The poisonous tail of the New Year’s Day Storm 1992: How orography shaped the fronts during landfall

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The New Year’s Day Storm 1992 was one of the most extreme storms in the rich history of storms affecting the Norwegian West Cost. The narrow band of extreme wind along its bent-back front became famous as the “poisonous tail”, and lead the way towards today’s sting jet terminology. This article re-examines the storm’s landfall with a particular focus on the interaction with the orography, an aspect which, compared to moist diabatic processes or the formation of a warm-air seclusion, has received considerably less attention. The presented results suggest that the warm-air seclusion forms due to an orographic occlusion process which lifts the warm sector from the ground and thereby cuts off the low-level flow towards the cyclone core. Consequently, the warm-air seclusion is confined to lower tropospheric levels. Convection sets in inside the warm-air seclusion quickly after the cut-off, and the slantwise ascent along the bent-back front is replaced by a line of convection. The subsequent steepening of the pressure gradients along the bent-back front leads to the formation of extreme winds and the rapid reorientation of the bent-back front, hence suggesting that orographically induced flow imbalances played an important role in the formation of the poisonous tail.