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PROVISIONAL ATLAS OF THE ASSOCIATION BETWEEN PLATYARTHRUS HOFFMANNSEGGI AND ANTS IN BRITAIN AND IRELAND

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INTRODUCTION

Platyarthrus hoffmannseggi is a common woodlouse throughout Europe which ranges widely across the southern half of Britain and southern Ireland (Fig. 1). Its northern range extends to Inverkeithing, Fifeshire (Harding & Sutton 1985). Platyarthrus hoffmannseggi is frequently found in the runs and nests of ants, although it is able to survive independently of ants (Williams & Franks 1985). It is, nevertheless, regarded as myrmecophilous, living as an ectosymbiont of ants (Wilson 1971). This categorization is shared with many other invertebrates including beetles, aphids and mites, some of which are found exclusively with ants. The actual nature of the association between Platyarthrus hoffmannseggi and ants has not yet been defined. It has been suggested that the main source of food for the woodlice is the ants' faeces (Harding & Sutton 1985) although Bernard (1968) considered Platyarthrus hoffmannseggi to be a scavenger which occasionally tends aphids. Williams & Franks (1985) reported that these woodlice may obtain infrabuccal pellets from the ants and gain nutritional benefit in this way. If indeed Platyarthrus hoffmannseggi is feeding on the sugar-rich honeydew or the infrabuccal pellets, they are showing a remarkable departure from the feeding habits of other terrestrial isopods.

DISTRIBUTION OF PLATYARTHRUS HOFFMANNSEGGI AND ANTS

When considering the nature of the relationship between Platyarthrus hoffmannseggi and ants, it is intriguing to question whether the woodlouse is selective in the choice of species with which it associates. Collingwood (1979) gives brief accounts of the distribution and biology of various ant species, which vary considerably with regard to habitat selection and foraging activity. Formica lemani for example is abundant in upland regions throughout the British Isles, but is absent from the south east where Platyarthrus hoffmannseggi is most common. This species of ant predates small insects and feeds on extrafloral nectaries and aphid honeydew. By contrast, Myrmica rubra and Lasius alienus favour lowland regions, the latter being found usually on sandy heaths or dry open pasture but remaining subterranean and utilising root aphids. Myrmica rubra is abundant in sheltered valleys, usually in alluvial soil by riversides, and collects nectar of umbellifers and other herbs

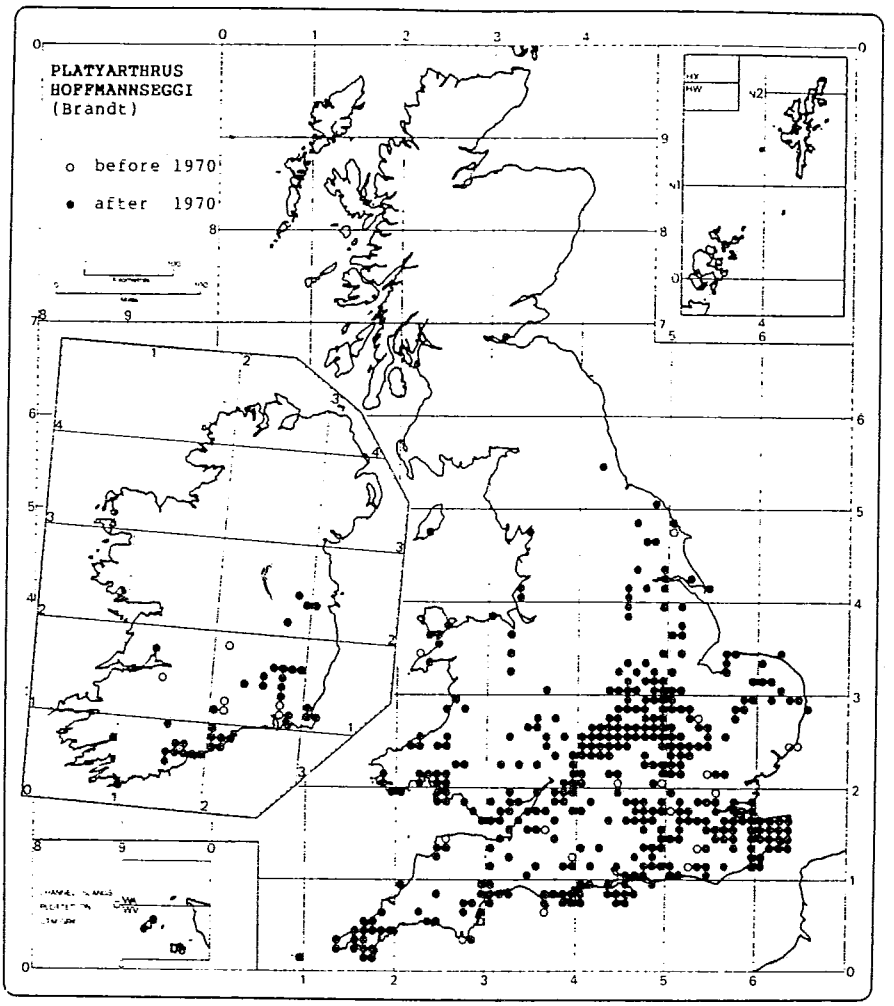

Fig. 1 : Recorded occurrence of Platyarthrus hoffmannseggi in the 10 km squares of the British and Irish National Grids to March 1987.

Table 1 : Species of ants recorded with Platyarthrus hoffmannseggi.

in addition to tending aphids more consistently than other Myrmica species.

Preliminary maps of the distribution of Platyarthrus hoffmannseggi with the 14 ant species with which it has been recorded (Table 1), are presented here (Figs. 2 to 15). These are derived from all records of Platyarthrus hoffmannseggi submitted to the Non-Marine Isopod Survey Scheme to March 1987 which indicated that the species had been found with ants. The maps are derived from those record cards on which the recorder or determiner had noted the species of ant with which Platyarthrus hoffmannseggi had been found. It should be noted that several of these records for ants are new 10 km square records based on the maps in the second edition of the Provisional Atlas for this group (Barrett 1979). It is apparent that the yellow meadow ant Lasius flavus and the black ant Lasius niger are the two most frequently recorded species with Platyarthrus hoffmannseggi, followed by Myrmica rubra and then scattered and infrequent records of the remaining 11 species of ants.

Lasius flavus and Lasius niger are very proficient at utilising aphids, indeed Lasius flavus can tend up to 30 species of aphid for their honeydew (Pontin 1978). Surplus aphids are predated to supply the ants' protein requirements. All of the ants with which Platyarthrus hoffmannseggi has been found tend aphids to varying degrees. It may be worth noting that two recorders have stated that when Platyarthrus hoffmannseggi was found with Lasius flavus, the woodlouse was not found in nearby nests of other Lasius and Myrmica species.

CONCLUSIONS

These preliminary maps (Figs. 2 to 15) show considerable recorder-bias towards collectors who are able to identify ants, and to those species which are most frequently encountered at the surface. However, it is notable that although there are several records for Lasius flavus and Lasius niger throughout northern Scotland (Barrett 1979), Platyarthrus hoffmannseggi has been recorded only once north of the border. It appears to be genuinely rare in this region as several experienced recorders have searched for the species to no avail. Platyarthrus hoffmannseggi appears therefore to be less resistant to extremes of climate than its apparently most frequent host species. Lasius flavus and Lasius niger are very common, live in large colonies and forage and tend aphids above and below ground. There is therefore a greater chance of finding these species than other less common or populous ants while searching for woodlice. A further complication is that some ants are found together with other species on which they predate, such as Myrmica scabrinodis feeding on Lasius flavus workers.

With the aim of updating the maps, it is hoped that woodlouse recorders will be stimulated to extend their foraging

strategies to seek out ant nests and Platyarthrus hoffmannseggi. That so little is known of this unique and fascinating woodlouse provides much incentive to discover more about its natural history.

Please send records and/or ants for identification to Chris Hames at the address given at the head of this article.

ACKNOWLEDGEMENTS

Most of the records for ants with Platyarthrus hoffmannseggi were made by A.J. Rundle and D.T. Richardson. I am grateful to Malcolm Spooner for his help in identifying some of the ant species and to Paul Harding for allowing access to record cards held at the Biological Records Centre.

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LEGENDS TO MAPS OF ASSOCIATIONS BETWEEN PLATYARTHRUS HOFFMANNSEGGI AND ANTS (FIGS. 2 - 15)

The number of 10 km squares of the British and Irish National Grids from which the association has been recorded to March 1987 is given for each map. Isolated records which may be overlooked are arrowed.

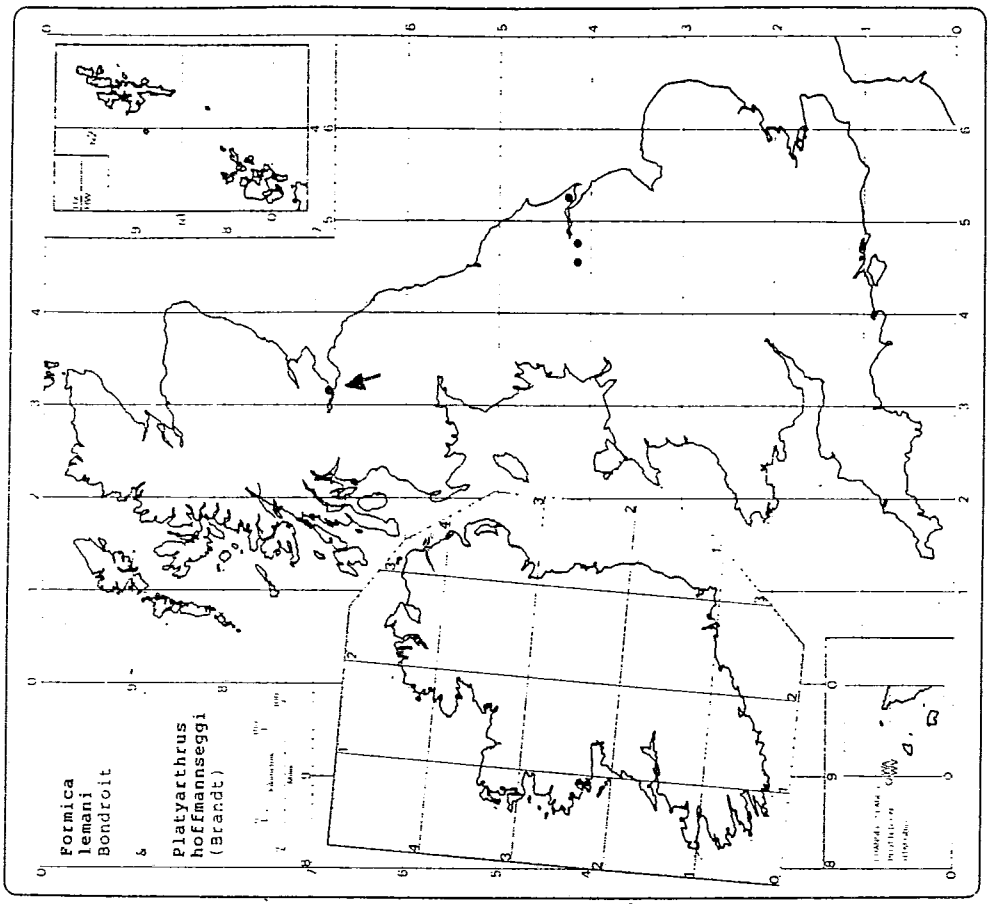

Fig. 3 : Formica lemani (4 squares)

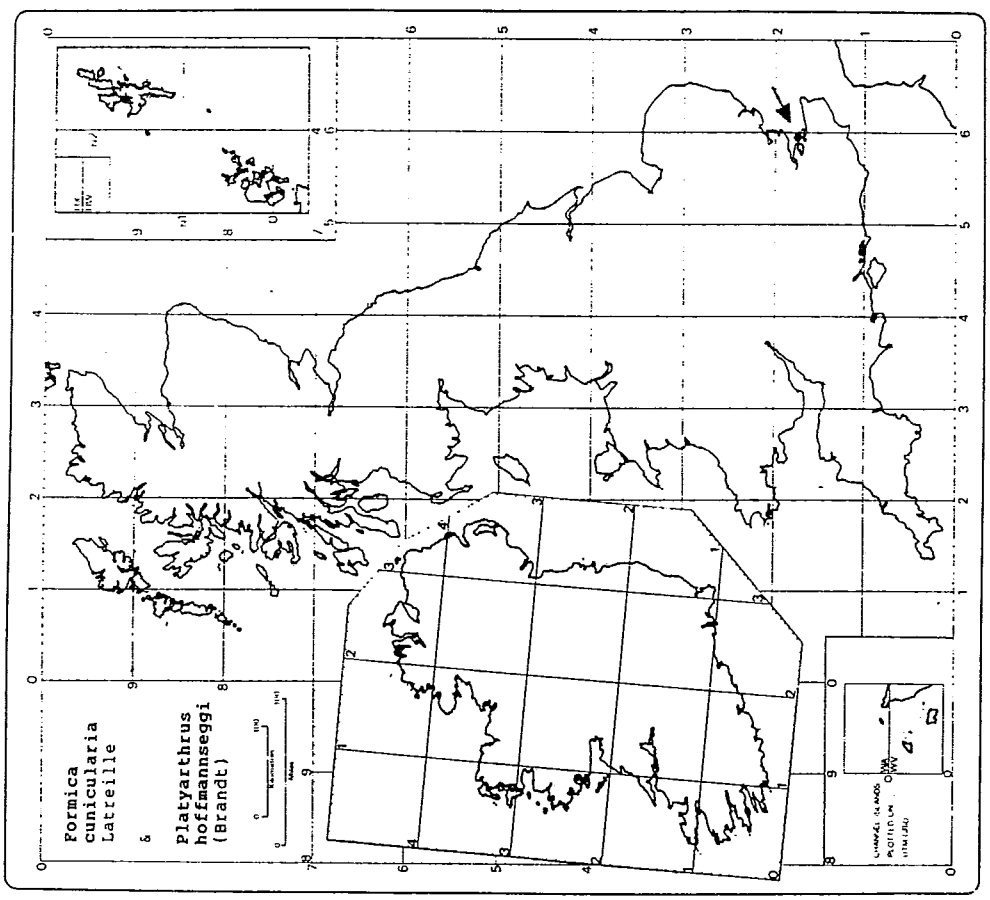

Fig. 2 : Formica cunicularia (1 square)

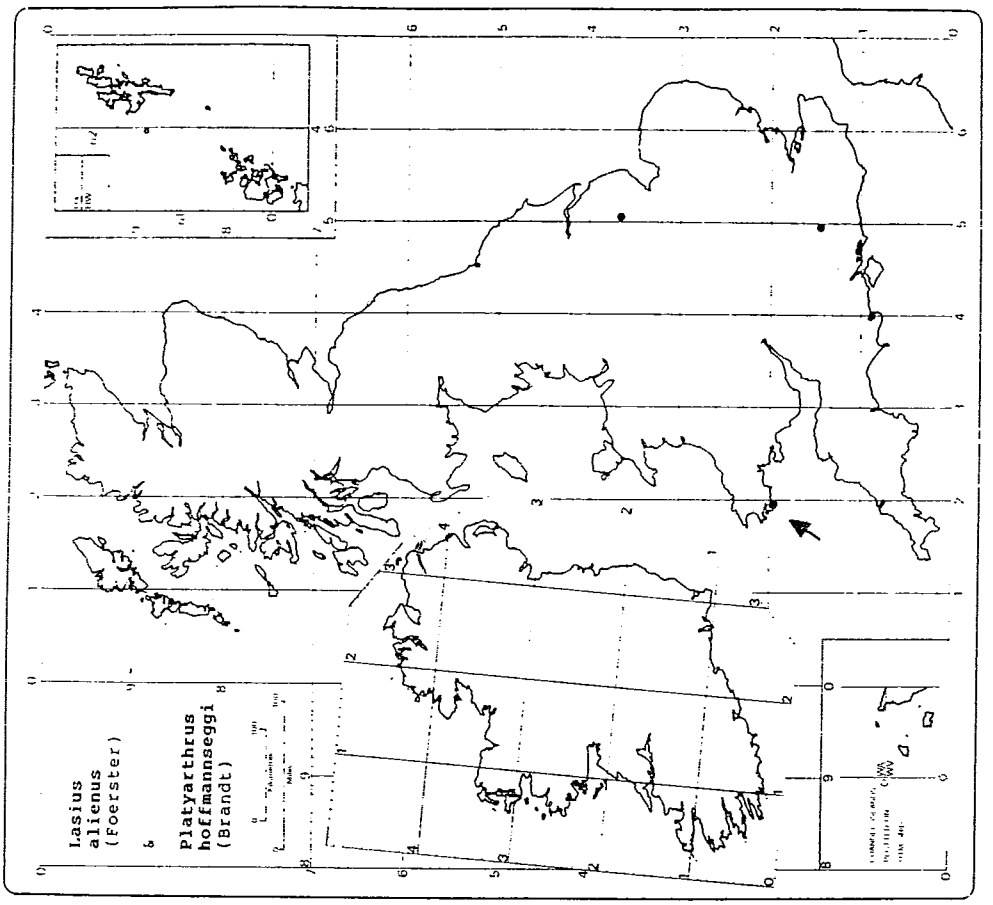

Fig. 5 : Lasius alienus (3 squares)

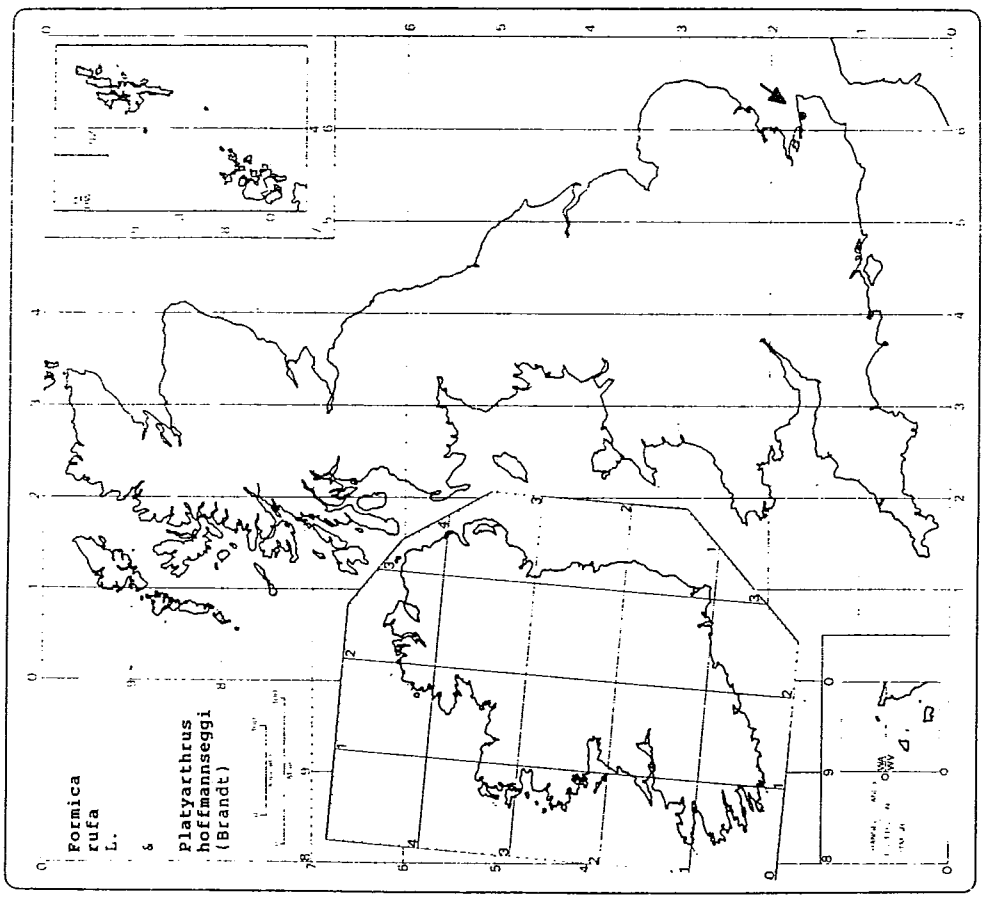

Fig. 4 : Formica rufa (1 square)

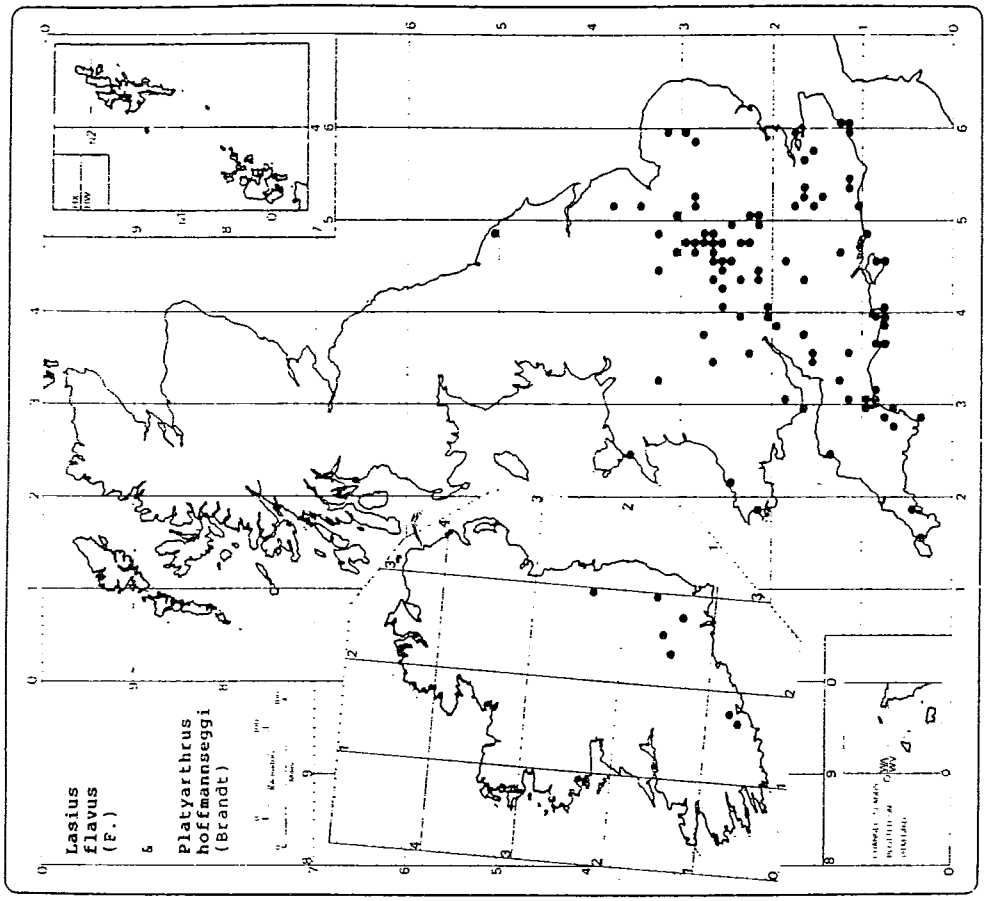

Fig. 7 : Lasius flavus (100 squares)

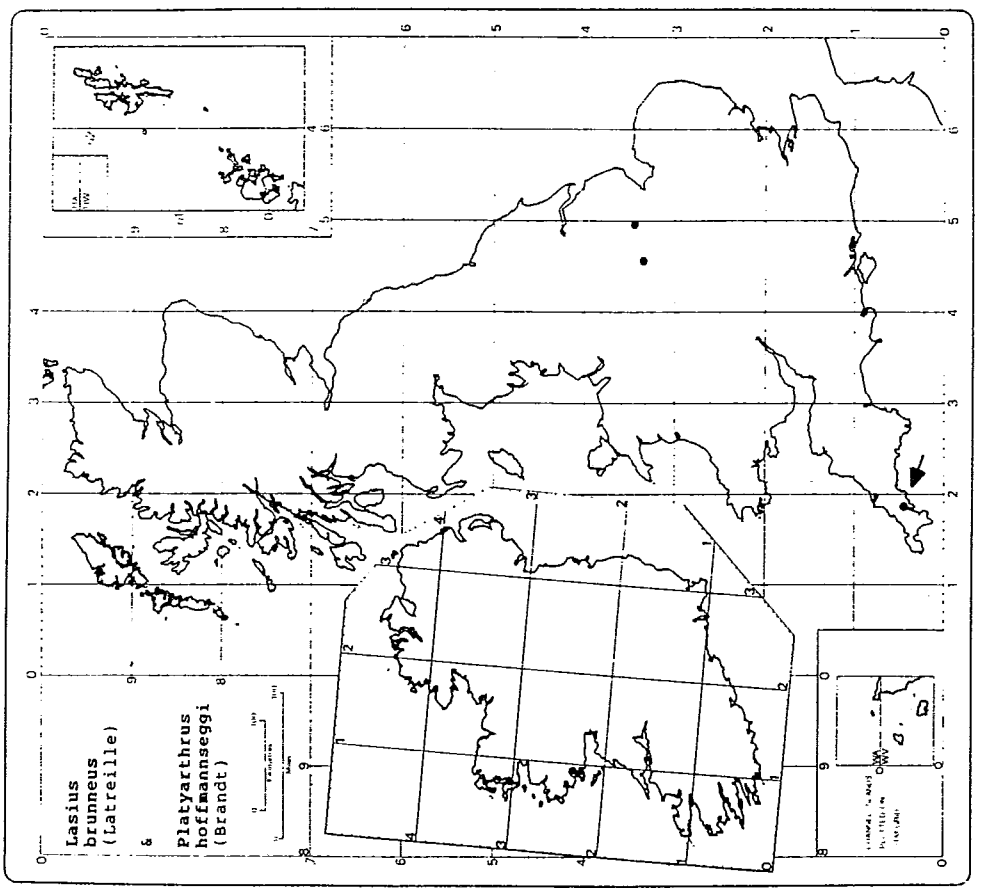

Fig. 6 : Lasius brunneus (3 squares)

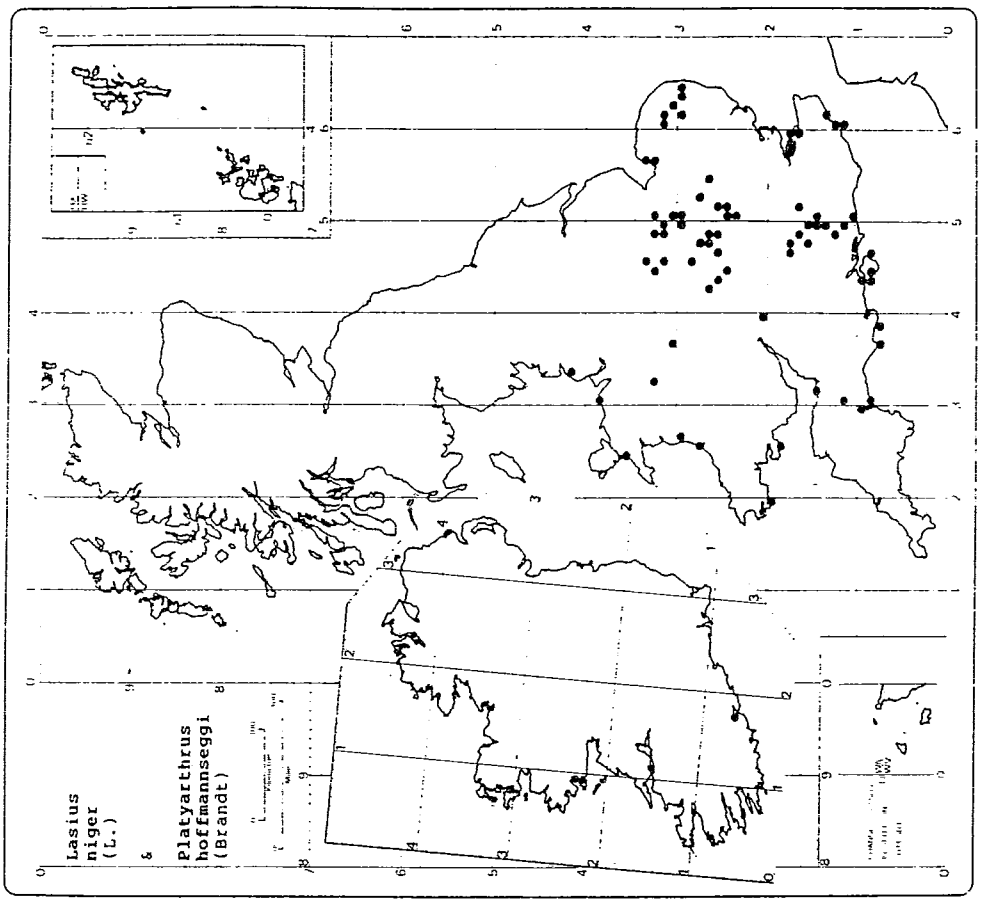

Fig. 9 : Lasius niger (73 squares)

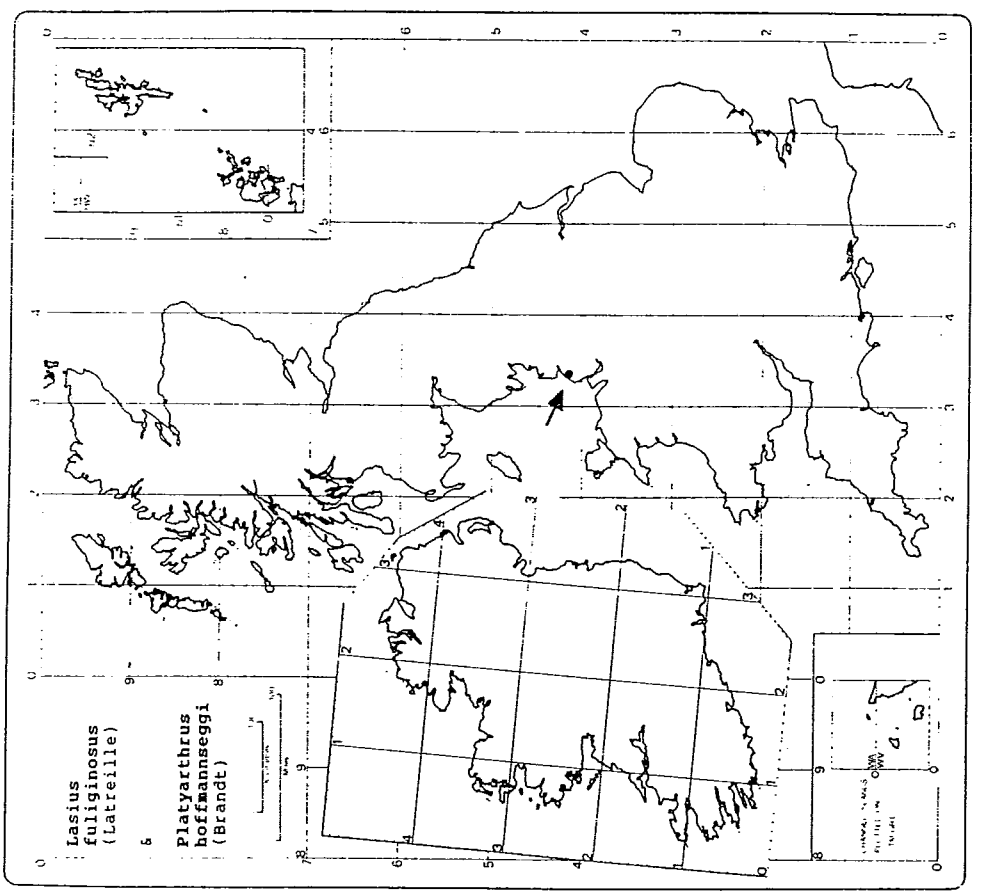

Fig. 8 : Lasius fuliginosus (1 square)

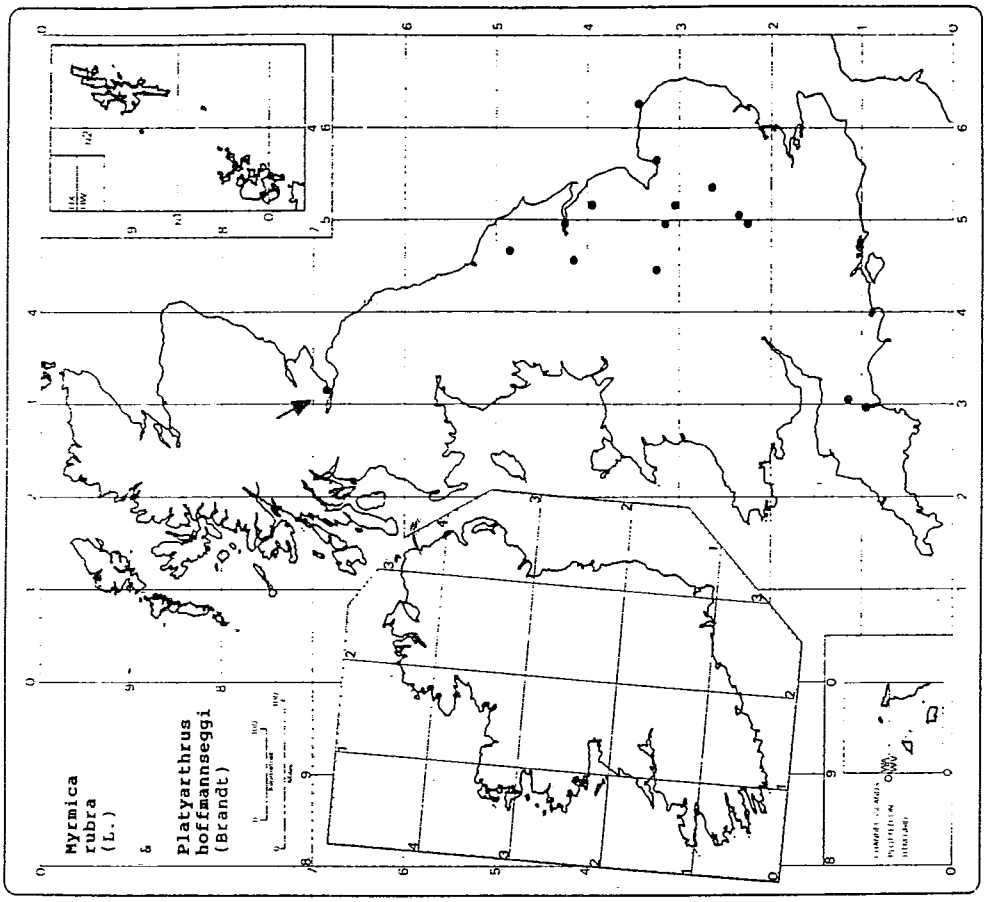

Fig. 11 : Myrmica rubra (15 squares)

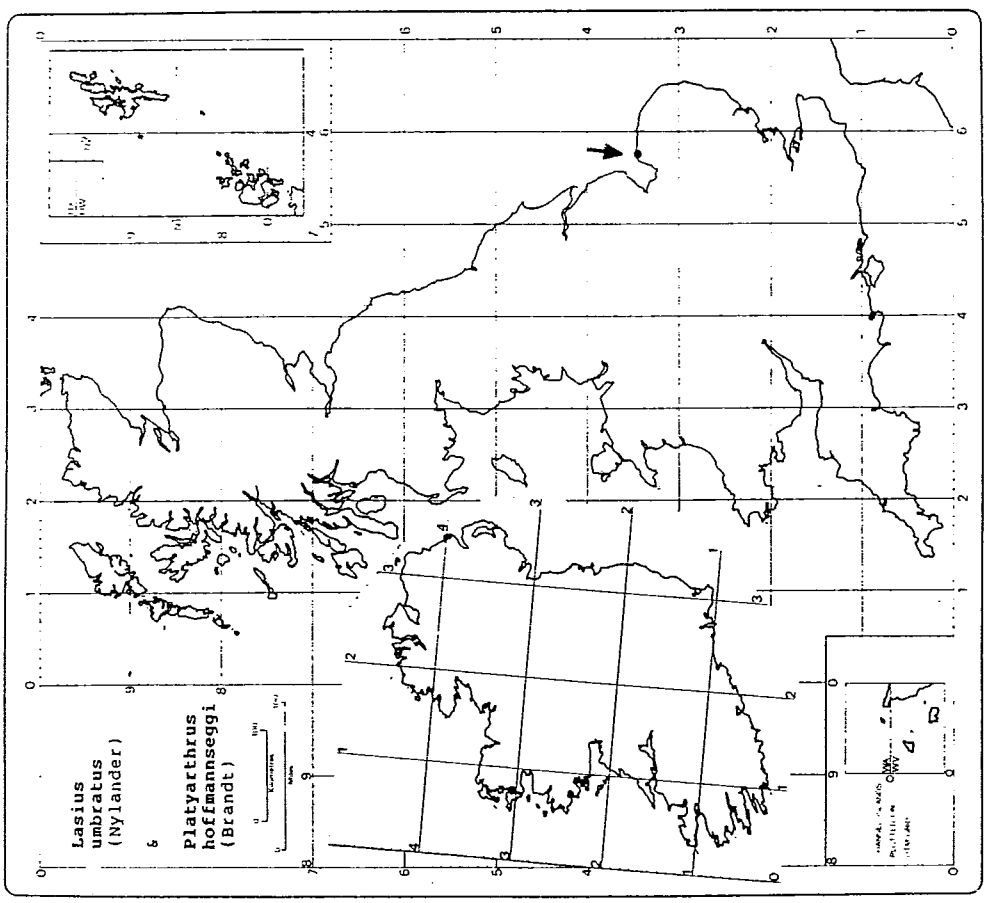

Fig. 10 : Lasius umbratus (1 square)

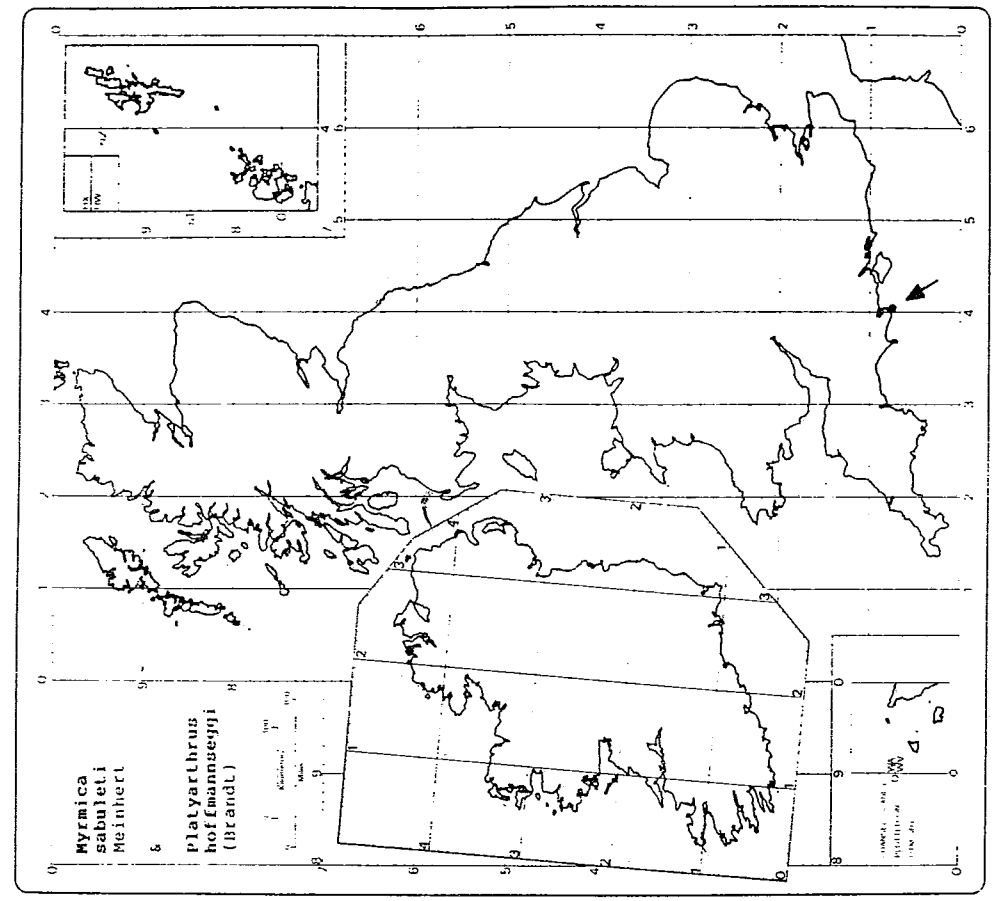

Fig. 13 : Myrmica sabuleti (1 square)

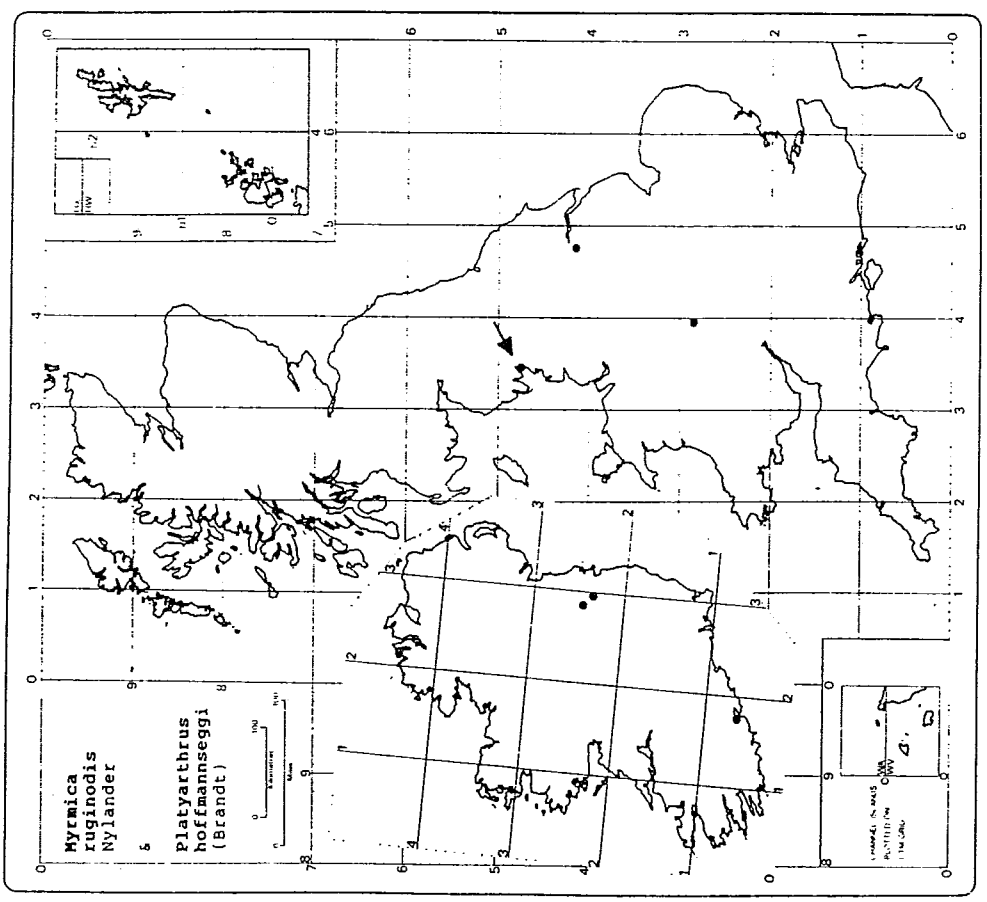

Fig. 12 : Myrmica ruginodis (6 squares)

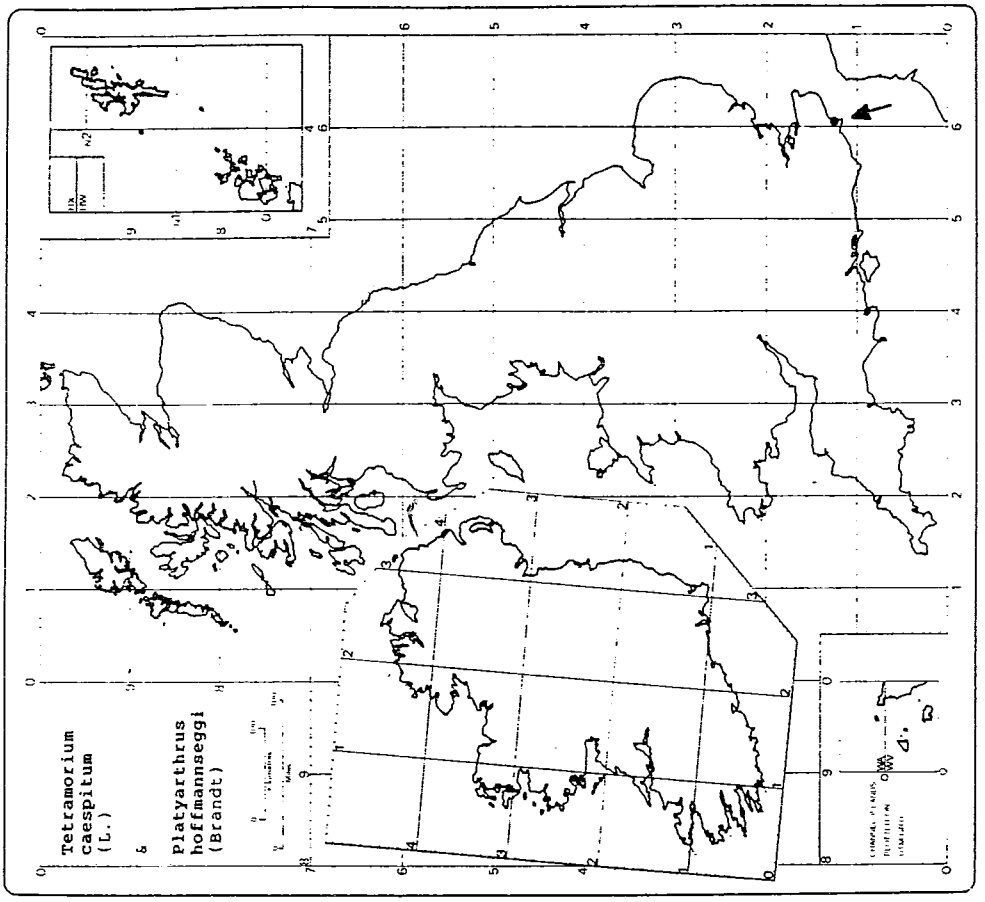

Fig. 15 : Tetramorium caespitum (1 square)

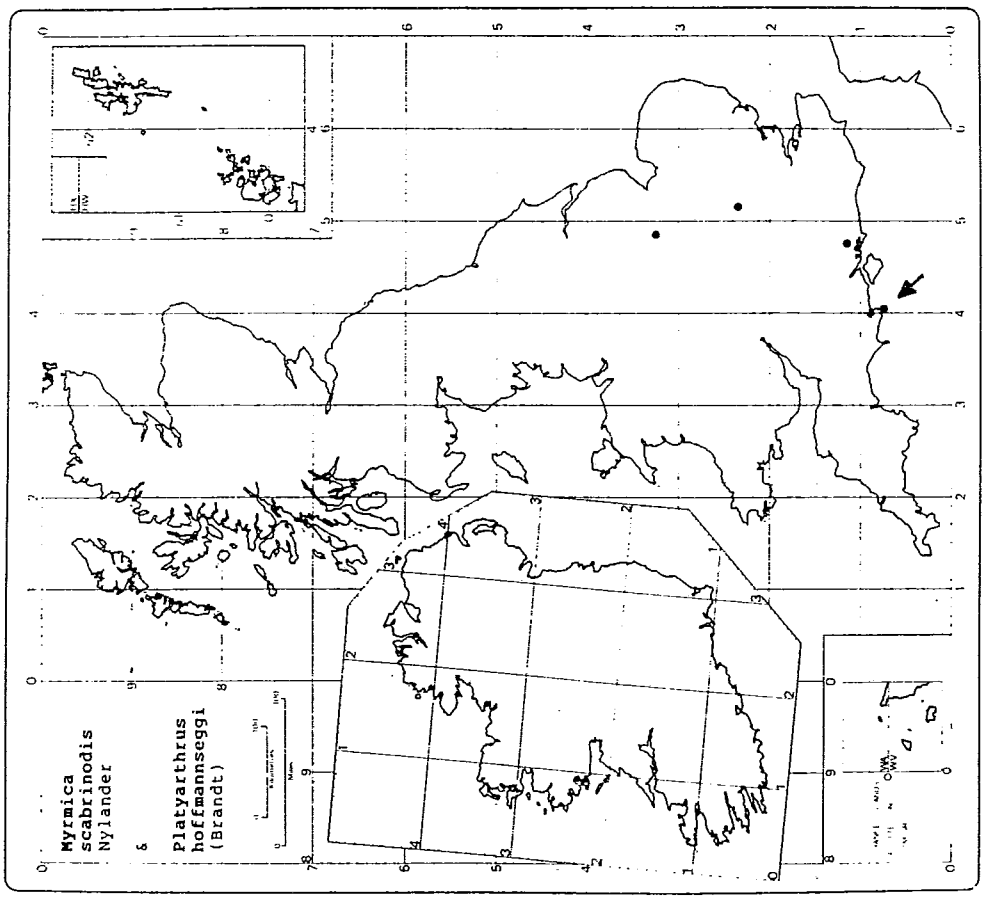

Fig. 14 : Myrmica scabrinodis (4 squares)