

Chapter 5

Damselflies and Dragonflies (Insecta: Odonata) of the Mt. Panié and Roches de la Ouaième region, New Caledonia

Inventaire odonatologique du massif du Panié et des Roches de la Ouaième, Nouvelle-Calédonie

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SUMMARY

We surveyed odonates at 46 sites in north-eastern New Caledonia, including 38 primary sites in three catchments on and around Mt. Panié. A total of 23 species were recorded during this survey, which comprises 41% of the 56 species known for the country. The lowest number of species was documented within the La Guen river catchment, where less species were found than in the Dané Yém river catchment despite only limited sampling (half a day) at this latter site. Localities within the La Guen catchment also appeared to suffer from higher disturbance compared to those in the Wewec river catchment where species richness was high. They had lower water pH, higher amounts of filamentous algae and an apparently low abundance of primary consumers (macroinvertebrates). Anthropogenic impacts, including bushfires and introduced mammals, may cause these differences. Our results suggest that odonates are useful bioindicators within the Mt. Panié area. This survey has provided baseline data on species occurrence and abundance at a range of sites, and identified several questions regarding disturbance to aquatic ecosystems that require further investigation.

RESUME

En Octobre 2010, les Odonates de 46 sites de la région du Mont Panié ont été évalués, dont 38 sites principaux au sein de trois bassins versants autour du Mont Panié. 23 taxons ont été inventoriés soit 41% des 56 espèces connues en Nouvelle-Calédonie. Le bassin versant de La Guen, moins riche que les autres sites, semble être perturbé : pH de l'eau inférieur, importantes quantités d'algues filamenteuses et

faible abondance des consommateurs primaires (macroinvertebrés). Les impacts anthropiques, y compris les feux de brousse et les mammifères exotiques envahissants, peuvent contribuer à ces observations. Nos résultats suggèrent que les Odonates peuvent être d'utiles bioindicateurs des cours d'eau de la région du Mont Panié et cette évaluation a fourni des données de base sur la présence et l'abondance des espèces sur une série de sites. Les questions concernant les perturbations des écosystèmes aquatiques nécessiteraient un travail de recherche.

INTRODUCTION

Spellerberg (2005) comments on the importance of national and international State of the Environment (SoE) reporting for answering crucial questions about the trends, pattern and changes in our environment. He lists 41 countries which already have produced these valuable assessments on their environments and emphasises the importance of “scientifically defensible information on the environment at different stages in time so that we can make temporal comparisons” (Spellerberg 2005: 80). Plant and animal species used as bioindicators play a vital role in this process. The United States' Environmental Protection Agency developed six general criteria for an environmental indicator to be considered as “useful; objective; transparent; and based on data that are high-quality, compatible, and representative across space and time” (U.S. EPA 2008). Following these criteria, and applying them to the characteristics of biological organisms that may be used as bioindicators requires consideration of a) their biological and ecological potential for answering specific questions, b) confidence that data about the group come from accurate statistical procedures and scientifically robust methods, and c) knowledge that these organisms can be used at different temporal and spatial scales for providing information about changes in ecological systems.

Odonata (hereafter *odonates* or *dragonflies*) qualify as reliable indicators based upon all the criteria above. These insects have been intensively studied worldwide because they have an important role as indicators of the ecological quality