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Laura L. Ingwell, Christelle Lacroix, Paul R. Rhoades, Nilsa A. Bosque-Perez

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VIRUS INFECTION IN AN ENDANGERED GRASSLAND HABITAT

Ingwell, L. L. (1, 2), Lacroix, C. (3), Rhoades, P. R. (1), and Bosque-Pérez, N. A. (1)

(1) *University of Idaho, 875 Perimeter Drive, Moscow, ID 83844-2339, USA*
(*nbosque@uidaho.edu*)

(2) *Purdue University, USA*

(3) *University of Minnesota, USA and INRA UR0407 Plant Pathology, France*



BACKGROUND and OBJECTIVES

The *Barley* and *Cereal yellow dwarf virus* (B/CYDV) species complex includes some of the most economically important disease-causing agents of small grain cereal crops. BYDV plays an important role in the competitive dynamics of native and invasive grasses in nonmanaged systems (Malmstrom et al. 2005, Borer et al. 2007). B/CYDV are known to infect over 150 *Poaceae* species, and BYDV was recently found to infect the invasive species *Ventenata dubia* in grassland habitats (Ingwell and Bosque-Pérez 2015). The Palouse region of northern Idaho and eastern Washington in the USA is one of the most productive wheat-growing regions of the world, but little is known about viral prevalence in grassland habitats of the region. In order to manage and conserve endangered grasslands a better understanding of the interactions among members of an ecological community, including pathogens, is required. The objectives of this study were to determine the prevalence of B/CYDV among grass hosts in endangered Palouse Prairie remnants and Conservation Reserve Program (CRP) lands, identify B/CYDV species present in the region, and examine the factors that influence virus prevalence.

MATERIAL AND METHODS

Field surveys of *Poaceae* species in five Palouse Prairie and six CRP sites, were conducted to examine for the presence of B/CYDV among potential grass hosts from 2010-2012. Aphid vectors were sampled to identify species present in each habitat and tested to determine virus presence. Molecular techniques were used to determine virus presence among grass and aphid samples and to identify viral species present.

RESULTS

B/CYDV infection was detected in grass hosts at every CRP and prairie remnant sampled, documenting for the first time virus infection in the endangered prairie remnants. Aphids were encountered at only one sampling time at one site. Virus prevalence was influenced by host life history, host tribe, location, and proportion of grain cover in the surrounding landscape.

CONCLUSIONS

Results demonstrate that B/CYDV infection is common among CRP and prairie habitats in this region. The low number of aphids collected suggests that non-colonizing aphids might be responsible for disease spread in these habitats. The identity of grass species in and grain crop acreage around prairie sites may play an important role in disease dynamics in nonmanaged systems.

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