209 TENNAKOON, KUSHAN U.[1,2], JAY F. BOLIN[1] AND LYTTON J. MUSSELMAN[1], Department of Biological Sciences, Old Dominion University, Norfolk, VA 23529[1] and Department of Botany, University of Peradeniya, Sri Lanka[2] – *Hydnora - Euphorbia* association: a model to investigate osmotic relationships of parasitic plants.

Hydnora is a rare and intriguing genus of subterranean holoparasitic plants in Southern Africa. Even though a number of studies have been conducted on the morphology and the habit of this genus, very little is known about the structural and functional attributes. We selected the *H. triceps: E. dregeana* association to unravel the osmotic relationships of this genus. Contact between the endophytic tissue of *Hydnora* haustoria with the host root ranges from direct lumen-to-lumen links between the xylem elements and continuity between the phloem sieve elements as well as transfer cells. The $\delta^{13}C$ signals of *Hydnora* dry matter (-13.49±0.19) mirrored those of the host *E. dregeana* (-13.43±0.22). This provided conclusive evidence of close synchronization of parasite carbon metabolism with the CAM pathway of the host. Percentage nitrogen content of *Hydnora* dry matter was about 3 times lower than *Euphorbia*. Significant levels of K and P enrichment (15.79±2.62 and 1.86±0.2 mg g^{-1} respectively) were recorded in *Hydnora* compared to the parasitized host roots (6.40±0.99 and 0.98±0.18 mg g^{-1} respectively). Almost all other common mineral elements and soluble NO_3^- levels were appreciably lower in *Hydnora* dry matter. Structural and functional studies provided evidence of water flux from host to parasite by slow diffusion and osmosis. K^+ could be an important compatible osmolyte responsible for maintaining a lower water potential in *Hydnora* than in the hosts. This study provides a background for future investigations of possible cellular mechanisms involved with the osmotica of root holoparasites.