THE EVOLUTION OF MATING SYSTEMS IN INSECTS AND ARACHNIDS
Edited by Jae C. Choe & Bernard J. Crespi

This volume is broad in scope, covering almost all aspects of sexual selection through groups with which the various authors are familiar. Predictably, insects get the lion’s share of the coverage, despite the depiction of a jumping spider engaged in sexual cannibalism on the cover. Only three chapters are directly relevant to arachnologists and I will limit my review to these. Two are on spiders (by Eberhard and Jackson & Pollard) and one on pseudoscorpions (by Zeh & Zeh). Two general chapters by the editors, introducing theoretical issues of sexual selection in arthropods, may also be of interest.

Bill Eberhard’s chapter contains a useful summary of a thesis that he has developed through two books and numerous research articles (see Eberhard, 1996). The thesis is that copulation has a function above and beyond gamete transfer. This function, according to Eberhard, is to ‘impress’ the female through copulatory courtship and genital stimulation to secure paternity. Through various mechanisms, the female can exercise cryptic female choice, in response to the male’s performance, over the fate of his ejaculate. This is cryptic in the sense that the choice is internal; this has hitherto been ignored by students of reproduction. The theory creates a backdrop against which physiological research can be integrated with behavioural studies in an evolutionary setting. It also explains many adaptations which make little sense when viewed from traditional standpoints. For example: (1) Females making it difficult for their eggs to be fertilised. Eberhard claims that natural selection operates when sperm is filtered from a single ejaculate, sexual selection when screening of sperm takes place between two ejaculates. This may have important repercussions for infertility in humans and other animals. (2) Baroque intromissive organs. Eberhard explains these as devices to encourage the female to allocate paternity to the bearer of the most stimulating organ she encounters. In this way, the penis, pedipalp, aedeagus, etc. are likened to the peacock’s tail. The list of examples goes on, but what is even more valuable is the account of the possible mechanisms employed to bring about cryptic female choice between males. Choice can be exercised at various stages of copulation: from allowing or not allowing ejaculation, to modulation of repeat matings dependent on male performance. This is a two-way street, however, and male retaliations do take place, over evolutionary time. Examples of these include seminal products which induce ovulation, to secure paternity before the female can mate with another male. Nevertheless, Eberhard’s conclusion is that the female’s body is the site of the battlefield and that she is the better equipped to determine the sire of her brood. This contrasts with more traditional viewpoints regarding sperm competition and who controls its outcome (Parker, 1984). Maybe these viewpoints were influenced by the model organisms chosen: by Eberhard mostly spiders, dungflies by Parker. These groups are very different in terms of female emancipation.

In my view, the accounts of the numerous mechanisms whereby cryptic female choice can be achieved, when conflict with males over paternity occurs, support the position adopted by Eberhard. If there is a mechanism