Phytotoxic activity of flavonols isolated from Annona coriacea

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Abstract

Annona coriacea is a Brazilian native species, which presents edible fruits and is very common in savanna areas of the country. Although phytotoxic activities were already described for the species, there are no data about the compounds responsible for this effect. The aim of this study was bioprospecting *A. coriacea* in relation to phytotoxic activity on the elongation of wheat etiolated coleoptiles fragments. Thus, the leaf ethanolic extract was subjected to chromatographic separation furnishing 9 groups (A-I). Group G (60% ethyl acetate: 40% methanol) had the highest phytotoxicity at 0.8 mg.ml-1, showing 66% of inhibition of coleoptiles elongation in relation to control. Therefore, this group was re-fractionated, enabling the isolation of 15 flavonols, most of them never identified in *A. coriacea*. Flavonols were quercetin (**1-5**), kaempferol (**6-9**), and isorhamnetin (**10-13**) derivatives. Compounds with complete identification were **2** (Quercetin-3-*O*-robinobioside), **3** (Rutin), **4** (Hiperin), **5** (Isoquercitrin), **6** (Biorobin), **9** (Nicotiflorin), **10** (Keioside), **11** (Narcissin), **12** (Cacticin) and **13** (Isorhamnetin-3-*O*-glycoside). Among the isolated compounds, those with higher phytotoxicity on coleoptiles elongation were **5** (IC50 2.20·10-4 M, r2 0.97) > **13** (IC50 2.84·10-4 M, r2 0.92) > **9** (IC50 4.80·10-4 M, r2 0.93) > **8** (IC50 1.16·10-2 M, r2 0.91). Although **5**, **13** and **8** showed satisfactory phytotoxicity in relation to other flavonoids described in literature(a), they did not exhibited significant effect on germination and initial growth of two standard-species (lettuce and tomato) and one weed (*Urochloa decumbens*, Poaceae). This behavior could be related to a higher activation of defense strategies in seedlings when compared to etiolated coleoptiles fragments. Different responses between these two systems have already been described for other compounds(a,b).
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a. Nebo et al. 2014. Phytochem Lett, 8: 226-232.
b. Lacret et al., 2010. J Chem Ecol, 36: 396-404.

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