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Quaternary tectonics of Miyazaki Plain and Kyushu Mountain, southern Japan

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The tectonics of the Miyazaki Plain during the past 2 Ma are estimated from landforms and geological structures. During 2-1 Ma, the forearc basin beneath the sea was uplifted slowly and the Miyazaki Plain emerged. Then the left-lateral movement of Wanitsuka Mts block bordering the plain on the north formed the two pull-apart basins of the Kariya and Nojiri formations at the southern part of the plain during 1-0.3 Ma. The left-lateral movement was caused by the opening of the Okinawa Trough in the back arc of Ryukyu Arc. At 0.3 Ma, the Miyazaki plain suddenly began uplifting rapidly due to E-W trend compression. During 0.8-0.6 Ma, the movement direction of the Philippine Sea Plate changed from NW to WNW, and then the plate subducted obliquely along the Nankai trough. Consequently, the Southwest Japan fore arc including the Miyazaki Plain decoupled from the inner arc, moving westward, and finally caused the E-W trend compression and uplifting around Miyazaki Plain. The uplift rate of the southern part of the plain accelerated from 0.1 m/ka to 1 m/ka during the last 0.3 Ma at the southern part of the plain. In detail, the tectonical mode is domical uplifting the center, which is several kilometers off Miyazaki City in the Pacific Ocean. The domical uplifting and the increasing uplift rate relate to the isostasy of the subducting Kyushu-Palau Ridge on the Philippine Sea plate under the Miyazaki Plain or a rising serpentinite diapir in the crust of the Eurasia plate.

Keywords: Quaternary, tectonics, uplift, Miyazaki