

## Conservation concerns in Yuzawa Geopark: Distributions and seasonal variation in blood-sucking flies and an invasive plant species

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Yuzawa Geopark, located in Yuzawa City, Akita, Japan, is subject to two conservation issues that are common to many urban greenspaces: pest species are of concern for sustainable tourism, and invasive species threaten the integrity of the satoyama landscape. The first step in the management of both of these species groups is to clarify their distribution and seasonal variation. Here, we focused on blood-sucking flies (*Hirosia* spp.) in tourism hotspots, and on the invasive *Rudbeckia laciniata* in areas where it has colonized the satoyama landscape. Using dry ice traps, we found that blood-sucking flies were most abundant in early August, and that *Hirosia iyoensis* and *Hirosia sapporoensis* may have mutually exclusive spatial distributions. Visual surveys for *R. laciniata* confirmed that these plants occupy orchards, mined areas, and areas around silos at high densities, and have a patchy distribution in downstream areas. Appropriate mitigative measures are presented and discussed based on these results.

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