also, increased asynchrony in the meiotic cell division in the inbred lines may be explained in a similar way. However, the effect of the genotypes, apparently, is more pronounced here.

The inbred lines of radish used in the present study must be highly homozygous since they are inbred for more than ten successive generations and, therefore, must have reached the stage called 'inbreeding minimum'. Our results clearly demonstrate that the chromosome behaviour in heterozygotes (original population and F_1 interlinear hybrids) is definitely more efficient than in the homozygotes (inbred lines). This may well be related with the genetically balanced condition of the original population and the F_1 hybrids. No doubt, the genetic balance of the original population has been built up by natural selection during the course of evolution. The normal chromosome behaviour of the interlinear hybrids may be attributed to the return of heterozygosity in them as a result of hybridization.

The superiority of the F_1 hybrids is not only confined to their demonstrating fewer types of chromosomal abnormalities. They also demonstrate superiority in the expressivity and the penetrance of genes which is much lower in them than in the inbred lines. It is significant that while in the inbred lines chromosomal abnormalities considerably reduce the pollen fertility, it has almost no effect in the hybrids.

Inbreeding depression and heterosis in chromosome behaviour have been reported in rye and maize[9-12]. The extent to which these phenomena are universal can only be tested by extending a similar investigation to other plant species. This has been done here in radish, an important vegetable crop plant, which has so far not received the proper attention of cytogeneticists. My results clearly demonstrate inbreeding depression and heterosis in chromosome behaviour of radish.

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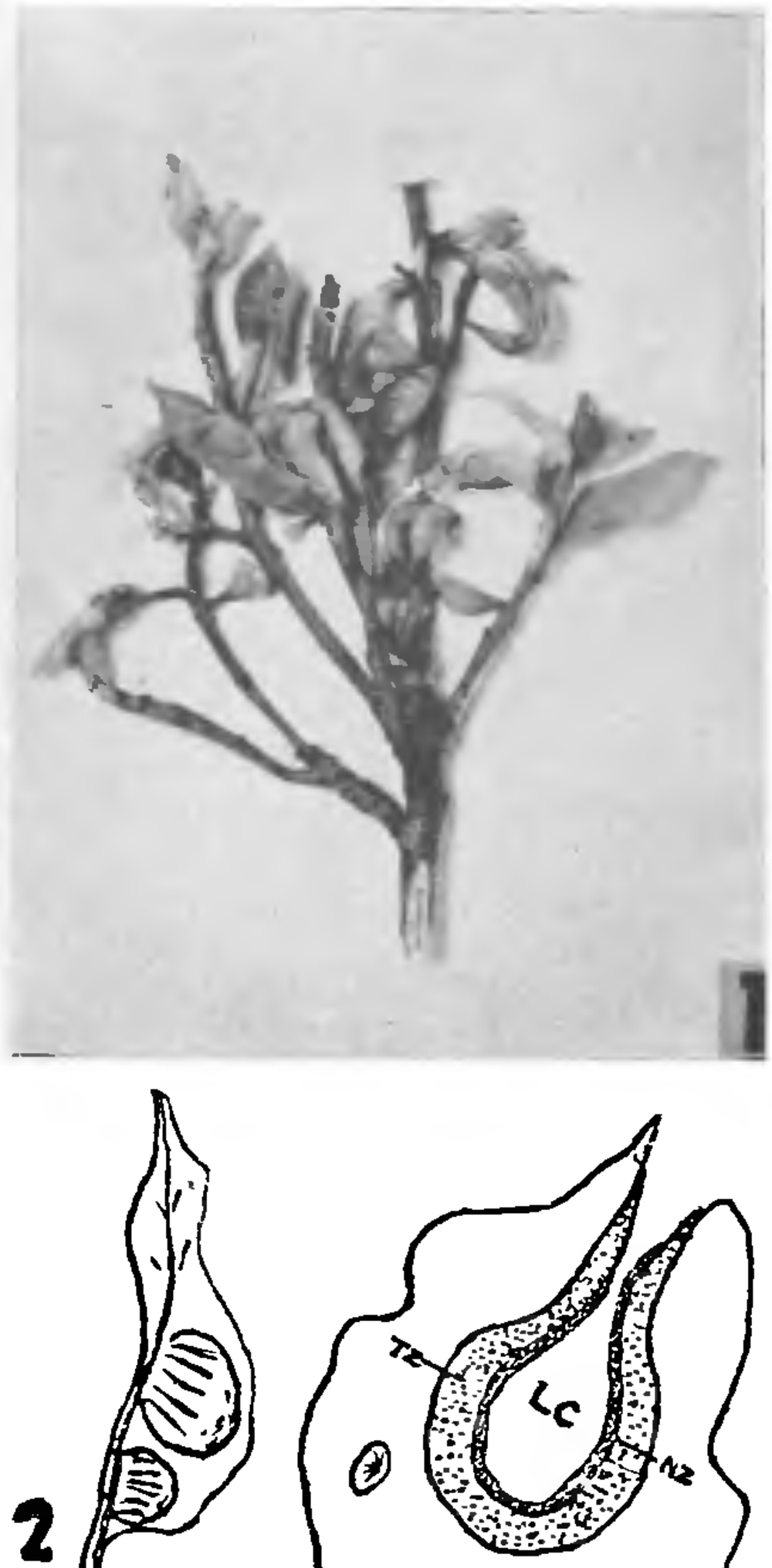
LEAF GALLS ON *SYMPLOCOS SPICATA* ROXB. (SYMPLOCOCEAE) CAUSED BY *TRIOZA* SP. (HOMOPTERA: PSYLLIDAE)

GALL formation in Symplococeae appears restricted to *Symplocos theaefolia* D.Don., on which Mani[1] has recorded globose bud galls and subglobose rinden galls on leaves by two cecidogenous psyllids—*Cecidotrioza baccarum* Kieff., and *Ozotrioza styracearum* Kieff., respectively, in addition to the stem galls induced by *Contarinia pulcherrima* (Kieff.) (Diptera), with distribution in eastern Himalayas.

Leaf galls on *Symplocos spicata* induced by a species of *Trioza* (Fig. 1) were collected at the Botanical Survey of India Orchidarium, Yercaud Hills (1,500 m). The hypophyllous leaf galls (Fig. 2) restricted to the region of the midrib are pale green in colour, hard and fleshy with an ovate outline (Fig. 3) in transverse sections. In a number of instances, 2–4 globular galls (Fig. 1) appear agglomerated on a single leaf, each harbouring a nymph. Occasionally, the entire leaf may be galled due to action of 8–10 nymphs. The galls appear as fold galls with nymphs feeding *extra-tissulaire*[2]. The laminar halves of the leaves function as the gall chamber with the nymph(s) feeding at the adaxial epidermal region. Transverse sections of the galls revealed 25–30 layers of closely packed parenchyma cells with dense cytoplasm and prominent nucleus with gradual decrease in size towards the centrally placed larval chamber. In mature galls, the larval chamber is bordered by the remnants of the nutritive zone, and a few layers of parenchyma cells adjoining the larval chamber exhibit tannin contents. With the development of the laminae constituting the gall, the gall has a wide ostiole (3–4 mm dia). However, it has been observed that the nymphs emerge as adults by making exit holes in the midrib region towards the abaxial epidermis of the galled leaf.

Galls with externally placed larvae are unusual among the psyllid cecidia, though a few have

been known as roll galls[3] and pit galls[4]. Histology of mature galls of *Symplocos* presents a cecidogenetic picture[5] involving the inhibition of development and normal differentiation, phenomenon of hypertrophy and adaptive phenomena of the development of nutritive zone and vascular irrigation.



FIGS. 1–3. Fig. 1. Galls of *Symplocos spicata* by *Trioza* sp; Fig. 2. One leaf showing the agglomeration of galls along the midrib regions (× 2); Fig. 3. Transverse section of the gall (× 12). (TZ, Tanniniferous zone; LC, Larval chamber; NZ, Nutritive zone; VB, Vascular bundle.)

Further work on the developmental anatomy of the galls is in progress.

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BASIC CHROMOSOME NUMBER AND THE PROBABLE ORIGIN OF THE GENOMES IN *BRASSICA*

Introduction

THE prevalence of aneuploidy of $n = 8, 9, 10, 11, 12, 17, 18, 19$ and 24 in the different species of the genus *Brassica* made this an interesting material for determining the basic chromosome number. The previous literature on meiotic chromosome pairing in haploid *B. campestris* L. var. *toria*[7] ($n = 10$) and *B. oleracea*[12] ($n = 9$) suggests that the basic chromosome number in this genus is less than the lowest chromosome number $n = 8$ seen in *B. nigra*. Secondary association at meiosis has been observed by several workers in the different *Brassica* species and the basic chromosome number is deduced basing on the maximum number of groups of secondarily associated bivalents at metaphase-I. The exact number reported by the different workers differed to a great extent. Alam[1] and Catcheside[2,3] found it to be 7, while Sikka[10] found it to be 5. Röbbelen[9] identified six morphological groups of chromosomes at pachytene in the three genomes 'a', 'b' and 'c' and considered the basic chromosome number to be six. He identified the duplicate sets of chromosomes at pachytene in the three genomes on the basis of secondary association at pachytene in some interspecific F_1 'aac' hybrids.

Stebbins[11] considered that secondary association can be utilised for understanding the ancient polyploid nature of a species or a genus, but it may be considerably modified by segmental interchange, duplication of chromosome segments and phenomena not related to polyploidy and as such is not to be considered as a reliable index of the exact basic chromosome number. Although the evidence from somatic chromosomes can be considered useful to some extent, in *Brassica*,