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*Functional Plant Biology*

### Supplementary Material

#### **Artemisinin and *Ambrosia trifida* extract aggravate the effects of short freeze–thaw stress in winter rye (*Secale cereale*) seedlings**

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Table S1. Two-way ANOVA of SP content in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	66.866	2	33.433	53.942	****
Temperature	144.445	3	48.148	77.684	****
Extract × Temperature	16.309	6	2.718	4.386	***
Error	22.313	36	0.620		
Sum	8467.417	48			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .

Table S2. Two-way ANOVA of Pn in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	18.961	2	9.480	231.552	****
Temperature	56.631	3	18.877	461.057	****
Extract × Temperature	8.737	6	1.456	35.565	****
Error	1.474	36	0.041		
Sum	143.088	48			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .

Table S3. Two-way ANOVA of Rr in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	2.184	2	1.092	54.727	****
Temperature	15.362	3	5.121	256.587	****
Extract × Temperature	2.580	6	0.430	21.546	****
Error	0.718	36	0.020		
Sum	156.249	48			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .

Table S4. Two-way ANOVA of MDA content in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	664.079	2	332.040	137.355	****
Temperature	580.352	3	193.451	80.025	****
Extract × Temperature	96.003	6	16.000	6.619	****
Error	58.017	24	2.417		
Sum	29058.041	36			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .

Table S5. Two-way ANOVA of SOD activity in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	47731.858	2	23865.929	27.436	****
Temperature	70989.259	3	23663.086	27.203	****
Extract × Temperature	30908.318	6	5151.386	5.922	***
Error	20877.085	24	869.879		
Sum	10808691.658	36			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .

Table S6. Two-way ANOVA of CAT activity in winter rye seedlings between Extract and Temperature factors.

Sources of error	SS	df	MS	F	P
Extract	890.471	2	445.235	6.135	***
Temperature	6799.816	3	2266.605	31.231	****
Extract × Temperature	2060.672	6	343.445	4.732	***
Error	3483.588	48	72.575		
Sum	383884.709	60			

SS = sum of squares, df = degrees of freedom, MS = mean square, \*\*\*\*  $P < 0.001$ , \*\*\*  $P < 0.005$ .