Supplementary Figures and Tables

Comparing apples and oranges (and blueberries and grapes): fruit type affects development and cold-susceptibility of immature *Drosophila suzukii* (Diptera: Drosophilidae)

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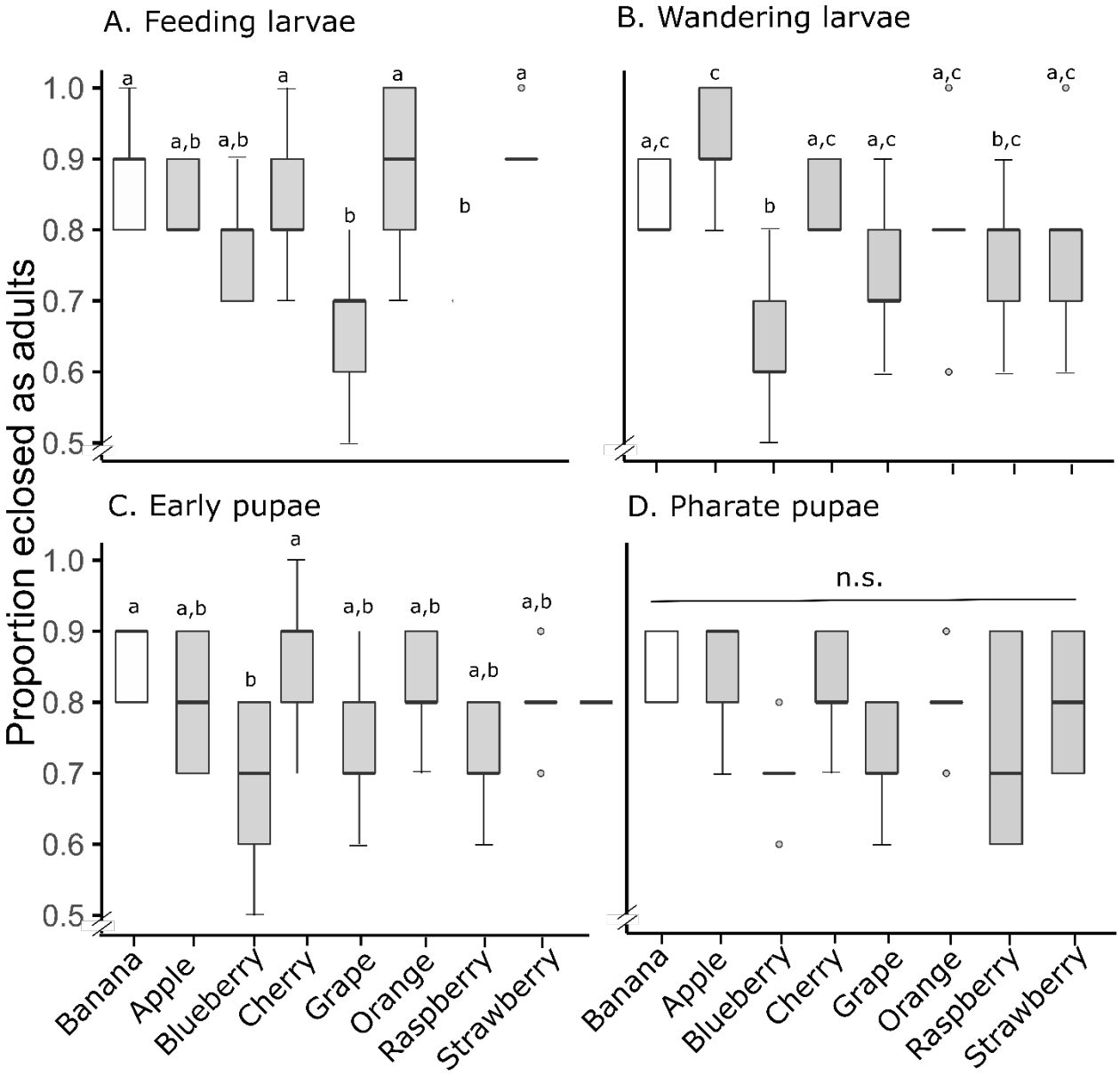
Supplementary Table S1. Analysis of deviance results for generalised linear models with binomial error distribution of the effect of fruit on the survival of *Drosophila suzukii* without exposure to cold.

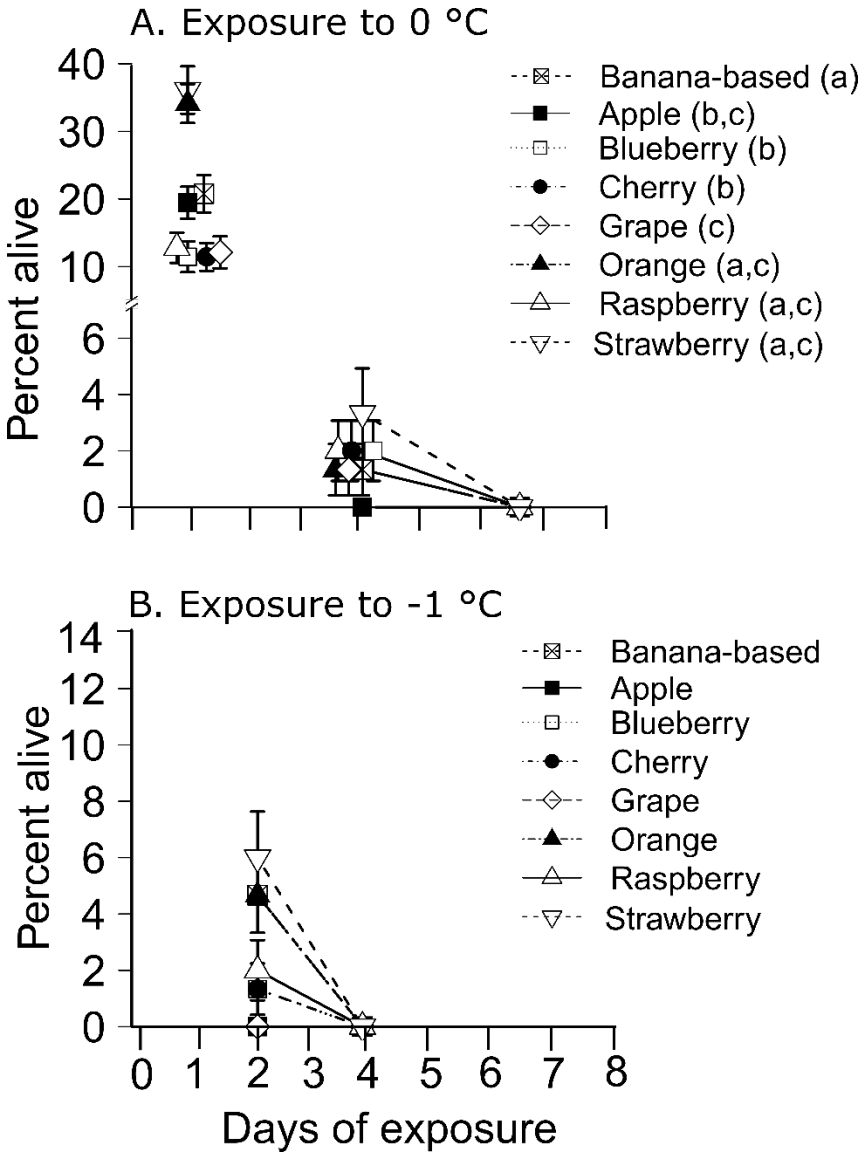
Life stage	df	χ^2	*P*
Feeding larvae	7	18.0	0.01
Wandering larvae	7	13.35	0.06
Early pupae	7	8.68	0.27
Pharate pupae	7	6.10	0.53

Supplementary Table S2. Analysis of deviance results for a generalized linear model of the effect of diet and cold exposure on development time in each treatment group and life stage of *Drosophila suzukii.*

Life stage	Treatment	Coefficient	df	χ^2	*P*
Feeding larvae	Control	Days	1	344.7	< 0.001
		Fruit	7	263.4	< 0.001
	+4 ºC, 24 h	Days	1	226.0	< 0.001
		Fruit	7	247.6	< 0.001
	0 ºC, 48 h	Days	1	39.3	< 0.001
		Fruit	7	73.2	< 0.001
	0 ºC, 96 h	Days	1	1.3	0.25
		Fruit	7	4.0	0.79
	-1 ºC, 48 h	Days	1	0.4	0.52
		Fruit	7	2.8	0.90
Wandering larvae	Control	Days	1	32.90	< 0.001
		Fruit	7	57.1	< 0.001
	+4 ºC, 24 h	Days	1	257.8	< 0.001
		Fruit	7	235.8	< 0.001
	-4 ºC, 1 h	Days	1	238.6	< 0.001
		Fruit		193.2	< 0.001
Early pupae	Control	Days	1	128.9	< 0.001
		Fruit	7	194.2	< 0.001
	+4 ºC, 24 h	Days	1	261.51	< 0.001
		Fruit	7	249.13	< 0.001
	-4 ºC, 1 h	Days	1	309.1	< 0.001
		Fruit	7	262.4	< 0.001
Pharate pupae	Control	Days	1	147.0	< 0.001
		Fruit	7	196.0	< 0.001
	+4 ºC, 24 h	Days	1	263.5	< 0.001
		Fruit	7	270.1	< 0.001
	-4 ºC, 1 h	Days	1	245.2	< 0.001
		Fruit	7	204.0	< 0.001



Supplementary Figure S1. The effects of handling on the survival of immature *Drosophila suzukii* reared on different fruit-based diets. This handling was the same as for individuals exposed to cold in subsequent experiments. Wandering and feeding larvae were both third instar. Mean ± SEM shown; different letters signify statistically significantly different survival among fruit types within each life stage ($P < 0.05$; generalised linear model with binomial error distribution; see text for statistics).

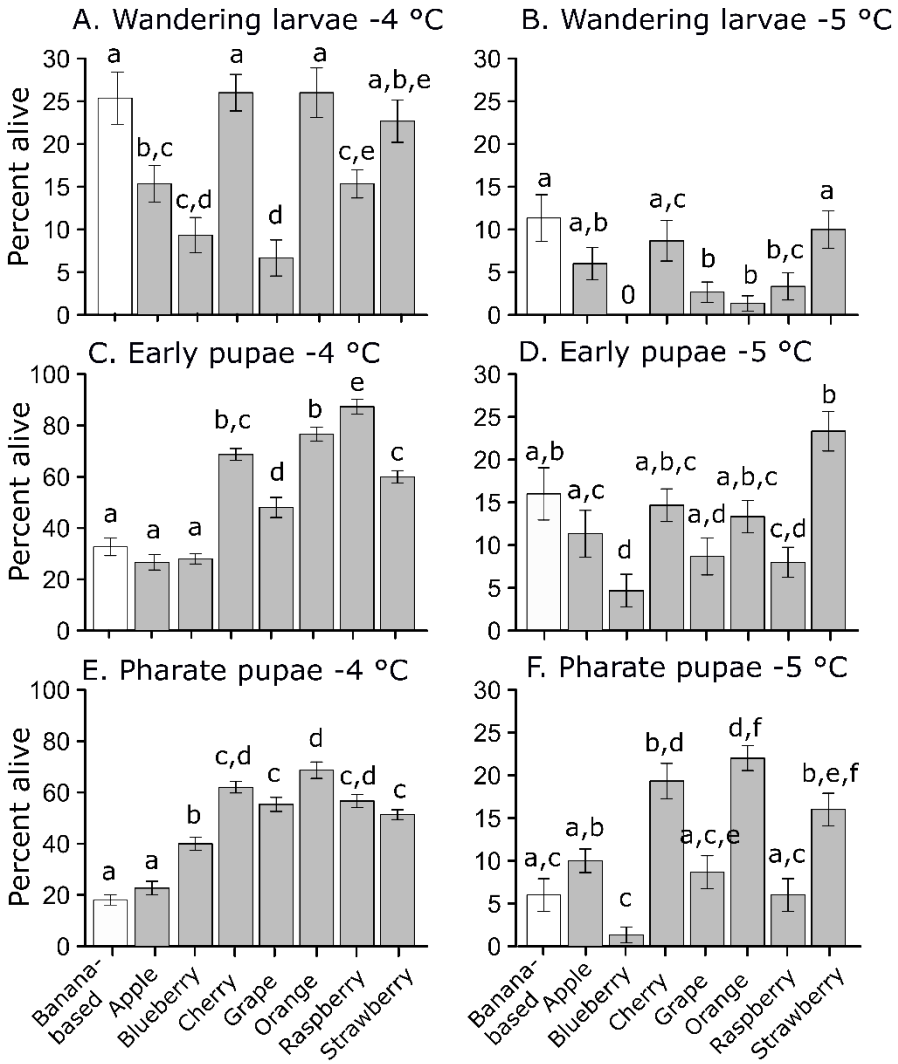


Supplementary Figure S2. Survival of feeding third-instar larvae of *Drosophila suzukii* following exposure to 0 °C (A) and -1 °C (B). Mean ± SEM shown; some points are slightly offset to improve visibility of data.

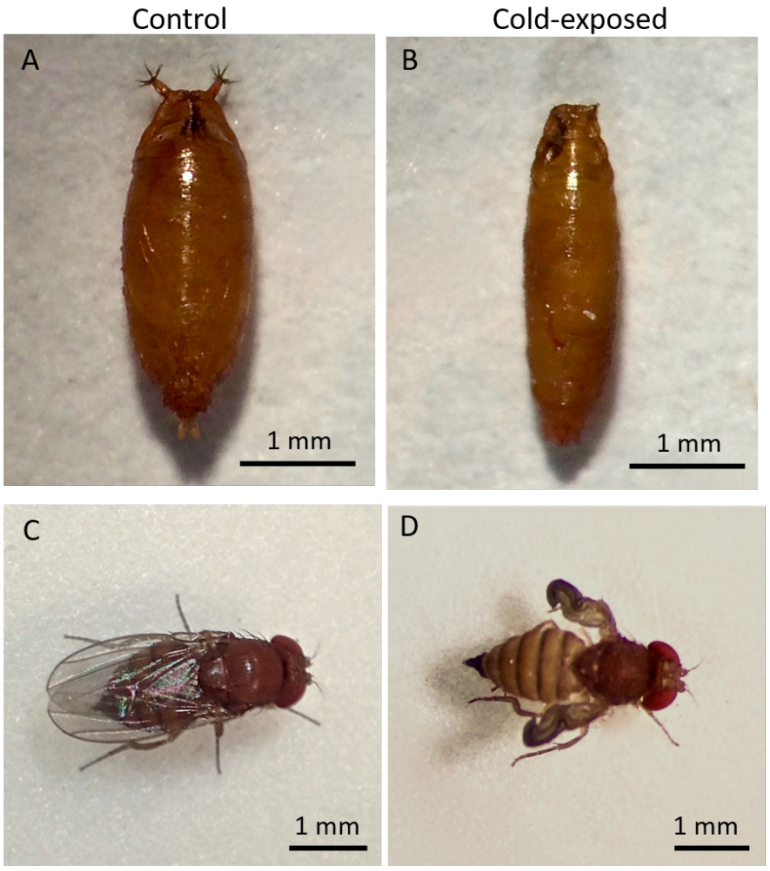
A. 3rd instar feeding larvae before exposure to 0.6 °C for 3 days.

B. 3rd instar feeding larvae exposed to 0.6 °C for 3 days.

Supplementary Figure S3. Melanisation indicating tissue damage in cold-exposed *Drosophila suzukii*. A. Larva prior to cold exposure. B. Larva following cold exposure to 0.6 °C for three days. Larva survived the cold exposure and melanisation appeared rapidly following recovery from cold; however, individuals with visible melanisation did not survive to eclosion. Larvae were maintained on food derived from oranges but represent larvae from all food sources.



Supplementary Figure S4. Survival of immature *Drosophila suzukii* reared on various fruit diets and exposed to either -4 or -5 °C for one hour. We measured survival as adult eclosion. Mean ± SEM shown; different letters signify statistically significant difference in survival among the fruit types ($P < 0.05$; generalised linear model with binomial error distribution; see Table 3 in main text for statistics).



Supplementary Figure S5. Incomplete development and wing deformities of *Drosophila suzukii* following cold exposure. A. Control pupa demonstrating healthy pupal development. B. Pupa demonstrating stunted growth and incomplete development following exposure to -5 °C for one hour as a third instar wandering larva. Pupae with these deformities failed to eclose. C. Control, four days old female with no visible deformities. D. Adult female with malformed, non-functional wings following exposure to -4 °C for one hour as third instar wandering larvae. Both controls and cold-exposed flies were reared in food derived from raspberries but represent adults reared on all food types.