Sexual selection in insects (read Freeman and Heron, Chapter 9, reserve readings at library, except for parts that refer to sexual selection in plants)

General definition

An exaggerated trait that is costly for survival
Having the trait confers greater reproductive success
Most sexually selected traits are found in males
In most species, male reproductive success is based on mating success, while female reproductive success is based on number of offspring produced
In species where males do most of the parental care, females exhibit sexually selected traits

Conditions favoring sexual selection: when one male monopolizes many females

Kinds of sexual selection

Male-male competition
Antlers of staghorn beetles or flies
Eyestalks in flies
Female choice- nuptial offerings

Variation in insect genitalia (described in your text)

Levels of variation

External variation pronounced in males
Internal variation pronounced in females

Explanations

Mechanical
Sexual selection reinforces reproductive isolation among species
Lock and key hypothesis
hypothsis
Genitalia fit in species specific ways
Interspecific mating prevented
Problems
Morphological correlation is often weak
Amputated male genitalia can still function in sperm transfer
Pleiotropy- not likely because genitalia differ more among species than other traits
Sexual selection based on genitalic recognition
Also a reproductive isolation argument
Sexual selection based on genitalic recognition
Appropriate genitalic stimulate sperm transfer
Females reject males with wrong genitalic

Female choice among males within a species
Male traits could evolve due to female preference
Evidenced in favor of this is that genitalia vary less among species when the species are primarily monogamous than when they are polygamous

Intersexual conflict
Females are selected to choose among males
Males are selected to maximize fertilization rate
This sets up a conflict between interests of females versus males