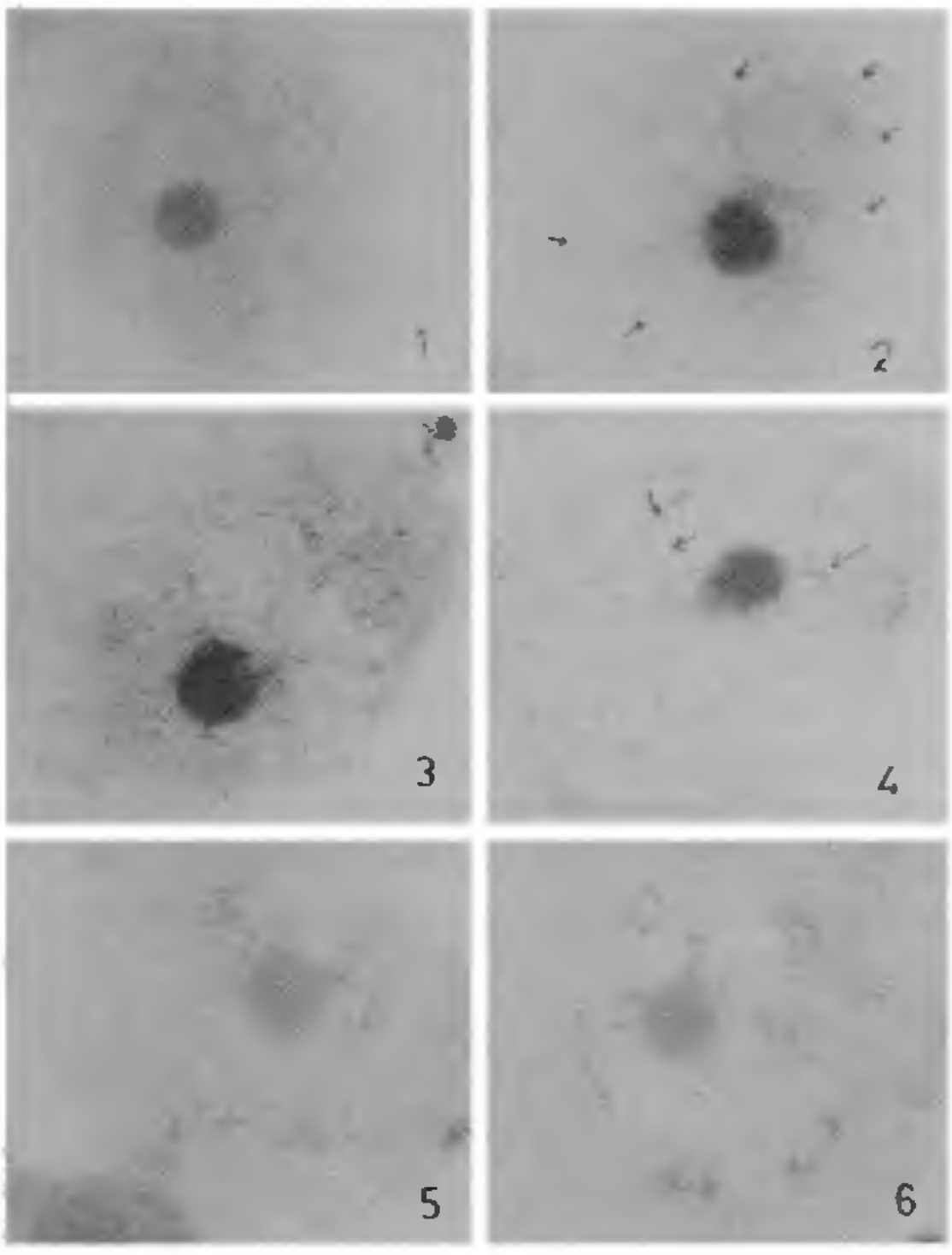

Figures 1–6. Stages of meiosis from pachytene to diakinesis in *Alysicarpus rugosus* DC. (× 2000 for 1, 3, 4, 5, 6 & 2400 × for 2). **1.** Pachytene, **2.** Late pachytene with initiation of diffusion, arrow marks show the sites of diffusion, **3.** Diffuse stage, **4.** Pollen mother cell in post diffusion condensation, arrow marks show bivalents with diplotene degree of condensation, **5.** Early diakinesis showing bivalents with end regions uncondensed, **6.** Normal diakinesis.

configurations (figure 3) showing the absence of regular network and the presence of some extremely thin chromatin strands with no relationship between thick and thin strands readily discernable. The appearance is thus quite different from normal leptotene-zygotene stages where one finds regular network with paired regions showing thicker strands and the adjoining regions with thinner strands. After the diffuse stage the chromatin strands recondense and diplotene loop-like appearances appear in some of the bivalents (figure 4); and the process seems to be asynchronous. Moreover, certain regions appear more condensed. By early diakinesis, the end regions of the bivalents are still relatively uncondensed (figure 5), followed by further condensation of the end regions resulting in normal diakinesis (figure 6) where eight distinct bivalents are seen. A synthetic stage (lampbrush stage) was earlier reported as diffuse stage. It is possible that diffuse stage in plants also represents a synthetic stage. This aspect is being investigated.

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KARYOMORPHOLOGICAL STUDY ON EIGHT CULTIVARS OF HIGH YIELDING RICE (*ORYZA SATIVA* L) FROM PACHYTENE

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SOMATIC chromosomes have been studied earlier[1] and pachytene analysis in a single strain of rice (*Oryza sativa* L) has also been carried out[2]. However pachytene analysis has not been attempted on high yielding cultivars of rice. In the present study, twelve pachytene bivalents of eight rice cultivars were identified following the criteria established for *Zea* by McClintock[3] to understand the intervarietal differences.

Young spikelets of suitable stages were fixed in propionic-alcohol (1 : 2) to which trace of ferric acetate was added at the temperature range 20°C to 35°C for 24 hr after which the materials were transferred to 70% ethyl alcohol for storage. Before smearing, suitable flower buds were kept in 45% propionic acid for 10 min and the anthers were dissected out and smeared with a drop of 1% propionic carmine. Gentle pressing and alternate warming and cooling favoured excellent spreading and differentiation of the pachytene bivalents in the sporocytes. In most of the cells only 4 to 6 bivalents could be traced from end to end; in 10 spore mother cells, however, all the twelve bivalents could be analysed. Figures were taken from

the temporary preparation with a table magnification of × 2500.

All the eight high yielding cultivars of rice showed gametic chromosome number of $n = 12$, the size of the chromosomes ranged from 17 to 72 μ. On the basis of the size and position of primary constrictions, three distinct chromosomal types could be distinguished, one of which was common.

The varieties, as might be expected, differed from one another in details of their karyotypes.

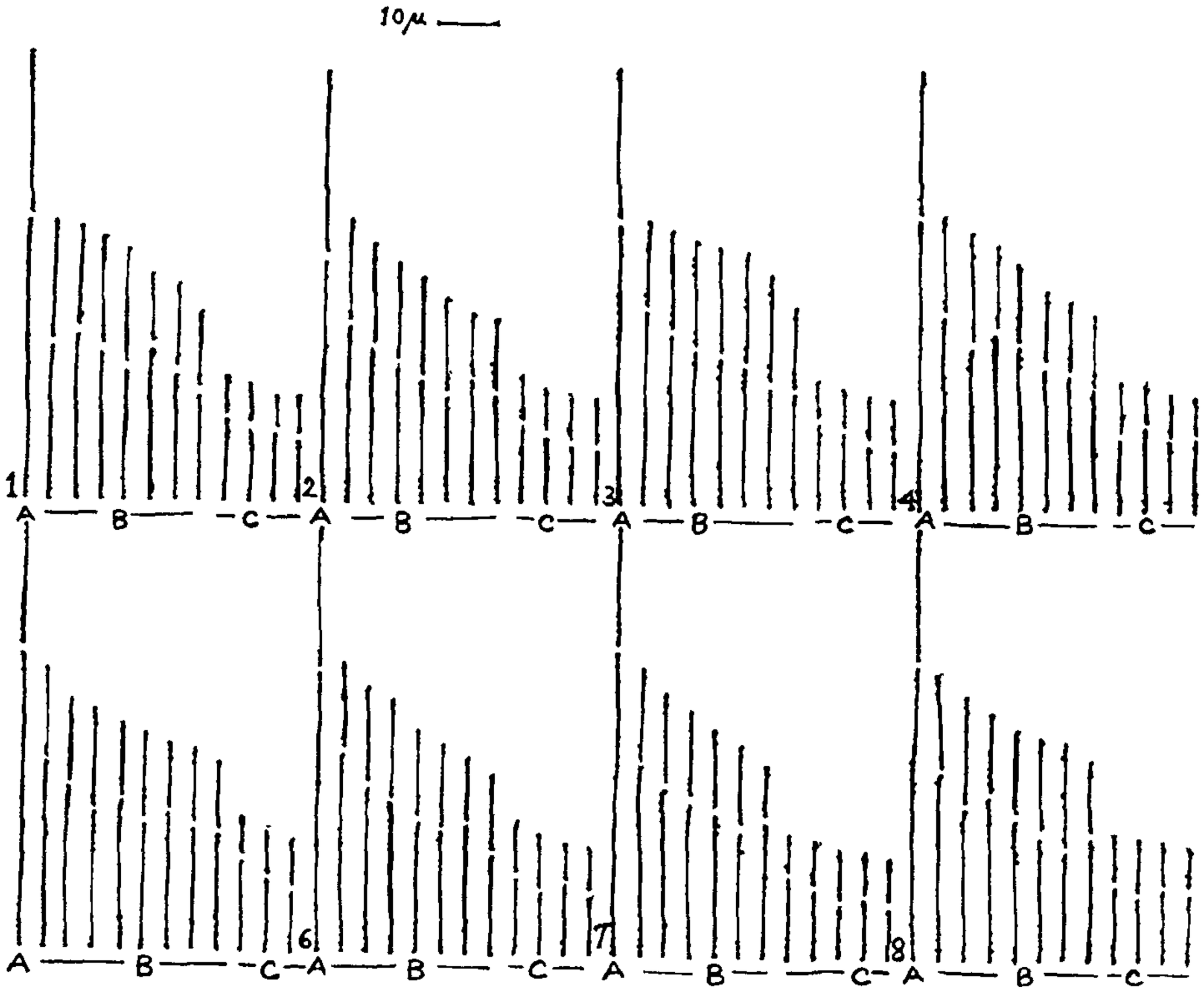
Type A: Long-sized chromosome 68 to 72 μ long, submedian, sharp defined chromomeres were visible in the terminal regions of both the arms.

Type B: Medium-sized chromosomes, 30 to 45 μ long, median to submedian primary constrictions, the terminal region of both the arms had clearly defined chromomeres, distinct chromomeres were visible above the centromeres.

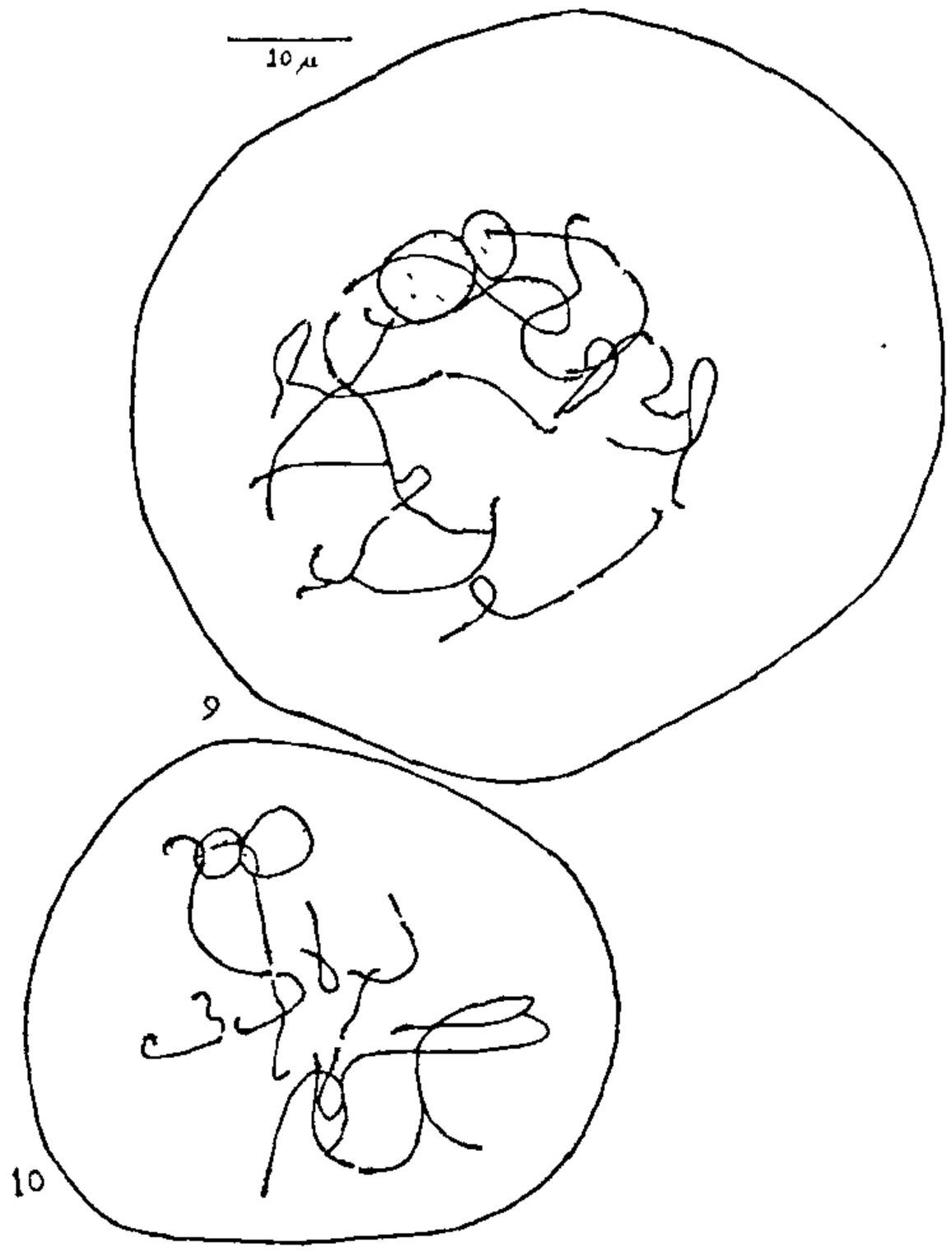
Type C: Short-sized chromosome, 17 to 20 μ long, median to submedian primary constrictions; distinct chromomeres were visible above the centromere and in the terminal regions of both the arms.

The varieties under study, their parentage karyotypic configuration and the ranges of chromosome length are given in table 1

The previous report of gametic chromosome number of rice ($n = 12$) Nandi[4], has been confirmed in the present study with eight high yielding cultivars of rice through pachytene analysis. The size of the chromosomes ranged from 17 to 72 μ. The chromosome morphology revealed that three distinct chromosome types were present (A, B and C; figures 1–10, table 1). Type A was common to all the cultivars studied. The cultivars differed in details of the karyotype. The position of the primary constrictions,



Figures 1–8. Idiograms of the cultivars, 'IR8', 'Jaya', 'Sona', 'IR22', 'Cauvery', 'Bala' and 'Ratna'.



Figures 9–10. Sporocytes of pachytene stage of the cultivars 'IR8' and 'Ratna'. (Only the figures containing the maximum number of traceable bivalents are given).

Table 1 *Karyotypic configuration and ranges of chromosome lengths of rice cultivars*

Cultivars	Parentage	Karyotype	Ranges of chromosome length (μ)
IR8	Peta × De-GE-WU-GEN	1A + 7B + 4C	17.5–72
Jaya	T(N)1 × T141	1A + 7B + 4C	18–70
Sona	GEB24 × T(N)1	1A + 7B + 4C	19–70
IR22	IR8 × Tadkun	1A + 7B + 4C	18.5–71
IR20	IR262 × TKM6	1A + 8B + 3C	17–70
Cauvery	T(N)1 × TKM6	1A + 7B + 4C	17–68
Bala	T(N)1 × N22	1A + 6B + 5C	17.5–68.5
Ratna	TKM6 × IR8	1A + 7B + 4C	18–70

the arm ratio and the chromomeric patterns were different in some cultivars. Where 'IR 8' or 'TKM6' was one of the parents as in 'Cauvery', 'IR22' and 'Ratna', the karyotypic configuration was more or less similar. The karyotypic configuration in 'IR8' was similar to that in 'Jaya' and 'Sona' which had T(N)1 as one of the parents. The configuration of 'Bala' was completely different from the other cultivars. However, on the basis of chromosome morphology, which had general similarity, consisting of medium to short size of mainly median to submedian primary constrictions having differentiated type of chromomeric pattern, the different cultivars seem to be allied to one another and perhaps originated from a common genome. This finding corroborates the finding regarding somatic karyotype by Mukherjee and Mukherji[1].

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AECIDIUM HARTWEGIAE THUEM AN ADDITION TO INDIAN MYCOFLORA

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DURING the course of studies on phytopathogenic fungi, a rust infection was noticed on the leaves of *Chlorophytum tuberosum* L at Shankargarh in Allahabad district. On microscopic examination the fungus was identified as *Aecidium hartwegiae* Thuem. The identity of the fungus was confirmed by the Commonwealth Mycological Institute, Kew, England where the infected material is deposited.

A perusal of the relevant literature has revealed that this species of *Aecidium* has not been reported so far from India. Hence this makes it a new record of this fungus from the country.

Further this species is known only from *Chlorophytum sternbergiani* and hence *C. tuberosum* is a new host record. Since this fungus has not been recorded from India, it is briefly described along with the symptoms produced on *C. tuberosum* for easy identification.

Aecidium hartwegiae Thuem. In Flora, 60: 411, 1877 (figures 1–4). *Symptoms:* The fungus appears on living