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Worldwide distribution of the modiomorphid bivalve genus *Caspiconcha* in late Mesozoic hydrocarbon seeps

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Exceptionally well preserved specimens of the bivalve mollusc *Modiola major* were collected from a Lower Cretaceous (Barremian) hydrocarbon seep deposit in northern California. This material, together with the type series of *M. major*, and various other specimens from Upper Jurassic to Lower Cretaceous seep localities in California, is redescribed and referred to the hydrocarbon seep–restricted modiomorphid genus *Caspiconcha*. We include also a description of *Myoconcha americana* because some previous reports have incorrectly synonymized *Myoconcha americana* with *Caspiconcha major*. In addition, we report *Caspiconcha* sp. from a Lower Cretaceous (Albian) hydrocarbon seep from Hokkaido, Japan, and we review all currently described species of *Caspiconcha*, and other species that probably belong to this genus. We demonstrate that *Caspiconcha* had a widespread distribution in Late Jurassic to Early Cretaceous hydrocarbon seeps, but became rare thereafter, with the last representative occurring in Upper Cretaceous strata of Japan. This macroevolutionary pattern is similar to that observed in the seep–restricted brachiopods. After the decline of *Caspiconcha* at the end of the Early Cretaceous and its last occurrence in the Campanian, the ecological niche of epifaunal to semi–infaunal seep endemic bivalves was largely vacant and not reoccupied until the Eocene with the appearance of the vesicomyid and bathymodiolin bivalves. The formal placement of *M. major* into the genus *Caspiconcha* restricts the fossil record of mytilids at seeps to post–Mesozoic times, and thus there is less discrepancy between the fossil record of chemosynthetic mytilids and their divergence age estimates from molecular data.

Key words: Bivalvia, Modiomorphidae, Kalenteridae, chemosynthesis-based ecosystem, cold seeps, Mesozoic, California, Japan.

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