

4. Cytological studies in a progeny of autotetraploid *Chionachne koenigii*.

Meiosis in autotetraploid *Chionachne koenigii* ($4n=40$) was reported earlier (MNL 41:6-7, 1967). The seed setting was very poor in the tetraploid and from the few good seeds obtained a progeny of 27 plants was raised in June, 1968. Cytological studies showed that all 27 plants had a tetraploid chromosome number ($4n=40$) and behaviour. The tetraploids and diploids grew almost to the same height, but in tetraploids the male and female spikelets and the inflated spathe enclosing half the inflorescence are larger in size than in diploids. The tetraploids generally have leaves which are pale green in colour.

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5. Annual and perennial habit in *Chionachne koenigii*.

Weatherwax (1926) described *Chionachne koenigii* under the name *Polytoca barbata* as a tall, slender annual grass with no tendency to perennate. Nirodi (1955) described *C. koenigii* as an erect grass with a perennial stem. In the collections maintained at the Experimental Farm, there are two populations of *C. koenigii*, one raised from the seed obtained from Maharashtra (Type 1) and the other raised by transplanting young plants got from Andhra Pradesh (Type 2). Externally the two types differ in a few noticeable features. Type 1 under cultivation is a vigorous, often aggressive, annual grass with thick culms and broad light-green leaves, on both surfaces of which and on the leaf sheath are somewhat stiff hairs. These plants produce abundant fertile seed. However, when plants of this type occur as weeds on the field embankments they are small and produce only a few seeds. The plants of Type 1 die soon after seed production. Type 2 is a perennial grass with a small woody root stock, thin culms and narrow dark-green leaves devoid of conspicuous hairs. The plants of this type also produce fertile seeds and perpetuate through the root stock putting forth several new shoots, which will be in various stages of development and some of which will not flower till the following year. Both types have a chromosome number of $2n=20$. The tetraploid ($4n=40$) plants of Type 1 obtained through colchicine treatment also

produced some seeds but died soon after. Type 2, in the place where it was collected, seems to propagate mainly through the perennial root stock as the same clumps are usually seen year after year although small plants developed from seeds also could be found, in the rainy season, scattered nearby and competing with other plants in the area for survival and growth. The ability of these young plants to become established and to perennate perhaps depends on the chance availability of conditions ideal for the purpose. Otherwise, they remain restricted in growth, produce a few seeds, and perish. Once they get established, they perennate. It may be concluded that in C. koenigii different types with variation in habit exist, reproducing either entirely by seed (annual) or by both vegetative and sexual means (perennial).

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1. Complementation between some colorless recessive mutations obtained from I and C.

We have isolated 3 i mutants (from I) and 9 c mutants (from C) all of which breed recessive to C and in homozygous condition yield only colorless kernels. All these mutants were reciprocally crossed to test for complementation. Extensive complementation was noted in i-3 x c-6, i.e., the majority of the kernels were partially pigmented. Slight complementation was also noted in i-3 x c-2 and i-3 x c-8. All other combinations were completely colorless. The data are summarized in Table 1.

The response of these mutants to Bh (Blotched) is variable. The observations are noted in Table 2. Only i-3, c-2, c-6 and to a slight extent c-9 gave a blotched expression. i-1 and c-1 gave completely colored kernels. All other mutants gave only colorless kernels. The significance of these observations is not clear.