The > 50 km³ Villa Senni Formation (355 ka) represents the youngest mafic caldera-forming eruption of the Colli Albani Volcano (Italy). The unit includes a basal surge/fallout deposit (VSN0), two main ignimbrites emplaced in rapid succession (the lower Tufo Lionato (VSN1) and the upper Pozzolanelle ignimbrites (VSN2)), a series of co-ignimbrite breccias between the two ignimbrites (VSN2b), and topping fallout deposits (VSN3). Chemistry ranges from tephri-phonolitic in VSN1 to phono-tephritic in VSN2. Juvenile clast textures have been quantitatively described in terms of: a) shape, size and number density of vesicles; b) microlite size and frequency.

The first sharp textural change occurs at the transition VSN0-VSN1, with a sudden decrease of vesicle and leucite microlite sizes combined with an increase of their number densities. These textural changes indicate that the early evacuation of the shallow magmatic system during the VSN0 phase triggered a quick decompression and increase of the ascent velocity, which caused homogeneous nucleation of bubble and leucite microlites in VSN1.

The second main textural change is observed at the transition from VSN1 to VSN2b, with an increase of vesicle and leucite microlite sizes combined with a decrease in their number densities, suggesting a decrease in ascent rates. Such changes in eruption dynamics correlate with the occurrence of the main caldera collapse, the rebuilding of pressure conditions and change to phono-tephritic and tephritic compositions in a chemically stratified magma chamber.