

VOLUME 4, NO. 2

APRIL 2001

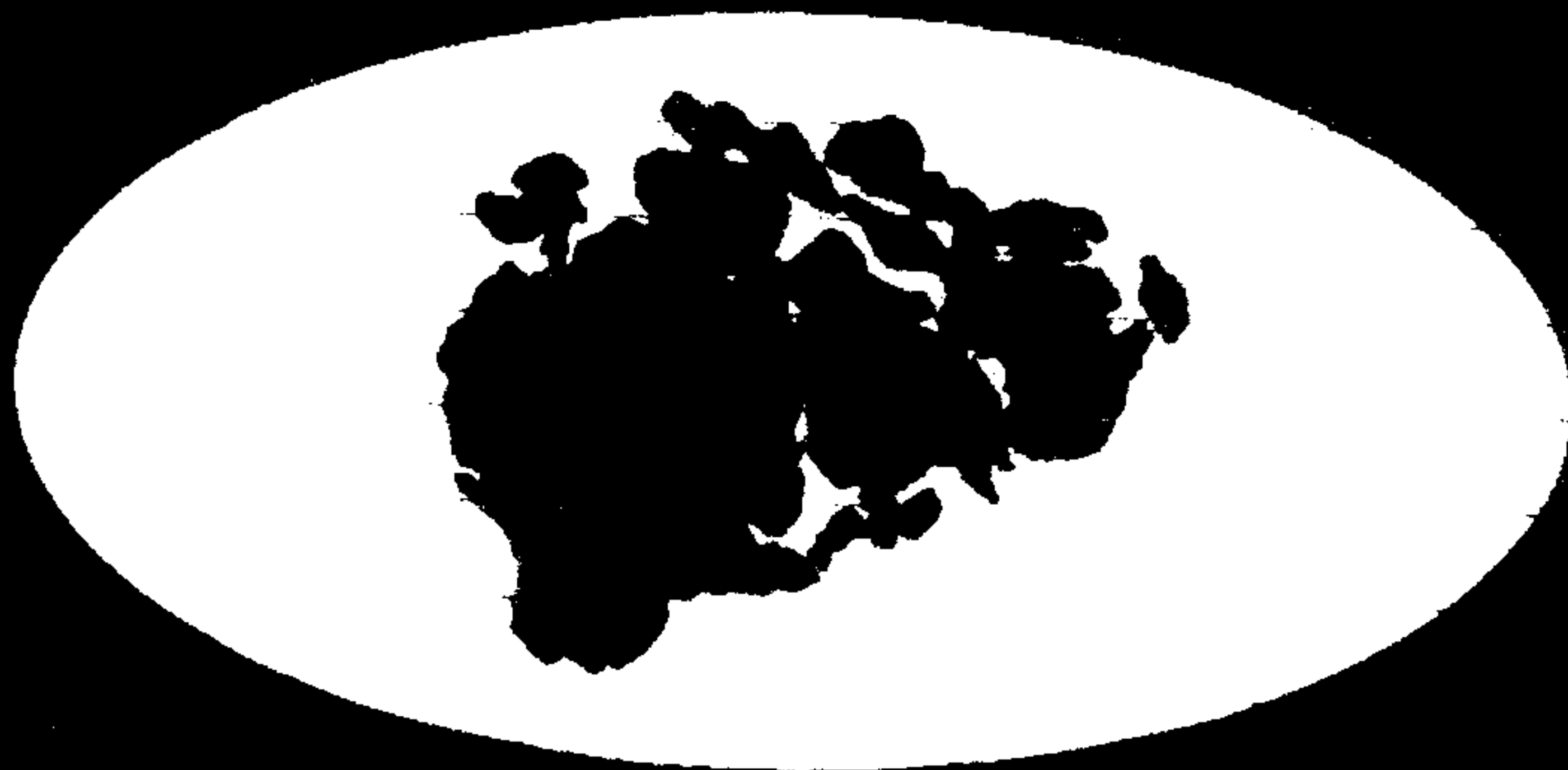
ISSN: 1342-937

SPECIAL ISSUE ON
"TECTONICS AND MINERALIZATION
IN THE ARABIAN SHIELD AND
ITS EXTENSIONS"
GONDWANA NEWSLETTER NO.16

SPECIAL EDITION OF JOURNAL SECTION
ABSTRACT VOLUME **DIV1**
IGCP-368
INTERNATIONAL CONFERENCE
JEDDAH, SAUDI ARABIA

INTERNATIONAL GEOSCIENCE JOURNAL

Gondwana Research



OFFICIAL JOURNAL OF THE
INTERNATIONAL ASSOCIATION FOR GONDWANA RESEARCH

Characteristic Features of the Late Precambrian Felsic Magmatism in Western Anatolia: Implications for the Pan-African Evolution in NW Perigondwana

S. Gürsu¹ and M.C. Göncüoğlu²

¹ General Directorate of Mineral Research and Exploration, Ankara, Turkey

² Middle East Technical University, Ankara, Turkey

It is prevalently accepted that the Tauride-Anatolide terrane is the NW continuation of the Arabian micro-continent and part of Perigondwana. The Pre-Cambrian basement of the Tauride-Anatolide terrane is mainly characterized by high-grade metamorphic complexes (e.g. Bitlis Massif). However, limited outcrops of slightly metamorphic volcanic assemblages and sedimentary/volcano-sedimentary successions have also been reported from different parts of the terrane (Kozlu and Göncüoğlu, 1996). To analyze the Pre-Cambrian events, the Sandikli Basement Complex, described in this study, is the most critical one of these units.

The Sandikli Basement Complex is located to the west of Sandikli town in western central Anatolia. It is composed of the low-grade metamorphic Güvercinoluk Formation that is intruded by the Kestelçayi Porphyroid Suite and unconformably overlain by archi-metamorphic Cambrian units.

The Güvercinoluk Formation consists of an alternation of dark-coloured meta-siltstones and meta-sandstones with rare black lydite and cherty meta-dolomite lenses. The middle part is represented by meta-turbidites and

olistostromal conglomerates. The uppermost part of the sequence is made up of dark coloured beccoidal limestones, cherty and laminated limestones interlayered with sandstones. The unit is intruded by quartz-porphyry dykes. The meta-clastic rocks are well-foliated and display the metamorphic paragenesis: quartz + albite + muscovite + calcite indicating low-grade metamorphism. The thickness of the unit reaches up to 800 meters and lateral as well as vertical facies changes are commonly observed. No fossils have been yet determined from this member.

The Kestelçayi Porphyroid Suite is characterized by a deformed and highly sheared dome-shaped rhyolitic-dacitic body with a granitic core. Granitic dykes intrude the volcanic carapace and the meta-sediments of the Güvercinoluk Formation. A narrow contact metamorphic zone with hydrothermal mineralization is locally preserved. Both the granitoids and the rhyolites-dacites are typically mylonitic rocks with relict igneous textures. Within the rhyolites, corroded quartz and micro-perthitic feldspar porphyroclasts are embedded in a mylonitic matrix with elongated fine-grained quartz and white mica. Preliminary geochemical data indicate that the granitoids are

peraluminous and display S-type characteristics (Ay et al., 1999). Tectonic discrimination diagrams suggest a within-plate (WPG) tectonic setting.

Kestelçayı and Güvercinoluk units are unconformably overlain by the Gögebakan Formation that contain in its basal part conglomerates with rhyolite, lydite and recrystallized limestone pebbles. This formation consists of dark gray-violet-pink and green colored, intensively folded mudstones with arkosic sandstone interlayers. It contains andesitic lava flows, pyroclastics and is cut by diabase dykes. The mudstones display only slaty cleavage and are anchi-metamorphic. The litho-facies indicate a low-energy environment with volcanic activity and continental influx. Upwards this formation is transitional to Celiloglu Member of the Hüdai Quartzite Formation. The Celiloglu Member is represented by siliceous mudstones and quartzites. In its lower part trace fossils (*Crustiana* isp., *Rusophycos* isp., *Phycodes* isp., *Diplichinites* isp.) of Tommotian age have been determined (Uchmann et al., 2000). The upward younging Hüdai Quartzite Formation and Çal Tepe Limestone are the most characteristic Cambrian rock-units of the Tauride-Anatolide terrane, the latter of which yielded earliest middle Cambrian fauna (Dean and Özgül, 1994) in the Sandikli area.

Based on the geochemical characteristics of the K-feldspar porphyritic granitoids and the depositional features of the Güvercinoluk Formation it is suggested

that the formation of the Sandikli Basement Complex is related to a post collisional transtensional event in NW Gondwana that may represent the last magmatic events of Pan-African orogenesis. Similar occurrences have been ascribed to a transition from continental plate convergence to continental plate divergence in the West African craton (e.g. Barbarin, 1999).

References

- Ay, A.M., Aytaç, N. and Tolloğlu, A.Ü. (1999) Orta Kambriyen yaşlı Sandikli Porfiroyitinin petrografik ve jeokimyasal karakteristikleri. Proceedings, 52nd Geological Congress of Turkey, pp. 263-271.
- Barbarin, B. (1999) A review of the relationships between granitoid types, their origins and their geodynamic environments. *Lithos*, v. 46, pp. 605-626.
- Dean, W.T. and Özgül, N. (1994) Cambrian rocks and faunas, Hüdai area, Taurus Mountains, southwestern Turkey. *Bull. Inst. Royal Sci. Natur. de Belgique, Sci. de la Terre*, v. 64, pp. 5-20.
- Kozlu, H. and Göncüoğlu, M.C. (1996) Stratigraphy of the infra-Cambrian rock-units in eastern Taurides and their correlation with similar units in southern Turkey. In: Göncüoğlu, M.C. and Derman, A.S. (Eds.), *Early Paleozoic evolution in NW Gondwana*. Turkish Assoc. Petrol. Geol. Spl. Pub., v. 3, pp. 50-60.
- Uchmann, B., Erdoğan, B. and Güngör, T. (2000) Trace fossil assemblages and age of the porphyroid-bearing metasandstones in the Sandikli region. *IFSCA Abstracts*, p. 78.