

The Logic of Animal Conflict

It is not surprising that animals are often in conflict because they compete for limited resources. What is surprising however is that such conflict is often resolved by a trial of strength, followed by the weaker animal surrendering resources to the stronger rival, without an injurious fight until



**A sparring match between male spotted deer
(Photo: E Hanumantha Rao)**

death. Before the 1960's, this was attributed to the good of the species. Along with G C Williams, David Lack and others, John Maynard Smith brought about the realization of the fallacy of the good of the species idea. This brought back the focus to individual selection and forced biologists to re-think evolutionary explanations for many apparently altruistic behaviours seen in animals. Maynard Smith took up the challenge of providing an explanation for animal conflicts from the individual rather than the species point of view. Along with George R Price he used game theory, originally developed by economists, to formulate the concept of *Evolutionarily Stable Strategies* (ESS). ESS is a strategy that is evolutionarily stable because it is unbeatable by any other strategy. Game Theory and the concept of ESS have since been applied with success to a variety of situations including foraging, cooperation, communication, sex ratios, parent-offspring conflict, predator-prey interactions and so on.

Suggested Reading

- [1] L A Dugatkin and H K Reeve, *Game Theory and Animal Behaviour*, Oxford University Press, New York, 1998.
- [2] R Gadagkar, *Survival Strategies – Cooperation and Conflict in Animal Societies*, Harvard University Press, USA, 1997 and Universities Press, Hyderabad, 1998.
- [3] Maynard Smith, *Evolution and the Theory of Games*, Cambridge University Press, England, 1982.
- [4] V Nanjundiah, *Resonance*, Vol.10, No.11, pp 70-78, 2005.

Raghavendra Gadagkar

Centre for Ecological Sciences, Indian Institute of Science, Bangalore, 560012, India

Email: ragh@ces.iisc.ernet.in; URL: <http://ces.iisc.ernet.in/hpg/ragh>

