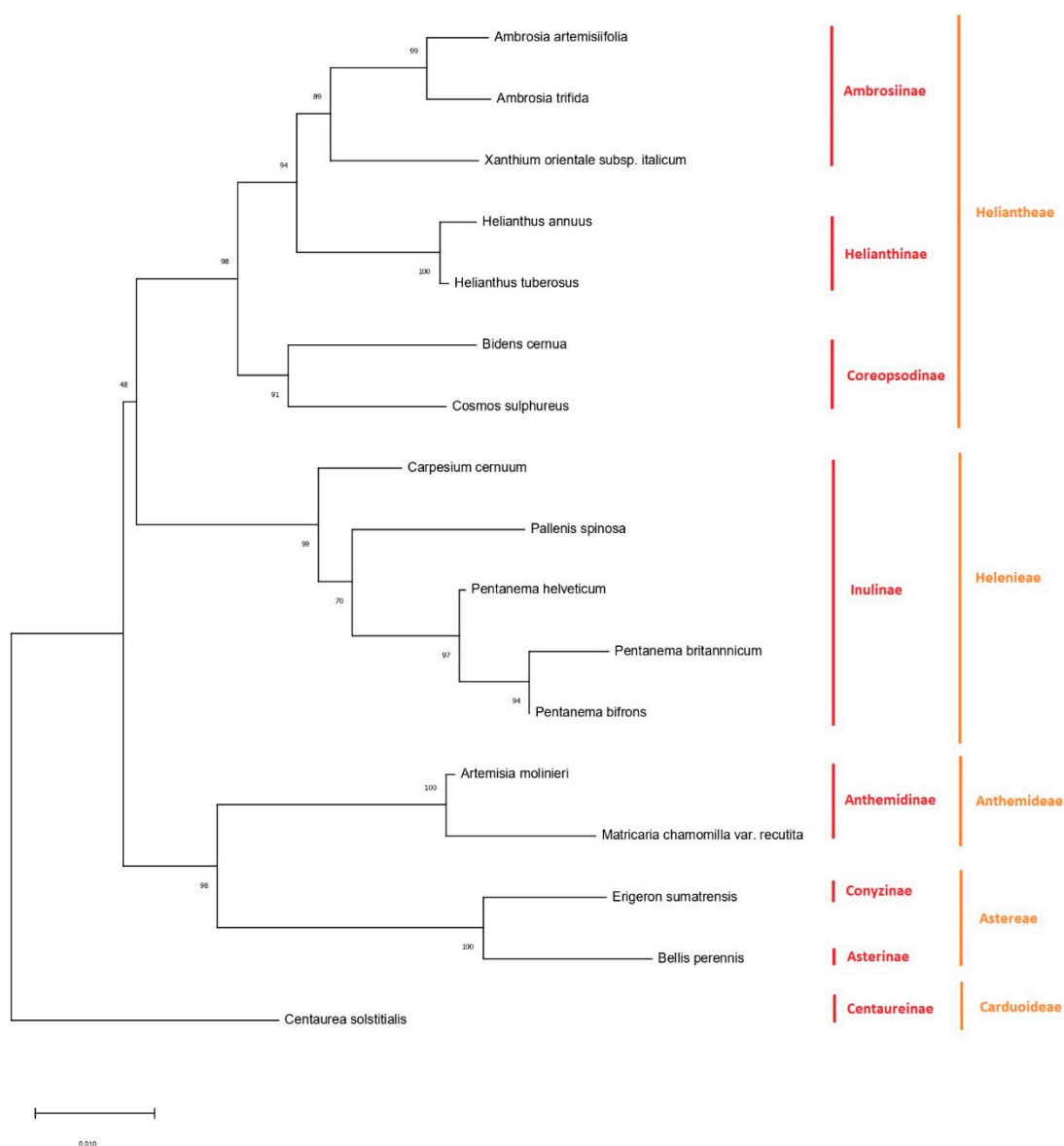
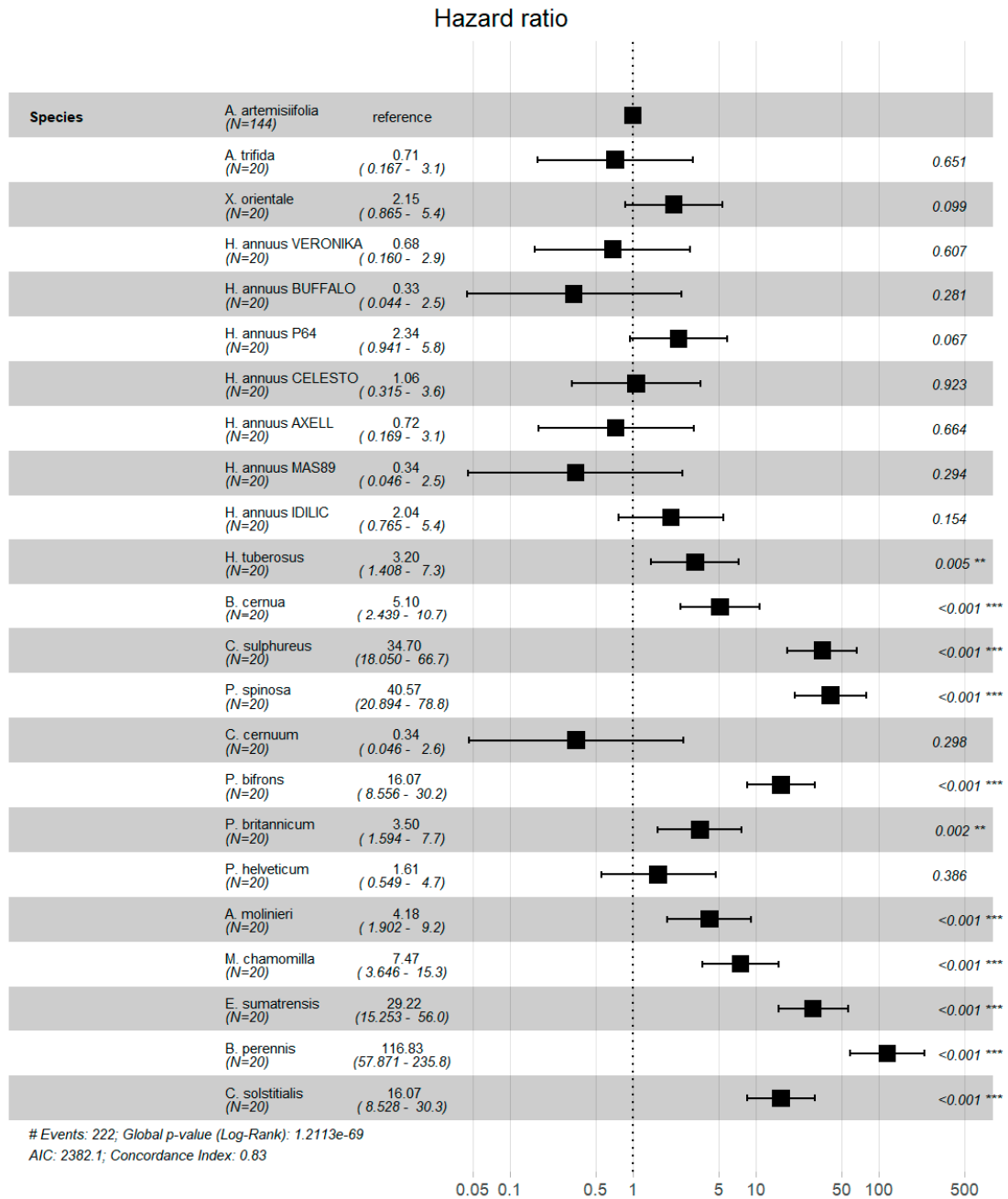


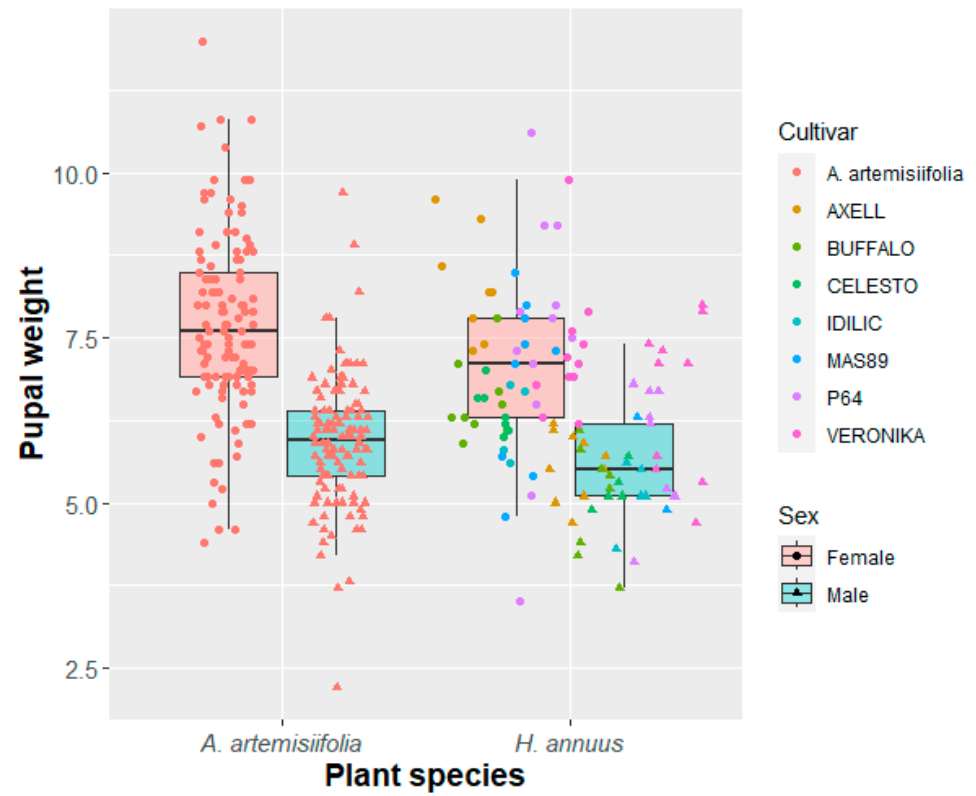
Supplementary material



Supplementary material: Figure S1. Phylogenetic tree of the tested plants. Orange text is the plant species tribe, and red text is the sub-tribe. The genetic distances were obtained by analysing the sequences of a portion of the matK (maturase K) gene. The sequences for each plant species were downloaded from the GenBank database (<https://www.ncbi.nlm.nih.gov/genbank/>). The sequences were then aligned using the Clustal W method. Genetic distances are represented by the number of base substitutions per site between sequences. Analyses were performed using the 3-parameter Tamura model. Rate variation between sites was modelled using a gamma distribution. The final dataset comprised a total of 440 positions. All analyses were performed via MEGA X software [71].



Supplementary material: Figure S2. Estimated effect sizes \pm 95CI for the difference in adult survival between the test plant and *A. artemisiifolia* (forest plot based on a Cox proportional hazards model adjusted for adult survival data). When the hazard ratio is greater than 1, it indicates an increase in the mortality risk compared with *A. artemisiifolia*, whereas if it is less than 1, it indicates a decrease in the mortality risk compared with *A. artemisiifolia*.



Supplementary material: Figure S3. Pupal weight depending on the sex of the individuals and the plant tested (*Artemisia artemisiifolia* and *Helianthus annuus*) in no-choice test. Female individuals are represented by circles (reddish boxplot), and males by triangle (blue boxplot)

Supplementary material: Table S1. Origins of seeds used in our experiments.

Species	Cultivars	Seeds origin
<i>Ambrosia artemisiifolia</i> L.		Côte d'Or (France)
<i>Ambrosia trifida</i> L.		Ariège (France)
<i>Xanthium orientale</i> L.		Hérault (France)
<i>Helianthus annuus</i> L.	ES VERONIKA	LIDEA
	RGT BUFFALO	RAGT Semences
	P64HE118	Pioneer Semences
	SY CELESTO	Syngenta
	RGT AXELL	RAGT Semences
	MAS 89HOCL	Mas Seeds
	ES IDILIC	LIDEA
<i>Helianthus tuberosus</i> L.		Gard (France)
<i>Bidens cernua</i> L.		MNHN
<i>Cosmos sulphureus</i> Cav.		Hérault (France)
<i>Pallenis spinosa</i> L.		Hérault (France)
<i>Carpesium cernuum</i> L.		Geneva Botanical Gardens
<i>Pentanema bifrons</i> L.		Botanical Garden La Gacilly (Brittany, France)
<i>Pentanema britannicum</i> L.		NBC Brest (France)
<i>Pentanema helveticum</i> (Weber)		Geneva Botanical Gardens
<i>Artemisia molinieri</i> Quézel.		NBC Brest (France)
<i>Matricaria chamomilla</i> L.		Hal (Belgium)
<i>Erigeron sumatrensis</i> Retz.		Hérault (France)
<i>Bellis perennis</i> L.		Hal (Belgium)
<i>Centaurea solstitialis</i> L.		Hérault (France)

Supplementary material: Table S2: No-choice results: Egg masses, total of viable eggs and larva survival rate. P-values were calculated with Benjamin & Hochbeg (1995) method in a Wilcoxon test.
^a Number of replicates used in the larvae test.

Sub-tribe	Species	Replicate	Egg batches			Total of viable eggs			Larval survival		
			Average	\pm	p-value	Average	\pm	p-value	a	Average	p-value
Ambrosiinae	<i>Ambrosia artemisiifolia</i> L.	32	26.7	\pm 11.7	-	637.1	\pm 374.1	-	26	0.85 \pm 0.1	-
	<i>Ambrosia trifida</i> L.	5	10.2	\pm 10.2	0.011 *	96.0	\pm 110.0	<0.001 ***	5	0.60 \pm 0.2	<0.001 **
	<i>Xanthium orientale</i> L.	5	10.4	\pm 5.00	0.003 **	150.2	\pm 119.5	0.002 **	5	0.44 \pm 0.2	<0.001 ***
Helianthinae	<i>Helianthus annuus</i> L.										
	ES VERONIKA	5	5.8	\pm 5.17	0.002 **	60.0	\pm 70.7	<0.001 ***	5	0.42 \pm 0.2	0.002 **
	RGT BUFFALO	5	7.2	\pm 4.76	0.003 **	99.8	\pm 87.0	<0.001 ***	5	0.34 \pm 0.1	<0.001 ***
	P64HE118	5	2.4	\pm 2.61	<0.001 ***	25.8	\pm 30.2	<0.001 ***	5	0.42 \pm 0.2	<0.001 ***
	SY CELESTO	5	11.4	\pm 4.51	0.006 **	194.4	\pm 113.5	0.006 **	5	0.26 \pm 0.1	<0.001 ***
	RGT AXELL	5	5.2	\pm 6.87	0.002 **	96.8	\pm 156.2	0.002 **	5	0.36 \pm 0.2	<0.001 ***
	MAS 89HOCL	5	6.0	\pm 7.04	0.002 **	103.8	\pm 149.5	<0.001 ***	5	0.26 \pm 0.1	<0.001 ***
	ES IDILIC	5	1.4	\pm 2.61	<0.001 ***	13.8	\pm 28.7	<0.001 ***	5	0.18 \pm 0.2	<0.001 ***
	<i>Helianthus tuberosus</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0.08 \pm 0.1	<0.001 ***
Coreopsidinae	<i>Bidens cernua</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
	<i>Cosmos sulphureus</i> Cav.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
Inulinae : Pulicaria complex	<i>Pallenis spinosa</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
Inulinae : Inula complex	<i>Carpesium cernuum</i> L.	5	3.0	\pm 2.35	<0.001 ***	24.0	\pm 23.0	<0.001 ***	5	0	<0.001 ***
	<i>Pentanema bifrons</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
	<i>Pentanema britannicum</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
	<i>Pentanema helveticum</i> (Weber)	5	0.8	\pm 1.30	<0.001 ***	4.4	\pm 6.0	<0.001 ***	5	0	<0.001 ***
Anthemidinae	<i>Artemisia molinieri</i> Quézel.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
	<i>Matricaria chamomilla</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
Conyzinae	<i>Erigeron sumatrensis</i> Retz.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
Asterinae	<i>Bellis perennis</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***
Centaureinae	<i>Centaurea solstitialis</i> L.	5	0		<0.001 ***	0		<0.001 ***	5	0	<0.001 ***

Supplementary material: Table S3. Choice test results: egg masses and total viable eggs on each plant. The p-value were calculated with a Wilcoxon rank sum test with continuity correction between *A. artemisiifolia* and the non-target plant. For each non-target plant species, the data on *A. artemisiifolia* and the plant tested are side-by-side, as they correspond of the same test.

Species	Cultivars	Replicate	Egg masses on each plant				Total viable eggs on each plant			
			<i>A. artemisiifolia</i>		Non-target	p-value	<i>A. artemisiifolia</i>		Non-target	p-value
<i>Ambrosia trifida</i> L.		8	23.6 ± 2.1		5.1 ± 3.3	<0.001 ***	666.5 ± 76.9		124.1 ± 83.5	<0.001 ***
<i>Xanthium orientale</i> L.		8	18.3 ± 6.0		2.6 ± 3.2	0.0013 **	350.9 ± 142.8		41.0 ± 46.3	<0.001 ***
<i>Helianthus annuus</i> L.										
	ES VERONIKA	8	26.4 ± 5.4		3.0 ± 3.9	<0.001 ***	606.9 ± 186.1		69.3 ± 109.2	<0.001 ***
	RGT BUFFALO	8	28.8 ± 6.3		1.0 ± 2.5	<0.001 ***	708.8 ± 172.3		25.5 ± 61.3	<0.001 ***
	P64HE118	8	27.5 ± 9.1		0.8 ± 0.9	<0.001 ***	550.1 ± 285.9		18.5 ± 26.1	<0.001 ***
	SY CELESTO	8	19.5 ± 8.2		1.4 ± 2.4	<0.001 ***	405.1 ± 229.1		29.3 ± 56.2	0.0013 **
<i>Carpesium cernuum</i> L.		7	13.0 ± 9.3		0.1 ± 0.4	0.0014 **	253.9 ± 247.4		1.1 ± 3.0	0.0014 **
<i>Pentanema helveticum</i> (Weber)		7	18.1 ± 8.7		1.9 ± 2.4	0.0038 **	364.9 ± 223.4		29.1 ± 31.6	0.0070 **

Supplementary material: Table S4. Choice test results: herbivory damages on each plant after one, two and three weeks. The p-value were calculated with a Wilcoxon rank sum test with continuity correction. For each non-target plant species, the data on *A. artemisiifolia* and the plant tested are side-by-side, as they correspond of the same test.

Species	Herbivory after one week				Herbivory after two weeks				Herbivory after three weeks			
	<i>A. artemisiifolia</i>	Non-target	p-value		<i>A. artemisiifolia</i>	Non-target	p-value		<i>A. artemisiifolia</i>	Non-target	p-value	
<i>Ambrosia trifida</i> L.	2.90 ± 1.73	3.88 ± 4.02	1	NS	6.52 ± 4.60	9.32 ± 5.80	0.38	NS	8.49 ± 5.10	9.08 ± 4.92	0.8785	NS
<i>Xanthium orientale</i> L.	3.39 ± 2.25	3.18 ± 1.73	1	NS	5.75 ± 3.13	3.29 ± 1.68	0.1049	NS	10.48 ± 4.52	4.61 ± 2.28	0.0047	**
<i>Helianthus annuus</i> L.												
Veronika	1.37 ± 0.83	4.01 ± 3.20	0.0070	**	4.80 ± 2.38	4.79 ± 3.38	0.6454	NS	7.88 ± 1.71	5.32 ± 3.19	0.0499	*
Buffalo	5.22 ± 2.46	3.65 ± 1.60	0.1605	NS	10.81 ± 4.08	4.70 ± 1.93	0.0030	**	14.79 ± 3.22	5.70 ± 3.54	<0.001	***
P64	2.71 ± 1.50	3.08 ± 2.88	0.6454	NS	4.81 ± 2.41	5.23 ± 5.36	0.7209	NS	9.17 ± 4.27	2.79 ± 1.32	<0.001	***
Celesto	1.18 ± 0.94	3.49 ± 1.30	0.0011	**	3.54 ± 1.70	4.33 ± 1.43	0.4418	NS	7.08 ± 3.09	4.87 ± 1.97	0.1605	NS
<i>Carpesium cernuum</i> L.	5.27 ± 4.22	2.80 ± 2.46	0.1807	NS	10.97 ± 8.81	2.34 ± 1.28	0.0070	**	19.68 ± 15.18	2.90 ± 1.89	<0.001	***
<i>Pentanema helveticum</i> (Weber)	1.92 ± 0.99	2.20 ± 1.55	0.62	NS	7.20 ± 1.16	5.97 ± 5.65	0.1649	NS	12.50 ± 1.41	7.57 ± 5.64	0.0973	*

Supplementary material: Table S5. Relative performance combined score, and Preference and Performance Index (PPI) calculated as describe by Paynter et al. (2015) and Grevstad et al. (2021)

Plant species	Cultivars	Relative performance		Combined score	PPI
		Oviposition	Larval survival		
<i>A. trifida</i>		0.151	0.703	0.106	0.374
<i>X. orientale</i>		0.236	0.515	0.121	0.258
<i>H. annuus</i>	SY CELESTO	0.305	0.305	0.093	0.161
	RGT BUFFALO	0.157	0.398	0.062	0.137
	ES VERONIKA	0.094	0.492	0.046	0.250
	P64HE118	0.040	0.492	0.020	0.148
<i>C. cernuum</i>		0.038	0.000	0.000	0.012
<i>P. helveticum</i>		0.007	0.000	0.000	0.030