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APHIDICIDAL, ANTIOXIDANT AND CYTOTOXIC PROPERTIES OF FOUR INVASIVE ALIEN PLANTS

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Invasive alien plants (IAPs) cause damage to biodiversity, natural ecosystems and commercial plantations. Value addition to IAPs through discovery of their bioactivities will help manage their uncontrolled distribution. We screened 12 extracts prepared from plant parts—leaf, root and stem/stem-bark—of the four IAPs, *Sphagneticola trilobata*, *Austroeuptorium inulifolium*, *Prosopis juliflora* and *Alstonia macrophylla*, for aphidicidal, antioxidant and cytotoxic properties. Each powdered dried plant part was extracted into 50% methanol in dichloromethane using a bottle extractor. The extracts were evaluated for aphidicidal activity by Potter's spray tower method using aphids (*Myzus persicae*) reared on cabbage leaf, antioxidant activity using 1,1-diphenyl-2-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP), total phenolic content (TPC) using Folin-Ciocalteau reagent and cytotoxicity using brine shrimp lethality assay. Leaf extract of *S. trilobata* was non-toxic (LC_{50} > 2000 mg dm^{-3}) and displayed the highest aphidicidal activity (77% mortality after 48 h) and strong antioxidant properties (DPPH, IC_{50} 48 mg dm^{-3}; FRAP, Fe^{2+} 2.73 mmol g^{-1}). Stem-bark extract of *S. trilobata* was also non-toxic (LC_{50} > 2000 mg dm^{-3}) but displayed only moderate aphidicidal (57% mortality) and antioxidant (DPPH, IC_{50} 160 mg dm^{-3}; FRAP, Fe^{2+} 0.74 mmol g^{-1}) properties. Root and stem extracts of *P. juliflora* showed strong antioxidant properties (DPPH, IC_{50} 20 and 17, respectively; FRAP, Fe^{2+} 2.6 and 0.8 mmol g^{-1}, respectively) and contained high TPC (4.0 and 2.6 mmol of gallic acid equivalents g^{-1}, respectively); however, *P. juliflora* extracts displayed low aphidicidal activity (37-47% mortality) and moderate to negligible toxicity (LC_{50} 169-1449 mg dm^{-3}). Leaf and stem extracts of *A. macrophylla* had low to moderate aphidicidal (40-60% mortality), negligible antioxidant (DPPH, IC_{50} 220-318 mg dm^{-3}) and low toxic (LC_{50} 199-767 mg dm^{-3}) properties. All *A. inulifolium* extracts were non-toxic (LC_{50} > 2000 mg dm^{-3}) and had negligible antioxidant (DPPH, IC_{50} > 287 mg dm^{-3}) and aphidicidal (23-47% mortality) properties. Most potent aphidicidal, antioxidant and toxic properties were shown by leaf extracts of *S. trilobata*, root and stem extracts of *P. juliflora* and leaf extract of *P. juliflora*, respectively.

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Key words: Aphidicidal, Antioxidant, Cytotoxic, Invasive alien plants