

Recolonisation strategies developed by pioneer plants of New Caledonia through their seeds and implications for restoration of ecological continuum on ultramafic soils

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New Caledonia has the important mission to reconcile its exceptional biodiversity with the rapid development of human activities. One of the most important threats is habitat fragmentation especially due to mining exploration. Over the past 40 years, revegetation has been developed to reduce such impacts but ecological restoration concept capability and concepts have only been developed in the past 15 years. It involves knowledge of ecological succession and the study of seed of pioneer species appears essential. In this context, a large synthesis on what is already known regarding seed ecology has been carried out into plants species occurring both on the Goro plateau and the Koniambo massif in New Caledonia. A database was constructed containing more than 8000 values on life-traits of all the species. This database presents data dealing with 41 life-traits such as the reproductive type, the adult height, the type of fruit, the size and weight of seeds, the dispersion type, the germination and dormancy types. An analysis of all these data allowed us to highlight two overriding ecological strategies integrating several life traits that allow pioneer plants to withstand and adapt to ultramafic constraints. The first brings together the fruit lignified character, the seed coat thinness, the low weight of the seeds, their wind dispersal, the large size of the embryo and their non dormancy character. The second brings significant thickness of the integument, the heavy weight of the seed, the pulpy fruit character bounds to dispersal by zoochorie, the occurrence of physical and/or physiological dormancy(ies) allowing a great persistence in the soil seed bank. The coexistence of these two strategies, among others, within the New Caledonia "mining maquis" is essential for its sustainability. These results finally also enabled us to propose strategies for the establishment of ecological continuums in these two areas.