because of their small size, even the position of the centromere could not be located with any confidence, and as such even when banding techniques were applied recognizable bands may not be observed. In view of these considerations, evidence from somatic chromosomes and secondary association at diakineses are not considered to be decisive enough to determine the basic chromosome number.

Since the study of chromosomes at pachytene facilitates observations of even minor structural differences of the chromosomes, the evidence obtained from pachytene morphology is considered here. From the investigations made here on the morphology of pachytene chromosomes in four diploid *Brassica* species,[13] and their pairing in three interspecific F_1 hybrids[4,5] and two intergenetic F_1 *Raphamobrassica* hybrids an attempt is made to determine the basic chromosome number and to decide the nature of the 'a', 'b' and 'c' genomes of *Brassica*.

Results and Discussion

The pachytene chromosomes in the four diploid *Brassica* species[13] could be sorted out into six morphological types designated as A, B, C, D, E and F in the three genomes 'a', 'b' and 'c' of *Brassica* belonging to the species *B. campestris* ($n = 10$), *B. nigra* ($n=8$) and *B. oleranea* ($n = 9$) respectively. The frequency of the types differed in each of the three genomes and some of the types in some genomes were missing in the others. Chromosomes with the same morphology and recognised under the same type such as B, C, E or F paired with each other forming bivalents and occasional trivalents and quadrivalents at pachytene, diakinesis and metaphase, in the three interspecific F_1 'aac' hybrids,[4] and two intergeneric F_1 *Raphanobrassica* hybrids with 'abr' ($2n = 27$) and 'acr' ($2n = 28$) genomes (in press) proving their genetic homologies. From these findings the basic chromosome number for *Brassica* is considered to be $x = 6$, a conclusion which is in agreement with that of the previous workers[1-3,6,9].

Two morphologically distinct nucleolus organising chromosomes were present in each of the three genomes 'a', 'b' and 'c' which did not pair with each other in the F_1 hybrids studied.[5,13]. A numerical correspondence in the number of nucleolus organising chromosomes has been observed in the pachytene complements of the four diploid *Brassica* species studied. The species *B. juncea* var. *gracilis* ($n = 18$, 'ab') and *B. napus* var. *oleifera* ($n = 19$, 'ac') contained four nucleolus organising chromosomes each, two of which belonged to the 'a' genome while the other two in each of the latter species belonged to the 'b' and 'c' genomes respectively[13]. Based on the numerical correspondence in the nucleolus organising chromosomes in the diploid species and their synaptic relationships in the interspecific F_1 'aac' hybrids[4,5] combined with the finding of the presence of six morphological types of chromosomes, the genomes 'a', 'b' and 'c' are considered as segmental allotetraploids probably obtained after doubling in the genome from an F_1 hybrid which might have arisen from two ancestral parents with a basic chromosome number of $x = 6$, and the species *B. carinata* ($2n = 34$), *B. juncea* ($2n = 36$) and *B. napus* ($2n = 38$) are considered as allo-octoploid hybrids.

A comparative study of the pachytene chromosomes of the 'a', 'b' and 'c' genomes shows that some of the types of chromosomes present in the genome 'a' are missing in the 'b' and 'c' genomes and some are present in different numbers in the three genomes. It appears from this that the actual parent that contributed to the 'a' genome differs from that which gave rise to the 'b' and 'c' genomes in terms of some translocations and other structural alterations.

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ACANTHOCORIS SCABRATOR FABR. A NEW PEST OF MANGO

Acanthocoris scabrator, Fabr. (Hemiptera—Coreidae) was observed for the first time as a pest of mango fruits in India. It was seen infesting mango fruits at Trivandrum in September, 1976. Lefroy has recorded its occurrence in India[1]. Previous records of this

insect as a crop pest are from Canton, infesting cape gooseberry (*Physalis peruviana*), red pepper (*Capsicum* sp.), egg plant (*Solanum melongena*) and squash (*Cucurbita maxima*)[2] from Malaysia infesting plants belonging to Salanaceae and Convolvulaceae[3]. The adult is dark brown in colour measuring 1·4 cm in length and 5 mm in width. It feeds on tender mango fruits by piercing the outer rind and sucking the juice from inside. Exudations ooze out through the feeding points and the skin around these points become dark in colour; secondary infection by microbes leads to rotting of the fruits which ultimately fall.

The insect breeds on *Ipomea carnea* Jacq. The seed-like eggs are laid in batches of 18 to 20 on leaves and vines. The nymphs are reddish in colour in the beginning turning greenish and brownish subsequently. They are gregarious in their habits and feed on the vines. The nymphal period lasts from 70 to 75 days in October–November. Detailed studies on the biology are being undertaken.

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CIRCADIAN RHYTHMIC ACTIVITY OF LIPASE IN THE SCORPION, *HETEROMETRUS FULVIPES* (C. KOCH)

DIURNAL rhythms in various activities like rate of heart beat, cholinesterase activity in the heart muscle[1], spontaneous electrical activity in the ventral nerve cord and segmental nerves[2], have been reported to occur in the scorpion, *Hererometrus fulvipes*. Similar rhythms have also been shown to occur in the levels of metabolites like blood glucose, and hepatopancreatic glycogen[3]. The rhythmic changes in the activities of succinate dehydrogenase[4], isocitrate dehydrogenase[5], phosphorylase[6] and alkaline phosphatase[7] in the scorpion, *Heterometrus fulvipes*, were correlated with the locomotor activity of these animals. In view of the existence of diurnal variations in the scorpion, it is of interest to find whether such changes would also occur in the activity of lipase, an enzyme that catalyzes the breakdown of high molecular weight esters, into fatty acids and glycerol. Hence, an attempt has been made to study the activity of lipase in different tissues of the scorpion.

The details of collection, maintenance of scorpions and sampling of tissues were described earlier[3]. The activity of lapase was estimated by the method of Cherry and Crandall[8] which was slightly modified as follows: The enzyme was incubated with an olive oil emulsion and the fatty acids produced were titrated against sodium hydroxide. The tissues after isolation were homogenized (10% W/V) in ice cold water, and centrifuged. The supernatant was used as the enzyme source. The enzyme source (2·0 ml : 200 mg tissue equivalent) was taken in a test tube and 0·5 ml of phosphate buffer was added to the tube followed by the addition of 2·0 ml of olive oil emulsion. The tube was shaken well and the contents were incubated at 37° C for one hour. At the end of this incubation period, 3 ml of 95% alcohol and 2 drops of phenolphthalein (1%) were added. The contents of the tube were titrated against sodium hydroxide (0·05 N) until the appearance of permanent pink colour. A zero time control was prepared which included the enzyme source, buffer and substrate but 95% alcohol (3 ml) was added prior to the addition of enzyme source. Lipase activity was calculated from the difference between the control and experimental titre value and expressed as lipase units/g wet weight of the tissue.

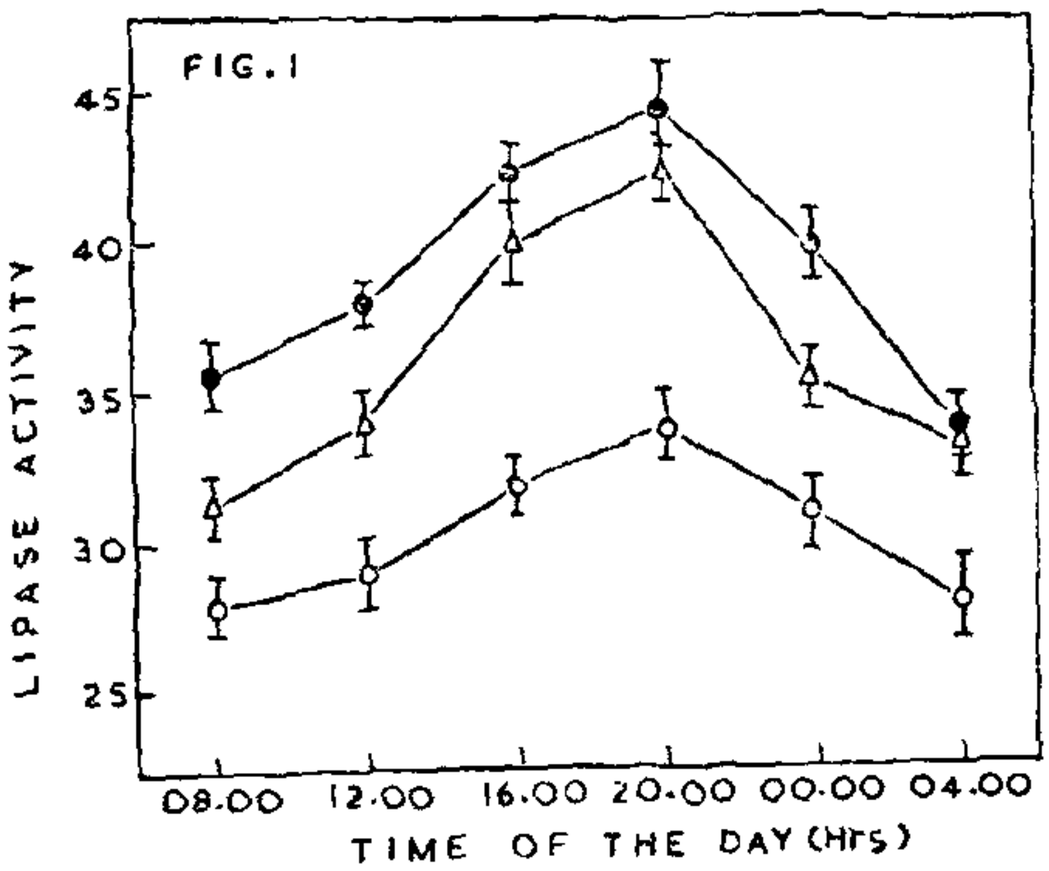

FIG. 1. Diurnal rhythmic activity of lipase under LD (normal) condition, at temperature 30 ± 1° C in the nervous tissue (●—●), hepatopancreas (Δ—Δ) and pedipalpal muscle (○—○). (Values, expressed as units/gram weight of the tissue, are mean ± S.D. of 6 observations.)