There have been few formal taxonomic proposals for the classification of these ants. Earlier studies proposed numerous 'forms' to describe the apparent species discovered during various investigations, but no formal species descriptions were given. A synthesis of this accumulated information was presented in an overview of the group by Greenslade and Halliday (1982). Thus, the *I. purpureus* group at the start of this study consisted of one valid species with three subspecies, and seven 'forms' which were considered to represent undescribed but distinct species.

In the present study, the available biological information is combined with a morphology-based taxonomic study to develop formal descriptions and diagnoses for all species within the group, as well as to define the species group for the first time. This analysis has resulted in the recognition of nine of the 10 taxa listed by Greenslade and Halliday (1982), as well as an additional two species.

It became apparent early during the present study that even rigorous taxonomic methods involving detailed morphometric analysis and examination of pilosity and sculpturing would contribute little to our understanding of these ants. Even male genitalia, thought to be of value in separating species (Greenslade and Halliday 1982) proved to be of limited use, allowing recognition of only one species (*I. spadius*) and one complex (*I. sanguineus*). Earlier work undertaken using extensive field observations of microhabitat preferences, behavioural interactions and, to a lesser extent, nest structure, provided the best estimate of the actual biological species occurring in nature (see below). The most reliable characters for recognition of forms found during these field studies were a combination of worker integument colour and iridescence. These characters allow the recognition of the majority of forms, and are currently the best available for discriminating these species.

Current Taxonomic Status of the *Iridomyrmex purpureus* Group

The genus *Iridomyrmex* was established by Mayr (1862) for two species, *I. purpureus* (Smith) and *I. nitidus*. Over the next 130 years, an additional 150 taxa were added, but no attempt was made to revise or review the genus, in whole or in part. Documented problems with the species composition of *Iridomyrmex* (Brown 1958, 1977; Crozier 1968*a*) led to a revision and redefinition of *Iridomyrmex* and related genera (Shattuck 1992*a*). Under this new concept, *Iridomyrmex* was reduced to about 62 described taxa, including the *I. purpureus* group.

The current taxonomic understanding of the *I. purpureus* group is based largely on the work of Greenslade and Halliday. Their research has consisted of ecological studies involving interspecific interactions and distributional patterns (both geographical and in relation to habitat), and analysis of biochemical characters. The results of these studies are discussed below.

Greenslade (1974*a*, 1974*c*) was the first to recognise that the *I. purpureus* group consisted of more than the long-recognised forms *purpureus*, *viridiaeneus* and *sanguineus* (e.g. Greaves 1971). While conducting detailed studies of distribution, microhabitat preferences and behavioural interactions, he discovered that '*viridiaeneus*' included two distinct forms, *viridiaeneus* strict sense and the 'blue form' (=*lividus* of the present study). He did not, however, propose formal taxonomic recognition of these taxa but, rather, treated them simply as 'forms'. In an earlier study, Greenslade (1970) had examined these forms, noting differences in nest structure, but treated them as representing the same species, *I. viridiaeneus*.

The distinctness of these three forms was examined by Halliday (1975) using comparisons of amylase enzyme allele frequencies. He found that *lividus* differed significantly in allele frequencies from forms *viridiaeneus* and *purpureus* and concluded that *lividus* was genetically isolated from them. However, in the same study, the forms *viridiaeneus* and *purpureus* were found to be very similar and not distinguishable using this enzyme system.

During this period, Greenslade continued his studies of the *I. purpureus* group and expanded the number of recognised forms to include the following: dark yellow or DY (=*spadius*), orange or O (=*spodipilus*), *purpureus*, *sanguineus*, small purple or SP (=*greensladei*), *viridiaeneus*, and yellow or Y (=*galbanus*). This system was summarised and presented during a symposium in 1977 (published as Greenslade and Greenslade 1984).