Acta Bot. Neerl. 24 (5–6), October-December 1975, p. 417–420.

POLYPLOIDY IN COTONEASTER II

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1. INTRODUCTION

A study of SAX (1954) involving 59 species and cultivars of *Cotoneaster* showed that 43 were triploid, among them 24 species. As the number of triploids found by Sax was strikingly large, ZEILINGA (1964) also carried out an investigation on the chromosome number in this genus, particularly in species and cultivars under cultivation. Among the 58 origins investigated, only 2 triploids were encountered, both cultivars. By contrast all species were diploid (2n = 34) or tetraploid (2n = 68). Complementary to Zeilinga's investigation, chromosome counts were made in species which are generally not in cultivation. This paper reports the results.

2. MATERIAL AND METHODS

Seeds of various species were obtained from botanic gardens and sown out. The resulting plants, mostly 5 per seed stock, were morphologically studied for 5 seasons and identified. For the determinations use was made of the descriptions of KLOTZ (1957, 1963a, b and c) and the classification of the genus of FLINCK & HYLMÖ (1966). From those plants that could be properly identified cuttings were taken which were rooted under mist. Root tips were fixed in 1 : 3 acetic alcohol and stained with acetic orcein. In the herbarium of the IVT pressed material of the plants of which the chromosome number was determined is present.

3. RESULTS AND DISCUSSION

The examined seed stocks and the chromosome numbers determined in the material are shown in *table 1*. This table also includes the chromosome counts of Sax on the species involved. The 47 investigated seed stocks represent 28 species, of which 3 were diploid, 3 triploid and 23 tetraploid. From this it appears, as was also found by ZEILINGA (1964), that *Cotoneaster* species are preponderantly tetraploid, only a small number being diploid.

In most species the established ploidy level differs from that found by Sax, probably because Sax determined the chromosome number on the basis of meiotic material, which, as a result of the occurrence of multivalents, may present difficulties.

In *C. integerrimus* two ploidy levels were found: two seed stocks were diploid and two tetraploid. In *C. microphyllus* three seed stocks were identified as tetra-

Table 1.

IVT no	species	received as	origin (hortus)	Kroon	Sax
65265	*C. acutifolius* Turcz.	*C. acutifolius*	Poznań	68	diploid
65253	*C. affinis* Lindley	*C. affinis*	Copenhagen	68	–
64016	*C. allochrous* Pojarkova	*C. allochrous*	Leningrad	68	–
65268	*C. apiculatus* Rehder et Wilson	*C. apiculatus*	Poznań	68	triploid
65036	*C. bacillaris* Wallich ex Ldl.	*C. affinis bacillaris*	Geneva	51	tetraploid
64007	*C. bullatus* Boiss.	*C. moupinensis*	Berlin, Humboldt Univ.	68	triploid
64012	*C. bullatus* Boiss.	*C. bullatus floribundus*	R.H.S. Gardens, Wisley	68	triploid
64031	*C. bullatus* Boiss.	*C. bullatus macrophyllus*	Edinburgh	68	triploid
64017	*C. cinerascens* (Rehder) Flinck et Hylmö	*C. cinerascens*	Uppsala	68	diploid
64010	*C. conspicuus* Comber ex Marquand	*C. conspicuus decorus*	R.H.S. Gardens, Wisley	34	diploid
65010	*C. conspicuus* Marquand	*C. microphyllus*	Antwerp	34	triploid
65017	*C. dielsianus* Pritzel	*C. dielsianus elegans*	Szeged	68	triploid
65212	*C. dielsianus* Pritzel	*C. turbinatus*	Vácrátót	68	–
65016	*C. foveolatus* Rehder et Wilson	*C. foveolatus*	Szeged	34	diploid
65081	*C. glabratus* Rehder et Wilson	*C. glabratus*	Rostock	68	–
65270	*C. ignavus* E. Wolf	*C. ignavus*	Tashkent	68	triploid
64092	*C. integerrimus* Med.	*C. integerrimus*	Vienna	68	triploid
64088	*C. integerrimus* Med.	*C. integerrimus*	Lund	68	triploid
65099	*C. integerrimus* Med.	*C. integerrimus*	Neufchatel	34	triploid
65058	*C. integerrimus* Med.	*C. integerrimus*	Dyon	34	triploid
64013	*C. karatovicus* Pojarkova	*C. karatovicus*	Leningrad	68	–
65321	*C. melanocarpus* Lodd.	*C. melanocarpus*	Odessa	68	tetraploid

65190	*C. melanocarpus* Lodd.	*C. melanocarpus*	Rostov	68	tetraploid
65228	*C. melanocarpus* Lodd.	*C. melanocarpus*	Boekarest	68	–
65276	*C.* × *melanocarpus* Lodd.	*C. melanocarpus*	Tashkent	51/68	–
64078	*C. microphyllus* Wallich	*C. microphyllus*	Amsterdam V.U.	68	diploid
65053	*C. microphyllus* Wallich	*C. microphyllus*	Ghent	68	diploid
64071	*C. microphyllus* Wallich	*C. microphyllus*	Leiden	68	diploid
65248	*C.* × *microphyllus* Wallich	*C. microphyllus*	Copenhagen	51/68	–
65107	*C.* × *microphyllus* Wallich	*C. microphyllus*	Strasbourg	51/68	–
64057	*C. moupinensis* Franchet	*C. moupinensis*	Berlin-Dahlem	68	triploid
65128	*C. multiflorus* Bunge	*C. multiflorus*	Greifswald	51	tetraploid
65133	*C. multiflorus* Bunge	*C. multiflorus*	Berlin	51	tetraploid
65181	*C. multiflorus* Bunge	*C. multiflorus*	Novy Drur	51	tetraploid
65203	*C. nitens* Rehder et Wilson	*C. nitens*	Zagreb	68	triploid
65026	*C. nitidus* Jacques	*C. hookeri*	Manchester	68	–
64029	*C. nitidus* Jacques	*C. distichus parvifolius*	Edinburgh	68	–
65102	*C. nitidus* Jacques	*C. fontanesii*	Palermo	68	–
65050	*C. nitidus* Jacques	*C. apiculatus*	Geisenheim	68	–
65018	*C. prostratus* Baker	*C. buxifolius*	Szeged	68	–
65061	*C. prostratus* Baker	*C. buxifolius*	Dresden	68	–
65322	*C. racemiflorus* K. Koch	*C. denticulatus*	Odessa	68	–
64084	*C. roseus* Edgeworth	*C. roseus*	Göttingen	68	triploid
65111	*C. rugosus* Pritzel	*C. henryanus*	Slepčany	68	triploid
64048	*C. sikangensis* Flinck et Hylmö	*C. sikangensis*	Uppsala	51	–
65096	*C. splendens* Flinck et Hylmö	*C. reticulatus*	Århus	68	–
64055	*C. sylvestri* Pampanini	*C. hupehensis*	Berlin-Dahlem	68	–

ploid; in two other seed stocks a few triploids were found. These triploids had probably arisen from a cross with *C. conspicuus*. In *C. melanocarpus* three seed stocks were determined as tetraploid; in another seed stock some hybrids with 51 chromosome were encountered.

In our experiments, only *C. conspicuus*, *C. karatovicus*, *C. lucidus*, *C. racemiflorus*, *C. melanocarpus* and *C. microphyllus* were rather heterogeneous. In the first four species no interspecific hybridization occurred. In *C. melanocarpus* and *C. microphyllus* interspecific hybrids were found as stated. The investigated populations of other species were all very uniform. In at least part of these species the uniformity may be due to apomictic seed development. The occurrence of apomixis in *Cotoneaster* has been established by HJELMQVIST (1962). From practice too it is known that a number of species, such as *C. horizontalis*, give highly uniform progenies, probably as a result of apomixis. By contrast other species appear to hybridize readily. This is in agreement with the situation in *Rosa canina* where apomixis occurs facultatively in varying degrees (KROON & ZEILINGA 1974) and numerous microspecies can be distinguished as a result of apomictic seed development.

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