

# A SHORT INTRODUCTION TO NEUROECOLOGY

## Summary

Neuroecology is the study of adaptive variation in cognition of the brain and bridges the gap between neuroscience and ecology. According to Sherry, who introduced the term “neuroecology” – the goal of this science is to understand how natural selection acts on cognition and its neural mechanisms. It is an emerging field of science originating in the 1980s, however, its roots can be traced back to Darwin’s time. In this paper, several examples of studies in neuroecology are reviewed. The focus is on the issues related with extremely important role of the olfactory perception in animal world, and on the brain structures called the hippocampus and the hypothalamus. Firstly, the examples of olfactory learning are presented. Secondly, role of the hypothalamus and hippocampus in stress response in animals are discussed. Thirdly, the role of the hippocampus

in memory formation (episodic memory and spatial memory) is shown. Fourthly, a peculiar feature of mammalian adult hippocampus, its ability to generate new neurons, in a process called neurogenesis is emphasized. Thus, mating systems, food storing behavior, birds singing and seasonal changes in relation to anatomy and function of the hippocampus are discussed. Fifthly, the impact of parasites on host behavior and functions on the nervous system are presented. Finally, several directions, in which this emerging and exciting field might develop, are presented. We hope that by the end of this paper the reader will have started to appreciate achievements in the new and exciting field of neuroecology, which helps us to understand the relationships between neuroscience and ecology.