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## INTRODUCTION

People who work on the ecology and population biology of ants often encounter forms that appear to be different from the normal species. The reasons for considering them to be different are often a qualitative assortment of observations on behaviour, nest sites, etc. The scientist is then faced with 2 related but separate problems: is the form really different, using the accepted morphological criteria for determining speciation within the genus?; and, if so, what name should be given to it? The first question is of primary importance to the field biologist, but the second becomes important when he wishes to publish his observations. We were faced with these problems when working on a site near Yenne, in the Haute Savoie region of France.

This site was a small marsh at the bottom of old hay-meadows, and it supported colonies of 2 species of the rare butterfly genus *Maculinea*: *M. nausithous* Bgstr. and *M. teleius* Bgstr. (Thomas 1984). The larvae of these butterflies are parasitic on colonies of *Myrmica* ants; we found that each *Maculinea* had a specific host, and that *Maculinea nausithous* used *Myrmica rubra* L. whilst *Maculinea teleius* used *Myrmica scabrinodis* Nyl. (Thomas 1983). It was therefore important to estimate the abundance and distribution of the 2 *Myrmica* species and to know the average nest population of each, so that we could estimate the carrying capacity of the site for the butterfly populations. In some of the nests of "scabrinodis" we found very large, dark, atypical queens. Subsequently, we began to notice small behavioural differences between the workers in the nests of "scabrinodis", and this led us to suspect that we might in fact be dealing with 2 distinct forms or species. If this was the case, obviously it would have an important bearing on our study of the butterfly populations.

For the first year we had only workers and queens available, and because Elmes (1978) had already studied queens of the *M. scabrinodis* group using morphometrics, we decided to use this approach on these ants. Using the key of Kutter (1977), which is the best current guide to the identification of *Myrmica*, we suspected that the large queens were either *Myrmica vandeli* Bondroit or some unknown species. However, we were misled by his descriptions of the workers and males, and the suggestion that *M. vandeli* might be a parasite did not fit our observations of the nest structure or the behaviour of the workers. The following illustrates the morphometric approach to this problem. In fact, it was more piecemeal than is suggested here because new material, including males and the types, were obtained as the study progressed. Here, we start with the detailed examination of the queens, as we did in fact, then examine the males, which were found clearly to be distinct from *M. scabrinodis*, and finally we consider the workers, which are the hardest to distinguish but which are all that are available in most field studies.