through successive mitoses but through successive generations of parthenogenetic individuals. The unpaired elements may, however, constitute a barrier to gametogenesis, and this could be the direct cause of the anholocyclic character of the biotype.

There are clear phenotypic differences between aphids with normal and abnormal karyotypes. Colour is not a reliable character, as the intensity of pigmentation varies with age, food and temperature, and some dark green clones are cytologically normal. However at constant temperature a simple morphometric ratio, that of the lengths of the processus terminalis to the base of antennal segment VI (WALDHAUER[2]), is a reliable character for distinguishing aphids of abnormal karyotype. In both $2n = 13$ and $2n = 14$ forms this ratio is larger than in the normal form, with scarcely any overlap (Table III). No morphological differences were detected between aphids with $2n = 13$ and $2n = 14$ karyotypes. This may indicate that the $2n = 13$ form is a relatively old parthenogenetic line which has had time to evolve a characteristic phenotype, and that the $2n = 14$ form arose from it only relatively recently[12].

Résumé. Le karyotype normal de *Myzus persicae* (Sulzer) provenant de diverses sources fut de $2n = 12$. Une forme anholocyclique verte de cette espèce possède un karyotype de $2n = 13$ ou $2n = 14$, avec 1 ou 2 autosomes non appariés. Une comparaison des dimensions relatives des chromosomes des karyotypes normaux et anormaux suggère que ces derniers dérivent des chromosomes par fragmentation.

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Mutagenic Effect of UV-Light and X-Rays on *Streptomyces nigrifaciens* and Yield of the Antifungal Substance

The antibiotic production by micro-organisms can be enhanced by the production of suitable strains. KELNER[1], SAVAGE[2], DULANEY et al.[3], DULANEY[4], HOVARTH[5] induced mutants of *Streptomyces* species by irradiation giving higher yield of antibiotics. A strain of *Streptomyces nigrifaciens* Waks. isolated from soil was found antagonistic to *Colletotrichum capsici* and a few other fungi (GUPTA[6]). The present investigation reports the effect of UV-light and X-rays in *S. nigrifaciens* on the survival and induction of mutants in view of the production of the antifungal substance.

Single spore suspension of *S. nigrifaciens* was obtained following KELNER's method[7]. 4 ml of the suspension was distributed in sterilized bacterial tubes and exposed to UV-light and X-rays for 5, 10, 15 and 20 min. X-ray irradiation was done from Cu-anticathode Machellet tube at 30 K.V.-10 M.A. and for exposure to UV-light, the suspension was transferred to a small watch glass. The irradiated spores were immediately plated out in 5 replicates on Czapek's agar and incubated for 10 days at 28 °C (± 2 °C). Control plates in equal number were run simultaneously under similar conditions.

Several colonies showed morphological differences but after repeated sub-culturing, only 2 mutants remained stable which were tested further for the production of the antifungal substance on yeast extract-glucose-asparagine medium. The antifungal substance was assayed by the spore germination test of *Colletotrichum capsici* (GUPTA[6]).

The effect of UV-light and X-rays on the survival of *S. nigrifaciens* has been presented in Table I. It is evident that the percentage of spore survival decreased with the increase in exposure time. The results show that the spores of *S. nigrifaciens* are more resistant to UV-light than to X-rays.

The 2 mutants selected for the production of the antifungal substance were: 1. Asporogenous mutant: Light brown to yellow in colour, slimy and transparent, non-sporulating. 2. Pigmented mutant: Vegetative growth thick, colonies slightly raised with abundant grey aerial mycelium producing dark brown soluble pigment on Czapek's agar. The production of the antifungal substance by these two mutants is presented in Table II.

It is evident from Table II that the asporogenous mutant has lost its capacity to produce antifungal substance, whereas the pigmented one showed slight increase over the parent culture.

UV-light and X-rays have long been used for irradiation to obtain mutants. According to HOLLAENDER[8], UV-light is supposed to produced gene mutation while X-rays cause predominantly chromosomal aberrations and breaks. In the present investigation 2 stable mutants were obtained. The spores of *S. nigrifaciens* are more

Table I. Effect of UV-light and X-ray irradiation on the survival of spores of *S. nigrifaciens*

Exposure time (min)	UV-light No. of spores survived	Survival (%)	X-rays No. of spores survived	Survival (%)
5	166.00	71.24	81.60	34.37
10	120.00	51.84	25.60	10.78
15	78.00	33.47	14.80	6.23
20	47.20	20.25	5.80	2.40
Control	233.00		237.40	

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resistant to UV-light than to X-rays, the percentage survival being greater in the former. SAVAGE[2] has also observed that the X-rays have more mutagenic effect than UV-light.

The yield of the antifungal substance by the mutants has changed due to irradiation. KELNER[7] has obtained an antibiotic producing mutant of *S. griseus* from a non-antibiotic producing culture. SAVAGE[2], DULANEY et al.[3], DULANEY[4] have obtained mutants of *S. griseus* through irradiation which gave higher yield of streptomycin than the original culture. It is likely that irradiation may effect the yield of the active substance in both ways, as is evident from the present investigation.

Table II. Production of the antifungal substance by the 2 mutants of *S. nigrifaciens* as well as the parent culture as assayed in terms of inhibition of spore germination of *Colletotrichum capsici*

Replicate No.	Parent culture	Asporogenous mutant	Pigmented mutant
1	98.05	4.05	100.00
2	98.28	3.21	100.00
3	98.26	3.26	100.00
4	97.84	4.05	100.00
Mean	98.13	3.75	100.00

Mean of 50 observations.

Résumé. Changement de capacité de production antibiotique chez mutants nouveaux de *Streptomyces nigrifaciens.*

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Testing of LSD-25 and Related Compounds for Possible Effects on Egg-Laying Capacity and Egg-To-Adult Viability in *Drosophila*

The controversial nature of the available information on the effects of lysergic acid diethylamide on somatic chromosomes[1–6], meiotic chromosomes[7–8], developing embryos[9–15] and directly on the genetic material[16–20] has prompted us to undertake experimentation in which lysergic acid diethylamide (LSD-25), Bromolysergic acid diethylamide (BOL), and D-lysergic acid, were tested for possible genetic and/or developmental effects.

Each experiment performed was designed as follows: third instar *Drosophila pseudoobscura* female larvae were injected with 0.4 µl of a 10 µg/ml solution of the compound under consideration in phosphate buffered (pH = 7.4) physiological saline. Female larvae, chosen at random from the same cultures as the ones above, were injected with 0.4 µl of phosphate buffered physiological saline and were used as controls. The injection apparatus was that described by STOCKER[21] and it involved the use of a 10 µl Hamilton microsyringe connected to a glass needle through plastic tubing. The injected larvae were placed in culture bottles and were allowed to complete their development to adults. These adult females were aged for a 3 day period and they were then crossed individually to males of the same age in plastic bottles containing charcoal blackened (to facilitate egg counts) *Drosophila* medium. Each pair was transferred to new medium every 24 h (for 10 consecutive days) and the eggs deposited were counted and were allowed to hatch. The adults produced from these eggs were counted and sexed to determine possible egg-to-adult viability differences, and/or sex-ratio disturbances.

The Table shows a summary of the data obtained from the above described experimentation. Statistical analysis of the data, using a Dunnett's[22] multiple comparison test showed the following: 1. Egg-laying capacity. a) Controls vs. LSD-25 – no significant difference; b) controls vs. BOL – significant with a probability value $P < 0.05$; c) controls vs. lysergic acid – significant with a probability value at $P \ll 0.01$. 2. Egg-to-adult viability: a) Controls vs. LSD-25 – no significant difference; b) controls vs. BOL – significant with a probability value at $P \ll 0.01$; c) controls vs. lysergic acid – no significant difference. 3. Sex ratio: no significant differences between controls and any of the other groups.

It has been suggested in many of the cited publications that exposure to LSD-25 may result in offspring wastage. Our data show no such effects for this drug. The reports

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