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A contribution to the karyology of *Euphrasia tatrae* WETTST. (*Scrophulariaceae*)

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Abstract: Several populations of *E. tatrae* from the West Carpathians (Slovakia) were analysed karyologically in the paper. The analyses revealed diploidy of the species studied, while the related *E. minima* is a tetraploid species.

Keywords: *Euphrasia tatrae*, karyology, Slovakia

Introduction

In the studies of evolution and taxonomy of selected Slovak *Euphrasia* species (cf. MIKOLÁŠ 1991, 1994) the necessity of their karyological investigation appeared. This contribution gives first karyological data on the species *Euphrasia tatrae* WETTST.

Euphrasia tatrae is a species with interesting distribution the taxonomical value of which is not clear enough. YEO (1979) includes it in the ser. *Parviflorae* WETTST. as *E. minima* JACQ. ex DC. in LAM. et DC. subsp. *tatrae* (WETTST.) HAYEK in HEGI.

The distribution of the species is not known sufficiently as a consequence of common confusion with *E. minima*. Thus an isolated occurrence is given from Krkonoše Mts., Czech Republic, which YEO (1979) evaluates as *E. frigida* PUGSLEY. The occurrence in Southern Carpathian Mts. and Bulgarian Central Stara Planina Mts. (cf. YEO 1979) is also doubtful, probably representing a confusion with *E. minima*. The main occurrence of the species is concentrated in the high West Carpathians from where it reaches the East Carpathians. In the West Carpathians it occurs mainly in the Tatra Mts. and Lower Tatra Mts., and an isolated occurrence is reported from the Malá Fatra Mts. and the Veľká Fatra Mts. (SMEJKAL 1964, KLIMENT et al. 1993), Babia gora Mt. (JASIEWICZ 1967) and several other mountain ranges of Polish West Carpathians (a part of these data may be false, and also the record of Yeo (1979) from the Pieniny Mts. is doubtlessly wrong).

No data on the chromosome number of *E. tatrae* have been published so far. Our data suprisingly revealed that *E. tatrae* is a diploid species. This is the third diploid species from the *E. minima* group (ser. *Latifoliae* PUGSLEY s. JUZEPCZUK 1955) found up to now. Two diploids from this group were described from the Austrian Alps (cf. EHRENDORFER et VITEK 1984, GREILHUBER et al. 1984).

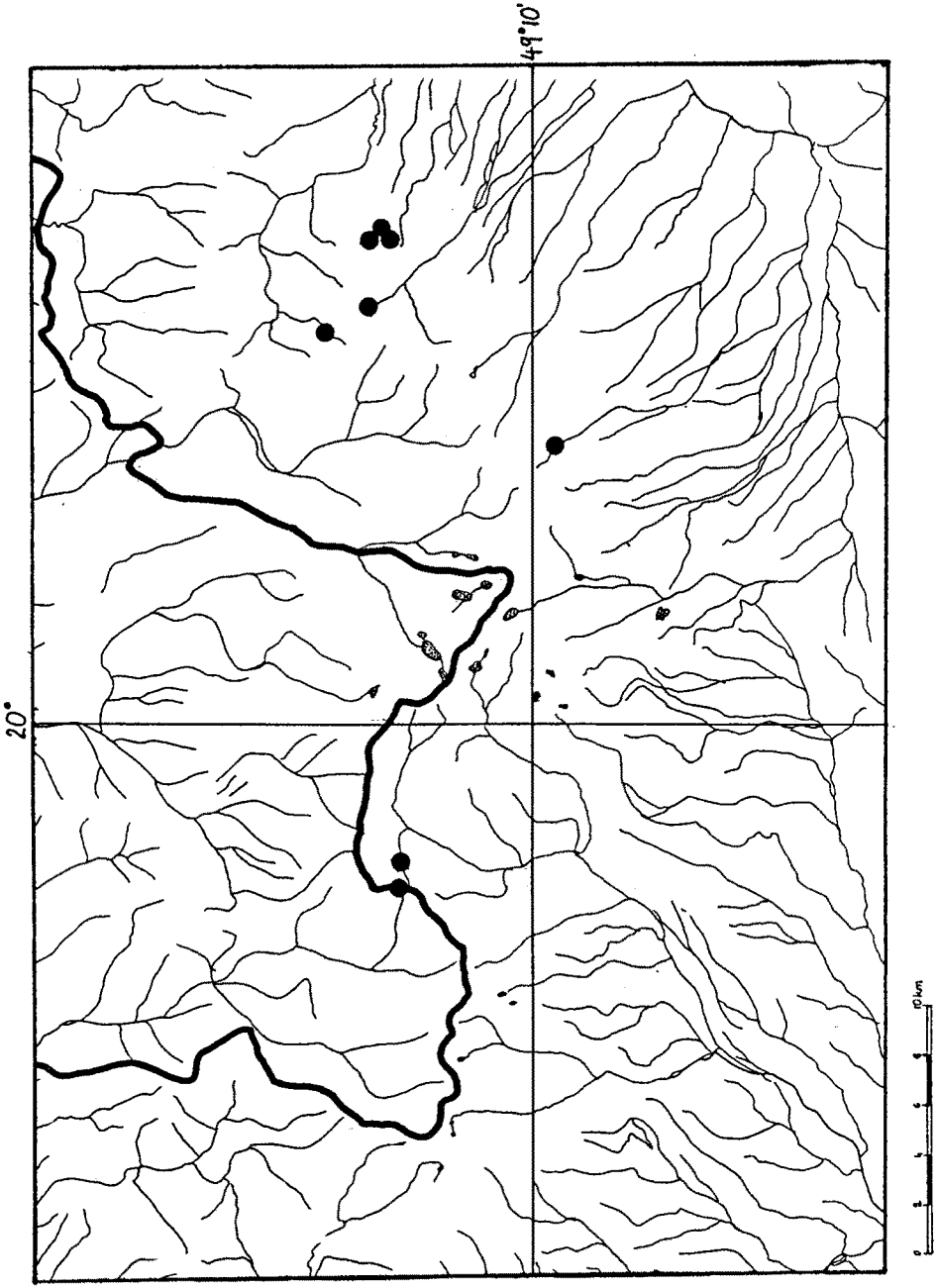


Fig. 1: Map of the karyologically studied localities of *E. tatrae*. (In some cases the point represents more localities which are placed very closely.)

Methods

Euphrasia seeds were sown on wet filter paper in Petri dishes and left in refrigerator at the temperature of 2 - 4 °C until the germs appeared. For the chromosome number analyses root tip meristems were used. As a pretreatment agent saturated water solution of p-dichlorbenzene was employed for 1.5 h, material was fixed in acethic ethanol (3 : 1) for 1 h and stained with Schiff reagent after 8 minute hydrolysis in 60°C warm nHCl. The material was squashed in a drop of 45 % acetic acid under the cover slip.

Results

(Position of karyologically studied localities is given on fig. 1)

Západné Tatry Mts., Podbanské; between Tomanove sedlo pass and Stoly Mt.; 18. 8. 1989, V. Mikoláš pop. 15; KO — 2n = ca. 22

Západné Tatry Mts., Podbanské; Tomanova dolina valley - central part; 23. 8. 1992, V. Mikoláš pop. 1; KO — 2n = 22

Západné Tatry Mts., Podbanské; Tomanova dolina valley - central part; 23. 8. 1992, V. Mikoláš pop. 2; KO — 2n = ca. 22

Vysoké Tatry Mts., Tatranská Polianka; Velická dolina valley, mylonits; 6. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; Skalné vráta Mt., SW slope, Protežka challet; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; Skalné vráta Mt., SW slope , near Protežka challet; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; Skalné vráta Mt., SW slope, in the direction of summit from Protežka challet; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; under the summit of Skalné vráta Mt.; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; under the summit of Skalné vráta Mt.; other pop.; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; above Skalné vráta Mt. in the direction of Bujačí Mt.; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Tatranská Kotlina; between Skalné vráta Mt. and Bujačí Mt.; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Ždiar; Slope of Belanská Kopa Mt.; 7. 9. 1989, V. Mikoláš; KO — 2n = 22

Belanské Tatry Mts., Ždiar; Monkova dolina valley - central part; 9. 9. 1989, V. Mikoláš 2n = 22

Belanské Tatry Mts., Ždiar; Monkova dolina valley - central part; other pop.; 9. 9. 1989, V. Mikoláš 2n = 22

Discussion

The discovery of diploidy in *E. tatrae* opens the possibility of a new interpretation of the tetraploid *E. minima* origin. YEO (1978) speculates that *E. hirtella* JORDAN ex REUTER, or *E. rostkoviana* HAYNE and unknown small-flowered, round-leaved taxon participated at its origin. VITEK (1986) modified this opinion. He considers alpine dwarf forms of *E. hirtella* and *E. alpina* (s. l.) as its parents with further possible introgressive influence of *E. inopinata* EHREND. et VITEK and/or *E. sinuata* VITEK et EHREND. The origin of the species is not, however, univocally proved and considering the diploid character of *E. tatrae*, its participation at the origin of *E. minima* cannot be excluded. *E. tatrae* shows considerable variability the biosystematic evaluation of which is desirable. In the next research modern biosystematic methods should be employed to help in the solution of these questions.

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