Analysis of Iris yellow spot virus replication in vector and non-vector thrips species

Keywords:

- Iris yellow spot virus; non-structural protein; nucleocapsid protein; replication; Thrips tabaci

Iris yellow spot virus (IYSV, genus Tospovirus) is a viral disease of bulb and seed onion crops and is transmitted by Thrips tabaci. Foliage damage of up to 75% has been reported in Kenya and Uganda. In this study, the rate of IYSV replication in the larva, pupa and adult stages of T. tabaci and other non-vector thrips species and colour forms such as Frankliniella occidentalis, F. schultzei (dark) and F. schultzei (pale) was evaluated by monitoring relative levels of nucleocapsid (N) and non-structural (NSs) proteins using N- and NSs-specific antibodies. The effect of IYSV replication on mortality of thrips was also determined. N protein levels increased in all three stages of IYSV-fed T. tabaci, indicating replication of IYSV. In IYSV-fed non-vector thrips, the increase of N protein levels in the larval stage was lower than IYSV-fed T. tabaci but higher than their healthy counterparts. The N protein levels did not increase at pupal and adult stages. NSs protein was not detected in first instar of either vector or non-vector thrips species. After a 4 h post-acquisition period, a significant increase in NSs proteins was only observed in IYSV-fed T. tabaci, clearly differentiating vectors and non-vectors of IYSV. IYSV replication did not influence the survival of the vector thrips species, T. tabaci populations or the non-vector thrips species. This study indicates the effectiveness of monitoring non-structural proteins such as NSs, compared to nucleocapsid proteins, for differentiating vectors and non-vectors of IYSV.