Anti-diabetic potential of leaf juice and flavonoids from *Sedum dendroideum* (Crassulaceae)

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**Introduction:** *Sedum dendroideum* (SD) is a medicinal species popularly used to treat inflammatory disorders and diabetes. Previous studies carried out in our group confirmed the anti-inflammatory activity of the leaf juice and its kaempferol glycosides (de Melo et al., J. Ethnopharmacol, v. 124, p. 228, 2009). Its major flavonoid, kaempferitrin, was reported to have *in vivo* hypoglycemic activity (Souza et al., J Nat Prod. v. 67, p. 829, 2004). The search for new options to treat diabetes mellitus stimulated this study, whose aim was to evaluate the anti-diabetic potential of SD leaf juice and its flavonoids.

**Experimental part:** SD leaf juice, a flavonoid-rich fraction and five flavonoids had their acute hypoglycemic activity evaluated in normal and streptozotocin-induced diabetic mice (n=3). The compounds were intraperitoneally injected. The flavonoids tested (fig. 1) were the diglycosides SF1 (kaempferitrin), SF2 and SF3, that are the major flavonoids, and the monoglycosides SF6 and SF7, in order to establish the structure/activity relationship. The effect of SF1 on the glycolytic enzyme phosphofructokinase (PFK) was evaluated in hepatic, muscular and adipose tissues from treated mice.

**Results and discussion:** The leaf juice (400 mg/kg), the flavonoid fraction (40 mg/kg) and SF1 (4 mg/kg) were able to reduce diabetic mice glycemic levels in 52%, 53% and 61%, respectively, with only a discreet activity on normal mice. The other flavonoids showed low activity at the dose tested (4 mg/kg). These data imply that SF1 is responsible for the activity and that the two rhamnosyl groups in its structure are essential requirements. Treatment with this flavonoid enhanced the PFK activity in the tissues, chiefly in hepatic tissue. This suggests that SF1 is able to stimulate tissue glucose consumption.

**Conclusion:** SD is a species with anti-diabetic potential, whose activity is probably due to the flavonoid kaempferitrin, which was able to stimulate PFK activity. This is the first report on a flavonoid with PFK stimulating activity in a diabetes model.

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**Fig 1.** Chemical structure of the flavonoids tested. The active flavonoid is highlighted