Objectives

• Know the structure and origin of insect silks
• Be aware of the diversity of biological uses of insect silks
• Know the structure and function of the silk production system in lepidopteran larvae

What is silk?

A functional term used to describe protein fibres spun by a number of arthropod lineages. Spinning does not involve any sort of rotation or twisting of the fibre but refers to the process of making an insoluble filament from an aqueous protein solution.

Phylogenetic Survey
Many independent origins of silk

Phylogenetic Survey
Labial gland silks
Phylogenetic Survey
Colleterial gland silks

Phylogenetic Survey
Other Class III gland silks
Phylogenetic Survey
Other Class III gland silks

Lepidopteran Silks
Fundamental to larval biology
Important commercial product from Bombyx mori

Other species are important pests, for example Helicoverpa armigera

Sorensen GS, Cobb BM, Merritt D, Johnson NL, and Zalucki MP (2006)
Silk fibres composed of 2 parallel strands
Many microvillae on secretory surface

Labial glands have branched nuclei

Complex “silk press” with musculature and cuticular press
Glands

Silk trail correlated to head movements in 1st instar *H. armigera*


Labial silk produced by glow-worms