Fossil ostracodes from the lower Eocene Crescent Formation in Washington State, USA
Tatsuhiko Yamaguchi (Niigata University) and James L. Goedert (Burke Museum, University of Washington)

Eocene ostracodes from the West Coast of USA have been reported rarely (Marianos and Valentine, 1958; Carreño and Cronin, 1993). They were reported from the lower Eocene “Capay” molluscan Stage of Givens (1974) from California and Baja California. They found the Tethyan genera in the faunas and suggested warm-water condition. The faunas including the genera reflected warm global climate during the early–middle Eocene. However, only ostracode faunas from the lower middle-latitude were previously reported. To understand paleobiogeographic characters linking with climatic warming, faunas from the higher latitudes should be revealed. Here we report fossil ostracodes from the lower Eocene Crescent Formation in Washington, more northern region than previous reports.

The lithostratigraphy, geologic age, and examined sample.—The Crescent Formation is distributed in Olympia, Washington State. It consists mainly of basaltic lava, and thin layers of basaltic siltstone and sandstone containing molluscan fossils (thickness <600 m). The basalt was dated to 53.1±1.0 Ma (1 σ error) using the potassium-argon method (Globberman et al., 1982). The molluscan fossils correlate with the lower Eocene “Capay” Stage, indicating ca. 52.5–50.2 Ma (Squire and Goedert, 1994). Hence, the formation is assigned to an early Eocene in age. Examined samples were collected from three localities.

Fossil ostracodes.—One hundred specimens were found in the three samples. Some of specimens are translucent in color and well-preserved. Most of the species are identified as new and extinct species and extant genera. Species from the sample bearing the most specimens are twelve and as following: Neonesidea? sp.1 Laperousecythere sp., Neonesidea? sp.2, Coquimba sp., Acanthocythereis sp., Cytherella, Cytherelloidea, and Neomonoceratina are also included.

Discussion.—Mudstone layers containing fossil ostracodes are lenticularly intercalated in basaltic lava. They yield benthic foraminifer, indicating shallower than 50 m at paleo-depth (Globberman et al., 1982) and abundantly rocky-shore gastropods (Squires and Goedert, 1994). These suggest the ostracodes inhabited embayments, having rocky shores.

The ostracode genera indicate mud and muddy sand bottoms of shelves (e.g., Brouwers, 1993) and are divided into three paleobiogeographic elements: cosmopolitan (e.g. Cytherella, Cytherelloidea, Neonesidea), Tethyan (Neomonoceratina and Buntonia), and endemic (Coquimba and Laperousecythere). The endemic genera are reported from Neogene Pacific (Coquimba; e.g. Brouwers, 1993) and middle Eocene strata of Japan and Neogene of the North Pacific (Laperousecythere; e.g., Yamaguchi et al., 2005) and distributed in only the Pacific.

The ostracodes of Washington do not share species in common with the other Eocene faunas from the West Coast. The fauna from Baja California links with one from the Gulf Coast (Carreño and Cronin, 1993). The Californian fauna shows cosmopolitan and Tethyan genera. The fauna of Washington contains more endemic genera of the Pacific than the others.