

Heat Stress Induced Oxidative Stress Alleviation Potential of Ingredient of PHYTOCEE® in Broilers : *Withania somnifera*

OBJECTIVE

To elucidate heat stress alleviating effect of supplementation of *Withania somnifera* extract (WS) in commercial broilers reared during hot summer.

MATERIALS AND METHODS

Day old broiler chicks (n=160) were randomly allocated to 4 groups consisting of 8 replicates with 5 chicks each from 1 to 42 day of age. The four groups were 1. Positive control (PC) (Basal diet +Vit-E 70mg/kg + Se 0.15 mg/kg), 2. Negative control (NC)-basal diet without antioxidant, 3. WS50 (Basal diet + 50 mg WS extract/kg diet) and 4. WS100 (Basal diet + 100mg WS extract/kg diet). The antioxidant enzymes were estimated in serum, spleen and liver samples.

RESULTS

Table 1. Effect of *Withania somnifera* extract on serum anti-oxidant responses in broiler chicken

Treatment	GSH-Px (units/ml)	GSH-Rx (units/ml)	FRAS (μ mol/ml)	LP (nmol MDA/mg protein)	SOD (units/mg protein)
PC	350.6 ^{bc}	412.3 ^{ab}	1198	6.275 ^b	3.018 ^b
NC	277.3 ^a	380.5 ^a	1096	8.663 ^c	1.418 ^a
WS50	301.1 ^{ab}	381.1 ^a	1148	6.736 ^b	1.631 ^a
WS100	372.2 ^c	416.1 ^b	1213	4.438 ^a	2.760 ^b
SEM	10.86	6.06	27.4	0.323	0.176
P-Value	0.003	0.045	0.443	0.000	0.000

Values are expressed as mean; n=8; a, b, c Means bearing different superscripts in a column differ significantly (p<0.05) GSH-Rx, Glutathione peroxidase; GSH-Rx, Glutathione reductase; FRAS, Ferric reducing ability of serum; LP, Lipid peroxidation; SOD, Superoxide dismutase.

Table 2. Effect of *Withania somnifera* extract on spleen and liver anti-oxidant responses in broiler chicken

Treatment	Spleen				Liver			
	GSH-Px (units/ml)	GSH-Rx (units/ml)	SOD (units/mg protein)	LP (nmol MDA/mg protein)	GSH-Px (units/ml)	GSH-Rx (units/ml)	SOD (units/mg protein)	LP (nmol MDA/mg protein)
PC	424.2	396.3	3.55	5.60 ^a	409.9	400.6	3.36	5.02 ^{bc}
NC	392.5	369.0	2.65	6.96 ^b	387.7	375.1	2.35	5.47 ^c
WS50	407.6	392.5	2.84	5.93 ^a	384.9	378.1	2.21	4.45 ^b
WS100	425.0	418.9	3.37	5.05 ^a	421.2	406.1	2.75	3.75 ^a
SEM	8.03	11.37	0.297	0.206	9.91	11.30	0.213	0.173
P-Value	0.456	0.523	0.706	0.002	0.536	0.729	0.227	0.000

Values are expressed as mean; n=8; a, b, c Means bearing different superscripts in a column differ significantly (p<0.05).

CONCLUSIONS

- Lipid peroxidation in serum decreased (p<0.05), while activities of GSH-Px, GSH-Rx in serum increased (p<0.05) in WS extract supplemented groups.
- In liver and spleen activities of GSH-Px, GSH-Rx and SOD were not affected, while lipid peroxidation decreased (p<0.05) in WS supplemented groups.

OUTCOME

These findings depicted that supplementation of *Withania somnifera* extract enhanced the antioxidant status and help in amelioration of heat stress induced oxidative stress in broilers.

Reference:

Kumar KP, Reddy VR, Prakash MG. Amelioration of heat stress induced oxidative damage in broilers by supplementing Ashwagandha (*Withania somnifera*) extract during summer. Pharma Innov. 2018;7:591-6.