Microphthalmia has evolved in evolution many times independently within unrelated groups of mammals (e.g.,
rodens, echolocating bats, shrews). Due to such extensive convergent evolution, investigation of mammals
with reduced eyes provides a unique approach for understanding the adaptive significance of sensory
regression, the impact of peripheral reduction on organization of central sensory structures and cross-modal
reorganization or compensation. In this thesis I review our current knowledge concerning the organization of
the primary sensory cortex in microphthalmic mammals. In subterranean species (the eastern mole, Scalopus
aquaticus; the star-nosed mole, Condylura cristata; the blind mole rat, Spalax ehrenbergi; the naked mole rat,
Heterocephalus glaber) is obvious expansion of somatosensoty cortex, which processes tactile information.The
sense of touch plays a pivotal role in orientation in their dynamically changing three-dimensional burrow
systems. Microphthalmic, echolocating bats whose body is adapted to flight have topographicly reorganized
somatosensory cortex, reduced the visual cortex and expanded, complexly organized acoustic cortex.
Terrestrial shrews (Soricidae, Insectivora) do not posses any specific adaptations at level of the sensory cortex.
Interestingly, their primary visual cortex is not significantly reduced despite of severe regression of the eye size
(1 mm).The reviewed evidence clearly indicates that the organization of the sensory cortex reflects the
species-specific adaptation to the habitat and mode of life.