TABLE I

Progenies produced by mated and unmated females of P. nephantidis

No. Reproductive cycle	No. progeny/female*		Total
	Male	Female	
Mated			
female 3	3·6±0·31	7·4±0·32	11·0±0·34
Unmated			
female 3	13·8±0·45	Nil	13·8±0·45

* Mean of ten observations.
± 95% confidence limit.

The results suggest that unmated females can be used in biological control of *N. serinopa*.

The authors are thankful to Mr. D. Settu for his help in the investigation and to the Indian Council of Agricultural Research, New Delhi, for financial support.

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CONTRIBUTIONS TO THE CYTOLOGY OF THE MOLE CRICKET *GRYLLOTALPA AFRICANA*

CONSIDERABLE amount of work has been done on the chromosome morphology and behaviour of the mole cricket *Gryllotalpa hexadactyla*[1–3], *Gryllotalpa gryllotalpa*[4], *Gryllotalpa africana*[5–7], *Gryllotalpa himalayana*[8], and *Gryllotalpa fossor*[9]. However, metrical analysis, nature and distribution of heterochromatin have not been made. Therefore this project on *Gryllotalpa africana* was undertaken to fill the gaps in our knowledge.

The adult males of *Gryllotalpa africana* collected from the environs of Manasagangotri, Mysore (India) formed the material for the present investigations. The chromosome preparations were made from the testes by the colchicine-hypotonic-flame dry technique. The metrical analyses (L^R and I^c values) were calculated according to the method proposed by Levan *et al.*[10]. Heterochromatin studies were made according to Sumner's[11] technique with minor modifications.

The chromosome number is 23 (22A + X) in males (Fig. 1). There are 9 pairs of metacentric autosomes with the L^R values ranging from 101·03 to 31·18 and the I^c values varying from 44·98 to 37·83. The remaining 2 pairs of autosomes are submetacentric with the L^R values of 106·15 and 106·00 and I^c values of 32·80 and 34·23. The X-chromosome is also metacentric with L^R and I^c values of 168·75 and 47·46, respectively. It is the longest member of the complement which accounts for about 17% of the total haploid set. Out of the 2 pairs of submetacentric autosomes, one pair has distinctly stretched centromeres and they serve as the marker chromosomes. The metrical values are given in Table I and the idiogram has been constructed (Fig. 2). The single B-chromosome encountered appears to be metacentric and it belongs to the smallest metacentric autosomal series (Fig. 3). The application of C-heterochromatin technique has

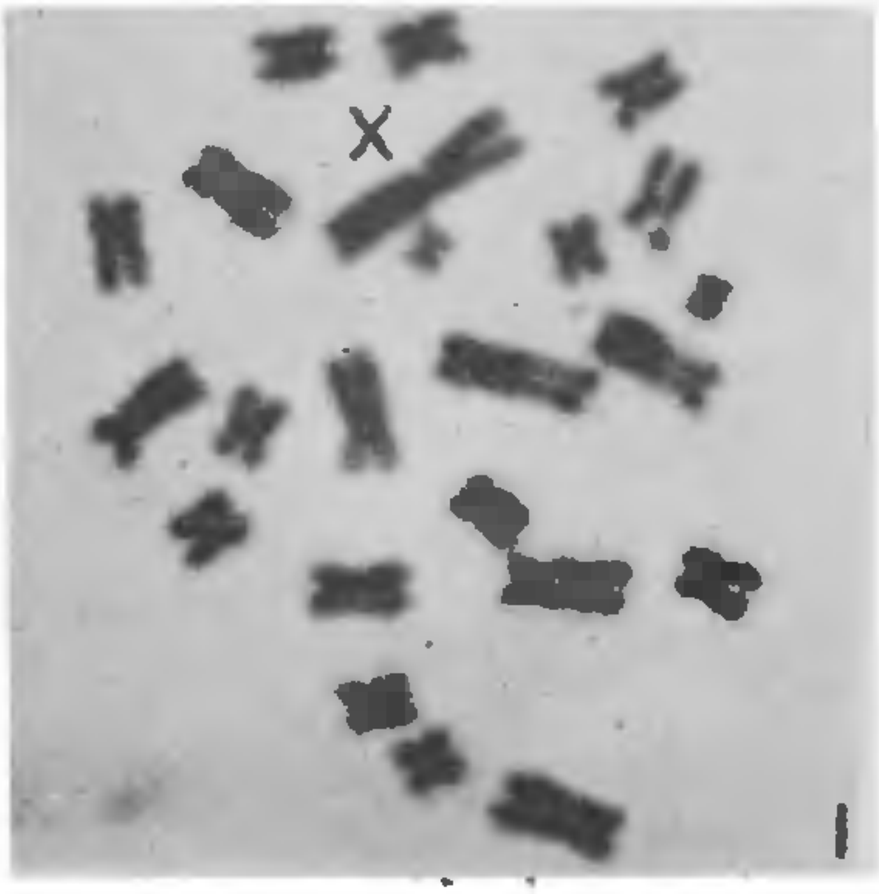

FIG. 1. Spermatogonial metaphase plate of *Gryllotalpa africana*.

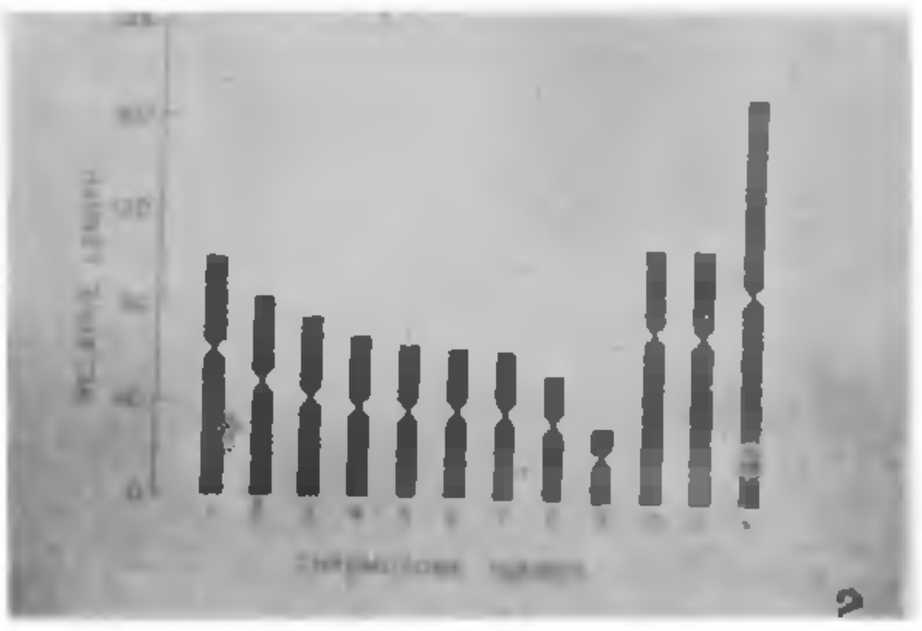

FIG. 2. Idiogram showing the relative lengths.

revealed the presence of C-positive segments at the centromeric and intercalary regions. The heterochromatin blocks are clearly seen in the spermatogonial (Fig. 4) and diplotene (Fig. 5) stages. The metacentric X-chromosome is characterised by the presence of centromeric as well as two C-positive blocks on both the arms.

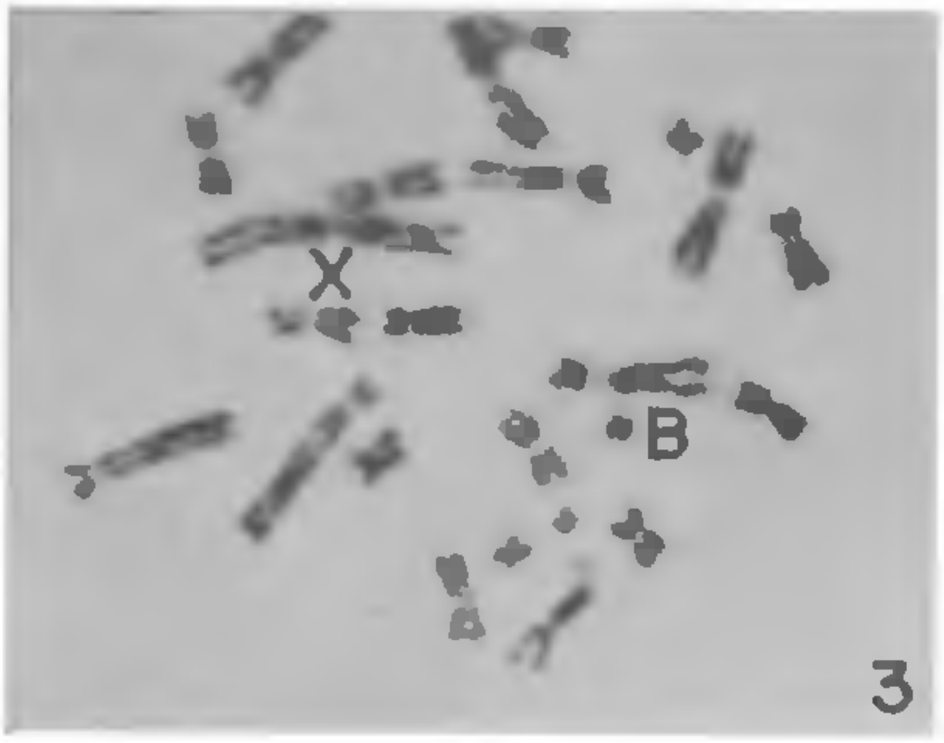

FIG 3. Spermatogonial metaphase showing the B-chromosome.

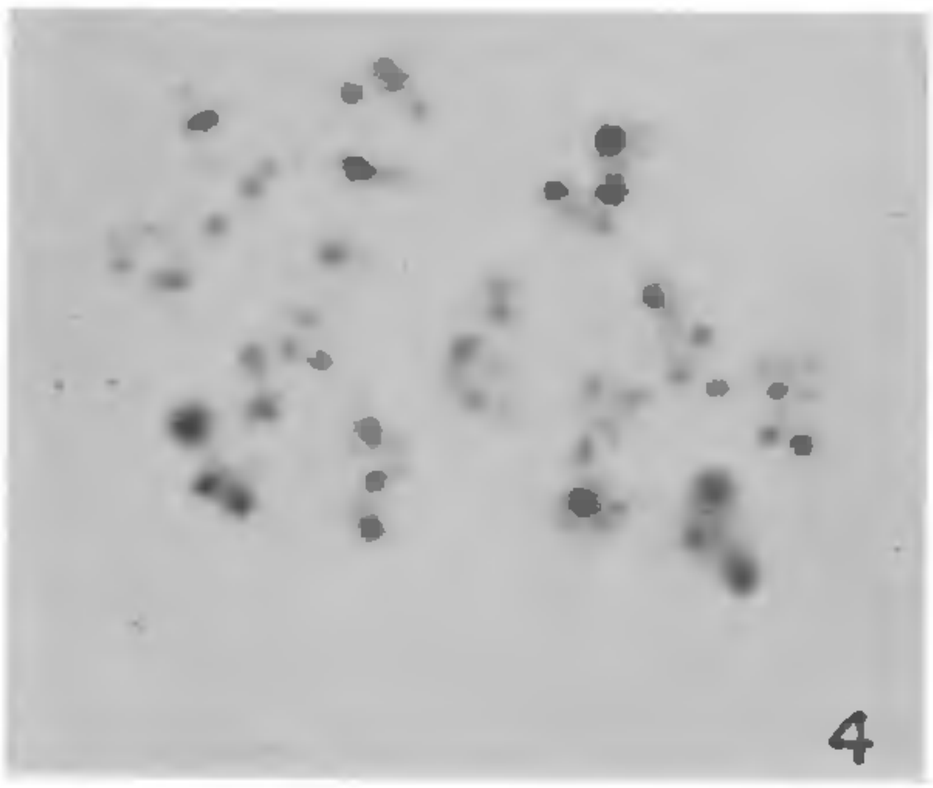

FIG. 4. Diplotene showing heterochromatin blocks.

FIG. 5. Heterochromatin distribution pattern in the spermatogonial metaphase chromosomes.

TABLE I

Showing the metrical values of the chromosome complement of the mole cricket Gryllotalpa africana

Chromosome number	L^R	I^c	Chromosome type
1	101·03	39·63	m
2	84·60	42·67	m
3	76·42	44·98	m
4	68·53	43·94	m
5	64·47	44·09	m
6	63·60	42·19	m
7	63·41	44·25	m
8	53·15	40·93	m
9	31·18	37·83	m
10	106·15	32·80	sm
11	106·00	34·23	sm
X	168·75	47·46	m

Even though 23 chromosomes have been reported in different species of *Gryllotalpa*, it is for the first time the metrical values have been worked out for *Gryllotalpa africana*. Similarly, no information is available with regard to the distribution pattern of hererochromatin in the chromosomes of the genus *Gryllotalpa*. The nature of heterochromatin blocks in the X-chromosome of *Gryllotalpa africana* is similar to the distribution pattern of heterochromatin blocks found in the X-chromosome of the Acridid grasshopper *Poekilocerus pictus*[12]. As it has been pointed out earlier[13], the distribution pattern of heterochromatin in the present study has shown that lot of repetitive DNA is present in the genome and the structural re-arrangements must have occurred during the course of karyotypic evolution.

One of the authors (KRK) acknowledges with gratitude the financial assistance by Council of Scientific and Industrial Research, New Delhi.

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CHLOROTIC STUNT—A NEW VIRUS DISEASE OF *CATHARANTHUS ROSEUS* IN INDIA

Catharanthaus roseus (L.) G. Don., a common perennial ornamental, known more for its medicinal value, has been observed in and around Lucknow to be suffering from a virus disease characterized by yellow green mosaic followed by crinkling of the leaves and general stunting of the plants. Present communication deals with the mode of natural spread and biophysical properties of the virus. Host range of the virus was also tested to identify the potential dangers which perennial plants, harbouring viruses, often pose to other economically important plants.

Pure culture of the virus was maintained by mechanical inoculation of *C. roseus* plants through sap prepared from a single local lesion produced on cotyledonary leaves of *Cucumis sativus*. Inoculum was prepared by grinding young infected leaves of *C. roseus* in a pestle and mortar with equal amount (W/V) of phosphate buffer (0·2 M, pH-6). The slurry was squeezed through double folds of muslin cloth and centrifuged at 5,000 rpm for 15 minutes at 10° C. The clear supernatant thus obtained, termed as standard extract (SE), was used in all experiments unless stated otherwise.

Transmission tests with aphids, *viz.*, *Myzus persicae*, *Aphis gossypii*, *A. craccivora*, *A. nerii* and *Brevicoryne brassicae* were carried out by giving them starvation period, acquisition probes and inoculation feedings of 3 hours, 2-3 minutes and 24 hours respectively. *C. roseus* was used both as a donor as well as recipient host.

The virus could easily be transmitted by mechanical means through leaves (using carborundum powder as an abrasive) as well as by all the aphid species tested in the present investigation.

Data included in Table I indicate that the virus infecting *C. roseus* has a wide host range including many economically important plants belonging to family Solanaceae, Amaranthaceae, Chenopodiaceae, Caryophyllaceae, Compositae, Cucurbitaceae, Malvaceae and Leguminosae. *Abelmoschus esculentus* L., *Ageratum conyzoides* L., *Ammi majus* L., *Antirhinum majus* L., *Brassica oleracea* L., *Cineraria* sp.,

TABLE I

Reaction of a virus from C. roseus *to some host plants*

Host	Family*	Symptoms
Amaranthus viridis L.	1	LNS
Beta vulgaris L.	2	CLL
Calendula sp.	3	MM
Capsicum annuum L.	4	MM
Celosia cristata L.	1	CLL
Centaurea moschata L. var. *alba*	3	SM
Chenopodium album L.	2	NLL
Chrysanthemum morifolium (Ram) Hernsel	3	MM
Citrullus vulgaris L.	5	LCS, SM
Cucumis sativus L.	5	NLL, SLN
Cucurbita pepo DC.	5	LNS
Lablab purpurens (L.) Sweet	6	LAL
Gomphrena globosa L.	1	CLL
Lycopersicon esculentum Mill.	4	Latent
Meliotus alba L.	6	MM
Nicotiana clevelandii Gray	4	LCS, SLN
N. glutinosa L.	4	SM, BLL
N. plumbaginifolia Viv.	4	SM, BLL
N. tabacum L. var. *Samsun* NN	4	VC, BLL
N. tabacum L. var white burley	4	SM, LD
Physalis minima L.	4	
Sida cordifolia L.	6	MM
Solanum nigrum L.	4	SM, LD
Sonchus oleraceaus Linn.	3	LCS
Spinacea oleracea L.	2	CLL
Vaccaria pyramidata Medic	7	SM, LC, CBF
Zinnia elegans Jacq.	3	MM

BLL = Blistering of leaf lamina; CLL = Chlorotic local lesions; LCS = Local large chlorotic spots; LNS = Local large necrotic spots; NLL = Necrotic local lesions; VC = Vein cleaving; CBP = Colour breaking in petals; LAL = Local angular lesions; LD = Leaf deformation; MM = Mild mosaic; SLN = Systemic lethal necrosis.

*1, Amaranthaceae; 2, Chenopodiaceae; 3, Compositae; 4, Solanaceae; 5, Cucurbitaceae; 6, Leguminosae; 7, Caryophyllaceae