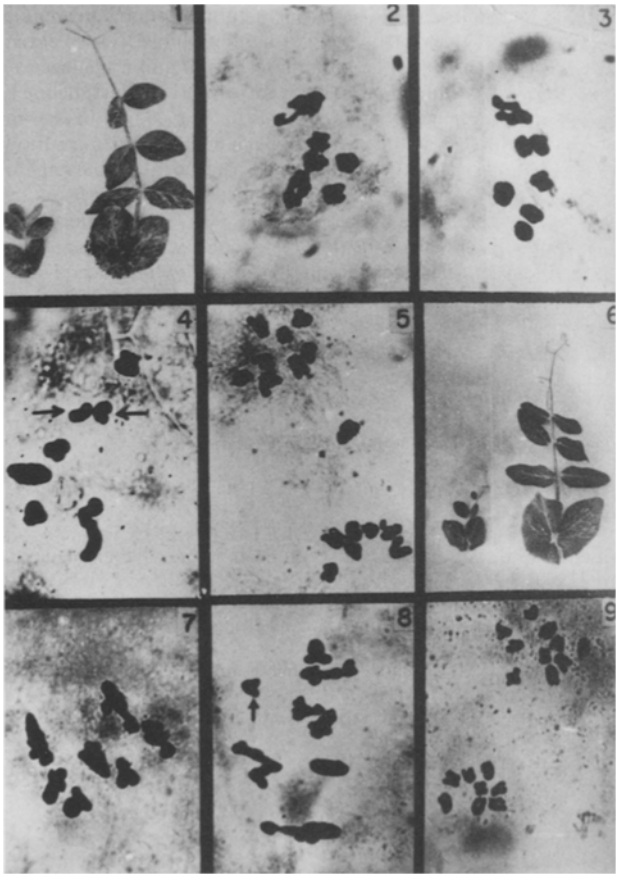

the detrimental effect of the extra chromosomes and the narrow tolerance limit. Studies[8] on pea aneuploids indicate that even the addition of one chromosome causes high imbalance leading to reduction in viability. The resultant effect of the extra chromosomes and their tolerance limits varies in different species, as is evident from the literature[7].

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Figure 1. Leaf; tetrasomy (left) and control (right) of pea. Figures 2–5. Meiotic stages of tetrasomy. Figure 2. Metaphase I, 1IV+4II (× 850). Figure 3. Metaphase I, 1IV+6II (× 850). Figure 4. Metaphase I, 2IV+3II+2I (univalents arrowed) (× 1050). Figure 5. Anaphase I, 8 and 7 disjunction with one laggard (× 950). Figure 6. Leaf, quadruple trisomy (left) and control (right). Figures 7–9. Meiotic stages of quadruple trisomy. Figure 7. Metaphase I, 4III+3II (× 1000). Figure 8. Metaphase I, 3III+4II+1I (univalent arrowed) (× 1000). Figure 9. Anaphase I, 10 and 8 disjunction (× 850).

Hyper-tetraploids in pea

H. Kumar[1] and V.C. Mercykutty[2]

Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005 (India),
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Summary. Cytomorphologically, five hypertetraploids; three hexasomic (4n+2 = 30), one double pentasomic (4n+1+1 = 30) and one multiple aneuploid tetraploid (4n+2+1+1+1 = 33), where isolated in the C_3 generation of pea autotetraploids. Plants with 30 chromosomes were morphologically very distinct from their euploids and characterized by variation in plant height and morphology of leaves. Hexasomic and double pentasomic tetraploids were characterized by the presence of a hexavalent and two pentavalents, respectively. The multiple aneuploid tetraploid showed very vigorous growth and varying frequencies of hexavalents and pentavalents. All the five aneuploids showed high Anaphase-I anomalies; pollen sterility ranged from 50% to 81%.
Key words. Pisum sativum; pea hypertetraploids; hexasomic tetraploids; double pentasomics; anaphase I-abnormalities.

Aneuploids constitute an apparently inescapable component of tetraploid populations and as such exert a negative influence on the productivity of tetraploids. Although the behavior of tetraploid aneuploids has been studied in a wide range of crops, like rye, barley, maize, etc.[3–7] such information for peas is very preliminary[8,9]. The present communication deals with the cytomorphological behavior of certain hypertetraploids in the pea (*Pisum sativum* L.) isolated in the self and F_2 progenies of C_3 generation autotetraploids which were induced through colchicine treatment of the diploid seeds of four cultivars[10], namely, T163 (a local cultivar), 68C (Dr W. Gottschalk, West Germany), 5064-S (a normal plant selection from the progeny of a chlorophyll mutant, L-5064 of Dr S. Blixt, Sweden) ad PI280064 (Dr A.E. Slinkard, Canada).

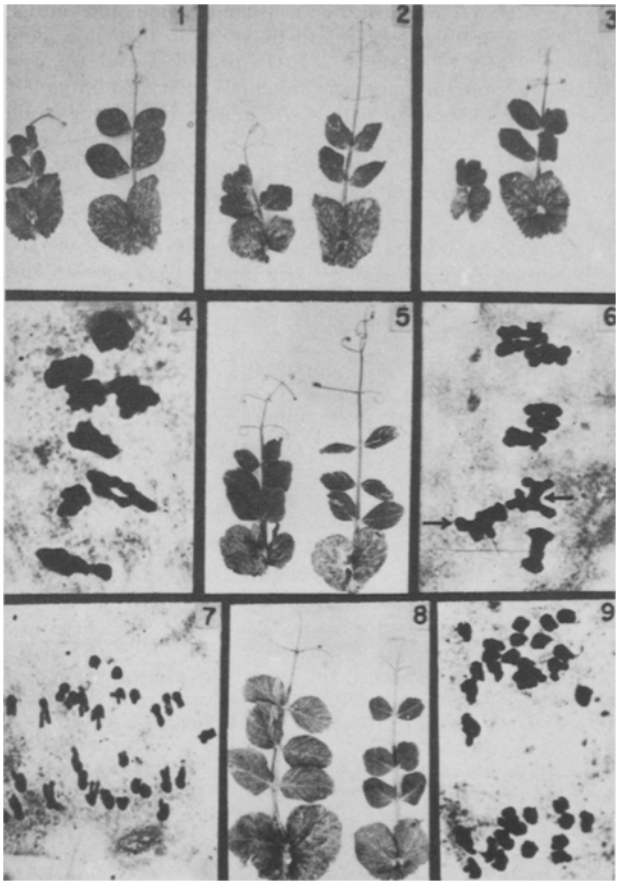
A total of 212 out of 3423 plants (6.19%) were morphologically distinct; this group consisted of plants of varying chromosome numbers, such as 26 and 27 (1.49%), 29 (3.62%), 30 (1.05%) and 33 (0.03%). None of the morphologically distinct plant was normal euploid (4n = 28). Four out of 36 plants (11.1%) which had 30 chromosomes (three hexasomics, one double pentasomic) and a lone multiple (4n = 33) aneuploid tetraploid were cytomorphologically analyzed (figs 1–9) as follows.

Hexasomic tetraploids (4n+2 = 30):

a) L282-1: It was a dwarf, thick and hardy in nature. The blades of the stipules and leaflets were wrinkled, with an irregular shape. It flowered earlier by 10 days.

b) L81-4: It was weak and a semi-dwarf, with a thin stem. Total leaf-length was reduced, with a compact arrangement of round stipule and leaflets.

c) L157-3: This plant was a dwarf with a thick and hardy stem.



Figures 1–3. Leaves of three hexasomic tetraploids (left) and corresponding controls (right) of pea. Figure 1. L282-1. Figure 2. L81-4. Figure 3. L157-3. Figure 4. Metaphase I of hexasomic tetraploid showing 7IV+1II (× 1000). Figures 5, 6. Leaf and metaphase I of double pentasomic tetraploid of pea. Figure 5. L136-3 (left) and control (right). Figure 6. Metaphase I, 2V+5IV (pentavalents arrowed) (× 1000). Figure 7. Anaphase I, 15 and 15 disjunction (× 600). Figures 8, 9. Leaf and anaphase I of multiple aneuploid tetraploid in pea. Figure 8. L266-15 (left) and control (right) (× 600). Figure 9. Anaphase I, 19 and 14 disjunction (× 800).

Internodal length, total leaf length and tendrils were highly reduced. Leaflets were clustered. Stipule and leaflets were small in size.

The double pentasomic tetraploid (L136-3, 4n+1+1 = 30) was a dwarf with a thick stem, highly reduced internode and poor vegetative growth. The round stipule and the leaflets were compactly arranged. The plant flowered earlier by 13 days.

The multiple aneuploid tetraploid (L266-15, 4n+2+1+1+1 = 33) was characterized by its thick stem, very vigorous growth with highly increased size of leaflets and stipules and late flowering by 30 days.

Cytologically the hexasomic tetraploids were characterized by the presence of a hexavalent (average ranged from 0.07 to 0.30 per cell) and a high frequency of cells with 7IV+1II. These hexasomic tetraploids did not show much variation with respect to chromosome configurations at metaphase I (MI).

Anaphase I (AI) abnormality was high, amounting to 80% in L81-4 and L157-3 as compared to about 50% in L282-1 and the euploids. While in the double pentasomic tetraploid about 10% of the cells showed 2V+5IV configuration at MI; AI abnormality was observed in about 70% of the cells. In the multiple aneuploid tetraploid, besides quadrivalents, trivalents, bivalents and univalents, cells with a hexavalent (0.50%) and pentavalents (2%) were also noted at MI, suggesting the presence of aneuploidy for different linkage groups. AT AI, 90 of the cells had abnormal separation. Pollen fertility in these hyperploid tetraploids ranged from 19 to 50%; remarkably, none of them produced any seed, which suggests a lack of correlation between pollen fertility, as judged from the stainability of pollen grains, and seed set.

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Eosinophilic granulocyte deficiency in mice mutant in *sl* and *w* loci

W. Wiktor-Jedrzejczak and M. Ratajczak[1]

Department of Immunology, Postgraduate Medical Center, CKP WAM, ul. Szaserów 128, 00–909 Warsaw (Poland), 2 August 1984

Summary. Homozygous *Sl/Sl* and W^v/W^v mice were found to have approximately 15% of the normal number of circulating eosinophils. Furthermore, these mice exhibited reduced numbers of eosinophilic granulocytes in the bone marrow, spleen and thymus as compared to littermate control normal mice.
Key words. *Sl* mutation; *W* mutation; eosinophils.

The expression of the semidominant mutations of *sl* and *w* genes of mice result in a number of effects on hemopoiesis, germ cells and neural crest melanocytes[2]. Differences exist between these various mutant alleles with regard to the resulting abnormalities[2]. However, in all these mutants hemopoiesis is affected markedly[3]. Deficiences of mast cells[4,5], erythrocytes[3], neutrophils[6,7], megakaryocytes[7,8], and lymphocytes[9] have been described. However, no studies of eosinophilic granulocytes in these mice have been reported to date. Additional interest in the possible effects of *w* and *sl* loci on eosinophilic granulocytes arises from the possibility of the existence of an independent origin of this cell line from the stem cell compartment[10].

Materials and methods (WC × WC Swiss F_1) BC_1 mice were bred as previously described[11] and were of the following genotypes: +/+, *Sl*/+ and *Sl/Sl* in *sl* locus. W^v/W^v mice were bred similarly using the backcross method[11]. Briefly, C57Bl/6-W^v/+ mice were