

## UPPER TRIASSIC RADIOLARIA AND CONODONTS FROM SAN HIPÓLITO FORMATION, BAJA CALIFORNIA SUR, MEXICO

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Late Triassic (late Norian-Rhaetian) conodonts and radiolarians are reported from three members of the San Hipólito Formation, part of the Vizcaino terrane. This formation consists of 2400 m of marine sedimentary rocks that overlie pillow basalts of the La Costa Ophiolite. It is divided into four informal members: from the base, chert, limestone, breccia and sandstone. These members range in age from Late Triassic (?Carnian/Norian) to Early Jurassic (late Pliensbachian). The composition of these volcanic and tuffaceous rocks indicates that the San Hipólito Formation was deposited adjacent to an active oceanic volcanic arc.

The conodont and radiolarian faunas of the San Hipólito Formation are intercalibrated utilizing the Rhaetian radiolarian zonation from Queen Charlotte Islands (QCI), British Columbia, Canada, and both European and North American conodont zonations. Collectively, they show that the limestone member is late Norian based on conodonts of the *bidentata* Zone, and sparse radiolarian fauna of the *Betraccium deweveri* Zone. The overlying breccia member includes re-worked upper Norian limestone and questionably includes basal Rhaetian radiolarians.

The upper sandstone member is Rhaetian, but neither the conodonts nor the radiolarians indicate latest Rhaetian: it includes common and variably preserved representatives of the *Proparvicingula moniliformis* Zone (lower to middle Rhaetian), and abundant and well preserved faunas assigned to the *Globolaxtorum tozeri* Zone (upper Rhaetian). This fauna is dominated by species of *Canoptum*, *Citriduma*, *Fontinella*, *Globolaxtorum*, *Haeckelicyrtium*, *Laxtorum* and *Livarella*. Conodont faunas from the sandstone member include species of *Epigondolella* that are well known in the Rhaetian of North America, accompanied by elements of *Misikella*, *Oncodella*, and *Zieglericonus* that are better known from low latitude Eurasian Tethys but which are rare in North America.

The radiolarians from the sandstone member compare closely with the Rhaetian faunas from the Sandilands Formation of QCI, but there is minor variation in the range of a few species, and other taxa occur that characterize low latitude regions of Tethys, i.e. the Philippines, central Japan and Turkey, but are unknown in QCI. Biogeographically and/or paleoecologically, the Baja faunas appear to be intermediate between those of eastern Panthalassa and Tethys. Understanding the affinity between Baja radiolarian and conodont faunas and those of more Tethyan regions may help to determine the position of the Vizcaino terrane during the Late Triassic-Early Jurassic.