

## Sperm storage in insects

### how it works

Females store sperm in spermatheca

depending on and how sperm is stored, you could have first, last or no male 'precedence' in fertilization

### consequences/evolutionary opportunities

female choice- features in female reproductive tract may affect which sperm fertilize eggs

male competition

extended copulation or mate guarding

sperm displacement

stratification

found when last in/first out principles applies

push other sperm away from oviduct

removal- found in dragonflies

## Mating versus egg laying

### mating increases egg production

### female receptivity to mating may decrease temporarily after mating

blow fly example

females need a protein meal before laying eggs

mating occurs after feeding

females refuse to mate for several days after mating with a male

male produces a substance, which is transferred to the female, that reduces female receptivity

previously mated males produce less substance and female receptivity decreases less with increasing mating frequency in male

## Methods of propagation

### Oviparity

Eggs deposited through female ovipositor

Eggshells maintain moisture inside egg, protect against infection, and must allow gas exchange

Eggs often covered with secretion that fastens them to a substrate

**Ovoviparity- fertilized eggs incubated in female reproductive tract**

**Viviparity- embryos develop inside female**

Placenta like tissue

Haemolymph source of nutrition

Larva feeds orally from accessory glands

### **ovipositor structure**

**modified appendages on eighth and ninth abdominal segments constitute ovipositor  
in many orders**

**hymenopteran ovipositor is highly modified**

ovipositor often used for stinging

eggs deposited from opening beneath it

**eggs pushed through ovipositor, which consists of tongue and  
groove joints**

**eggs often compressed while in ovipositor**

**in some hymenoptera, must travel far down ovipositor in order to  
be laid inside host (e.g. in tree)**

**in others, posterior segments are used for oviposition**

### **Unusual forms of reproduction**

#### **Parthenogenesis**

**Females produce viable unfertilized eggs**

**Found in nearly all insect orders**

**Can be obligatory or facultative**

Sometimes unfertilized eggs produce males- hymenoptera

Others produce only females- aphids

Sometimes seasonal parthenogenesis, as in aphids that mix  
parthenogenesis and sexual cycles during the season