti-protease, anti-lipoxygenase, and membrane stabilization. The best antioxidant activity was observed in the bark (DPPH: IC50 = 13.45 ± 0.10µg/mL) and roots (TAC = 29.68 ± 1.48 mgAAE/g DW) of *Piliostigma thonningii* and in the roots (ABTS: IC50 = 1.83 ± 0.34 µg/mL) of *Cassia sieberiana*. The best anti-inflammatory activity was observed in the bark (anti-lipoxygenase: IC50 = 13.04 ± 1.99 µg/mL) and leaves (anti-proteases: IC50 = 75.74 ± 1.07 µg/mL, membrane stabilization: IC50 = 48.32 ± 6.39 µg/mL) of *Cassia sieberiana*. Total polyphenols (ABTS: r = −0.679, TAC: r = 0.960) and condensed tannins (ABTS: r = −0.702, TAC: r = 0.701) were strongly correlated with antioxidant activity. Total flavonoids (anti-proteases: r = −0.729), condensed tannins (anti-proteases: r = 0.698), and

vitamin C (anti-proteases: r = −0.953) were strongly correlated with anti-inflammatory activity. Total polyphenols, flavonoids, condensed tannins, and vitamin C could contribute to the antioxidant and anti-inflammatory activities of the two studied plants. These results could validate the traditional use of these plants to treat various inflammatory diseases.

Keywords: anti-inflammatory; antioxidants; *Cassia sieberiana*; *Piliostigma thonningii*

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