

Throwback to when life slid down the ocean

Let us travel back to the Late Triassic when dinosaurs first started to appear and where the climate had extreme mega-monsoons that created a world with seasonal rain periods. While dinosaurs and mega-monsoons is greatly documented we lack many pieces of the puzzle to understand the Late Triassic and what events took place 208 million years ago that changed our oceans forever. Density flows is something that could open a door into this grand mystery.

Density flows are one of many things that like long waterslides. The differences between waterslides in modern parks and waterslides the Triassic density flow slid, is that density flow slid underwater and they span for approximately 50 km in length and vertically approximately from 100 – 2000 meters down across the ocean floor to the bathyal zone which is the ocean zone between 1000 – 4000 meters deep.

What is it that makes these density flows so special to study? Well, the first density flows are from the Norian to Rhaetian boundary (NRB) which is an estimate of between 205.7 – 209 million years ago and came from platforms that no longer exist. The following density flows are from the time after the NRB. These platforms can be the key to understanding the NRB extinction event that occurred under a massive sea-level fall lowering biodiversity in the ocean during the Late Triassic. This is why we need to get an understanding of what platforms these organisms lived on and how the diversity changed over time.

The Tethys Ocean which carved through the west and separated the ancient mega-continents of Laurasia and Gondwana, is where the 11 samples were taken for this study and come from the middle of this ocean, which is where Türkiye was located during the Triassic. The samples are taken from the Orbuklukelli section in a mega sedimentary block (Tavuscayiri-block). The section has alternating limestone-chert beds. The density flows are a more uncommon occurrence and exist between the alternating beds in this section. From the samples that are studied, some of them show different ancient bio diversities that have everything from shells, crustaceans and ancient snails that spark interest in how the environment looked under the late Triassic! Some of the samples show geological change for example rounding of grains which suggest a long transport distance.



Picture of the alternating bodies of limestone-chert and debrisflows at the Tavuscayiri-block.

The density flows are studied through self-made thin sections which are very thin rocks on glass that will be used for microscopy to understand what environment the rocks were initially formed. There are several sites for where density flows possibly originated from. All between the lagoon, which is a shallow water depositional area, to the reef crest, to the slope, which is a ramp that slopes down from the shallow to the deep sea. By finding out which environment the biodiversity and sediments deposited on, it could make a difference in understanding the mystery that changed our oceans 208 million years ago and tell us what really happened.