Reduced maternal fecundity of the high Andean perennial herb Alstroemeria umbellata (Alstroemeriaceae) by aphid herbivory

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Assessments of the effects of invertebrate herbivores on high-altitude plants have seldom taken into account both mutualistic and antagonistic interactions. To evaluate the effect of herbivores (antagonists) and pollinators (mutualists) on the female reproductive success of the high-Andean perennial herb Alstroemeria umbellata, we separately and simultaneously excluded aphids (herbivores), and bees and bumblebees (pollinators) in a 2×2 factorial design. In flowers with pollinators excluded, aphids did not reduce seed set per flower (i.e., a direct effect). However, in flowers exposed to pollinators, aphids reduced seed set by 1.7 times (i.e., a pollinator-mediated indirect effect). Likewise, both types of animals exerted non-additive effects on maternal fecundity. These results suggest a modulating role for herbivores on the selection pressures exerted by pollinators on A. umbellata.