

at least in the geographical regions where both species are sympatric. The morphological differences demonstrated here are a strong confirmation of the different species identity concluded from genetic and behavioural investigations. The morphological differentiation of the males remains to be studied. *Formica paralugubris* is obviously a very abundant and widespread species in the Jura and central Alps in altitudes between 800 and 2000 m. The known distribution ranges from E France, throughout entire Switzerland to N Italy and W Austria. A syntopic occurrence with *Formica lugubris* was noted for several places in the Swiss and French Jura mountains. *F. paralugubris* is most probably absent in areas north of the Alps, the eastern Alps and the mountain regions of Bulgaria, where only *lugubris* and *aquilonia* are found. There is a rather small sympatric range of *paralugubris* and *aquilonia*. A syntopic occurrence of these species is still not confirmed. Of high interest would be an more detailed investigation of the situation in Graubünden where all 3 species are sympatric.

Acknowledgements

I wish to thank D. CHERIX and M. CHAPUISAT from Lausanne which supplied genetically typed nest samples of *Formica lugubris* and *paralugubris* and kindly guided my own sampling in the study sites in the Jura Mountains. I am indebted to PAUL DASSART from the Royal Institute of Natural Sciences of Belgium in Brussels and to MICHEL BRANCUCCI from the Museum of Natural History in Basel for the loan of type specimens of BONDROIT and SANTSCHI. I kindly acknowledge the informational help of WOLFGANG DOROW from the Senckenberg-Museum Frankfurt/M., of STEFAN COVER from the Museum of Comparative Zoology of the Harvard University, and of BARRY BOLTON from BMNH London.

References

- KUTTER, H. (1967): Variationsstatistische Erhebungen an Weibchen von *Formica lugubris* Zett. – Mitt. Schweizer. Ent. Ges. **40**: 63–77.
- KUTTER, H. (1977): Hymenoptera-Formicidae. Insecta Helvetica **6**: 1–298.
- PAMILO, P., CHAUTEEMS, D., CHERIX, D. (1992): Genetic differentiation of disjunct populations of the ants *Formica aquilonia* and *Formica lugubris* in Europe. – Ins. Soc. **39**: 15–29.
- PASSERA, L., L. KELLER, A. GRIMAL, D. CHAUTEEMS, D. CHERIX, D.J.C. FLETCHER, W. FORTELIUS, R. ROSENGREN, E.L. VARGO (1990): Carbohydrats as energy source during the flight of sexuals of the ant *Formica lugubris* (Hymenoptera: Formicidae). – Entomol. Gener. **15**, 1: 25–32.
- ROSENGREN, R., D. CHAUTEEMS, D. CHERIX, W. FORTELIUS, L. KELLER (1994): Separation of two sympatric sibling species of *Formica* L. ants by a behavioural choice test based on brood discrimination. – Memorabilia Zool. **48**: 237–249.
- ROSENGREN, R., D. CHERIX (1981): The Pupa-Carrying Test as a Taxonomic Tool in the *Formica rufa* Group. In: HOWSE, P. E., J.-L. CLEMENT (eds.), Biosystematics of Social Insects (Systematics Association Special Vol. 19, pp. 263–281). Academic Press, London & New York.
- SANTSCHI, F. (1911): Une nouvelle variété de *Formica rufa* L. – Bull. Soc. ent. France 1911: 349–350.
- SEIFERT, B. (1992a): A taxonomic revision of the Palaearctic members of the ant subgenus *Lasius* s.str. (Hymenoptera: Formicidae). – Abh. Ber. Naturkundermus. Görlitz **66**, 5: 1–67.
- SEIFERT, B. (1992b): *Formica nigricans* EMERY, 1909 – an ecomorph of *Formica pratensis* RETZIUS, 1783 (Hymenoptera, Formicidae). – Entomologica Fennica **2**: 217–226.
- WALTER, F., D.J.C. FLETCHER, D. CHAUTEEMS, D. CHERIX, L. KELLER, W. FRANCKE, W. FORTELIUS, R. ROSENGREN, E.L. VARGO (1993): Identification of the sex pheromone of an ant. *Formica lugubris* (Hymenoptera, Formicidae). – Naturwissenschaften **80**: 30–34.

(Received on 27. VI. 1995)