CONTENTS

INTRODUCTION 7

1. SURVEY OF LITERATURE 10

1.1. Artificial hybridization as a starting point of both earlier and present trends in pine breeding 10

1.2. Artificial hybridization as an example of experimental approach to pine taxonomy 19

1.3. Possibilities of isoenzyme utilization in genetic investigation of forest woody plants 26

1.4. Genetic control of isoenzyme systems in the Scotch pine (*Pinus sylvestris* L.) 29

2. MATERIAL AND METHODS 35

2.1. Artificial hybridization of pines 35

2.2. Karyological analyses of pines 38

2.3. Analysis of immunological properties of pollen and ovule proteins 38

2.4. Analysis of isoenzyme composition of Scotch pine seeds 40

3. RESULTS 45

3.1. Morphological organization of reproductive organs of pines and its changes in the course of development 45

3.2. Artificial hybridization of pines 49

3.3. Relative autofertility and lethal equivalents of individual pine species 67

3.4. Karyological structure of analysed pine species .. 68

3.5. Serological properties of pollen grains and ovules in selected pine species 74

3.6. Isoenzyme polymorphism of selected populations of the Scotch pine (*P. sylvestris* L.) 82

4. DISCUSSION 93
5. SUMMARY 101
References 104
Súhrn 114
Резюме 117