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History and records from Mineoka ophiolitic mélange belt for the idea of initiation and development of Izu-Bonin arc in Western Pacific

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Much of data from on land Mineoka ophiolite, along the Honshu forearc sliver fault zones in the Izu collisional forearc area, south of Tokyo, and related submarine data from Izu-Bonin arc made us to compile the complicated but eventual history on the initiation and development of Izu-Bonin arc in Western Pacific. The stratigraphy and rock assemblage involves the following rocks; Cretaceous oceanic rocks (including bedded radiolarian chert (ca. 100 Ma) and MORB-chemistry pillow basalts (ca. 85 and 81 Ma, Ar-Ar ages; hereafter some plateau, some isochron ages; See companion paper, Mori et al., GSASP in press)) to Paleogene MORBs (ca. 47 Ar-Ar) and tonalite-diorite (ca. 37 Ar-Ar), a succession of Paleogene to Miocene bedded radiolarian-diatomaceous-foraminiferal limestone/chert, Paleogene to Miocene continental crust derived clastic rocks (turbidite and siliceous shale), and middle Miocene island arc derived volcaniclastic rocks. IABs are exactly included but no critical ages have yet obtained. In addition, four blocks of schists of amphibolite facies (one originated from eclogite facies of 2 GPa, 650C, and some ca. 33 and 40 Ma K-Ar), and sheared or brecciated serpentinite blocks (dominantly harzburgite in origin), are involved in dextral strike-slip fault zones. These ophiolitic and other kinds of rocks are altered, faulted and folded, brecciated, disrupted and mixed together to form the present forearc sliver fault system for the Philippine Sea plate subduction in front of the Izu arc in the Boso TTT-triple junction realm, which occur close to the continental margin subduction zones. The key points are as follows; 1) The stratigraphy comes back to Cretaceous up to middle Miocene, being very similar to that from North New Guinea, suggesting the plate for the ophiolite may be the counter part of the North New Guinea plate. 2) change from MORB to IAB and totalite chemistry may occur around 40 Ma, being close to the change of the Emperor Seamount to Hawaiian hotspot chain direction of Pacific plate motion. 3) Metamorphic rocks of subduction processes as well as the boninitic rocks of the Izu-Bonin arc are also of the similar ages, suggesting the change of Pacific motion may make sense to the change of setting for the Mineoka ophiolite and related Izu arc system. 4) Clastic rocks from clear continental or island arc provenances of younger ages, one of them being andesitic tuff breccia of middle and late Miocene (ca. 16 Ma and 5.8 Ma K-Ar, respectively) (including high Mg andesite clasts ca. 29 Ma, K-Ar), unconformably overlie the altered and strongly deformed ophiolitic rocks of earlier ages. Thus, it is concluded that ca. 40 Ma is the first turning age from the Cretaceous to Paleogene MORB setting to IAB and later mature island arc setting both in Mineoka ophiolite and Izu-Bonin arc. Another line is that alkaline volcanic rocks of Paleogene to Miocene age (some 26 Ma, others 20 Ma, K-Ar and Ar-Ar, respectively) are inserted along the strike-slip fault system, some together with serpentinite, some with pelagic claystone or limestone of up to middle Miocene age. This suggests that petit-spot like alkaline rocks, which may form seamounts on the Pacific or Mineoka plate, may be incorporated with the present Honshu arc in the realm of the Izu arc collision zone at the latest in some time of middle Miocene, probably ca. 15 Ma, further supporting the idea that the present Boso TTT-type triple junction arrived off central Honshu around this time.