Coevolution between host and parasite is a long-term object of scientific interest, mostly because of negative influence of parasites and human need to defend against it., The evidence concerning host-parasite coevolution mechanisms is, however, still incomplete and various models and theories are considered separately, out of the general concept. Beside generally well-known theories such as the “Red queen” theory or the coevolution “arms race” theory, several other models were proposed, e.g. the “gene for gene” model or the “matching allele” model, which describe detailed aspects of host-parasite coevolution and principles of genetic variability maintenance in their interaction. Although there are many studies mapping reciprocal evolution of hosts and parasites, the connection between empirical evidence and theoretical models is often missing. Therefore, this thesis covers theory on host-parasite evolutionary interactions and provides examples of host-parasite systems and molecules, which correspond to behavior of described models.