

SUPPLEMENTARY INFORMATION

Enhancing Chickpea Resistance to *Fusarium oxysporum* f. sp. *ciceris* Infection and PEG-Induced Drought Stress through Exogenous Phytohormone Application

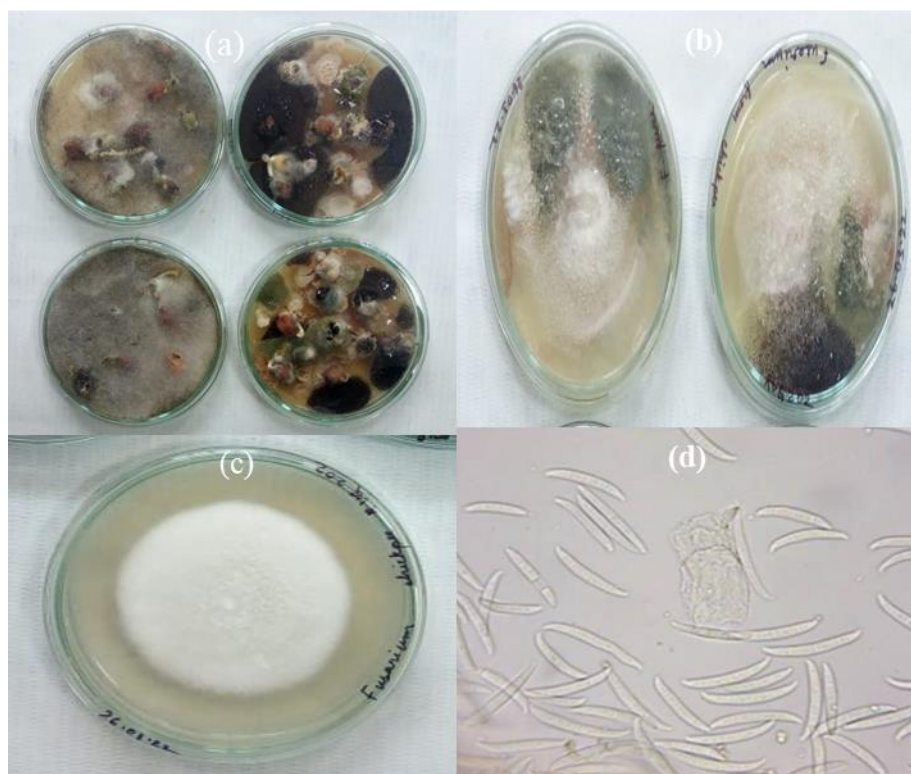
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Supplementary Fig. S1. Seedborne mycoflora and isolation of *Fusarium*. (a) Seed borne mycoflora colonies from R1 (JG-14) and R2 (RVG-202); (b) Isolation and culturing of *Fusarium* spores on PDA plates; (c) Pure culture of *Fusarium oxysporum* f. sp. *ciceris*; (d) *Fusarium* spores in compound microscope.

Supplementary Table S1. Treatments combinations with their durations

SN	Treatment Combination	Category	Duration of treatment
1.	Control	Control	7 days
2.	−0.03 MPa PEG8000	Treatment with PEG	7 days
3.	−0.06 MPa PEG8000		
4.	−0.15 MPa PEG8000		
5.	Infected with <i>Foc</i>	Treatment with <i>Foc</i>	24 hours
6.	−0.03 MPa PEG8000 + <i>Foc</i>	Combined stress of PEG and <i>Foc</i>	Droughted for 7 days with PEG followed by treatment with <i>Foc</i> on the 6 th day.
7.	−0.06 MPa PEG8000 + <i>Foc</i>		
8.	−0.15 MPa PEG8000 + <i>Foc</i>		
9.	−0.03 MPa PEG8000 + 300 mg/L GA ₃	Mitigation Treatments	For 5 days after stress treatments.
10.	−0.03 MPa PEG8000 + 1 mM SA		
11.	−0.06 MPa PEG8000 + 300 mg/L GA ₃		
12.	−0.06 MPa PEG8000 + 1 mM SA		
13.	−0.15 MPa PEG8000 + 300 mg/L GA ₃		
14.	10% PEG8000 + 1 mM SA		
15.	<i>Foc</i> + 300 mg/L GA ₃	Pathogen	For 5 days after stress

16.	<i>Foc</i> + 1 mM SA	mitigation	treatments.
17.	−0.03 MPa PEG8000 + <i>Foc</i> +300 mg/L GA ₃	Combined PEG + <i>Foc</i> +Mitigation	For 5 days after stress treatments.
18.	−0.03 MPa 8000 + <i>Foc</i> + 1 mM SA		
19.	−0.06 MPa PEG8000 + <i>Foc</i> +300 mg/L GA ₃		
20.	−0.06 MPa PEG8000 + <i>Foc</i> + 1 mM SA		
21.	−0.15 MPa PEG8000+ <i>Foc</i> +300 mg/L GA ₃		
22.	−0.15 MPa PEG8000 + <i>Foc</i> + 1 mM SA		

Foc, *Fusarium oxysporum*; SA, salicylic acid; GA₃, gibberellic acid; PEG, poly ethylene glycol.

Supplementary Table S2. Effect of PEG induced and *F. oxysporum* stress and their mitigation using gibberellic acid (GA₃) and salicylic acid (SA) on shoot length of chickpea cultivar JG-14 and RVG-202

Treatments	JG-14 of Shoot Length, cm			RVG-202 of Shoot Length, cm		
		Mitigation Treatments			Mitigation Treatments	
		GA ₃	SA		GA ₃	SA
Control	36.97 ± 1.25 ^a	42.84 ± 0.05 ^a	38.45 ± 0.14 ^a	33.21 ± 1.45 ^a	37.91 ± 1.81 ^a	35.16 ± 0.64 ^a
<i>Foc</i>	30.11 ± 0.86 ^b	33.59 ± 1.42 ^b	31.95 ± 0.76 ^b	28.46 ± 0.51 ^b	31.77 ± 1.42 ^b	30.58 ± 0.76 ^b
−0.03 MPa PEG8000	29.87 ± 0.65 ^b	32.19 ± 1.58 ^b	30.52 ± 0.88 ^b	27.89 ± 0.64 ^b	30.54 ± 1.57 ^b	29.88 ± 0.78 ^b
−0.03 MPa PEG8000+ <i>Foc</i>	24.51 ± 0.78 ^c	27.49 ± 0.89 ^c	24.59 ± 0.92 ^c	22.34 ± 0.78 ^c	28.94 ± 0.88 ^c	26.54 ± 0.91 ^c
−0.06 MPa PEG8000	23.64 ± 0.36 ^{cd}	26.01 ± 1.04 ^{cd}	24.05 ± 0.63 ^c	20.33 ± 0.36 ^d	24.17 ± 1.03 ^d	23.94 ± 0.62 ^d
−0.06 MPa PEG8000+ <i>Foc</i>	21.54 ± 0.7 ^d	26.87 ± 0.33 ^c	22.84 ± 1.19 ^d	19.67 ± 0.69 ^d	27.19 ± 0.32 ^c	23.94 ± 1.18 ^d
−0.15 MPa PEG8000	20.57 ± 0.61 ^d	22.09 ± 1.14 ^d	21.32 ± 0.57 ^d	19.64 ± 0.61 ^d	23.17 ± 1.13 ^d	20.56 ± 0.56 ^e
−0.15 MPa PEG8000 + <i>Foc</i>	18.57 ± 0.77 ^e	19.99 ± 1.00 ^e	18.96 ± 0.89 ^e	16.44 ± 0.76 ^e	18.94 ± 0.99 ^e	19.11 ± 0.88 ^e
CD at 5%	0.31			0.32		
CV, %	1.02			1.09		
SEM	0.155			0.16		

Values are shown as a mean ± SE (n = 3). *Foc*, *Fusarium oxysporum*; SA, salicylic acid; GA₃, gibberellic acid; PEG, poly ethylene glycol.

Supplementary Table S3. Effect of PEG induced and *F. oxysporum* stress and their mitigation using gibberellic acid (GA₃) and salicylic acid (SA) on root length of chickpea cultivar JG-14 and RVG-202

Treatments	JG-14 Root Length,cm			RVG-202 Root Length,cm		
		Mitigation Treatments			Mitigation Treatments	
		GA ₃	SA		GA ₃	SA
Control	16.54 ± 0.69 ^a	18.62 ± 0.62 ^a	17.25 ± 0.35 ^a	13.22 ± 0.47 ^a	15.47 ± 0.63 ^a	14.58 ± 0.61 ^a
<i>Foc</i>	15.26 ± 0.79 ^b	16.04 ± 0.40 ^b	15.48 ± 0.63 ^b	7.56 ± 0.56 ^f	9.59 ± 0.31 ^b	7.56 ± 0.58 ^f
−0.03 MPa PEG8000	14.22 ± 0.56 ^c	16.47 ± 0.60 ^b	14.51 ± 0.60 ^c	11.89 ± 0.74 ^b	11.23 ± 0.62 ^c	8.17 ± 0.77 ^e
−0.03 MPa PEG8000+ <i>Foc</i>	14.76 ± 0.40 ^{bc}	15.02 ± 0.74 ^c	14.71 ± 0.59 ^c	7.56 ± 0.6 ^f	8.14 ± 0.77 ^d	9.14 ± 0.60 ^c
−0.06 MPa PEG8000	13.82 ± 0.52 ^d	14.64 ± 0.55 ^d	13.99 ± 0.64 ^d	7.12 ± 0.64 ^g	8.46 ± 0.7 ^d	7.57 ± 0.56 ^f
−0.06 MPa PEG8000+ <i>Foc</i>	11.67 ± 0.59 ^e	12.96 ± 0.54 ^e	11.98 ± 0.50 ^e	7.54 ± 0.49 ^f	7.46 ± 0.47 ^e	9.46 ± 0.77 ^{bc}
−0.15 MPa PEG8000	11.27 ± 0.76 ^{ef}	12.43 ± 0.67 ^e	11.84 ± 0.48 ^e	8.17 ± 0.76 ^e	8.43 ± 0.69 ^d	7.41 ± 0.59 ^f
−0.15 MPa PEG8000 + <i>Foc</i>	10.29 ± 0.78 ^f	11.29 ± 0.52 ^f	10.99 ± 0.61 ^f	8.09 ± 0.79 ^e	6.55 ± 0.70 ^f	9.59 ± 0.48 ^b
CD at 5%	0.14			0.08		
CV, %	0.29			0.16		
SEM	1.88			1.59		

Values are shown as a mean $\pm$ SE ($n = 3$). *Foc*, *Fusarium oxysporum*; SA, salicylic acid; GA₃, gibberellic acid; PEG, poly ethylene glycol.

Supplementary Table S4. Effect of PEG induced and *F. oxysporum* stress and their mitigation using gibberellic acid (GA₃) and salicylic acid (SA) on fresh weight of chickpea plants viz JG-14 and RVG-202

Treatments	JG-14 Fresh Weight,g			RVG-202 Fresh Weight,g		
		Mitigation			Mitigation	
		GA ₃	SA		GA ₃	SA
Control	3.85 ± 0.48 ^a	4.02 ± 0.58 ^a	3.95 ± 0.62 ^a	2.37 ± 0.21 ^a	3.51 ± 0.84 ^a	3.33 ± 0.25 ^a
<i>Foc</i>	2.08 ± 0.66 ^e	3.58 ± 0.61 ^b	2.55 ± 0.38 ^c	2.31 ± 0.13 ^a	3.54 ± 0.57 ^a	2.75 ± 0.28 ^b
–0.03 MPa PEG8000	2.56 ± 0.76 ^c	3.75 ± 0.42 ^{ab}	2.99 ± 0.67 ^b	1.98 ± 0.10 ^{ab}	2.92 ± 0.17 ^{ab}	2.13 ± 0.22 ^c
–0.03 MPa PEG8000+ <i>Foc</i>	2.01 ± 0.76 ^e	3.01 ± 0.42 ^c	2.45 ± 0.67 ^c	1.96 ± 0.26 ^{ab}	2.92 ± 0.13 ^{ab}	2.13 ± 0.27 ^c
–0.06 MPa PEG8000	2.08 ± 0.56 ^e	3.24 ± 0.58 ^c	2.19 ± 0.35 ^d	1.96 ± 0.09 ^{ab}	3.12 ± 0.2 ^{ab}	2.08 ± 0.19 ^c
–0.06 MPa PEG8000+ <i>Foc</i>	2.00 ± 0.61 ^e	2.98 ± 0.48 ^c	2.14 ± 0.59 ^d	1.9 ± 0.45 ^{bc}	2.74 ± 0.18 ^{bc}	2.04 ± 0.23 ^c
–0.15 MPa PEG8000	1.87 ± 0.45 ^f	2.16 ± 0.66 ^d	1.92 ± 0.49 ^e	1.73 ± 0.11 ^{cd}	2.1 ± 0.26 ^{cd}	1.87 ± 0.24 ^{cd}
–0.15 MPa PEG8000 + <i>Foc</i>	1.42 ± 0.57 ^g	2.29 ± 0.46 ^d	1.59 ± 0.67 ^f	1.39 ± 0.14 ^d	2.13 ± 0.29 ^{cd}	1.48 ± 0.22 ^d
CD at 5%	0.11			0.05		
CV, %	3.71			0.09		
SEM	0.05			3.48		

Values are shown as a mean ± SE (n = 3). *Foc*, *Fusarium oxysporum*; SA, salicylic acid; GA₃, gibberellic acid; PEG, poly ethylene glycol.

Supplementary Table S5. Effect of PEG induced and *F. oxysporum* stress and their mitigation using gibberellic acid (GA₃) and salicylic acid (SA) on dry weight of chickpea plants

Treatments	JG-14 Dry Weight,g			RVG-202 Dry Weight,g		
		Mitigation			Mitigation	
		GA ₃	SA		GA ₃	SA
Control	0.81 ± 0.02 ^a	0.82 ± 0.01 ^a	0.81 ± 0.02 ^a	0.8 ± 0.02 ^a	0.81 ± 0.03 ^a	0.8 ± 0.03 ^a
<i>Foc</i>	0.69 ± 0.01 ^c	0.74 ± 0.03 ^c	0.7 ± 0.02 ^c	0.67 ± 0.03 ^c	0.73 ± 0.03 ^c	0.7 ± 0.03 ^c
−0.03 MPa PEG8000	0.74 ± 0.03 ^b	0.78 ± 0.02 ^b	0.75 ± 0.03 ^b	0.72 ± 0.03 ^b	0.8 ± 0.03 ^a	0.75 ± 0.03 ^b
−0.03 MPa PEG8000+ <i>Foc</i>	0.41 ± 0.03 ^g	0.52 ± 0.03 ^e	0.46 ± 0.03 ^f	0.44 ± 0.02 ^e	0.54 ± 0.02 ^d	0.45 ± 0.03 ^e
−0.06 MPa PEG8000	0.63 ± 0.03 ^d	0.7 ± 0.02 ^c	0.64 ± 0.03 ^d	0.42 ± 0.03 ^e	0.5 ± 0.02 ^d	0.44 ± 0.03 ^e
−0.06 MPa PEG8000+ <i>Foc</i>	0.39 ± 0.03 ^h	0.48 ± 0.02 ^f	0.43 ± 0.03 ^g	0.38 ± 0.03 ^f	0.46 ± 0.02 ^e	0.42 ± 0.02 ^f
−0.15 MPa PEG8000	0.52 ± 0.02 ^e	0.53 ± 0.03 ^e	0.52 ± 0.03 ^e	0.31 ± 0.01 ^h	0.37 ± 0.02 ^g	0.34 ± 0.03 ^h
−0.15 MPa PEG8000 + <i>Foc</i>	0.11 ± 0.02 ^j	0.15 ± 0.03 ⁱ	0.12 ± 0.02 ^j	0.12 ± 0.03 ^j	0.15 ± 0.03 ⁱ	0.13 ± 0.03 ^j
SEM	0.01			0.01		
CD at 5%	0.03			0.03		
CV, %	4.99			5.12		

Values are shown as a mean ± SE (*n* = 3). *Foc*, *Fusarium oxysporum*; SA, salicylic acid; GA₃, gibberellic acid; PEG, poly ethylene glycol.