Petrography, Mineral Chemistry and Petrology of the Early Miocene Şaroluk and Göloba (NW Turkey) Intrusives: Post-collisional Magmatism in Biga Peninsula

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Tertiary magmatism is widespread in Biga peninsula (NW Turkey). Of these, the granitic Göloba pluton and quartz-monzodioritic Şaroluk plutons are composed of orthoclase, plagioclase (An_{13-37} Ab_{60-85} Or_{1-3}; An_{23-42} Ab_{51-75} Or_{1-4}, respectively), quartz, biotite, hornblende main minerals and apatite, zircon and sphene accessory minerals. Hornblende thermobarometric estimations gave 0.1-0.9 kbar, 793-808 ^{o}C and -13.90 oxygen fugacity for the Göloba pluton; 0.2-1.0 kbar, 663-706 ^{o}C and oxygen fugacity of -18.92 for the Şaroluk pluton. Both plutons have emplaced in a shallow depth with 0.37-3.33 km for the Göloba Pluton and 0.74-3.70 km the Şaroluk Pluton. Petochemically, both of the plutons are I-type, metaluminus (A/CNK=0.84-1.44) and high-potassic calc-alkaline in compositions. Major oxide and trace element variations implies fractionation of main mineral phases. The rocks show enrichment in large ion litophile elements (Sr, K, Rb ve Ba), Th and Ce while depletion in HFSE (Y and Ti), Nb and Ta. Chondrite normalized REE patterns are concave-shaped (mean La_N/Lu_N=11–25), and show a slight negative Eu anomalies (Eu_N/Eu^*=0.51–1.03). Magma-tectonically, plutons show post-collisional features. In the Göloba pluton, $^{87}Sr/^{86}Sr$ and $^{143}Nd/^{144}Nd$ isotopic ratios range between 0.707380–0.709259 and 0.512450–0.512503 respectively, and ƐNd(i) values are between -2.3 and -3.4. In the Şaroluk pluton, $^{87}Sr/^{86}Sr$ and $^{143}Nd/^{144}Nd$ isotopic ratios range between 0.707258-0.707359 and 0.512477-0.512494 respectively, and ƐNd(i) values are between -2.4 and -2.9. These isotopic values may indicate that parental melts of the plutons have derived from enriched lithospheric mantle and middle-lower crust. The subduction of the northern Neo-Tethyan oceanic crust under the Sakarya Continent than the collision of the Tauride–Anatolide Block and the Sakarya Continent led to formed magma by partial melting within the continent. Asthenospheric upwelling together with extensional regime formed these plutons.

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