



Triassic/Jurassic bivalve extinction and recovery in the Neuquén Basin, Argentina

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The extinction event at the end of the Triassic is one of the “big five” global crisis in the history of life in the marine realm. Nevertheless, that extinction and the subsequent biotic recovery are not so well known as others, and most of the published analyses were based on data from the Northern Hemisphere. Bivalves are one of the best studied groups in relation to the recovery after the end-Triassic extinction event. We analyze the Late Triassic extinction and Early Jurassic recovery of bivalve faunas within marine environments in the Atuel river area of the Neuquén Basin, Argentina (Riccardi et al., 1988; Lanés, 2005). The nearly continuous presence of marine stenohaline major taxa such as cnidarians, rhynchonelliform brachiopods, echinoderms and cephalopods indicate normal salinity (Damborenea & Mancenido, 2005). Data were collected from a thick and exceptionally well-exposed latest Triassic-earliest Jurassic section of the Andes, which allows a high-resolution reconstruction of the local diversity dynamics.

Four phases can be clearly distinguished on the basis of the analysis of bivalve diversity through time from Rhaetian to Early Sinemurian (Fig. 1), each characterized by the relative relationships between regression lines of cumulative first and last appearance data (FADs and LADs respectively) for the recorded species against section thickness: a) Triassic equilibrium phase (Rhaetian), b) extinction phase (late Rhaetian?), followed by a long interval with no recorded benthonic fauna (Early Hettangian), c) recovery phase (Middle to early Late Hettangian) and d) Jurassic equilibrium phase (from latest Hettangian). The recovery of the bivalve fauna was relatively rapid, within the Middle and lowermost Late Hettangian.

The taxonomic composition analysis through time at generic level suggests that the recovery was mainly triggered by immigration into the basin of widely distributed genera, and the origination of new taxa was restricted. Bivalve palaeoecologic diversity seems to have been fairly homogeneous along the section, being dominated most of the time (after extinction) by attached epifaunal bivalves. Strikingly, since the abrupt mid-Hettangian diversification, relative diversity of the different main life habits shows little variation, though some minor trends could be identified. One main difference between Triassic and Jurassic faunas is the abundance (both relative and absolute) of shallow burrowers, being more frequent during the Rhaetian than on subsequent stages. This new set of local data can be compared with information from other latitudes and contribute to future global analyses.

Key words: Triassic/Jurassic extinction; biotic recovery; Bivalvia; Argentina

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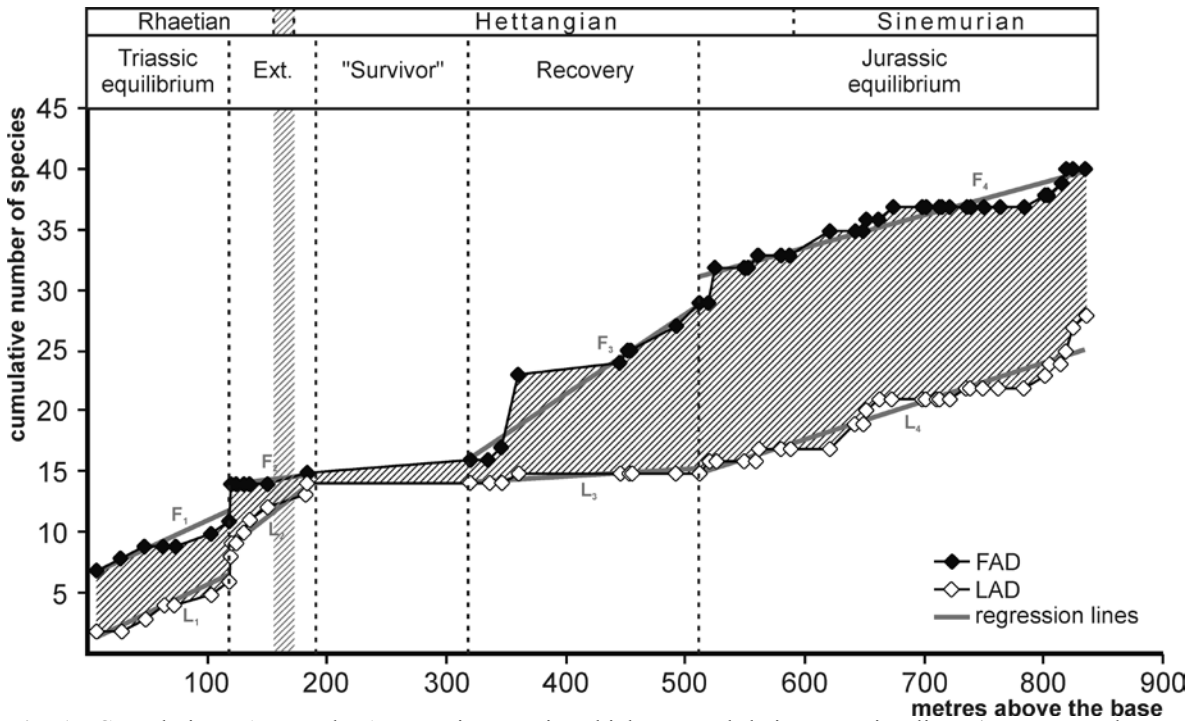


Fig. 1 . Cumulative FADs and LADs against section thickness and their regression lines (F₁ to F₄ and L₁ to L₄ respectively), characterizing four extinction/recovery phases across the Triassic/Jurassic boundary. Shaded area represents changes in diversity through time.