## **Supporting Information**

## Ryabov et al. 10.1073/pnas.0901389106



**Fig. S1.** Viruses of the rosy apple aphid. (A) Transmission electron microscopy of purified virus from clone WS. Two types of virus particles: 32 nm (RAAV) and 22 nm (DpIDNV). (*B*) Organization of the genomic DNA of DpIDNV (GenBank accession no. EU851411). MB, histidine-rich divalent metal cofactor binding; NTPase, nucleotide-binding and helicase domains. (C) Organization of the genomic RNA of RAAV. HEL, picorna-like RNA helicase; PROT, chymotrypsin-like protease; RdRpol, RNA-dependent RNA polymerase. ORFs are represented as shaded arrows; numbers indicate nt positions; CP, coat protein; fs, site of translational frameshift; An, poly(A) sequence. (*D–F*) Detection of DpIDNV and RAAV infections in the rosy apple aphid by RT-PCR, gel electrophoresis of the products. (*D*) Detection of PDIDNV and RAAV in the aphids from the clone SWS and 2–11; no viruses detected in aphids from the clone EM-1. (*E*) Detection of the intro in the DpIDNV mRNA for expression of the nonstructural genes. (*f*) Detection of RAAV and DpIDNV in individual aphids from clone WS; light fifth instars without wing buds, dark fourth instars with wing buds, winged fifth instars.

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DplDNV-NS EX610113 MpDNV-NS	RVALRNWCARIREWSVSEFNDYYSSGKITPYFNAYSRDKKQVYYDVQTSVQIAEELLCYQ NRIFNAYARGPGTVYYDIDKSV9IASELLMYQ TIPLRNWAATLRRWSIHDFNKYYNDSTVFPYFNAYGSDICNMYYSISESLTIAKELLNYQ ****:***
DplDNV-NS EX610113 MpDNV-NS	FDNDGDLISKFLYDVYAIVDKLVPKRNSMCVVSPPSAGKNFFFDAVASYFLNYGMFGTAN FENNDGLICRFLQTLVNILDKKIPKRNSMLIHSPPSAGKNYFFDAVAAFFLNYGMFGTAN FGDDPEVVIEFLTTLYNVIDKRVPKLNSICIKSPPSAGKNFFFDAVASYLLSYGMFGTAN * :: :: .** : ::** :** :** : : *******
DplDNV-NS EX610113 MpDNV-NS	KTNNFSWADGAGKRLVLWNEPNYETFHVEKIKELLGGDTTRVHVKYKGDQPLQGPPIFLL KTNNFSFSDGAGKRLVIWNEPNYEVYHLEKMKELLGGDTTRVHVKYKNDVPLQGPPIILL KNNNFSWADGAGKRLVLWNEPNYEQYHIEKIKELLGGDTTRIHVKYANDVSVQRVPIIIL *.****::********:*******
DplDNV-NS EX610113 MpDNV-NS	TNNTLSICNDPAFADRLVTYEWKSAPFLKQYNKKLNPLFFYVLLTKWIKVVNPNNKS TNHYLSIINDPSFKDRLSVYTWISAPFLKMYNKKLSPLFFYHLLNKYNITYY TNNHLNIISHPAFNDRLRSYEWMSAGFLKDYDKKLHPLMFYELLKDYGVINDNNMID **: *.**:* *** ** ** ** *** *:*** **::**
В.	
DplDNV EX610113-rev MpDNV-1801	1612-ATTTAAATCATATAGACGATAATTGTAAAAAAATACGTGTAGCCTTGAGAAATTGGTGCG AATAGAAGAAGAAGACCAAAAAATGTAAAGTAGCTCTTAGG-AAATTGGTGCG 1921-ATATAAACTGGATAGACATGAAAGATTTTAAAGTAACGATACCGTTACGTAATTGGGCGG *****: * .:::::::::::::::::::::::::::
DplDNV1601 EX610113-rev MpDNV-1801	CTAGAATACGAGAATGGTCGGTTTCAGAGTTTAACGATTATTATCGAGTGGTAAAATAA CTATTATACGGGAAGGGAGTATTAATGAATTCGTTGAAATACTATAATAAACCTAATGTA CGACTTTACGCAGATGGTCTATTCATGATTTCAATAAATA
DplDNV1601 EX610113-rev MpDNV-1801	CGCCGTATTTTAACGCATATTCTCGCGATAAAAAACAAGTTTACTACGACGTACAAAC AAACCGTATTTTTAACGCGTACGCTAGAGGGCCTGGAACAGTTTATTACGATATCGATAA TTCCATATTTCAACGCGTACGGTTCAGATATTTGCAATATGTATTACAGTATTTCGGA .* :*** ***** * * .* .* .* .* .* .* .* .* .*
DplDNV1601 EX610113-rev MpDNV-1801	ATCTGTTCAAATAGCCGAGGAACTGTTGTGTGTTACCAGTTTGACAACGACGGTGACCTCAT ATCCGTTTCAATAGCTTCCGAGTTATTGATGTATCAATTTGAAAATAACGACGGTCTTAT GAGTTTAACAATAGCAAAAGAATTACTCAACTATCAATTTGGCGATGACCCTGAAGTAGT .: *: ****** ** ** * * * ** ** ****** **
DplDNV1601 EX610113-rev MpDNV-1801	TTCTAAGTTTTTATACGATGTTTACGCAATTGTCGACAAACTGGTTCCGAAACGCAATAG TTGTCGATTTTTGCAAACTCTAGTCAATATATTGGATAAAAAAATTCCGAAAAGAAATAG AATTGAATTTTTAACAACACTATATAATGTCATAGACAAAAGAGTTCCGAAATTAAATAG :: ******: *:* * ** ***********
DplDNV1601 EX610113-rev MpDNV-1801	TATGTGCGTAGTTTCTCCGCCGAGTGCCGGCAAAAATTTTTCTTCGACGCAGTAGCTAG CATGCTAATACATTCTCCCCCCAGCGCGGGCAAAAATTATTTTTCGATGCCGTGGCCGC TATATGTATAAAAAGTCCCCCCTTCGGCAGGTAAGAACTTTTTTTT
DplDNV1601 EX610113-rev MpDNV-1801	TTATTTTTTAAATTACGGAATGTTCGGTACCGCTAATAAGACTAATAATTTTTCGTGGGC CTTTTTTTGAATTACGGTATGTTCGGAACTGCCAACAAAACGAATAATTTCAGTTTCC GTATTTGCTTTCATATGGTATGTTCGGTACAGCCAATAAAAACAATAATTTTTCGTGGGC *:*** * :.:** **:************ ** ** ** **.*. ******* : * *
DplDNV1601 EX610113-rev MpDNV-1801	CGATGGCGCCGGAAAACGACTAGTCTTGTGGAACGAACCAAACTACGAAACATTTCACGT CGATGGTGCCGGCAAACGTCTCGTCATTTGGAACGAACCTAATTACGAGGTGTATCATTT AGACGGAGCGGGTAAACGATTAGTTCTATGGAACGAACCAAACTATGAACAATACCATAT .** ** ** ** *****: *.** * ************
DplDNV1601 EX610113-rev MpDNV-1801	AGAAAAAATTAAAGAATTGCTCGGCGGTGACACTACTCGTGTGCACGTTAAATACAAAGG GGAAAAAATGAAGGAACTATTAGGAGGGGATACCACTAGAGTGCATGTCAAATACAAAAA AGAAAAAATAAAAGAACTTTTGGGGGGGAGATACAACAAGAATACATGTAAAATATGCAAA .******** ** *** * * *** ** ** ** ** **
DplDNV1601 EX610113-rev MpDNV-1801	CGACCAACCTCTACAAGGCCCACCTATTTTTCTATTAACTAATAACACTTTGAGTATTTG CGATGTTCCCCTACAAGGGCCCCCGATAATATTATTGACCAATCACTATTTATCAATAAT CGACGTTAGTGTGCAAAGGGTACCCATTATTATATTA
DplDNV1601 EX610113-rev MpDNV-1801	TAATGATCCCGCGTTCGCTGACCGATTGGTCACGTACGAATGGAAATCAGCACCCTTTTT CAATGACCCGTCGTTCAAGGACCGTTTATCAGTGTACACATGGATTAGGGCACCTTTCCT TAGTCACCCAGCTTTTAACGATAGATTGCGGAGTTACGAATGGATGTCAGCTGGCTTCTT *.* * ** * ** ** *** *** *** *** *** *** *** *** *** *** *** *** ***
DplDNV1601 EX610113-rev MpDNV-1801	AAAACAATATAATAAAAAACTTAACCCATTATTTTTTTATGTATTACCTAACAAAGTGGAT AAAAATGTATAATAAAAAACTTTCTCCCGTTATTTTTTTT

**Fig. 52.** Partial sequence of the mRNA of putative Acyrthosiphon pisum densovirus (EST GenBank accession no. EX610113 from the whole genome library of *Acyrthosiphon pisum*, strain LSR1, from winged and wingless nymphs and adults). (A) Sequence alignment of the peptide encoded by the *A. pisum* EST accession no. EX610113 and the C-terminal parts of the nonstructural proteins of DpIDNV and MpDNV (GenBank accession no. NC\_005040). (B) Sequence alignment of the nucleotide sequences of the *A. pisum* EST accession no. EX610113 and homologous parts of DpIDNV and MpDNV genomic sequences.



**Fig. S3.** Distribution of the aphids from the virus-free and virus-infected clones on plantain plants. The colonies were established by placing 10 adult aphids on 15-cm-high plantain plants and propagated for 12 days at 20 °C  $\pm$  1 °C on a 16/8-h light/dark cycle. Three plants were used for each of 4 aphid clones. Bars depict mean  $\pm$  standard error of (*A*) aphid number and (*B*) percentage of aphids to the total number on the plant on lower parts of the plants, L (from the base of the leaves to 5 cm above the leaf base); and on the upper parts of the leaves, U (from the 5 cm above the leaf base to the top of the leaf). The same letters above the bars indicate the aphid numbers or the percentages of the aphids in the upper parts of the leaves (U) without significant difference (ANOVA, LSD test, P < 0.05).



**Fig. S4.** Aphid dispersal experiments. (*A*) Controlled environment dispersal experiment. Each pair of donor and recipient plantain plants are located  $\approx$ 85 cm apart within insect-proof chambers, 100 cm long, 30 cm high, and 20 cm wide. Plants were placed in water traps (Petri dishes filled with water), and watering was carried out through built-in piping. (*B* and *C*) Field dispersal experiment. The donor and recipient plants were placed inside insect-proof tent-shaped chambers made of a nylon mesh, 2.5 m long, 1 m wide, and 0.85 m high. Plants were placed inside water traps (plastic trays filled with water).

## **Other Supporting Information Files**

Table S1 Table S2 Table S3 Table S4 Table S5 Table S6