Genital evolution and sexual conflict in the lichen tuft moths.

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Eligible for student prize

Many animal species may be defined by the morphology of their male genitalia. Species almost identical in general morphology may still display a wide variation in male genital morphology. Therefore, genital evolution appears to be a rapid and divergent process. Theories explaining genital evolution include species isolation (lock and key hypothesis) and pleiotropy, however recent comparative and experimental research has proposed sexual selection to be the best explanation; one promising hypothesis involving the theory of sexual conflict. Sexual conflict may drive genital evolution through opposing selection on male and female reproductive strategies. Genital adaptations that allow males a competitive advantage may consequently reduce female fitness. Females may counter adapt to reduce the harm imposed by male adaptations, leading to an evolutionary arms race via sexually antagonistic co-evolution (SAC). Species within the genus *Izatha* (Lepidoptera: Oecophoridae) are candidates for exploring the occurrence of sexual conflict. Within this genus, males of some species have detachable spines (deciduous cornuti) which they eject into the female reproductive tract during their first mating; some have permanently attached sclerotised teeth on the phallus which cause damage; others lack these structures all together. Species within the genus *Glaucocharis* (Lepidoptera: Crambidae) also display variation of male genitalia and a number of fixed cornuti. To gain an insight into the evolution of these complex genitalic adaptations, morphological characteristics were mapped onto a molecular phylogenetic analysis of both genera. To further examine reproductive functionality and co-evolution, specific genitalic structures of male *Izatha* were compared with female *Izatha* structures that they make contact with during copulation.