From a number of metaphase plates it appears that there are 10 pairs of metacentric and 6 pairs of submetacentric chromosomes in the karyotype ($2n = 32$). But there is variation in chromosome morphology with the variation of chromosome numbers. Secondary construction is not found in the karyotypes. This may be due to presence of B-chromosomes[4].

Polytene chromosomes (Figs. 2, 3) are found in the endopolyploid cells adjacent to the root meristem as reported in *Phaseolus vulgaris*[5]. They arise through endomitosis. The number, length, breadth of these polytene chromosomes vary according to the degree of polyteny and endomitotic reduplication. Their morphology is not so clear as they are in prophase stage[6]. Some of the endopolyploid cells are found with high number of polyploid chromosomes.

This investigation was financed in part by the Ministry of Higher Education, USSR, while the author was a post-doctoral research fellow there as well as in part by the Kalyani University, Kalyani, Nadia, West Bengal, as personal research grant.

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OUTBREAK OF A NEW BACTERIAL DISEASE OF AMALBEL, A MEDICINAL PLANT IN RAJASTHAN

DURING a survey in September, 1971 around Jobner, severe leaf spot was observed on a shrub, commonly known as Amalbel (*Cayratia carnosa* Gagn: family Ampelideae). Plants are commonly found in the hilly tracts of tropical Himalayas and throughout the hotter parts of India. The shrub has many medicinal properties.

During the years 1974 and 1975, the disease was observed during August in the hilly areas around Udaipur. Symptoms appear first as minute water-soaked lesions on aerial parts of the vine including leaves, stem, branches and tendrils; later these turn into dark brown irregular spots bearing bacterial masses. The bacterial nature of the disease was established by 'ooze test'. A yellow bacterium was isolated from infected leaves on nutrient dextrose agar medium and purified by streaking on triphenyl tetrazolium chloride agar and picking up single colonies under a sterioscopic microscope. Pathogenicity was proved by inoculating the lower trifoliate leaves with a fresh culture grown on yeast extract glucose chalk agar slants by using carborundum abrasion technique. Typical symptoms appeared 6–9 days after inoculation. Under artificial inoculation conditions, the bacterium was found to be not pathogenic to plants belonging to 19 different hosts.

Morphological, cultural, physiological and biochemical characteristics were studied by following the methods of Dye[1]. The bacterium is rod-shaped, gram negative, motile with single polar flagellum; on nutrient dextrose agar produces yellow, circular and raised, glistening colonies; on potato wedges produces yellow slimy growth; tolerates NaCl upto 3% and grows best at 27–30° C; strictly aerobic showing an oxidative metabolism of glucose; hydrolyzes starch weakly; asparagine is not utilized; nitrates are not reduced; produces acid but no gas in xylose, glucose, sucrose, fructose and mannitol; maltose was not utilized upto 27 days. The bacterium has important characters of the genus *Xanthomonas* and resembles *Xanthomonas vitis-carnosa* causing leaf spot of *Vitis carnosa* (Wall) Moniz and Patel[2].

The bacterium (IMI B 6141) has been identified by Dr. J. F. Bradbury, of the Commonwealth Mycological Institute, Surrey, U.K., as a member of *Xanthomonas campestris* group and we would also refer the bacterium to the same species.

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INDUCING SPORULATION IN *HELMINTHOSPORIUM GRAMINEUM* IN CULTURE

Helminthosporium gramineum Rabenh., the causal organism of the barley leaf stripe disease, sporulates profusely on the lesions on the foliage and glumes under natural conditions. But it fails to sporulate in the pure culture. In India, attempts to induce sporulation in seven isolates of the fungus using a variety of culture media at different temperatures, pH, carbon and nitrogen sources proved unsuccessful[1]. In culture, sporulation of the fungus was successfully induced through the combined effect of light and temperature[2] and through a low temperature treat-

ment at 6 (± 1)° C for 7 days alternated with a high temperature treatment at 28 (± 1)° C for 5 days[1].

In this laboratory, a very simple, quick, convenient and reliable method was developed to induce sporulation in *Helminthosporium gramineum* using PDA (Potato dextrose agar) containing 2% hot water extract of rice straw. This has induced sporulation in all isolates of the fungus collected from around Kalyani. The fungus was isolated by seeding infected leaf bits on slants containing the said medium. Incubation was done at 25 (± 1)° C in diffused light. Growth of the fungus was visible 2 days after seeding and the culture sporulated profusely by the 5th day. Subculturing on the above medium produced abundant sporulating culture within 3 days. Repeated isolation and subculturing on the above medium yielded sporulating cultures invariably in all cases. The medium adjusted at pH 5, 6 and 7 and incubation at 20 (± 1)° C and 25 (± 1)° C supported luxuriant sporulating culture of the fungus due perhaps to the amino acid content of the Straus extract.

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EFFECT OF ALBINO RAT GASTRIC JUICE ON THE VIRULENCE OF *MYTHIMNA* (*PSEUDALETIA*) *SEPARATA* NUCLEAR POLYHEDROSIS VIRUS

A SUBSTANTIAL concentration of nuclear polyhedrosis virus (NPV) of the cabbage looper *Trichoplusia ni* is reported to occur naturally on cabbage leaves[1, 2]. Many animals, including man, thus consume such entomopathogens as natural contaminants of food but without toxic effects[3]. The lack of toxicity of entomopathogenic viruses for vertebrates has been attributed to the inactivation of viruses by acidic gastric juice[4]. In the present work, therefore, the effect of albino rat gastric juice on the virulence of *Mythimna* (*Pseudaletia*) *separata* NPV is investigated as orally administered NPV had no toxic effects in albino rats[5].

Albino rats starved for 12 h were operated to ligate the opening of stomach into duodenum. Twelve hours later, rats' stomach was cut open to collect the gastric juice. The latter was then centrifuged at 2,000 rpm for 30 min to remove solid particles. The treatments were as mentioned below.

Suspensions of polyhedral inclusion bodies were mixed with the following in 1 : 7 ratio by volume : (A) Normal gastric juice (pH 2·0–2·5), (B) Buffer (pH 2·3) and (C) Neutralised gastric juice (pH 7·0). The mixtures, incubated at 37° C for 2 h, were then mixed with artificial diet and fed individually to 3rd instar *M.* (*P.*) *separata* larvae. Groups D and E, containing the larvae fed untreated virus and distilled water, served as treated and untreated controls respectively. There were 25 larvae at each treatment and the concentration of virus used was $10{\cdot}0 \times 10^6$ polyhedral inclusion bodies/larva. All the larvae maintained individually in plastic cups were provided daily with fresh diet. Larval mortalities by NPV which determined the virulence were recorded every day.

Results are presented in Table I.

TABLE I

Effect of albino rat gastric juice on the virulence of NPV of M. (P.) separata

Group	Treatment	Larval mortality (%)
A	NPV + Normal gastric juice	8
B	NPV + Buffer	20
C	NPV + Neutralised gastric juice	88
D	Untreated virus	92
E	Distilled water	4

N.B. : Groups D and E served as treated and untreated controls respectively.

The result for the group A indicated that the normal gastric juice of albino rats inactivated the virus as evidenced by the low larval mortality (8%) by NPV. Similarly human gastric juice also inactivated the NPV of *Heliothis zea*[4]. This inactivation is due to the high acidic nature of gastric juice as neutralised gastric juice has little effect on virulence of virus and larval mortality by NPV did not vary significantly from that recorded in group D. The view is supported by the finding that buffer of pH 2·3 (group B) also inactivated the virus. Further, that acidic pH does decrease the virulence of virus is supported by several workers[6, 7]. Thus, the inactivation of *M.* (*P.*) *separata* NPV by albino rat gastric juice will further add to the safety of the said NPV for albino rats.

A research fellowship from U.G.C., New Delhi, and financial assistance from Karnatak University, Dharwad, are gratefully acknowledged. Thanks are also due to Dr. M. Appaswamy Rao, Professor and Head, Zoology Department, Karnatak University, Dharwad, for encouragement and supply of albino rats.