



Transovarial Transmission of Dolichos Yellow Mosaic Virus by Its Vector, *Bemisia tabaci* Asia II 1

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The cultivation of dolichos bean [*Lablab purpureus* (L.) Sweet] has been severely affected by dolichos yellow mosaic virus (DoYMV, *Begomovirus*) transmitted by whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae). We tested the transovarial transmission of DoYMV in next-generation *B. tabaci* by PCR, real-time PCR, Southern blot hybridization, and biological transmission. The eggs, laid by DoYMV-exposed *B. tabaci*, carry the virus in a unique pattern. Only the eggs laid in between 3 and 6 days post virus acquisition by a parent *B. tabaci* were DoYMV positive. When tested individually in real-time PCR, around 31–53% of the eggs carried the virus. The presence of DoYMV in ovaries and F1 eggs was further substantiated by the hybridization of a Cy3-conjugated nucleic acid probe complementary to the viral strand of DoYMV. Viral DNA was also detected in F1 adults and F2 eggs. *B. tabaci* progenies carried not only the DoYMV DNA but were also infective. The F1 adults transmitted DoYMV to all tested plants and produced strong yellow mosaic symptoms. An increase in viral copies from egg to nymphal stage indicated propagation of DoYMV in *B. tabaci*. However, the increase was for a short period and decreased thereafter. The present study provides the first evidence of transovarial transmission and propagation of a bipartite begomovirus in its vector, *B. tabaci* Asia II 1. The transovarial transmission and replication of DoYMV in *B. tabaci* have great epidemiological relevance as *B. tabaci* can serve as a major host of the virus to bridge the gap between the cropping seasons.

Keywords: *Geminiviridae*, DoYMV, Silverleaf whitefly, vertical transmission, infected progeny, replication, virus-vector relationship 3

INTRODUCTION

Begomovirus (family *Geminiviridae*, order *Geplafuvirales*) is the largest known genus of plant viruses, which contains more than 445 virus species (ICTV, 2020). Begomoviruses are single-stranded (ss) circular DNA viruses that are either monopartite having single genomic DNA or bipartite with two DNA components viz. DNA-A and DNA-B (Brown et al., 2015; Krenz et al., 2015). Most of the begomoviruses are phloem limited and restricted to the vascular system except bean dwarf mosaic virus that invades mesophyll tissue (Levy and Czosnek, 2003). Infected plants show chlorosis, yellow mosaic, vein yellowing, vein thickening, leaf curling, flower bud abscission,