Bark beetles are considered major pests of coniferous trees in temperate zone. Through feeding on phloem and cambium tissues of living trees, and spreading of pathogenic fungi and nematodes, these organisms can kill large number of trees in a short time. The economic importance of bark beetles is increasing dramatically in the recent years, due to rapid climate change. Frequent occurrence of droughts and extreme weather events, have significantly weakened many coniferous stands, making them more susceptible to the bark beetles attacks. Mass occurrences of bark beetles, called outbreaks, may encompass millions of trees and area of even 160,000 km^2 (half of Poland territory). Nevertheless, each gradation is initiated by the successful population spread and colonization made by a few pioneering individuals. This requires an efficient flight abilities. Despite the fact, that the flight ability is considered a crucial factor directly affecting the population dynamic and the outbreak course, it is arguably the least understood aspect of bark beetle ecology. Our knowledge in this case is restricted almost only to the few most harmful species. The goal of the project is to understand within- and between species differences in dispersal potential in bark beetles. For this reason, the flight-related morphology, including wings size and shape, and flight muscles development, will be studied, and then compared among a large number of species from different genera. We are going to apply an innovative approach, involving the geometric morphometrics, high-precision real time 3D measurements, flight experiments, and micro computed tomography. In the next step, we are going to investigate how the reproductive strategy, phylogeny, physical constraints, and a trophic specialization - affect the development of flight-related morphology in bark beetles, and how its development influences the dispersal abilities, aggressiveness and the population dynamic of the studied species. We predict that the evolution of dispersal abilities in bark beetles has been influenced mostly by the reproductive strategy. Our study will contribute to a better understand of the origin and diversity of dispersal strategies of bark beetles, and help to create more accurate models of population dispersion and outbreak dynamic, which is a key step to develop an effective management strategy against bark beetles.