

## The Tectono-stratigraphic Units of the Sofrana Insular Complex, Dodecanese Islands, Greece

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The geological mapping on the Sofrana insular complex, in the SE Aegean Sea, sheds some light on the geological history gap on that part of the Carpathian Sea, which extends among Astypalea, Karpathos and Cretan basin. We recognize two tectono-stratigraphic units that correlated with the geotectonic units of the external Hellenides on the adjacent islands, such as a parautochthonous unit at the base, tectonically overlain by an upper unit as follow:

A) The parautochthonous unit of the insular complex consists, from base to top, of a) basal recrystallized or dolomitic limestones and dolomites, overlain by a succession of fine-grained to mixed with big clasts, locally dolomitized, of grainstones, packstones and wackestones, as well as of *Thaumatoporella* bindstone, similar to the Ionian “Pantokrator” facies, of Late Triassic-Middle Lias age, occurring on the islets of Mikro Sofrano, Divounia and Astakida, and having a thickness up to 600m; b) Upwards, Upper Lias to Middle Jurassic platy to thin-platy, white, pelagic to sublithographic limestones occur, of mudstone texture, like the Ionian Sinies facies, 100m approximately thick, in the islets of Mikro Sofrano and Astakida, and c) at the top of the islets of Mikro Sofrano, Karavonisia, Avgo, Sial, Astakida and Astakidopoulo, an Upper Jurassic – Cenomanian sequence occurs, significantly recrystallized, with thin-to-mid-bedded, multifolded, green, pelagic limestones bearing silex intercalations and nodules, similar to the Ionian Vigla limestone facies, over than 500m in thickness.

B) The tectonically overlying upper unit consists, from base to top, of the following distinguished members: a) Medium-to thick-bedded, fine- to coarse-grained and brecciated limestones, slightly recrystallized, with rudist and coral fragments and, towards the base, micritic with bioclasts, of Cenomanian age. They occur on the islands Megalo Sofrano, Astakida (klippe) and Chamili, having a 500m apparent thickness; b) On Megalo Sofrano and Chamili islets develop upwards micritic to fine-clastic limestones (mudstones and wackestones), of early Senonian age, tending to emerge. The thickness is 100m approximately; c) At the top on Megalo Sofrano and Chamili islets develop Upper Campanian bioclastic limestones, with fine- to coarse-grained packstones, characterized by mild recrystallization, of 200m approximate thickness; d) Paleocene-Middle Eocene nummulitic bioclastic limestones, 150m approximately thick, occurring on the last two islets and, finally, e) a Middle (?) - Upper Eocene flysch sequence, with thin- to medium-bedded, fine- to medium-grained turbiditic sandstones with foliated argillite intercalations occurs solely on the Megalo Sofrano islet, exceeding 50m in thickness.

The above stratigraphy and stacking order of the Sofrana insular complex consists of a parautochthonous unit, which outcrops in Mikro Sofrano, Karavonisia, Avgo, Sial, Divounia, Astakida and Astakidopoulo islets, and is correlated to the Ionian geotectonic zone. Besides, the upper tectonic unit, occurring in Megalo Sofrano, Chamili and Astakida (as klippe) is correlated to the Gavrovo-Tripolis geotectonic zone and more precisely to the Gavrovo sub-zone.

This stacking setting, characterized by a thin-skinned thrusting, would occur in the late Miocene times, during the southward detachment of the Plattenkalk unit (Crete - Kassos - eastern Rhodes) that is implicated, in turn, in an inter-thrusting under the Ionian zone (Sofrana insular complex) and over the pre-Apulian zone (Ro - Strongyli – Kastellorizo complex).

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