

UPPER CRETACEOUS AMBER ARTHROPODS AND THEIR
IMPLICATIONS ON CHANGES IN INSECT COMMUNITY STRUCTURE

PIKE, E. M. Dept. of Biological Sciences, University
of Calgary, Calgary, Alberta, Canada, T2N-1N4.

Assessment of changes in terrestrial ecosystems since Cretaceous time, until recently, has had to rely on paleobotany (including paleopalynology) and vertebrate paleontology to provide data for analysis. Insects contribute a major portion of the terrestrial diversity in any ecosystem, but their fossil record and state of preservation had discouraged paleoecological study beyond the Pleistocene. With the discovery of prolific Upper Cretaceous amber deposits in Russia and Canada, and the investigation of Tertiary amber deposits from the Baltic, the Dominican Republic, Mexico and the USA, the prospect of clarifying changes in insect diversity and ecology over time becomes real. Methods are reported which allow the description of species richness and relative abundance of arthropod taxa from an Upper Cretaceous (Campanian: 75 MYA) amber deposit in Alberta, Canada. Diversity and abundance are described at the Order level for hexapods, and for the Acarina and Araneae. Taxa present, in order of abundance, are Homoptera (66 specimens/kg of amber), Diptera (28/kg), Acarina (21/kg), Hymenoptera (13/kg), Araneae (12/kg), Psocoptera (4/kg), Coleoptera (2/kg), Blattodea (1/kg), Thysanoptera (1/kg), Trichoptera (0.6/kg). Other orders present are Lepidoptera, Collembola, Dermaptera, Mantodea, and Ephemeroptera. In total, of 35 identified families, 8 are extinct. There are about 20 genera identified, of which only 1 is extant. All identified species are extinct. Estimated species richness is about 100 species of arthropods. In comparison, virtually all Families reported from Baltic amber (Oligocene) are still extant, as are the majority of genera. Morphology and feeding structures are well within the variation seen in modern insects. This suggests that throughout the Tertiary, Entomologists would feel quite at home with the insect fauna, and during the Upper Cretaceous, they would have little difficulty identifying insects at least to the family level. It is hypothesized that the taxonomic structure of modern insect communities was well established before the end of the Cretaceous, and that the structure and interrelationships of insect guilds were also very similar to those of today.