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Explosive and non-explosive volcaniclastics related to intermediate lava domes from Oas-Gutai Mts., Romanian Eastern Carpathians

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Oas and Gutai Mts. had been built up by the volcanism developed during Middle Miocene in the Carpatho-Pannonian Region. They belong to the inner volcanic arc of the Eastern Carpathians. An early felsic calc-alkaline volcanism, less extent in time and space, had been followed by the intermediate calc-alkaline volcanism, lasting between 12.0-9.5 Ma in Oas Mts and 13.4-7.0 Ma in Gutai Mts.

The intermediate volcanism shows both coherent lavas and a wide range of volcaniclastics belonging to the calc-alkaline series, from basalts to rhyolites; lava flows and lava domes are pierced by intrusions; a coeval sedimentation developed in small intravolcanic basins.

A major dome-building phase developed in Oas Mts. Lava domes are predominant, preserving the original shapes of typical tholoids or flat topped dome coulees, composed of felsic volcanics.

Lava flows are widespread in Gutai Mts. Lava sheets interbedded with volcaniclastics and sedimentary deposits fill volcano-tectonic depressions suggesting fissure-fed lavas emplaced in submarine setting. The pile is pierced by domes composed of felsic lavas. Lava domes are rarely preserving the original shapes, but partly eroded widespread dome coulees are still easy to be identified in the geological record, mainly in the southern part of the mountains.

In both Oas and Gutai Mts., lava domes are associated with volcaniclastics preserving the evidences of either explosive or non-explosive fragmentation in subaerial versus submarine setting. Approaching volcaniclastics may reveal explosive destruction or

gravity driven failure of parts of the domes, small rootless explosions associated to submarine emplacement of quench-fragmented lava and episodes of reworking.

In Oas Mts., most of the domes had been growing under water exposing typical hyaloclastic deposits both in situ and resedimented, sometimes associated with phreatomagmatic deposits and debris flows reworking altogether hyaloclastic and pyroclastic debris. However, an explosive release of gases during dome growth in subaerial setting was considered to be responsible for large pumice and ash pyroclastic flows and cogenetic fallout tuffs, mostly reworked in submarine setting.

In Gutai Mts., a major gravity driven failure of a dome is recorded by autoclastites and debris flows reaching water and getting to phreatomagmatic explosions and to repeated more or less fluidized flows. Other domes had experienced the submarine emplacement of lavas with transitions to hyaloclastites and underwent small phreatomagmatic explosions; large episodes of reworking built up thick sequences of debris flows, hyperconcentrated flows emplaced en masse or fluidized flows, mostly emplaced by progressive aggradation.

Volcaniclastics show the explosive and/or non-explosive origin of the clasts, the mechanism of transport and emplacement, as well as the subaerial or submarine setting of evolution from fragmentation to settlement.