

***Hesperis pycnotricha* BORB. et DEG.
Further Diploid Species of the *Hesperis* Section**

Hesperis pycnotricha* BORB. et DEG. další diploidní druh sekce *Hesperis

František Dvořák

Botany Department, J. E. Purkyně University, Kotlářská 2, Brno

Received February 17, 1964

A b s t r a c t — Number of the chromosomes of the species *Hesperis pycnotricha* BORB. et DEG.: $2n = 14$. The taxon is evolutionally an ancient species from the Tertiary period.

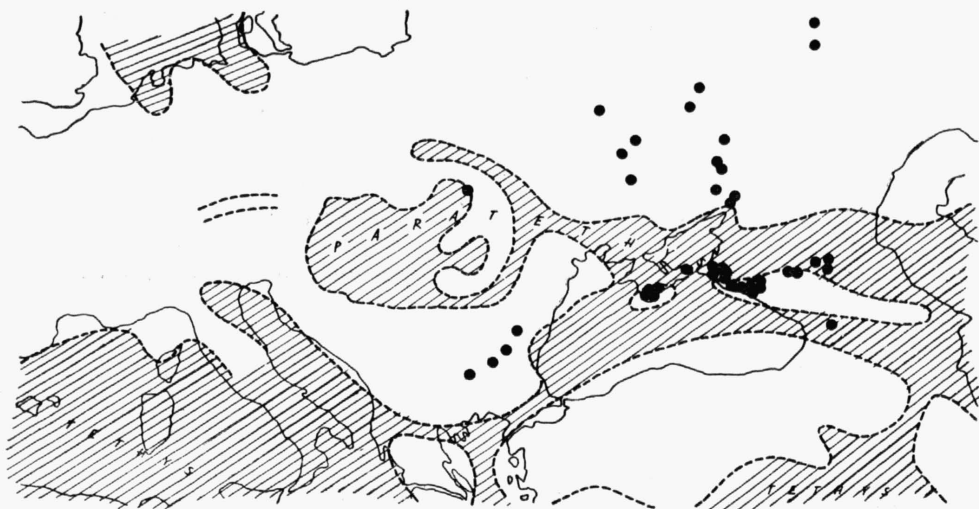
Introduction

The species *Hesperis pycnotricha* BORB. et DEG. in BORB. Magy. Bot. Lap. 2 : 17, 1903 was for a long time associated with the aneuploid *Hesperis matronalis* L. Only BORBÁS and DEGEN correctly discerned, above all by its smaller flowers and a dense indumentum of the plant (including its siliquae) that it is a new species. They fixed the type as follows (2 : 18, 1903): "Exsicc. A. CAL-LIER: Iter tauricum tertium n. 541, sub *H. Steveniana* (non DC.)." As a lecto-type I determined (DVOŘÁK, 1963) the herbarium sheet 144316 BP. Lately this species originating from USSR territory was dealt with by TZVELEV (1959). Remarkable is his (TZVELEV, 150 : 1959) charakterization of the ecology factors: "In contradiction to all formerly given species growing on the forest and highland meadows, *Hesperis pycnotricha* is a plant limited to steppes in lowland and undulated areas." The species reaches its greatest extension on the slopes of the Crimea mountains, where even the Tertiary flora has been preserved.

Remarkable are the localities of this species in the area of the Don forest-steppe, from where or DUBOVÍK (1963) indicates 65 species with disjunct areas. Among the species with disjunct Crimea-Don forest-steppe area he unfortunately does not mention the species *H. pycnotricha* BORB. et DEG. Although in respect to its area it belongs hereto. Remarkable are also DUBOVÍK's (1963) conclusions about the age of this species: "I back the opinion of these scientists who evaluate these species as Tertiary ones." The opinion is also verified by paleogeographic studies (SENEŠ, 1959 and 1961) from which it follows that neither the Crimea mountains nor the localities in the Don forest-steppe were flooded out by Paratethys transgression (see map. 1).

Material and Method

1. Material: Seeds: "Gosudarstvennyj Nikitskij botaničeskij sad". Yalta. Crimea. Herbarium-sheets: "Okresnosti Nikitskogo sada. Opuška dubovo-grabinnikovogo lesa. 30. 5. 1958 ASTA-CHOVA". 411596—411600 BRNU.



Map. 1. — A paleogeographic map of the upper Torton (according to SENEŠ, 1961) with the actual localities of the species *Hesperis pycnotricha* BORB. et DEG. in the southern part of the area. Del. by DVOŘÁK.

2. Method: I used root tips; fixation (3 parts of 96% C_2H_5OH : 1 part of CH_3COOH) for 10 minutes; maceration (1 part of 37% HCl : 1 part of 96% C_2H_5OH) for 10 minutes; rinsing with water for 10 minutes; staining by acetocarmine; M e o p t a microscope (of $1/12$ in oil-immersion obj., oc. $15\times$); Microphotographie: obj. $100\times$, oc. FU 6,3.

Results

Number of the chromosomes: $2n = 14$ (Plate XIII).

A diploid number of chromosomes was also shown by the comparison of the size of pollen grains of the so far known diploid species with the polyploid ones (see Table 1).

Comparison of the weight of the seeds:

<i>Hesperis matronalis</i> L.	100 seeds	0.26 g
<i>Hesperis pycnotricha</i> BORB. et DEG.	100 seeds	0.12 g

Hesperis pycnotricha BORB. et DEG. is with regard to evolution relatively more ancient than for inst. the polyploid *Hesperis matronalis* L. The karyological study, as will be explained in another work, shows that it is one of the species that gave rise to *Hesperis matronalis*.

The classification of *Hesperis pycnotricha* BORB. et DEG. into a system:
 Genus: *Hesperis* L. SECTIO: *Hesperis*. Series: *Matronales* TZVEL. Mat. Gerb. Inst. 19 : 145, 1959. Subseries: *Diploideae* subser. nova. Diagnosis: Chromosomorum numerus $2n = 14$.

So far the following species of the series *Matronales* are known: *Hesperis sibirica* L. (SOKOLOVSKAJA and STRELKOVA, 1948); *Hesperis sylvestris* CRANTZ (DVOŘÁK, 1964); *Hesperis pycnotricha* BORB. et DEG.; *Hesperis steveniana* DC. (DVOŘÁK, in the press). From this I conclude that all the diploid species of the section *Hesperis*, known so far, developed gradually from the Tertiary period on parts of the area of the supposed primary type of the section *Hesperis*. The

Table 1

Taxa	Chromosomes 2n	Pollen grains:				Herbarium sheets
		Length		Breadth		
		$\bar{x} \pm 3 \cdot s\bar{x}$	$\pm s$	$\bar{x} \pm 3 \cdot s\bar{x}$	$\pm s$	
<i>Hesperis sibirica</i> L.	14 SOKOLOVSKAJA and STRELKOVA 1948	$24,48 \mu \pm 3 \cdot 0,146 \mu$	$\pm 1,460 \mu$	$22,48 \mu \pm 3 \cdot 0,081 \mu$	$\pm 0,810 \mu$	411014—411016 BRNU; 411021 BRNU
<i>Hesperis sylvestris</i> CRANTZ	14 DVOŘÁK 1964	$25,39 \mu \pm 3 \cdot 0,116 \mu$	$\pm 1,160 \mu$	$21,37 \mu \pm 3 \cdot 0,132 \mu$	$\pm 1,321 \mu$	258184 BRNU; 72483 BRNU; 402795 BRNU; 50450 BRNU
<i>Hesperis pycnotri- cha</i> BOBB. et DEG.	14	$24,27 \mu \pm 3 \cdot 0,143 \mu$	$\pm 1,014 \mu$	$23,74 \mu \pm 3 \cdot 0,096 \mu$	$\pm 0,777 \mu$	411599 BRNU
<i>Hesperis matrona- lis</i> L.	24 MANTON 1932; LÖVE Á. LÖVE D. 1956 et 1961; DVOŘÁK 1964	$35,45 \mu \pm 3 \cdot 0,118 \mu$	$\pm 1,184 \mu$	$28,12 \mu \pm 3 \cdot 0,135 \mu$	$\pm 1,348 \mu$	35686 BRNU; 15081 BRNU

view is backed by the fact that *Hesperis sibirica* L. reaches by its habitat as far as the area, where for inst. BABCOCK (1948) or KRYSHTOFOVICH (1948) place the origin of the *Angiospermous*.

Shrnutí

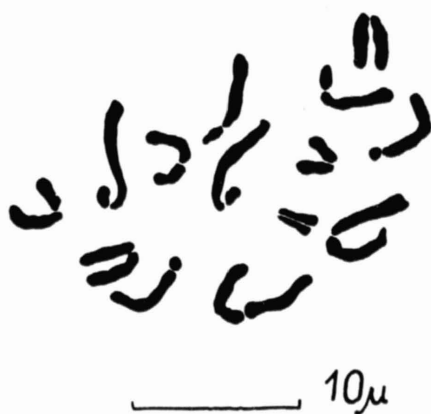
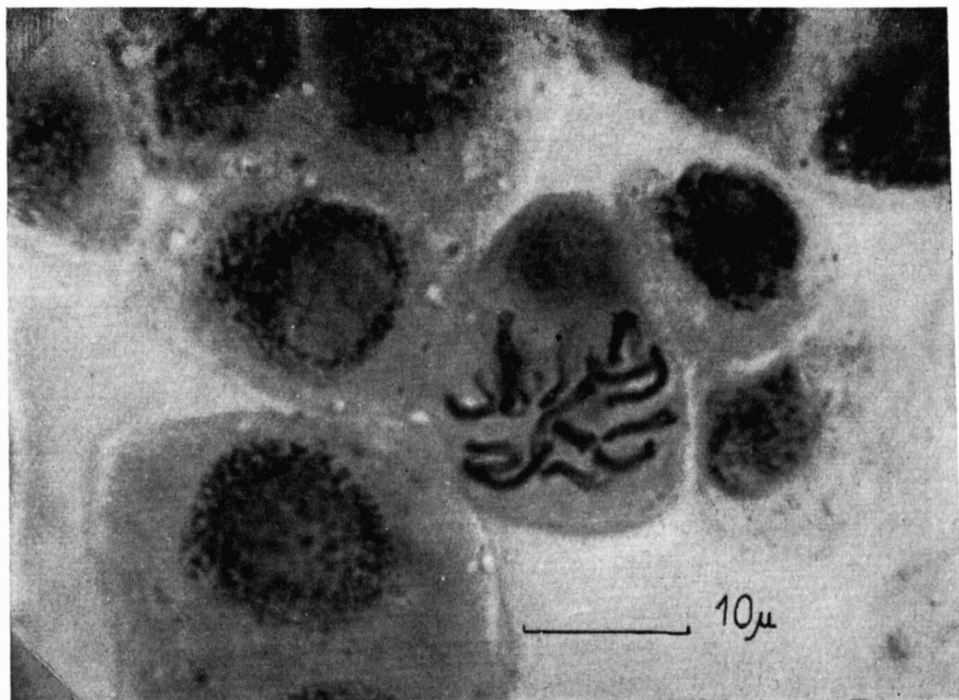
Počet chromosomů u druhu *Hesperis pycnotricha* BORB. et DEG.: $2n = 14$. Zařazují jej do nově vystavené subseries *Diploideae*. Usuzují, že dosud známé diploidní druhy sekce *Hesperis* se pozvolna vyvíjely na částech areálu předpokládaného pratypu této sekce.

References

- BORBÁS V. (1902—1903): Hazánk meg a Balkán Hesperis-egyeseindendö. — *Magy. bot. Lap.*, Budapest, 1 : 161, 196—204, 229—237, 261—272, 304—313, 344—348 et 369—380; 2 : 12—23.
- DUBOVÍK O. M. (1963): Naris flori Doněckovo lisostěpu I. Zagalna charakteristika flori i diz'junkcii arealiv roslin. — *Ukrainsk. bot. Ž.*, Kiiv, 20 (6) : 63—73.
- DVOŘÁK F. (1963): *Hesperis pycnotricha* BORB. et DEG. v ČSSR. — *Biológia*, Bratislava, 18 : 527—530.
- (1964): Taxonomic results of the studies on the chromosome numbers in the genus *Hesperis* L. *Preslia*, Praha, 36 : 178—184.
- (in the press): *Hesperis steveniana* Dc. $2n = 14$
- KRYSHTOFOVICH (KRISTOFOVIČ) A. N. (1946): Evoljucia rastitělnogo pokrova v geologičeskom prošlom i jejo osnovnyje faktory. — in KOMAROV V. L. [red.]: *Mat. Inst. Fl. Rast. SSSR*, Moskva et Leningrad, 2 : 21—86.
- LÖVE Á. et LÖVE D. (1956): Cytotaxonomical conspectus of the Icelandic flora. — *Acta Hort. gotoburgensis*, Göteborg, 20 (4) : 65—291.
- (1961): Chromosome numbers of Central and Northwest European plant species. — *Opera bot.*, Lund, 5 : 1—581.
- MANTON I. (1932): Introduction to the general cytology of the Cruciferae. — *Ann. Bot.*, London, 46 : 509—556.
- SENEŠ J. (1959): Súčasné znalosti o paleogeografii centrálnej Paratetydy. — *Geologické Práce*, Bratislava, 55 : 83—108.
- (1961): Paläogeographie des westkarpatischen Raumes in Beziehung zur übrigen Paratethys im Miozän. — *Geologické Práce*, Bratislava, 60 : 159—195.
- SOKOLOVSKAJA A. P. et STRELKOVA O. S. (1948): Geologičeskoje raspredělenije poliploidov 2. Ispredovanije flory Altaja. — *Učonyje zapiski*, ser. *biol. Nauk*, Leningrad, 66 : 179—193.
- TZVELEV N. N. (1959): Rod *Hesperis* v SSSR. — *Bot. Mat. Gerb. Inst.*, Moskva et Leningrad, 19 : 114—155.

Explanations of the plate:

Tab. XIII.: The chromosomes of the species *Hesperis pycnotricha* BORB. et DEG. Microphoto by A m b r o ž. Del. by D v o ř á k.



F. Dvořák: *Hesperis pycnotricha* BORB. et DEG. Further Diploid Species of the *Hesperis* Section