

Kanto Syntaxis: when did it start to form?

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The Kanto Syntaxis is a cusped, convex-northward crustal feature in central Japan where the Honshu arc has been collided with the Izu–Ogasawara (Bonin)–Mariana (IBM) arc. The formation of this deformation structure is now generally accepted as a result of the arc-arc collision since Miocene time. Our knowledge is, however, still not complete about how and when the deformation occurred. This review will concentrate on geological and paleomagnetic studies in and around the collision area, particularly published during the last quarter century, for elucidating the age of onset of formation of the syntaxis. So far, an age of about 15 Ma, an estimated age for the climax of tectonic rotation of both Northeast Japan and Southwest Japan during back-arc opening of the Japan Sea, has generally been advocated for the approximate age for the onset of the formation. However, it is probable that the arc-arc collision actually began at or shortly after 17 Ma, which is suggested from sedimentary records in the earliest accreted volcanic edifice called the Kushigatayama (or Koma) block, originally formed on the IBM arc, now present in the Izu collision zone. Paleomagnetic analyses including an orocline test using Miocene data from both the eastern and the western limbs of the Kanto Syntaxis suggest that it began to grow sometime between 17 and 15 Ma. Consistency is apparent between the age estimate for the onset of arc-arc collision inferred from geology and the age estimate for the onset of formation of the Kanto Syntaxis suggested from paleomagnetism. Thus, it is concluded that the arc-arc collision that began sometime between 17 and 15 Ma caused the start of formation of the Kanto Syntaxis at the same time. Some proposed hypotheses related to the development of the syntaxis are introduced, which need to be tested by future studies.

Keywords: arc-arc collision, Izu collision zone, Kanto Syntaxis, Median Tectonic Line, paleomagnetism, crustal rotation