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Origin of Lower Paleozoic terranes in Turkey

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The palinspastic reconstruction of Lower Paleozoic events in the Anatolian and Northern Arabian portion of NW Gondwana reveals that the Tauride and SE Anatolian-North Arabian terranes (southern zone) had a geological history that differs from a northern zone represented by Balkan and Istanbul terranes(Goncuoglu, 1997).

Outcrops of pre-Cambrian rocks occur only in the basement of the Istanbul terrane and in some metamorphic complexes such as Menderes -Central Anatolian and Bitlis Massifs in the south. The Pre- and Infracambrian lithologies in the northern zone are represented by meta-gabbros, metaserpantinites, and amphibole-gneisses within the basement of the Istanbul Terrane. Discontinuous bands of biotite gneisses and biotite bearing para-amphibolites are observed as thin interlayers. Blasto-mylonitic alkali-feldspar granites and quartz-monzonites are common intrusive ingredients the unit. This basement complex has common features with the Precambrian ophiolites and Cambrian island-arc associations of the Balkan Terrane (Haydoutov, 1989). We suggest that in the northern zone the inta-oceanic subduction and formation of an ensimatic arc magmatism has lasted until ?Late Cambrian. A possible pre-

Cambrian geodynamic scenario involves a southern zone (Taurides, SE Anatolian-Arabian, and Central Iranian terranes) and a northern zone (Carpato-Balkan, Istanbul and Main Range terranes) representing remnants of a Precambrian orogenic collage with oceanic, arc-type and continental elements.

Infracambrian-Early Cambrian sequences in Turkey are described only from the Tauride and SE Anatolian-N Arabian terranes. During this period extensive volcanism and very similar successions of continental deposition dominate the NW Gondwanean pericratonic margin. In the relatively eastern part of this margin in Turkey as well as in Iran, Oman and Pakistan, the Infracambrian-Early Cambrian period can be ascribed to the formation of Red Sea-type rifting on the Panafrican consolidated basement by back-arc extension or transtension.

Late Lower Cambrian-Upper Cambrian period is designated by a regional transgression in the southern areas. The diachronously younging of platform-deep marine carbonates towards southeast suggesting a rapid subsidence in the area to the northwest of Arabian-Tauride platform. Latest Cambrian in the Tauride part is represented by a regional sea-level fall. In the northern areas, in Istanbul terrane, no Cambrian sediments has been documented yet.

Early Ordovician in the Tauride area is characterized by a monotonous deposition. Towards the end of Early Ordovician shallowing upward sequences are noticed in the southern Taurus area (Bozdogan *et al.*, 1996). In SE Anatolia-N Arabia, the Lower Ordovician deposition is mainly controlled by the formation of Mardin-Kahta and the Dar-ez-Zor paleotectonic highs. The stratigraphic hiatuses, unconformities and irregular distribution of the Ordovician units in the Taurides and SE Anatolia may be ascribed to glacio-eustatic sea-level changes of the Late Ordovician. The coarse-grained basement derived conglomerates and glacio-marine sediments attached to the bottom of Lower Silurian sequence in Central Taurus are the first indications of newly discovered latest Ordovician glaciation in the Turkish area.

In the northern zone, in Istanbul Terrane, Lower Ordovician siltstones and quartzites mark the beginning of the transgression on a peneplained crystalline basement. The succeeding dark shales with Arenig-Llanvirn trilobites of Welsh affinity may indicate that Istanbul Terrane was in a closer position to the East-Avalonian microplate than the Tauride-Arabian plate, which in turn suggests the presence of an intervening deep basin between the northern and southern zones.

Lower Silurian period in the Tauride unit is characterized by a transgression on the Early Ordovician strata and is represented by clastics followed by the development of graptolitic black shales. Local volcanic activity is recorded in the southwestern and eastern Taurides. Whereas in SE Anatolia, Lower Silurian is a period of non-deposition or erosion. In Istanbul Terrane, Lower Silurian units rest on Late- Middle Ordovician strata and are characterized by graptolitic black shales indicating deep-marine deposition.

Upper Silurian-Lower Devonian period is characterized by a well-established regression characterized by shallowing upward sequences and a transition from slope-deep platform to restricted shelf deposition both in the Taurides and SE Anatolia. In the Istanbul Terrane three different zones with facial and structural differences have been formed at the Silurian-Devonian boundary. Considering that Istanbul Terrane was attached to the northerly located microcontinents: these differences may be related to the buffered effects of the closure of an deep-sea basin between the northern microcontinents. The effects of this closure may also be suspected in the Taurus and SE Anatolian terranes where a regional uplifting and an important unconformity are noticed at the Late Silurian-Early Devonian transition.

During the Lower Devonian an extensive platform carbonate deposition is observed in both the Tauride-SE Anatolian and Istanbul areas. The augmenting carbonate deposition suggests that both the southern and northern zones were located in similar lower latitudes.

It is concluded that the southern and northern zones represent different continental microplates at the NW Gondwanean margin and were separated by an intervening deep basin during Lower Paleozoic.

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