



A regional olistostrome- mélange belt formed along a major strike-slip tear fault: Bornova Flysch Zone, western Turkey

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The Bornova Flysch Zone in western Turkey is a regional olistostrome-mélange belt with a length of 225 km and a width of 60 km. It is located between the İzmir-Ankara Tethyan suture in the northwest and the metamorphic rocks of the Menderes Massif in the southeast. Most of the Bornova Flysch Zone consists of gravity mass flows, which were tectonized during or soon after their deposition. The blocks are mainly Mesozoic limestone and ophiolite, which range up to several kilometers in size and lie in a latest Cretaceous to Paleocene matrix of sheared sandstone and shale. The Mesozoic limestone blocks are of two types. The first type consists of shallow marine carbonates, Upper Triassic to mid Cretaceous in age. The second type has also an Upper Triassic shallow marine section, which however is overlain by deep marine Jurassic to mid Cretaceous limestones. These two types of blocks represent the Anatolide-Tauride carbonate platform and its passive margin, respectively. A semi-intact part of the platform occurs in the Karaburun peninsula west of İzmir and on the adjacent island of Chios. The ophiolitic blocks in the Bornova Flysch Zone include ultramafic rock, gabbro, diabase, basalt and radiolarian chert. Radiolaria in the cherts give ages between Middle Triassic and Upper Cretaceous.

The formation of the Bornova Flysch Zone overlaps in time with the Late Cretaceous subduction and HP/LT metamorphism of the northern passive continental margin of the Anatolide-Tauride Block. It is here postulated that this continental subduction zone was bounded in the west by a NE-SW trending strike-slip tear fault. The Bornova Flysch Zone formed in a narrow basin between this tear fault and the Neo-Tethyan ocean. The gravity mass flows came from the east from the overriding ophiolite and accretionary complex and from the west from the uplifted segments of the platform margin. This model provides an explanation for the unmetamorphosed nature of the Bornova Flysch Zone, whereas the equivalent strata in the adjoining zones, including the Menderes Massif, were metamorphosed at depths of over 20 km. The tear fault model also explains the prominence of gravity flows and the southward younging in the Bornova Flysch Zone, and for the apparently anomalous observation that, although the Neo-Tethyan ocean lay to the west, the ophiolitic blocks are more common on the eastern side of the Bornova Flysch Zone. Regions away from the tear fault, such as the Karaburun peninsula or Chios, were least affected by subsidence and deformation during the latest Cretaceous.