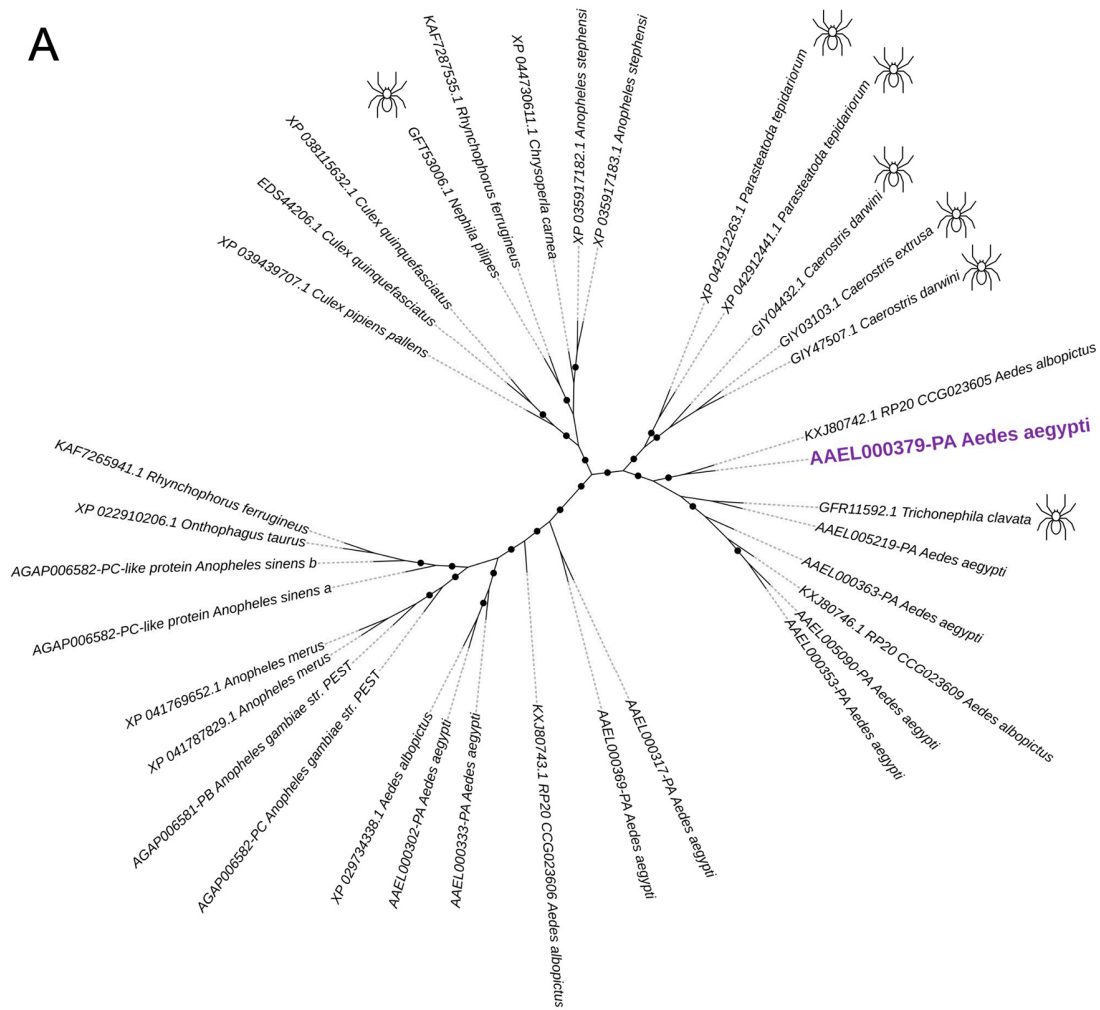
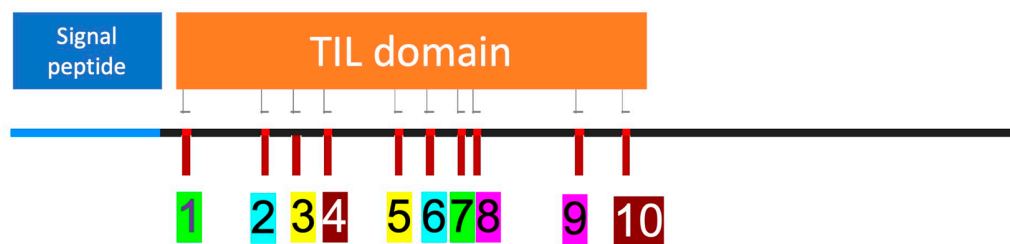


SUPPLEMENTARY FIGURES

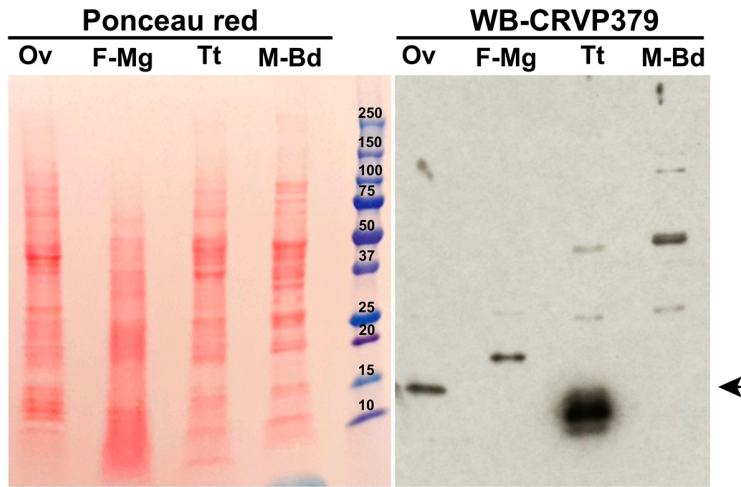
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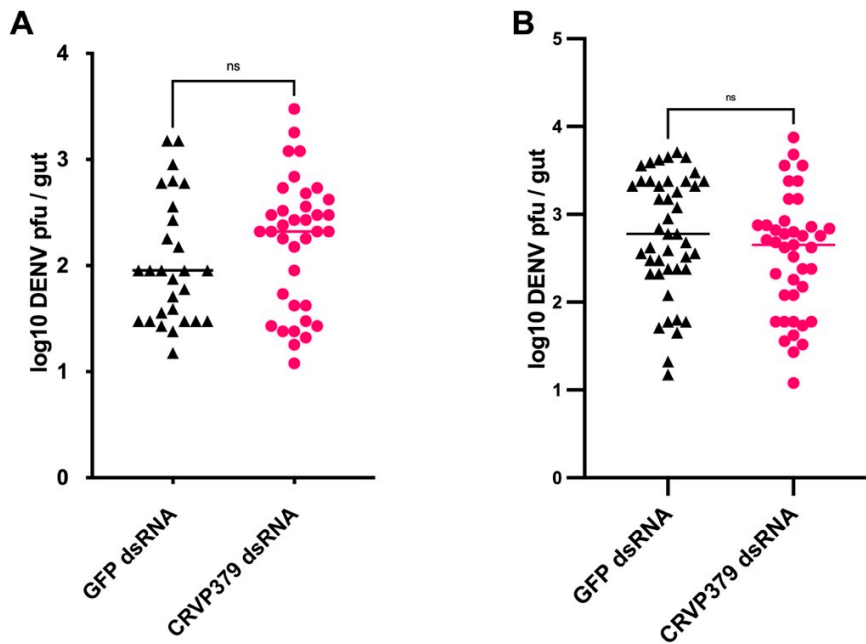
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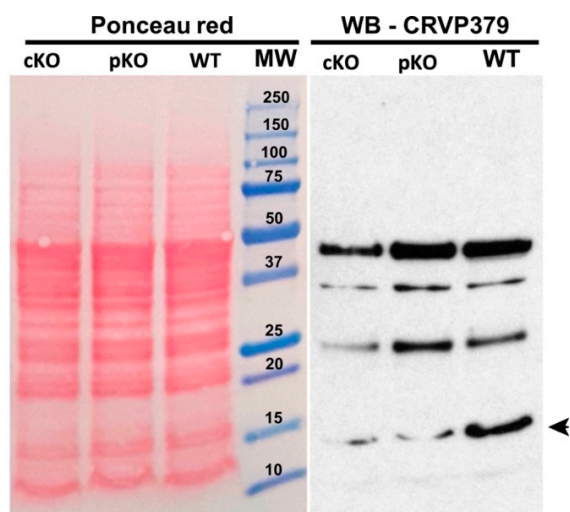
Supplementary Figure S1: (A) Unrooted phylogenetic tree of *Ae. aegypti* CRVP379 and closely related proteins obtained from the NCBI (nr database). CRVP379 is highlighted in bolded purple. Bootstrap values of 70% or higher are highlighted with dots. Proteins from spiders are highlighted with icons. (B) Schematic representation of key features from *Ae. aegypti* CRVP379. Cysteine residues predicted to form disulfide bridges are highlighted in the same color.



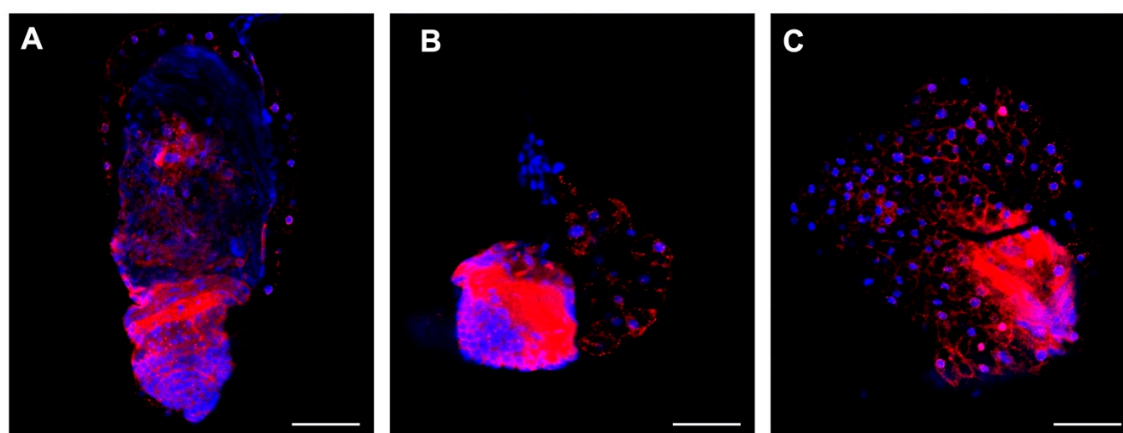
Supplementary Figure S2: Detection of CRVP379 with Western blotting utilizing anti-CRVP379 antibody. Ov: ovaries; F-mg: female midgut; T: male testes; M-bd: male body without testes. Left panel: Ponceau staining; right panel: Western blotting. Arrow indicates CRVP379 band.



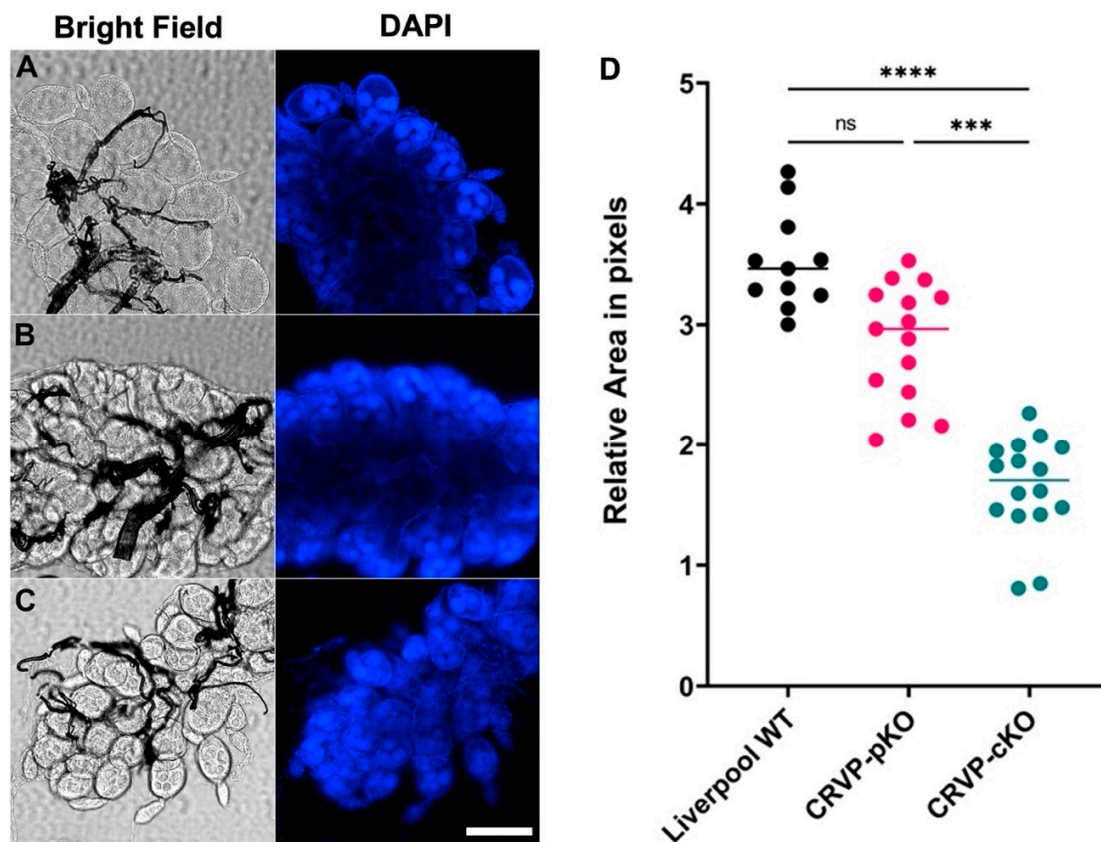
Supplementary Figure S3: Effect of CRVP379 gene silencing on DENV titers in the *Ae. aegypti* Rockefeller midgut. (A) 4 days after infection; (B) 7 days after infection. There was no statistically significant difference in DENV titers between control mosquitoes injected with GFP dsRNA and CRVP379 dsRNA (Mann Whitney test: $p=0.2645$ for day 4, $p=0.1239$ for day 7).



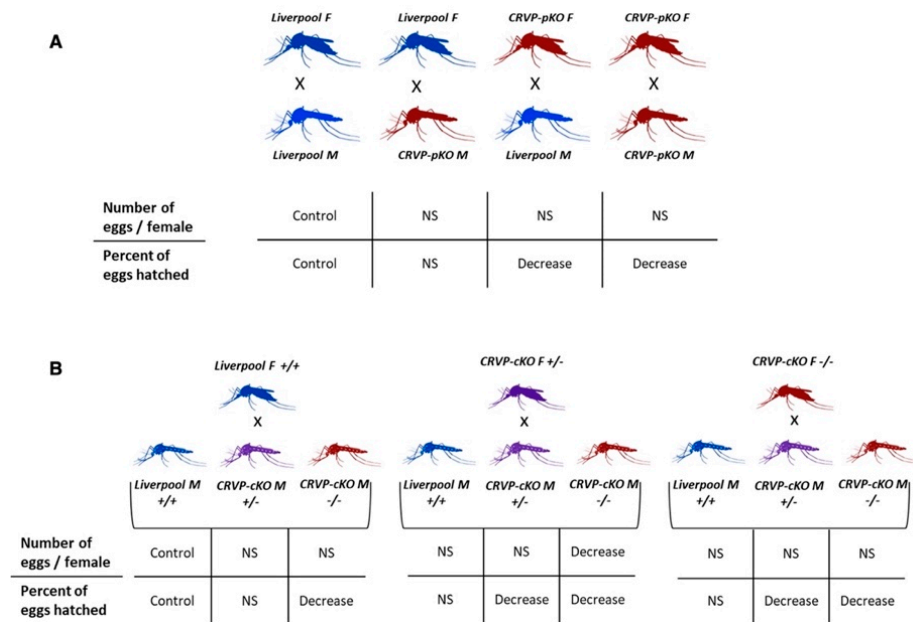
Supplementary Figure S4: Detection of CRVP379 with Western blotting utilizing anti-CRVP379 antibody in wild-type, CRVP-pKO, and CRVP-cKO whole bodies. Left panel: Ponceau staining, right panel: Western blotting. Arrow indicates CRVP379 band.



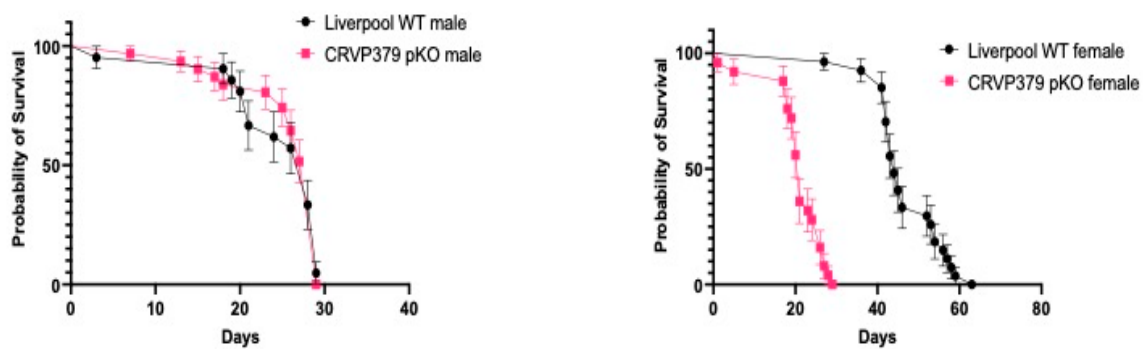
Supplementary Figure S5: Immunofluorescent detection of CRVP379 in the testes of *Ae. aegypti*. Anti-CRVP379 antibody: red; DAPI: blue. (A) *Ae. aegypti* Liverpool. (B) CRVP-pKO. (C) CRVP-cKO, 20X magnification, Bar scale = 100µm.



Supplementary Figure S6: (A) General morphology of follicles in wild-type (A) Liverpool, (B) CRVP-Pko (C) CRVP-cKO ovaries, 20X magnification (D) Follicle size as measured by the area (pixels) tool in ImageJ Fiji for wild-type Liverpool, each data set represents one follicle, CRVP-pKO, and CRVP-cKO ovaries (Dunn's multiple comparison test, **** $p < 0.0001$ between Liverpool and CRVP-cKO, *** $p = 0.0005$ between CRVP-pKO and CRVP-cKO. ns- non-significant). Bar scale = 100 μm .



Supplementary Figure S7: Graphical representation of various CRVP379 crosses; F-female, M- male, NS- No significant change compared to WT Liverpool cross, Decrease- Statistically significant decrease A) CRVP-pKO crosses B) CRVP-cKO crosses; WT Liverpool +/+, CRVP379 heterozygous genotype +/-, CRVP379 homozygous genotype -/-. Image generated with Biorender, (Agreement number AA240G3DTD, IX240G37A0)



Supplementary Figure S8: Kaplan-Meier survival curves for wild-type Liverpool and CRVP-pKO A) Males; B) Females. There was no significant difference in the survival proportion of males ($p=0.4545$). CRVP-pKo females had a significantly shorter lifespan than did Liverpool females ($p<0.0001$, log-rank Mantel-Cox test).

SUPPLEMENTARY FILE S1

Table S1 Protein sequences of CRVP379 from wild type and mutant lines

Primer/ Guide RNA	Sequence
CRVP_seq_F / CRVP_qpcr_F	5'-CGGCACCAAACAGTTCAAG-3'
CRVP_seq_R	5'-TCCTAGCCGAACAATGGCG-3'
CRVP_qpcr_R	5'-CGCCGTAACGCAAGTGTAG-3'
CRVP_RNAi_F	5'-TAATACGACTCACTATAGGGCGCTAATCTACACTTGCGTT-3'
CRVP_RNAi_F	5'-TAATACGACTCACTATAGGGAGCCACCACAATGGAC-3'
GFP_RNAi_R	5'-TAATACGACTCACTATAGGGTTCATCTGCACCACCGGC-3'
GFP_RNAi_F	5'-TAATACGACTCACTATAGGGCTGGTAGTGGTCGGCGAG-3'
Rps17_F	5'-GCAGACCACCATTGAACACA-3'
RPS17_R	5'-CACGTCCGGTCAGCTTCTTG-3'
gRNA 8	5'-AACGAGGTGTACCAGGAATGTGG-3'
gRNA 4	5'-CCAGTGCGTACCGAGTTCCAAGT-3'
gRNA 1	5'-CCTCCGCTGGTAATACCCGTACC-3'

>CRVP_WT

MKLLISLAVIALIYTCVTASNFCSGPNEVYQECGSACEKTCAGLGANQTCNEKCVPGCFCADGFVRLNHSGQCVPSKCP
KVRVRRAPPEPLPLVIPVPIPIVPPIVRPRGPLWWLRPPPPPLFG

>CRVP379-pKO

MKLLISLAVIALIYTCVTASNFCSGPNEVYQECGSACEKTCAGLGANQTCNEKCVPGCFCADGFVRLNHSGQCVPRPRG
PLWWLRPPPPPLFG

>CRVP_379-ckO

MKLLISLAVIALIYTCVTASNFCSGPNEVYQAKCGSACANVAQLARRHVPALESTSRA TKSAFRDASARMGSFGSTIAAS
AYRVPSVPK