



The contribution of *Corynephorus canescens* to the geodiversity of inland drift sands

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Most dunes in the Netherlands are phytogenic, which means that plants are essential in their formation. This applies also to the dunes of the inland drift sand areas, which are nicknamed Atlantic deserts on account of their extreme climatic conditions. Daily temperatures on the bare sand surfaces may run up to 60° C on sunny summer days, dropping as low as below freezing point at night. Apart from blue and green algae, *Corynephorus canescens*, Grey hair-grass, it is the first conqueror of these active sands and plays an important role in the geomorphological development of the inland drift sands.

C. canescens is a rapid colonizer and flourishes when it receives a regular supply of fresh sand, but is soon succeeded by competitor species. Like *Ammophila arenaria* (Marram grass), its vigour declines after some time, because its roots are affected. Therefore the plant requires a regular supply of fresh sand to outgrow the affected root zone.

The growth of *C. canescens* is stimulated by two different geomorphological processes: aeolian and pluvial processes. Aboveground, the tussock architecture of the plant helps to trap sand and form small initial dunes. When formed by wind, these are called nabkahs; when formed by splash bush mounds. In a micro-morphological thin section both processes can often be recognized in one dune.

The decline of *C. canescens* is caused by two soil-forming processes: reduction of permeability and accumulation of organic matter. Poor aeration and compaction restrict the growth of its roots. Increase in organic matter hampers the rate of root respiration and promotes conditions for the establishment of competitor species. In the nabkahs, thin slides show on the positive side for *C. canescens* there is little blown-in organic matter, but on the negative side that the grains upon aging develop a colourless organic coating formed by cyanobacteria (algae). For splashed sands on the positive side for Grey hairgrass there are few organic coatings, but on the negative side there are many organic fragments. So although different both sediments have the same effect.

Under the present climate and level of air pollution, the phase of *C. canescens* is short-lived. Its disappearance marks the end of dune formation and after its decline slope development changes drastically. In conclusion, the interaction between *Corynephorus canescens* and the geomorphological and soil processes are important in the development and the geodiversity of inland drift sands.