

Contents

| | |
|---|-----------|
| Abstract | 7 |
| Introduction | 9 |
| Acknowledgements | 11 |
| 1. Materials and methods | 13 |
| 1.1 The data set | 13 |
| 1.1.1 Sampling | 13 |
| 1.1.2 Environmental variables | 16 |
| 1.1.3 Life history variables | 18 |
| 1.1.4 Distributional data | 18 |
| 1.2 Statistical treatments | 20 |
| 1.2.1 Ecological analyses and ecological profiles of species | 20 |
| 1.2.2 Analysis of life history traits | 21 |
| 2. The Mediterranean | 23 |
| 2.1 Brief survey of the geological history | 23 |
| 2.2 Delimitation of the area | 23 |
| 2.3 The climate and soils | 24 |
| 2.4 The phanerogamic vegetation | 25 |
| 3. Ecological groups of species | 29 |
| 3.1 Link between species and biotopes | 29 |
| 3.2 Levels of significance of the environmental variables | 29 |
| 3.3 Ecological groups of species | 31 |
| 3.4 Recurrence of the ecological groups in the Mediterranean | 35 |
| 3.5 Distribution patterns of the species within the ecological groups | 36 |
| 3.6 The ecological groups and the phanerogamic vegetation | 40 |
| 3.7 Co-occurrence of taxa | 40 |
| 3.8 Marker species of groups | 41 |
| 3.9 Constancy of species to individual environmental variables | 42 |
| 4. Life history patterns | 43 |
| 4.1 Significance of the life history variables | 43 |
| 4.2 Species groups sharing similar life history traits | 45 |
| 4.3 Evolution of life history traits | 48 |
| 4.4 Life history patterns and ecological groups | 49 |
| 4.5 Distribution of the life history groups in the Mediterranean | 52 |
| 4.6 Distribution patterns of the species within each life history group | 52 |
| 5. Population and community variations | 55 |
| 5.1 Genetic polymorphism in liverwort populations | 55 |
| 5.2 Community variations | 56 |
| 6. Diversity | 59 |
| 6.1 Areas with high species diversity, or harbouring infrequent species | 59 |
| 6.2 Local and regional diversity | 59 |

| | | |
|------------|---|------------|
| 6.3 | Altitudinal zonation | 60 |
| 6.4 | Phanerogamic vegetation and liverwort diversity | 61 |
| 7. | Distribution | 63 |
| 7.1 | Numerical and taxonomic representation of liverworts in the Mediterranean | 63 |
| 7.2 | The endemic and native Mediterranean species | 64 |
| 7.3 | Mediterranean species with wide distribution patterns | 64 |
| 7.4 | Adjacent zones that may have furnished elements to the liverwort flora | 65 |
| 7.5 | East-west and north-south differences | 66 |
| 7.6 | Island liverwort floras | 67 |
| 7.7 | Biological islands | 69 |
| 7.8 | Similarities between the floras of areas with Mediterranean-type climates | 70 |
| 8. | Summary of observations | 73 |
| 8.1 | Consequences of the past history of the Mediterranean | 73 |
| 8.2 | Composition of the Mediterranean liverwort flora | 74 |
| 8.3 | The genetic structure of liverworts | 75 |
| 8.4 | Liverwort ecology | 75 |
| 8.5 | Life history traits | 75 |
| 8.6 | Diversity and distribution | 76 |
| 8.7 | Floristic similarities to other areas with a Mediterranean-type climate | 76 |
| 8.8 | Community variations | 77 |
| 9. | List of species, their ecology and distribution | 79 |
| 9.1 | Species list | 79 |
| 10. | References | 233 |
| | Annex 1. Species recorded from the Mediterranean but not collected | 237 |
| | Index | 249 |