The Virus Detection of Viruliferous Aphid Caught Alive on a Yellow Trap for Potato Leafroll Virus in Daekwallyeong Area

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Abstract

This study was conducted to test the presence of the potato leafroll virus (PLRV) in aphid caught alive on a yellow water trap in Daekwallyeong, a major potato seed-producing area in Korea. Aphids caught were fed for inoculation on Physalis floridana to know the infectivity of aphid for PLRV. On late August and early September in 1988, 3.4% of total aphids trapped alive were viruliferous and the viruliferous aphids were finally caught in the first September. In 1989, the viruliferous aphid was initially appeared on June 16. The rates of viruliferous aphid on late June and July were 20.8% and 11.8%, respectively. The viruliferous aphid was finally trapped on August 14 and the incidence of viruliferous aphid was 10% in average in 1989. Viruliferous aphids were identified to be Myzus persicae, Aphis gossypii, Macrosiphum euphorbiae and others as 63.4%, 10.7%, 7.1% and 17.9%, respectively.

Key words : Viruliferous, PLRV, Myzus persicae

Introduction

Viruliferous PLRV is a serious disease of potato and can be transmitted by aphids. Aphids become viruliferous after feeding on infected plants. PLRV is transmitted to healthy plants by contact or mechanical transmission. The disease causes stunting, yellowing, and discoloration of leaves. In severe cases, the plants may die. The virus can also reduce tuber yield and quality. The tubers may be infected with PLRV, making them unsuitable for use as seed potatoes. Therefore, it is important to control aphids and PLRV to prevent the spread of the disease.

Materials and Methods

Aphids were caught with yellow water traps in Daekwallyeong, a major potato seed-producing area in Korea. The aphids were fed on Physalis floridana to test for their infectivity for PLRV. The infection rate of aphids was recorded for each month from June to August.

Results

In 1988, 3.4% of aphids trapped alive were viruliferous. The infection rate increased to 20.8% in June and 11.8% in July in 1989. The infection rate for the first time was recorded in June 16th, and the incidence of viruliferous aphid was 10% in average in 1989. Viruliferous aphids were identified to be Myzus persicae, Aphis gossypii, Macrosiphum euphorbiae and others as 63.4%, 10.7%, 7.1% and 17.9%, respectively.

Discussion

The results of this study indicate that viruliferous aphids were present in Daekwallyeong area. The infection rate increased significantly in June and July in 1989. The results also suggest that the incidence of viruliferous aphid was 10% in average in 1989. These findings highlight the importance of controlling aphids and PLRV to prevent the spread of the disease.

Conclusion

The results of this study suggest that aphid and PLRV control is necessary in Daekwallyeong area to prevent the spread of the disease. The findings also provide valuable information for potato farmers and agricultural researchers. Further studies are needed to better understand the transmission of PLRV and to develop effective control strategies.
물의 중요성을 높이는 데 두려운 공헌을 한 바 있으며 그 후 진딧물의 이동과 바이러스 전파에 대한 많은 연구가 진행되었다 (5, 17, 25).

서갈자 재배지에서 PLRV의 발생은 진딧물의 전파가 많았으며,增加하여 (10), 안정적으로 변동과 주의가 바이러스의 죽음을 주의 깊게 관찰하고, 밭거리 주변의 환경에 더욱 중요하다 (2, 10). 일반적으로 서갈자 생산지역의 진딧물의 전파가 높을 경우, 전파로 인한 피해가 상당할 수 있다. 따라서, 서갈자 병원수발과 관련하여 바이러스 감염물에 대해 이용할 수 있는 방법을 연구하는 것이 보다는 병원수발에 대한 수단을 찾는 것이 중요하다.

현재 우리나라의 서갈자는 전등물의 밀도가 비교적 적어, 해양 800~1000m 되는 대전에 주변에서 재배 생산되고 있으나, 바람이 불어오는 서방의 방향에 감자 바이러스병의 죽음률이 60~100%로 높은 음용감자가 있다. 서갈자 재배지 및 주변의 환경에서, 밭거울 진딧물은 바이러스 공급자로 하여 바이러스를 감염시킨다.


**材料 및 방법**

진딧물 발생 및 보인자 검출, 진딧물을 산재로 잡기 위해 50 x 30 x 10cm의 이의 Water trap)을 대전에 위치한 고려대 실험정, 내부에 설치하여 실시하였다. 1988년에는 8월 20일부터 7월 2일, 1989년에는 감자의 뿌리가 깊은 5월~7월까지 20일을 기준으로 2~3일간

**結果 및 검토**

大田에서 셀자의 재배지에 많이 발생하고 있는 감자 알발림 바이러스병 (PLRV)은 안정적으로 전파가 관찰되고, 바이러스와 함께 증상이 발생하는 PLRV, PLRV 보인자로부터 본 연구를 통해 확인하였다 (7, 9).

**Fig. 1. A potato field with lots of PLRV infected potatoes in Jinbu-Ri, Pongchang-Gun near Daekwallyeong, 1989.**

**Fig. 2. Yellow water trap to sample aphid.**

**Fig. 3. PLRV symptoms on Physalis floridana.**

15 days after inoculation by viruliferous aphids trapped in yellow water trap.