

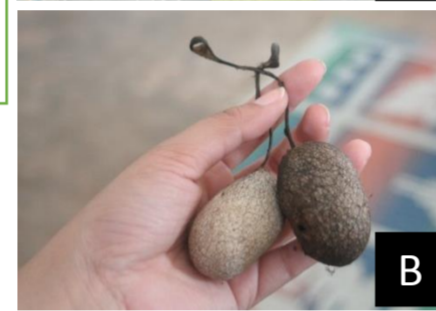
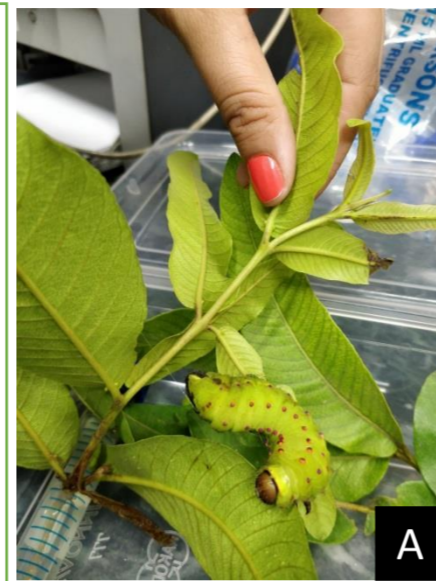


Plant-Insect Interactions in Beneficial insects: SILKWORMS

Investigators: Mahasweta Saikia, Y. Tuginba Singh, Sochanngam Kashung, Parul Bhardwaj



India is uniquely qualified to be able to produce all three economically important varieties of non-mulberry silk namely Muga, Eri and Tasar. Previous work from the lab includes molecular biology of digestive adaptations to host plant choice in Muga and Eri silkworms. Also a project to study Genetic Diversity in Muga funded by DBT has been completed in 2007 which suggested transposition as a mechanism for maintaining genetic diversity.



(A) Tasar larva (B) Tasar cocoons (C), (D) Male and Female moth, (E),(F) Tasar rearers



Current research focuses on two Saturniid species, *S. ricini* and *A. mylitta*. Research objectives include improvement of larval growth, development and health based on improved nutrition. A better understanding of adaptation to host plant species involving nutritional biology and ecology will help in control and management of diseases and annual loss of yield.

An amalgamation of molecular biology, biochemistry and bioinformatic tools together with field and laboratory experiments help reveal the mechanisms underlying these ecologically important relationships.

Projects completed:

- Genetic Diversity of *A. assamensis* silkworms from NE India (P.I. in collaboration with CMERTI, CSB, Assam) Output: See www.mugadbase.com. Funded by DBT.

Publications:

- Saikia, M., Singh, Y. T., Bhattacharya, A., & Mazumdar-Leighton, S. (2011). Expression of diverse midgut serine proteinases in the sericigenous Lepidoptera *Antheraea assamensis* (Helfer) is influenced by choice of host plant species. *Insect molecular biology*, 20(1), 1-13.
- Singh, Y. T., Mazumdar-Leighton, S., Saikia, M., Pant, P., Kashung, S., Neog, K., ... & Babu, C. R. (2012). Genetic variation within native populations of endemic silkworm *Antheraea assamensis* (Helfer) from Northeast India indicates need for in situ conservation. *Plos one*, 7(11), e49972.
- Bhardwaj, U., Bhardwaj, A., Kumar, R., Leelavathi, S., Reddy, V. S., & Mazumdar-Leighton, S. (2014). Revisiting Rubisco as a protein substrate for insect midgut proteases. *Archives of insect biochemistry and physiology*, 85(1), 13-35.

Poster Presentations in International Conferences:

- "Midgut serine proteinases from larval *Antheraea assamensis* (Helfer) reflect host plant choice." in The 2007 ESA Annual Meeting December 9-12, 2007.
- "Identification of Midgut serine proteases from the larva of *Antheraea assama* (Westwood) indicates host plant choice" in China, 2007.
- "Midgut trypsin participate in adaptation of the Indian 'Eri' silkworm, *Samia ricini* Anderson to host plants *Ricinus communis* L. and *Ailanthus excelsa* Roxb." in Entomology 2017, Entomological Society of America, ESA's 65th Annual Meeting, Virtual poster Nov 5-8, 2017.