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# The influence of varying effusion rate and front cooling on lava flows: Insights from analogue experiments of pseudoplastic flows.

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The study of the behavior of lava flows is critical for hazard assessment. The emplacement of a lava flow depends on the effusion rate, topography, cooling effects and its rheology. Numerous studies have shown that crystal-bearing lavas behave as plastic fluids. This paper presents the results of analogue experimental study of lava flows considering non-isothermal flows of pastes that behave as Herschel Bulkley plastic fluids, giving insight into a wide range of lava flow types and expanding available data for geological hazard assessment. We studied the advance rate and final run-out of flows of temperature-dependent plastic material flowing down an inclined plane. We measured the cooling of the flow using a FLIR camera. Our results indicate that for low effusion rates the cooled material formed at the front stops the advance of the flow and it grows mainly by thickening at the front.