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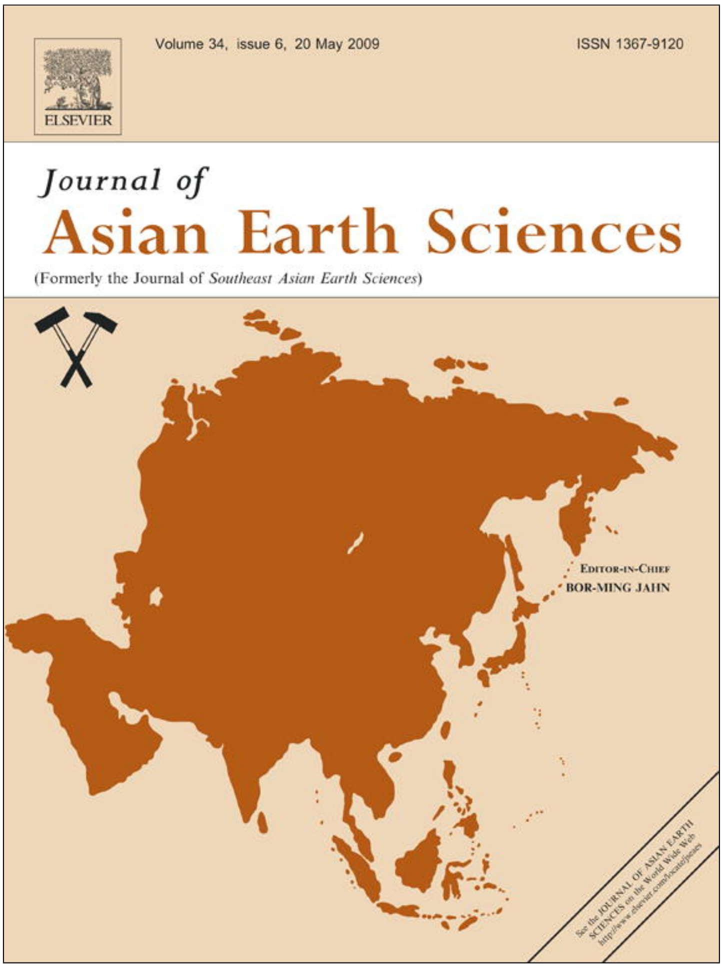

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Comment on "207Pb–206Pb single-zircon evaporation ages of some granitoid rocks reveal continent-oceanic island arc collision during the Cretaceous geodynamic evolution of the Central Anatolian crust, Turkey" – Boztug, D., Tichomirowa, M. & Bombach, K., 2007, JAES 31, 71–86

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ABSTRACT

A continent-oceanic island arc collision model was proposed as a new geodynamic scenario for the evolution of the Cretaceous Central Anatolian granitoids in the Central Anatolian crystalline complex (CACC) by Boztug et al. (2007b) [Boztug, D., Tichomirowa, M., Bombach, K., 2007b. 207Pb–206Pb single-zircon evaporation ages of some granitoid rocks reveal continent-oceanic island arc collision during the Cretaceous geodynamic evolution of the central Anatolian crust, Turkey. Journal of Asian Earth Sciences 31, 71–86]. The key aspects of this model include an intra-oceanic subduction in the Neotethyan Izmir-Ankara Ocean, formation of an island arc and its subsequent collision with the northern margin of the Tauride–Anatolide Platform. The identical scenario was initially proposed by Göncüoglu et al. (1992) [Göncüoglu, M.C., Erler, A., Toprak, V., Yalınız, K., Olgun, E., Rojay, B., 1992. Geology of the western Central Anatolian Massif, Part II: Central Areas. TPAO Report No: 3155, 76 p] . Moreover, the weighted mean values of the reported 207Pb–206Pb single-zircon evaporation ages by Boztug et al. (2007b) [Boztug, D., Tichomirowa, M., Bombach, K., 2007b. 207Pb–206Pb single-zircon evaporation ages of some granitoid rocks reveal continent-oceanic island arc collision during the Cretaceous geodynamic evolution of the central Anatolian crust: Turkey. Journal of Asian Earth Sciences 31, 71–86] from A-type granitoids in the CACC seem to be miscalculated and contrast with the field data.

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The Central Anatolian Crystalline Complex (CACC, Göncüoglu et al.,1991) in central Anatolia, Turkey, is a key area to understand igneous events that occur within a passive continental margin during complex episodes of collision. In this region, the *N* margin of the Gondwanan Tauride–Anatolide microplate was affected during the alpine closure of the Neotethyan Izmir-Ankara Ocean (Sengör and Yilmaz, 1981). Collision involved an initial alpine arc-continent, and subsequently a continent–continent collision. Since 1970s, a number of geological, petrological and geochronological studies have been focused on the tectono–magmatic evolution of this area (for a brief review, see Köksal et al., 2004a; Boztug et al., 2007a).

Recently, new geochemical and geochronological data have been reported to better understand igneous activity in CACC (Boztug and Arehart, 2007; Boztug and Harlavan, 2007; Boztug and Jonckheere, 2007; Boztug et al., 2007a,b). For example, Boztug et al. (2007b) report new single-zircon evaporation ages from nine granitic intrusions belonging to the Central Anatolian Granitoids and a "new" geodynamic scenario. The scenario entails that the granitoids in the CACC were formed by the collision of an intra-oceanic arc with the northern margin of the Tauride–Anatolide continental microplate during the Late Cretaceous. The arc was formed by an intra-oceanic subduction within the Izmir-Ankara Neotethyan oceanic lithosphere. Note that this interpretation of the geodynamic evolution of this area differs from earlier suggestions of Boztug (e.g. Boztug and Arehart, 2007; Boztug and Harlavan, 2007; Boztug and Jonckheere, 2007; Boztug et al., 2007a).

This geodynamic scenario is not a new contribution to the present state of our understanding of this area. This model has been proposed and cited by Göncüoglu et al. (1991,1992); Göncüoglu and Türeli (1993,1994); Türeli et al. (1993); Akiman et al. (1993), and Erler and Göncüoglu (1996). It is inappropriate to suggest that the island arc-continent collision in the Central Anatolia and its timing as proposed in Boztug et al. (2007b) is a "a new contribution in the Neo-Tethyan evolution of Central Anatolian crust in Turkey". Note that Boztug (1998) acknowledges the contribution of Göncüoglu and Türeli (1994) in developing this same model.

A more critical issue concerns the evaluation of the radiometric age data. The ^{207}Pb–^{206}Pb single-zircon evaporation ages from the felsic A-type Camsarı quartz–syenite from Kaman–Kırsehir area and Cayagzı syenite from N of Kırsehir district in Central Anatolia, respectively, are 95.7 ± 5.1 Ma and 97.0 ± 12.0 Ma (Boztug et al.,

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2007b). These reported weighted mean ages appear to be incorrectly calculated from the individual results. For example, six grains of the Camsarı quartz–syenite range from 81.3 ± 43.3 Ma to 106.3 ± 13.5 Ma with an average of 93.3 ± 26.8 Ma. It is unclear how these ages could result in the highly precise 95.7 ± 5.1 Ma reported weighted mean age. Zircon grains from the Cayagzı syenite range from 77.0 ± 24.5 Ma to 107.8 ± 12.2 Ma with an average of 92.0 ± 14.6 Ma. The range of ages indicates that the zircon grains from these plutons likely record a complicated and protracted tectonic history, and the precise weighted mean dates can be misleading and easily misinterpreted.

In addition, the weighted mean ages from these two plutons contrast with the results of the previous studies, where it is univocally accepted that the A-type granitoids in CACC are the late-stage products of the Central Anatolian granitic magmatism. This interpretation is mainly based on the cross-cutting relationships between S, I and A-type granitoids that are very clearly observed in the field (e.g. Erler et al., 1989, 1991; Akiman et al., 1993; Aydin et al., 1998; Boztug, 1998, 2000; Köksal et al., 2001). Age data reported in the previous studies also contrast with ages reported by Boztug et al. (2007b). To exemplify, the A-type plutons are post metamorphic, and the age of the main metamorphism in CACC is 90–85 Ma (Göncüoglu, 1986; Whitney et al., 2003), younger than the ages reported above. Consequently, there is obviously a problem with the ages around 97–95 Ma and needs to be clarified.

Note that Köksal et al. (2004a) reported titanite U/Pb age of 74.1 ± 0.7 Ma from the Camsarı quartz syenite. These data are in accordance with the 207Pb–206Pb single-zircon evaporation ages of 77.0 ± 7.8, 74.1 ± 4.9 and 75.0 ± 11.0 Ma, obtained from the Hasandede quartz monzonite, the Baranadag quartz monzonite and the Hamit quartz syenite, respectively. This is another clue to doubt whether the 207Pb–206Pb single-zircon evaporation ages measured really reflect the intrusion ages. This suspect is also supported by the fact that the zircons of the Camsarı quartz syenite are highly metamict and include folder cores, see Köksal et al. (2004b). Hence, it is possible that the measured zircon evaporation ages do not correspond to the intrusion ages.

I have also some comments on the inappropriate citations of the previous work on the important processes in the CACC such as the "lithospheric delamination as the triggering mechanism" of the Central Anatolian Granitoids. This model was initially proposed by Aydin et al. (1997) and not by Boztug (1998). The same criticism is valid for the incorrect citation to the original source for the "collision-type granitoids" in the CACC. To my knowledge, the original suggestion for the collisional character of the Central Anatolian Granitoids is the unpublished PhD theses of Türeli (1991) and not Boztug (2000) as noticed in Boztug et al. (2007b). This idea was then adopted by Akiman et al. (1992) and evaluated by Türeli et al. (1993).

It is also regrettable that these critical points were disregarded by the referees, one of which is the co-author of a joint paper on Central Anatolian Granitoids (Yaliniz et al., 1999).

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