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## Effect of elevated CO2 and water stress on tomato at flowering stage

Mamatha H, N.K. Srinivasa Rao and Laxman R.H Indian Institute of Horticulture Research, India

Thirty five days old seedlings of Tomato (SolanumlycopersicumL.)cv.ArkaAshishwere transplanted in open top chambers (Bangalore, India) during rabi 2010. Water stress was imposed by withholding irrigation three weeks at flowering stage (49 DAT).Photosynthesis,stomatal conductance, transpiration and stomatal density were characterized in response to  $CO_2$  enrichment and water stress conditions.Irrespective of soil moisture status the net photosynthetic rate (Pn) of tomato leaves exposed to elevated  $CO_2$  (550ppm) was greater than ambient  $CO_2$  (380 ppm). Reduction in Pn was observed when water was withheld at both  $CO_2$  concentrations but reduction at ambient  $CO_2$  (380 ppm). Reduction in Stress condition as compared to well watered plants. The stomatal conductance and transpiration decreased with increasing  $CO_2$  concentration due to partial closure of stomata. Elevated  $CO_2$  had negative correlation on stomatal density. Stomatal density on adaxial surface was 24 percent lower and abaxial surface was 28 percent lower in elevated  $CO_2$  than in ambient  $CO_2$  concentration.Stomatal density of the plants grown under elevated  $CO_2$  and water stress recorded 23 percent decline as compared to plants grown at ambient  $CO_2$  condition. Results indicate that elevated  $CO_2$  had beneficial effects under water stress conditions, by decreased stomatal conductance and transpiration.

Table 2. Effect of elevated CO2on gas exchange studies of tomato cv. ArkaAshish

## Three week stress

Treatments	Photosynthesis (μ mol CO <sub>2</sub> m <sup>-2</sup> s <sup>-1</sup> )	Conductance (mol H <sub>2</sub> O m <sup>-2</sup> s <sup>-1</sup> )	Transpiration (mol H <sub>2</sub> O m <sup>-2</sup> s <sup>-1</sup> )
T <sub>1</sub> -550ppm irrigated	25.38	0.43	8.15
T <sub>2</sub> -550ppm stress	22.31	0.23	6.71
T <sub>3</sub> -380ppm irrigated	23.21	0.44	11.05
T <sub>4</sub> -380ppm stress	19.78	0.33	9.36
F-Test	*	*	*
S.Em+	0.4136	0.0329	0.2224
CD@ 5%	1.2408	0.0329	0.6672

\*Significant @ 5%

mamtha.patel@gmail.com