

Isolation, characterization, and biological activity of naphthoquinones from *Calceolaria andina* L.

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Two compounds recognized as responsible for the insecticidal activity of extracts of *Calceolaria andina* L. (Scrophulariaceae) have been isolated and characterized as

2-(1,1-dimethylprop-2-enyl)3-hydroxy-1,4-naphthoquinone and the corresponding acetate, 2-acetoxy-3-(1,1-dimethylprop-2-enyl)-1,4-naphthoquinone. Their activities against 29 pest species and 9 beneficial species of arthropod from a total of 11 orders have been determined. Activities against homopteran and acarine species are of the same order as those of established pesticides, and, significantly, no cross-resistance is observed for strains resistant to established classes of insecticide. Mammalian toxicities are low.