Human life is a life in coexistence with Diptera, as these are ubiquitous and may be present in immeasurable myriads of individuals. While Diptera to most people probably are known mainly as a nuisance, not to mention the immense suffering brought about by the disease-carrying capacity of blood-sucking species, Diptera are also key players in the recycling of organic material in ecosystems, from the sewage of our urban communities to the leaf litter of the forest floor. And Diptera provide other general ecosystem services like pollination and pest control. Diptera have a particular relevance for the Palaearctic Region, as there is an increasing relative dominance of Diptera with latitude, until Diptera are reigning supreme among the insects in the high arctic.

1. Geology and Biogeography

The continental basis for the Palaearctic can be traced back to the late Jurassic, when the break-up of Pangea into Laurasia and Gondwana was well underway, and the Atlantic Ocean was born by the formation of the Mid-Atlantic Ridge. By mid to late Cretaceous (100–80 Mya), Laurasia was divided by epicontinental seaways into the two palaeocontinents Euramerica (Europe and eastern North America) and Asiamerica (Asia and western North America). With a growing Atlantic Ocean and the final closing of the epicontinental Turgai Strait about 30 Mya, the geological conditions for the Palaearctic Region as we know it today were largely set (Sanmartín et al. 2001), although events like the Alpine (Oligocene-
Miocene) and the Himalayan (Eocene-Miocene) orogenies and the opening of the Japanese Sea (Miocene) certainly have been shaping Diptera diversity at a more local geographical scale.

The Palaearctic Region includes all of Europe, Africa north of the Sahara, Asia north of the Himalayas, and Japan exclusive of the Ryukyu Islands. This is roughly the area from longitudes 10°–170°W and latitudes 30°–80°N, and with a total area of some 46 million km², the Palaearctic is the largest of the biogeographic regions, more than twice as large as each of the Nearctic, Neotropical and Afrotropical regions, and almost three times as large as the Oriental and Australasian regions taken together.

The Palaearctic Region has its northern border along the Arctic Ocean, where large stretches of marshes, bogs and lakes form the treeless tundra, and where the nutrient-poor topsoil is frozen for most of the year and the subsoil permafrost means very poor drainage. Approximately south of the 10°C July isotherm, the treeless tundra gives way to the taiga or boreal coniferous forest, which stretches across the entire region. South of the taiga is a belt of temperate broadleaf and mixed forests, the nemoral zone, and further south is the Mediterranean Basin and the Arabian deserts in the west, the steppe grasslands and desert basins of Central Asia, and the

![Figure 5.1. Number of valid species of Diptera described per year for the Palaearctic Region. Data from the BioSystematic Database of World Diptera (Evenhuis et al. 2007).](image-url)