

## Tephrostratigraphy of the Kokumoto Formation, Kazusa Group in the Yoro river route

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Because the M-B boundary is intercalated in the Kokumoto Formation, the Yoro river route is important as the type section of the formation. The marker tephras of the Kokumoto Formation that are the indices of the horizon in the type route, has been described in the Yoro river and the circumference are as follows, Ku0.1, Ku1, Ku2A, Ku2B', Ku2B, Tas-A, Tas-B, Tas-C, Tap-A, Tap-B, Kosp-A, Kosp-B, Kosp-C, Koss1-A, Koss1-B, Koss2, Byk-A, Byk-B, Byk-C, Byk-D, Byk-E, Byk-F, Byk-G1, Byk-G2, Kws, Kwg, Kwp, okoshi, Ku5, Ku6 in descending order (Mitsunashi et al., 1959; WQSB, 1996; Kimura et al., 2014; Kazaoka et al., 2016, etc.). Authors clarified the rock description characters of these tephras, advanced the reexamination of the tephrostratigraphy in the type route, and obtained the following new findings.

Byk-F located 15cm below Byk-E is a pumiceous crystal tephra with a thickness of 5mm, and it corresponds to Byk-L (Hyodo et al., 2016). It contains hornblende, biotite, and the orthopyroxene crystals. The refractive indices of pumiceous type volcanic glass shards and hornblendes are  $n_1$ : 1.507-1.511 (mode 1.509) and  $n_2$ : 1.681-1.691 (1.686-1.687). These features are similar to that of YUT4 ( $n_1$ : 1.504-1.511 and  $n_2$ : 1.681-1.694 (1.685-1.686)) which locates under YUT5 correlated to Byk-E at the foot of the eastern slope of Older Ontake volcano (Takeshita et al., 2016). Because the major element composition of the volcanic glass shards from Byk-F and YUT4 is also corresponding well, the set of Byk-E and F can be correlated with the set of YUT5 and 4.

The tephra group assumed to be Ku5 by Mitsunashi et al. (1959) and WQSB (1996) in the Yoro river was correlated with Ku3, Ku4, and Ku4.5 based on the refractive indices of each unit and the major element composition of the volcanic glass shards (Nakazato et al., 2017). In this research, the crystal tephra Ku5B and the vitric tephra Ku5A were newly confirmed at the riverbed of Yoro river. The refractive indices of volcanic glass shards of Ku5A and hornblendes of Ku5B are  $n_1$ : 1.498-1.503, 1.505-1.512 (1.509), 1.525-1.536 and  $n_2$ : 1.662-1.676 (1.668-1.669). These values are corresponding to the report of Nanayama et al. (2016). Ku6C, D, and E have already been confirmed at the upstream of these Ku5A and B (Nakazato et al., 2017). The horizons of the main marker tephras of the Kokumoto Formation in the Yoro river route became clear by the confirmation of Ku5A and B.

Keywords: marker tephra, Kokumoto Formation, M-B boundary