

## News About NGICAns

Dr. Venu Margam

We are more than delighted to report that on Friday, October 9, 2009, Venu Margam presented and successfully defended his doctoral dissertation before the faculty of Purdue University in West Lafayette, Indiana, USA. Venu has been a substantial contributor to the Bt cowpea project as well as to the Gates Foundation-funded PICS (Purdue Improved Cowpea Storage) project.



Venu's PhD research focused on two cowpea insect pests, the legume pod borer (*Maruca vitrata*) and the cowpea bruchid (*Callosobruchus maculatus*).

His work on *Maruca* shed (and is shedding) new light on the nature of its worldwide populations. Using molecular bar-coding techniques with mitochondrial cytochrome C oxidase to characterize global populations, Venu obtained evidence that the genus *Maruca* might actually constitute a species complex. Alternatively, it may have undergone a recent evolutionary bottleneck.

Dr. Margam's dissertation work, with the collaborative efforts of Dr. Brad Coates and several others, resulted in the development of genomic DNA-based and EST-based molecular markers useful for characterizing *M. vitrata* populations. In further work, he assembled the nearly complete mitochondrial genome of *M. vitrata*.

His work with the cowpea bruchid resulted in some novel measures of bruchid life, including (1) estimates of the total oxygen consumption of individual bruchids from the time they emerge from the egg until they emerge from their host seeds as adults (2) the susceptibility of various developmental stages (egg, larva, pupa, etc.) to lowered oxygen concentrations (hypoxia) and elevated carbon dioxide concentrations (hypercarbia); (3) estimates of the relative contributions of occluded water and metabolic water to the water balance of the insect as it develops.

Thanks to an expedition to Nigeria and Niger – where he was graciously hosted and assisted by Dr. Mohammad Ishiyaku and Dr. Ibrahim Baoua respectively – Venu carried out a study to assess whether wild hosts of *M. vitrata* have the potential to serve as natural refuges. While this was a limited study, results suggested that in the more northern parts of the cowpea range in West Africa, alternate hosts for *Maruca* may not be abundant enough to serve as natural refuges.

Barry Pittendrigh (who now holds an endowed professorship at the University of Illinois) and Larry Murdock served as co-major professors to Venu.

Next time you meet Venu, please address him as *Dr. Venu*! He'll be delighted.

Larry Murdock