

SECTION OF BIOLOGICAL SCIENCES

ABSTRACT OF PAPERS

1. Presence of pseudobranchial neurosecretory system in two clupeids, *Notopterus notopterus* and *Notopterus chitala*.

A. GOPESH

Department of Zoology, University of Allahabad, Allahabad—211002, India.

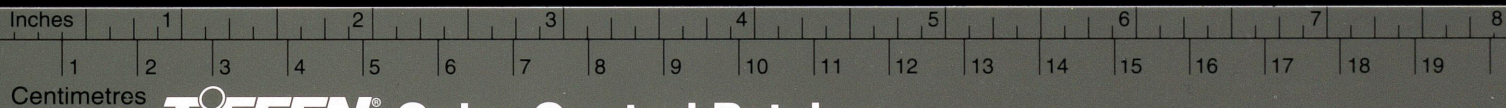
Histologically prepared serial sections of the gill region in immediate neighbourhood of the pseudobranch has been examined to verify the presence of the pseudobranchial neurosecretory system of two amphibious clupeid species, *Notopterus notopterus* and *Notopterus chitala*, earlier reported in all the catfish species. The observations revealed the existence of a full-fledged system of neurosecretion in the gill region of these two clupeids which has got all the morphological attributes of a neurosecretory system. Details of this system in both the species are discussed and comparison is made with the system found in other groups of fishes.

2. Aquatic oxygen uptake in the early developmental stages of a freshwater air-breathing Climbing Perch, *Anabas testudineus* (Bloch).

T. K. GHOSH AND D. N. PANDIT

Ichthyology Research Laboratory, University Department of Zoology, Bhagalpur University, Bhagalpur.

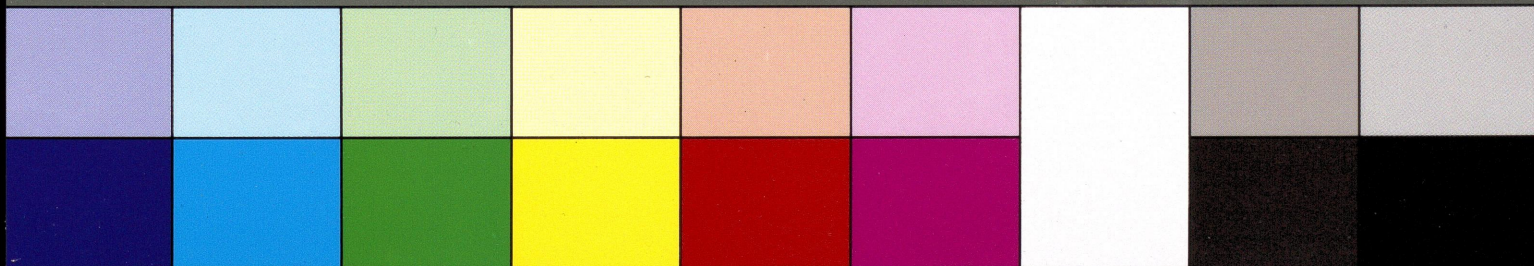
Measurements of aquatic oxygen uptake in relation to body weight have been made in the early developmental stages of an air-breathing climbing perch, *Anabas testudineus* (Bloch), using a cylindrical glass respirometer at $29.5 \pm 1^\circ\text{C}$. With the gradual increase in body weight from 4.333 ± 1.555 to 2200.0 ± 0.0 mg, the rate of aquatic oxygen uptake per unit time per fish increased from 18.826 ± 4.077 to $414.612 \pm 10.661 \mu\text{10}_2 \cdot \text{h}^{-1} \text{ fish}^{-1}$, whereas the oxygen uptake per unit body weight decreases from 4.393 ± 0.274 to $0.184 \pm 0.005 \mu\text{10}_2 \cdot \text{mg}^{-1} \cdot \text{h}^{-1}$. When the data were analysed using logarithmic transformations, the exponent value for oxygen uptake per unit time was 0.472, whereas oxygen uptake per unit body weight was -0.527 . Both the increase in oxygen uptake per unit time ($r=0.9820$, $P<0.001$) and the decrease in relation to per unit body weight ($r=0.985$, $P<0.001$) were found to be statistically significant.



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3. On the Morphology of the male reproductive organs in the Indian Saw Back Turtle (*kachuga tectum tectum*) and Brown Roofed Trutle (*kachuga smithi*) from Jammu.

P. L. DUDA, ANIL K. VERMA AND D. N. SAHI

P. G. Department of Biosciences, University of Jammu, Jammu, J&K State—180004.

In reptiles, the male reproductive organs show a multitude of special modification in architecture. Information on the architecture of the reproductive organs in Indian turtles especially in the males, is significantly scant. Therefore, it has been attempted to gather information on the reproductive organs of the two sympatric emydid turtle species, viz., *Kachuga tectum tectum* and *K. smithi* inhabiting various freshwater environs of Jammu, J&K state. The present paper deals with the comparative account of the morphology of reproductive organs and their functional significance in the males of these turtle species for the first time.

4. The histo-morphological structure of hypothalmo-neurohypophyseal system of an upland fish, *Puntius dukai*

K. D. JOSHI AND P. C. JOSHI*

National Bureau of Fish Genetic Resources, Allahpur, Allahabad—211006,

*Deptt. of Zoology, R. H. Govt. P. G. College, Kashipur, Nainital

The hypothalmo-neurohypophyseal (HT-NH) system participates in the endocrine control of the body physiology, and forms part of an endocrine organ. The HT-NH system of *Puntius dukai* (Day) consists of two paired neurosecretory centres, the Nucleus Preopticus (NPO) and Nucleus Lateralis Tuberosus (NLT). The NPO has an inverted L shaped configuration and lies antero-dorsal to the base of Optic Chiasma (OC) on either side of the third ventricle. The NLT is represented by a small mass of cells lying at the infundibular floor at the base of pituitary stalk. The Neurosecretory cells of both NPO and NLT contain fine granules positive to AF, AT, AB, and CH stains. The NPO shows two contiguous zones differing only in the size of their cells. Dorsally the cells are large and form Pars Magnocellularis (PMC). Ventrally, the cells gradually decrease in size constituting the Pars Parvocellularis (PPC). The PMC cells are oval and bi or even multipolar, whereas the PPC cells are mostly rounded or oval and monopolar. The NLT cells are oval or elongated and monopolar. Axonal extensions from both NPO and NLT cells are observed. The neurosecretory axonal fibres of the NPO unite to form a pair of loosely set tracts which enter the pituitary gland.

5. Ag-NOR bands

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National Bureau of
Allahabad-121006

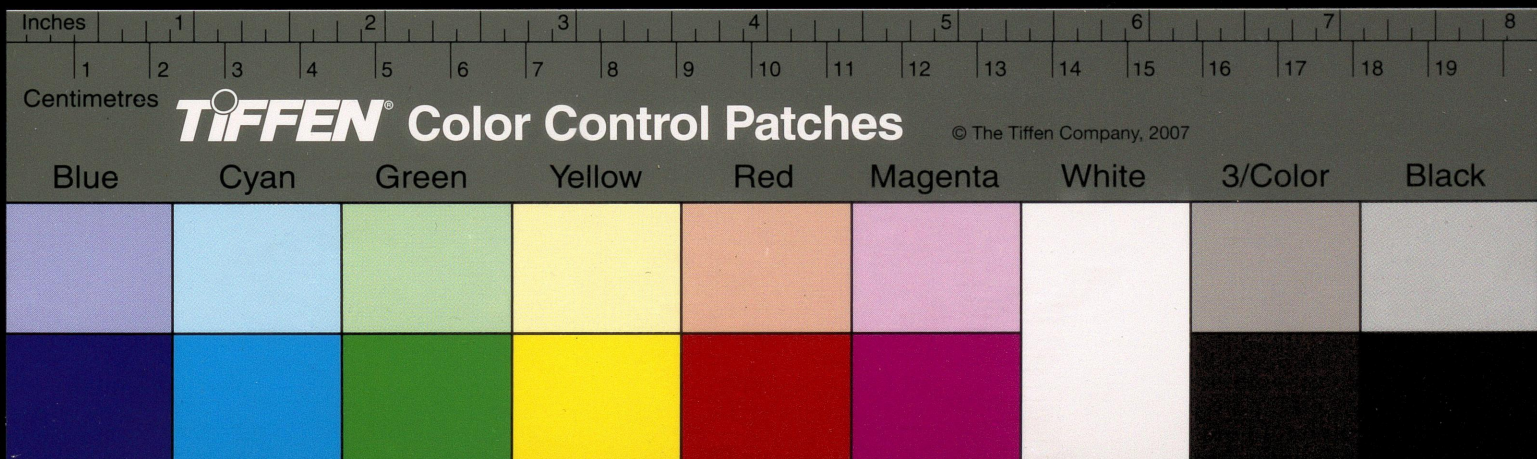
Cytogenetic for the improvement of 20,000 taxonomic species. These studies, however, karyotypes. Some (etc.) are also applied deals with the application of specific chromosomes which form and 18s ribosomes

6. Monitoring

HEMANTH KUMAR

Malaria Research

Lymphatic system for public health purposes in regions of the world. In human beings, treatment is more effective there is no more. However, the control of worms and cestodes is obviously important in parasite circulation. treatment efficiency one would expect is based on the efficacy of experimental treatment as



11. Sequential pathological studies in goats infected intratracheally with *Aspergillus fumigatus*

P. C. MANDAL AND P. P. GUPTA

Department of Veterinary Pathology, Punjab Agricultural University, Ludhiana, India

Intratracheal inoculation of goats with *Aspergillus fumigatus* spores resulted in the development of characteristic gross and microscopic lesions. The lesions were restricted to lungs and there was no dissemination of infection to other tissues of the body except liver in one goat, 16 days after infection. The experiment was continued for 37 days. Gross changes in lungs were observed up to the 24th day post-infection. The lesions, in general, included congestion and oedema in the first 6 days followed by the development of varying greyish-white nodules in the lungs. Microscopic changes consisted of granulomatous reaction with well developed granulomas in lungs. Hyphae and conidiophores with fruiting bodies of *Aspergillus fumigatus* could be demonstrated in sections up to 24 days of infection. Reisolation of the fungus was achieved consistently upto 24 days. It is concluded that intratracheal inoculation of *Aspergillus fumigatus* spores in goats leads to pulmonary aspergillosis up to 24 days.

12. The effect of eutrophication on certain biological aspects of *Puntius chola*

RAVI SHANKAR PISKA, C.* VENKATESHWAR, AND INDIRA DEVI

Department of Zoology, P. G. College, Osmania University, S. P. Road, Secunderabad-500 003.

*Department of Botany, P. G. College, Osmania University, S. P. Road, Secunderabad-500 003

The present study deals with the effect of eutrophication on biological aspects of *Puntius chola*. Two reservoirs have been selected for this study in Hyderabad. (1) Hussainsagar as eutrophicated reservoir, which got eutrophicated due to the indiscriminate release of domestic sewage and industrial effluents. Due to the eutrophication, the fish fauna changed considerably and only hardy species dominated the reservoir. (2) Osmansagar as oligotrophic reservoir, the showed that growth rate and fecundity were reduced considerably. Feeding activity was also less and insects, insect larvae and worms, dominated in food, whereas copepods and diatoms dominated in oligotrophic reservoir. Relative condition factor and gonadosomatic values were also less and parasitic infection was also observed in eutrophicated water body.

13. Present status of

M. V. SUBBA RAO

Member, IUCN
of Environment

Out of 22 species of crocodiles are found in the Gangetic, Gmelin and mugger crocodile. C

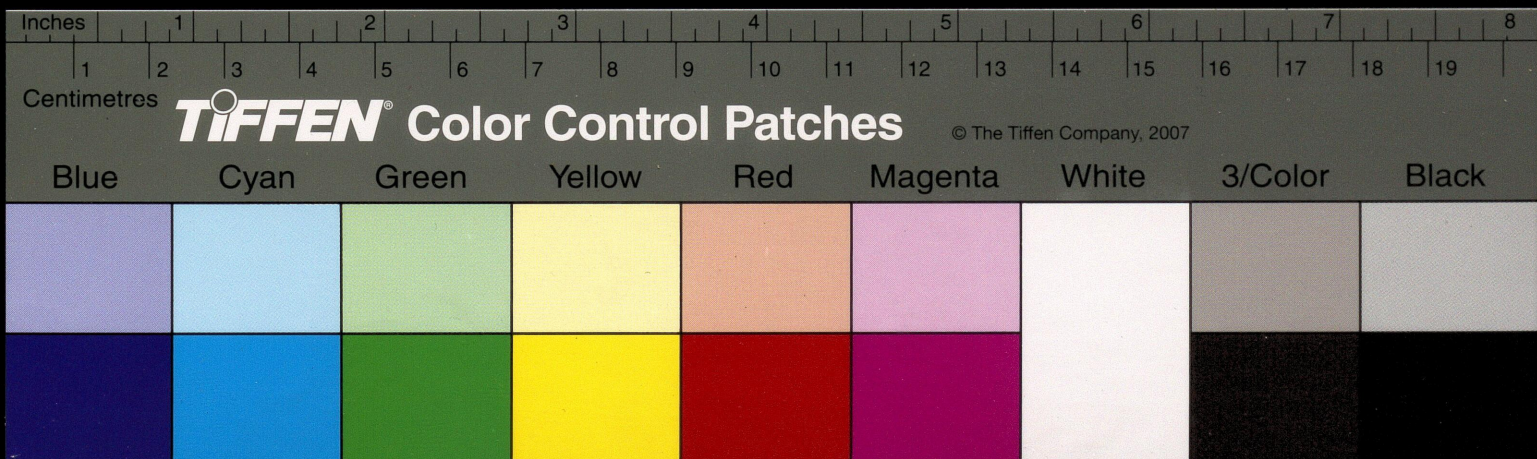
There is a great

The causes of

- (1) Habitat destruction
- (2) Deforestation
- (3) Agricultural activities
- (4) Collection of eggs
- (5) Urbanization
- (6) Industrial effluents
- (7) Pesticide use
- (8) Introduction of exotic species
- (9) Collection of animals
- (10) Destruction of fishing grounds
- (11) Water pollution
- (12) Extension of agriculture

Status : The crocodiles have become so scarce that the Govt. of India

Besides, the crocodiles are wildlife (Protected species) threatened with extinction prohibited by law



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University, Ludhiana,

gatus spores resulted in lesions. The lesions were to other tissues of the experiment was continued 4th day post-infection. The first 6 days followed the lungs. Microscopic developed granulomas in *Aspergillus fumigatus*. Reisolation of the ded that intratracheal pulmonary aspergillosis

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on biological aspects study in Hyderabad. complicated due to the eutro- species dominated the ved that growth rate also less and insects, and diatoms domina- nadosomatic values hichated water body.

13. Present status of the Indian crocodiles

M. V. SUBBA RAO

Member. IUCN, SSC, Crocodile Specialist Group and CBSG, USA, Department of Environmental Sciences, Andhra University, Visakhapatnam-530 003, India

Out of 22 species of crocodiles present in the world, only three species of crocodiles are found in the Indian sub-continent. They are the gharial, *Gavialis gangeticus*, Gmelin; the estuarine crocodile, *Crocodylus porosus*, Schneider and the mugger crocodile. *C. palustris* Lesson.

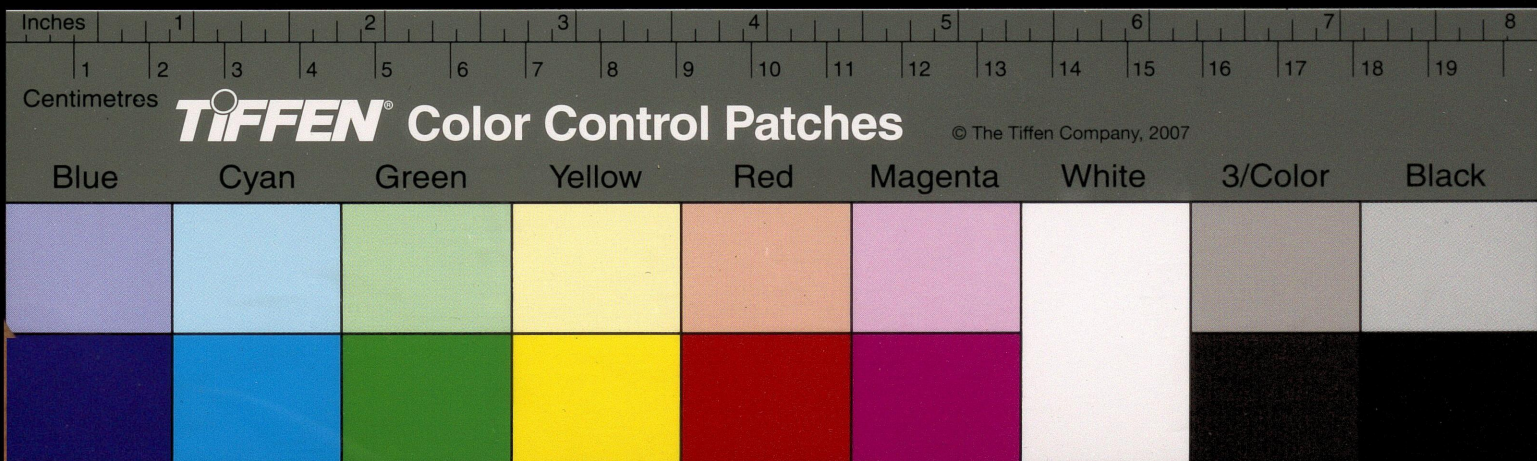
There is a great need to preserve the natural habitats of the crocodiles.

The causes of habitat loss of crocodiles are as follows :—

- (1) Habitat distribution (pollution is one type of habitat destruction).
- (2) Deforestation
- (3) Agricultural practices along the river banks.
- (4) Collection of the sand from the nesting sites.
- (5) Urbanisation
- (6) Industrialisation
- (7) Pesticides
- (8) Introduction of exotic species
- (9) Collection of crocodile eggs for food
- (10) Destruction of both juveniles and adults by Nylon set nets used for fishing.
- (11) Water development project.
- (12) Extensive hunting for their extremely valuable skin.

Status : The survival condition of these three species of Indian crocodiles have become so precarious that a ban on the export of their skins has been imposed by the Govt. of India.

Besides, the Indian crocodiles have been categorised in schedule-I of the Indian wildlife (Protection) Act, 1972 along with Tiger and Black buck, which too are threatened with extinction. Shooting of these crocodiles in any part of India is prohibited by law.



14. Relationship of Hansen's disease with perturbed neuromic networks

M. M. BAJAJ AND VIJAY RAJ SINGH

Cite Internationale Universitaire, 606, Maison de l'Inde, 7 Bd. Jourdan-Paris, 14^{eme}, France.

Our field studies and experience with the H. D. patients during the last two decades reveal that perturbation of the neuronc functioning is closely associated with the Hansen's disease. Though several attempts were made by our group and associated welfare societies, no significant success was achieved in setting these devastating trends in the rehabilitation of H. D. patients. We have found that the mental leprosy is one of the biggest problems in India. We have realised that if we are able to manage this complexity of human behaviour, it will definitely change the living patterns of our unfortunate patients. In continuation to the hard core bio-medical researches and investigations, it is imperative to teach to the patients that life can still be meaningful and useful with H. D., provided there is a change of outlook in the dependence on others without contributing anything in the world of manual and intellectual contributions.

15 The role of catalytic agents in the proliferation and dynamism of *M. Leprae*

M. M. BAJAJ AND VIJAY RAJ SINGH

606, Maison de l' Inde, Cite Internationale Universitaire, 7 Bd Jourdan-Peris 14^{eme}, FRANCE.

We have made an extensive study of the catalytic agents which play a very significant role in the dynamism of *M. Leprae*. Identified agents are (1) wine, (2) tobacco products (3) mal-nutrition, (4) poor quality of food, (5) scarcity of food, (6) non-vegetarian food items.

16. Multifractal aspects and chaotic scenario generated by nerve conduction loss in Hansen disease

M. M. BAJAJ AND VIJAY RAJ SINGH

606, Maison de l' Inde, Cite Internationale Universitaire, 7 Bd. Jourdan-Paris 14^{eme}, FRANCE and Medical Physics Research Laboratory, Department of Physics and Astrophysics, University of Dehli, Delhi—110 007, INDIA.

This paper reports the chaos generated by *M. Leprae*. We have studied these aspects using resonant and non-resonant spectroscopic techniques. Multifractals resulting in the bio-systems have been critically examined.

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MRS. J. G. MAHAN
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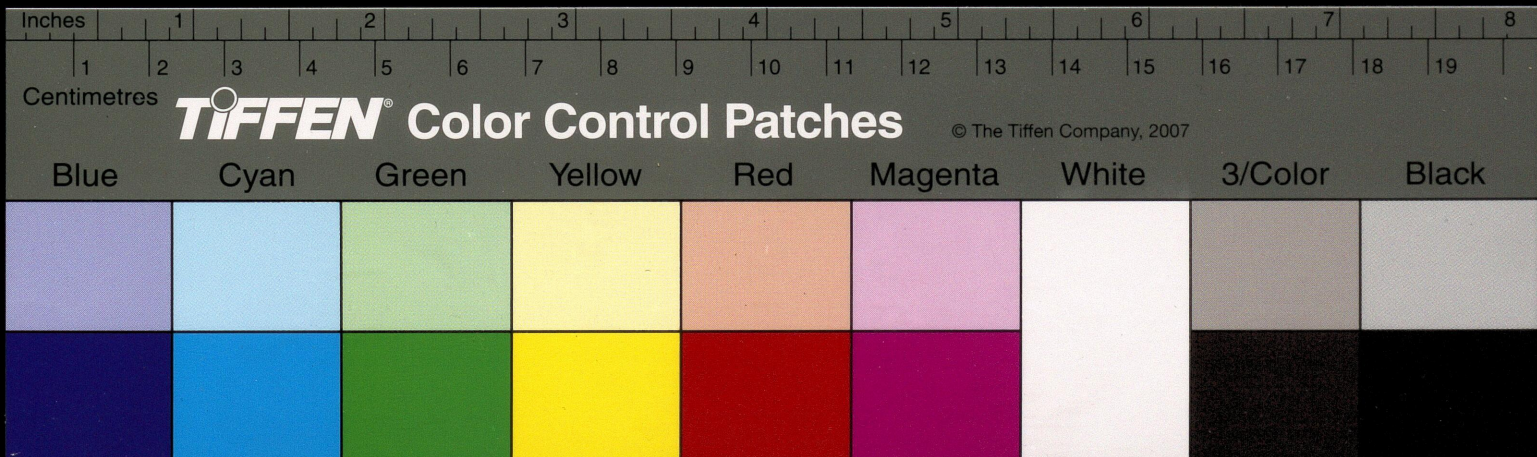
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17. Calcium induced dermal abnormalities in Indian Bull Frog-*Rana tigrina*.

MRS. J. G. MAHANTA

C/o P. K. Mahanta 63 Old M.L.A. Hostel, Dispur, Guwahati-781006 (Assam).

Habitat calcium at detectable amounts in living media of adult *Rana tigrina* (Indian Bull Frog) showed some dermal abnormalities. This led to the present investigation of young adult *Rana tigrina* to variable dosages (0.1, 0.3, 0.6, 0.9, 1.2 mg/Dl) of exposure (24 hours) under froggery rearing conditions.

The observation showed a hyper calcaemic reaction leading to melanophoric complex disarray and an observable shift in serum-calcium level from 10.5 ± 1.5 (N) to 24.4, 11.4, 11.5, 08.6, 10.8 mg/Dl in different dosages of exposure respectively.

The result further showed higher reaction in lower exposure with a gradual symptomatic exposition of dermal melanomic pathogenic conditions with depigmentation and hyperpigmentation clumping in localized areas. These findings confirmed that habitat Ca/oral Ca played a remarkable role in the induction of muco-epithelial abnormalities like melanoma and depigmentation of dermal layer leading to leucodermal and carcinomic conditions in vertebrates.

18. Allozymic similarity in *Drosophila nepalensis* populations

MANJU SHARMA, SUMAN SHARMA, RAVI PARKASH AND VANDNA

Department of Biosciences, Maharshi Dayanand University, Rohtak-124001.

Since there are no data on genetic structure of endemic *D. nepalensis* populations, allozyme polymorphism for seven gene enzyme systems were studied through horizontal starch gel electrophoresis in ten Indian populations of *D. nepalensis*. Four autosomal loci coded for dimeric *AcpH*, *Odh*, *Mdh* and *Ao* phenotypes allelic variants were represented by segregating single-band variants while *Adh* and α -*Gpdh* were controlled by a single locus each and homozygous strain depicted epigenetic two-banded and four-banded phenotypes. The data on allelic frequencies and F_{ST} analysis revealed allozymic similarity at all the polymorphic loci in *D. nepalensis*. The observed genic homogeneity patterns in *D. nepalensis* are comparable with those of *D. simulans*, *D. busckii* and *D. immigrans*. The allozymic uniformity observed in *D. nepalensis* might constitute a genetic strategy for this endemic species in respect of its limited niche-width for spatial climatic adaptations. The present observations comprise the first report on the population genetic structure of this oriental species.

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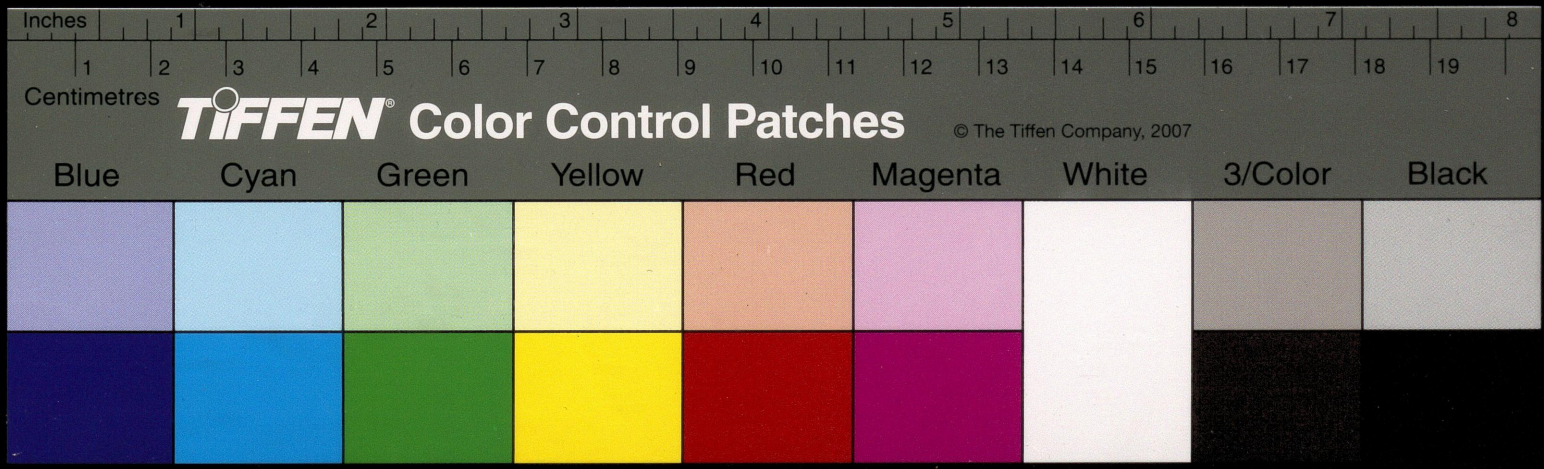
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19. Ethanol tolerance in *Drosophila immigrans* and *Zaprionus indianus*

RAVI PARKASH, MINAKSHI VASHISTH, SHAMINA AND NEENA

Department of Biosciences, Maharshi Dayanand University, Rohtak-124001

Electrophoretic analysis of alcohol dehydrogenase revealed monomorphism in *D. immigrans* and polymorphism in *Z. indianus*. The patterns of ethanol tolerance in *D. immigrans* revealed that adults could utilise ethanol in the range of 1.6 to 3% while larvae utilised ethanol in the range of 3.2 to 5% and thus revealed lesser geographical variation for ethanol tolerance. The LC_{50} ethanol concentrations for adult individuals of different populations were found to vary in the range of 2.8% to 3.5%. On the contrary, *Z. indianus* populations revealed significantly higher ethanol tolerance in larval (5.6 to 12.7%) and adult individuals (3.8 to 8.8%). The LC_{50} values revealed clinal variation in the range of 4% to 8.5% ethanol concentration i. e. southern populations depicted lower ethanol tolerance as compared with northern populations. Thus, the observed patterns of ethanol tolerance revealed interspecific genetic divergence and were found to be in agreement with niche-width variation hypothesis. The variation at *Adh* locus did not seem to be correlated with the extent of ethanol tolerance in these two drosophilids.

20. Allozymic variation in populations of *D. immigrans* and *D. busckii*

J. P. YADAV, SHAMINA, RAVI PRAKASH AND MINAKSHI VASHISTH

Department of Biociences, Maharshi Dayanand University, Rohatak-124001

Allozymes (genetic variants of enzymes) revealed by gel electro-phoretic technique constitute useful markers to examine the role played by micro-evolutionary processes in altering the genetic architecture of species populations. Yearly population samples of *D. immigrans* and *D. busckii* were analysed electrophoretically for allozymic variation of six gene-enzyme systems. All the polymorphic loci revealed constancy in temporal allelic frequency patterns in both the colonising *Drosophila* species. The extent of genic diversity was found to be significantly higher in the Indian populations of both these species as compared with the species populations from other continents. The allozymic uniformity observed in *D. immigrans* as well as *D. busckii* might constitute a genetic strategy for these colonising species in respect of their limited niche-width for temporal climatic adaptations.

21. Non-Linearity Pa

A. K. SINGH AND J. B.

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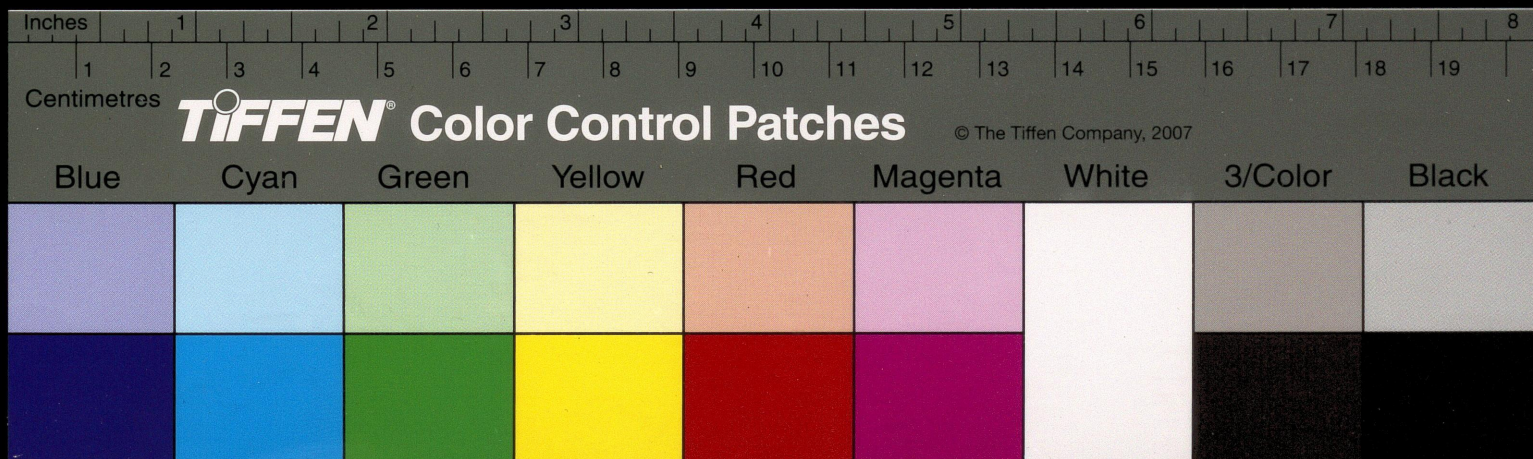
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29. Effect of constant photoperiods on normal diel activity pattern in *Anabas testudineus*

K. P. SINGH AND C. B. L. SRIVASTAVA

Zoology Department, Allahabad University, Allahabad, 211002

Under normal light-dark photoperiod conditions, the diel pattern of locomotor activity was recorded by an ichthyometer. Recorded actographs display a pattern of higher and lower activity during scotophase and photophase respectively in a characteristic pattern of circadian rhythm. The initiation and termination of locomotor activity synchronized with dusk and dawn respectively. The Sunset twilight acts as strong Zeitgeber or entraining agent than Sun rise. When fish kept in constant illumination and dark conditions against the real night and real day, fish completely lost their normal diel pattern of circadian activity. Thus, the circadian rhythm is not governed by endogenous mechanism but display solely exogenous nature. The significance of the present investigation exists in the culture and capture point of view.

30. Genetic upgradation of fishes for production enhancement

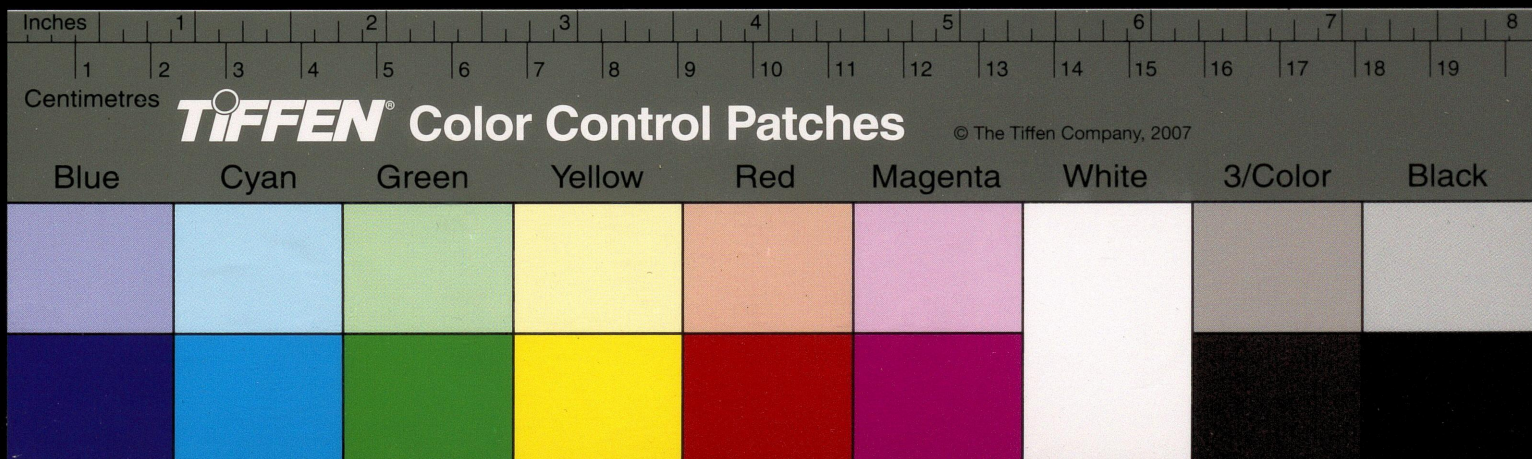
P. DAS

National Bureau of Fish Genetic Resources Allahpur, Allahabad—211 006, U. P.

India possesses plentiful aquatic resources with tremendous potential for fish production. But for various reasons our production figure has not exceeded 4.14 mt as in 1991-92 against its two and half fold present demand.

Application of genetics in plant and animal sciences resulted in green and white revolutions in India. Similar attempts in fishery science also offers comparable scope with encouraging indications.

While sex reversal offers a scope for monosex culture of prolific breeders while sterile fish production minimizes wastage of energy into gonadal maturation and both enhances growth. Genetic selection involves increasing the frequency of favourable allele of genes for production parameters which are additive in nature. Hybridization between different genetic groups may lead to hybrid vigour. Cryopreservation technique is useful for availability of gametes round the year for hybridization and also for biodiversity conservation of fish genetic resources. The techniques of gynogenesis and androgenesis for production of individuals with maternal and paternal genome alone avoiding the genetic contribution of the other sex. Production of triploid and tetraploid fishes through genetic engineering would hopefully increase growth. Production of transgenic super fishes through gene cloning has a great potential for enhancing production, yet its impact on ecology and consumers are to be observed.



31. Oxygen uptake in the juveniles of an Indian major carp, *Labeo rohita* (Ham.) under an Anaesthetic, Benzocaine

KESHAV K. JHA AND TAPAN K. GHOSH

Ichthyology Research Laboratory, University Dept. of Zoology, Bhagalpur University, Bhagalpur—812007.

Effect of Benzocaine (Ethyl-p-aminobenzoate) on the ventilation rate and oxygen uptake in the juveniles of *Labeo rohita* has been investigated at $30.0 \pm 1^\circ\text{C}$ using cylindrical glass respirometer with continuous water flow. A fish of $7.23 \pm 1.63\text{g}$ average body weight ventilates about $80 \pm 3/\text{min}$ in control water (borehole water) while in 2h and 24h treated (35 ppm of benzocaine) fish, the average ventilation rate/min was recorded to be 42.0 ± 3 and 53 ± 4 respectively. Thus, the 2h exposed fish shows 47.76% reduction from the control fish while 34.61% reduction was observed in 24h exposed fish. Under the controlled condition of borehole water, fish of $7.23 \pm 1.63\text{g}$ average body weight consumes $0.244 \pm 0.033\text{mlO}_2 \cdot \text{g}^{-1} \cdot \text{h}^{-1}$ whereas in 2h and 24h exposed fish of same body weight, the oxygen uptake was found to be 0.137 ± 0.019 and $0.158 \pm 0.017\text{mlO}_2 \cdot \text{g}^{-1} \cdot \text{h}^{-1}$. when compared to control the 2 and 24h anaesthetic exposed fish shows 43.85 and 35.25% reduction respectively. The difference was statistically significant.

32. Malaria surveys in tea estates of Assam

V. DEV AND V. P. SHARMA

Malaria Research Centre, Sonapur (Assam), and M.R.C., Delhi

With the resurgence of malaria, certain Tea Estates particularly those bordering Bhutan and Arunachal Pradesh have been adversely affected causing high degree of morbidity and mortality. In Consequence of which, malaria surveys were conducted in some of the Tea Estates namely Tarajulie, Paneery, Borangajulie, Bhooteachang, Corramore, Dimakuchi, Attrekate, Kolony, Naharani and Sonajulie during (1992-93). Blood smears collected through passive agency (fever cases), and/or mass blood surveys were examined for malaria parasite. In the passive collections, SPR varied between 12% to 67%, and over 70% of the infections were due to Pf. Malaria positivity were recorded in all age groups including infants. In the mass blood surveys, 16% to 18% of the cases were found to be afebrile carriers. Chloroquine sensitivity studies (using 3 day WHO test) revealed that 86% of the cases were S/RI, and RI, RII and RIII comprised only 8%, 4%, 2% respectively. Entomological studies revealed that *An. minimus* was the principal vector in these Tea Estates, and sporozoite rate varied between 3.14% to 4.23%. *An. minimus* breedings were recorded in adjoining slow flowing water streams, and it comprised 9% to 28% of the total indoor day resting collections in the human dwellings. In the whole night human bait catches 70% to 79% of the total collections were *An. minius*, and man biting rate (MBR) varied from 13.25 to 19.60. Due to high incidence of malaria coupled with high man/vector contact, insecticide impregnated bednets were proposed as personal protection method against malaria.

33. Availability of nat during storage

ARCHANA SINHA, K. K. Digestive Physiology and Versova; Bombay 400

The vitamin C (*Tubifex* and *bivalves* recorded in all the *Artemia* (37.32 mg/100 mg/100 g) and *Daphnia* vitamin occurred in all four weeks. This mentioned organisms

34. Hydrobiological

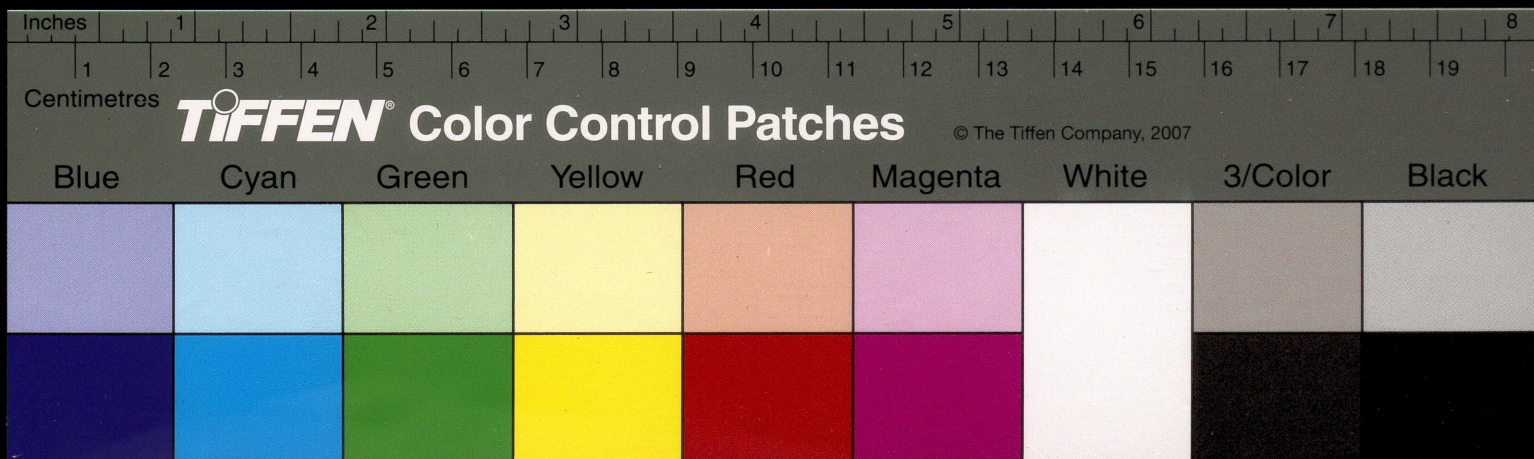
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the ventilation rate and investigated at $30.0 \pm 1^\circ\text{C}$ low. A fish of $7.23 \pm 1.63\text{g}$ of water (borehole water) the average ventilation rate/ thus, the 2h exposed fish reduction was observed borehole water, fish of $10.2\text{g}^{-1}\text{h}^{-1}$ whereas in 2h uptake was found to be compared to control the 2% reduction respectively.

particularly those bordering causing high degree of surveys were conducted ngajulie, Bhooteachang, najulie during (1992-93). d/or mass blood surveys ns, SPR varied between Malaria positivity were blood surveys, 16% to quine sensitivity studies S/RI, and RI, RII and al studies revealed that d sporozoite rate varied ded in adjoining slow tal indoor day resting an bait catches 70% to ate (MBR) varied from with high man/vector as personal protection

33. Availability of natural vitamin C in certain live fish food organisms and its losses during storage

ARCHANA SINHA, K. K. JAIN AND P. P. SRIVASTAVA

Digestive Physiology and Nutrition Division, Central Institute of Fisheries Education, Versova; Bombay 400 061.

The vitamin C (ascorbic acid) content of live food organisms *Artemia*, *Daphnia*, *Tubifex* and *bivalves* were analysed and a considerable amount of vitamin was recorded in all the four food organisms. The highest content was recorded in *Artemia* (37.32 mg/100 g), followed by *Tubifex* (34.09 mg/100 g), then *bivalves* (27.46 mg/100 g) and *Daphnia* (10.08 mg/100 g). A considerable loss of the analysed vitamin occurred in all the organisms after storage in freeze under frozen condition for four weeks. This paper describes the availability of vitamin C in the tissue of the mentioned organisms and the details of losses during their storage.

34. Hydrobiological studies of inshore waters of Bombay

V. JACOB, R.A. SELVAKUMAR, R. ABIDI, R. K. LANGER, R. P. RAMAN AND V. LANDE

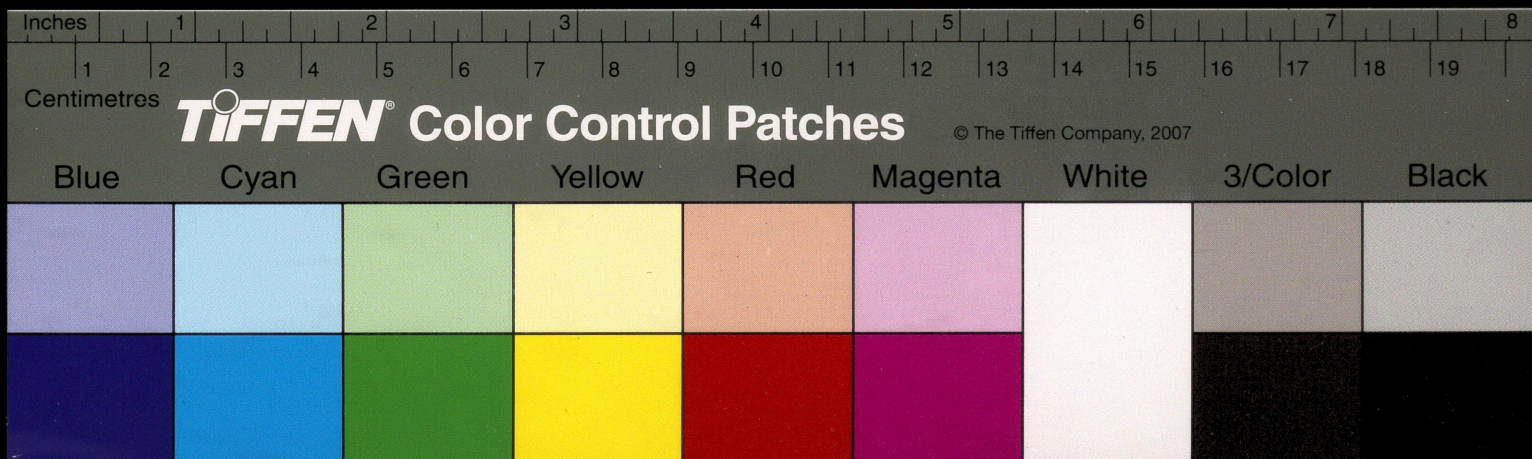
Central Institute of Fisheries Education (I.C.A.R.) Versova, Bombay 400061

The inshore waters of Bombay are highly polluted due to the indiscriminate disposal of wastes into them. In this context, hydrobiological studies of such water-bodies are very important as it would indicate the present status of pollution load on them.

Present study has covered two nearshore stations off Mahim and Versova (5 m depth) representing polluted systems and two parallel off-shore areas, (10 m depth) representing rather unpolluted waters.

Parameters studied were surface water temperature, salinity, dissolved oxygen pH, nitrite nitrate; phosphate, zooplankton (Qualitative and quantitative).

Salinity, DO, pH, NO_2 , NO_3 and zooplankton biomass values were lowest in Mahim whereas pO_4 was found to be highest. This indicated that Mahim nearshore waters, are more polluted than offshore Mahim waters, Versova nearshore and offshore waters.



35. Limnology of Farooq Nagar pond, Jammu Part II-Rotifera

S. P. S. DUTTA, JYOTI SHARMA AND S. KOUL.
 Department of Bio-Sciences, University of Jammu, Jammu-180004.

Qualitative composition and quantitative variations of rotifers in relation to various physio-chemical parameters of water and phytoplankton was studied during June, 1991 to May, 1992. Fifty one species of rotifers belonging to twenty nine genera remained seasonal. Qualitatively and quantitatively rotifers recorded annual highest peak in August and lowest in October and May, respectively. Analysis of coefficient of correlation (r) of rotifers with various physico-chemical parameters has shown insignificant results. Rotifers have shown significant correlations with Englenophyceae ($r = -0.6024$) and Bacillariophyceae ($r = 0.5626$) and insignificant with total phytoplankton ($r = 0.1936$), Chlorophyceae ($r = 0.2550$), Cyanophyceae ($r = 0.0119$), Xanthophyceae ($r = 0.05278$) and Pyrrophyceae ($r = 0.1661$).

36. On Genus *Exitianus* Ball (Homoptera : Cicadellidae) along with description of the new species

BALDEV SHARMA AND UPASNA SHARMA
 Department of Biosciences, University of Jammu, Jammu-180004.

The paper deals with *Exitianus* leafhoppers inhabiting grasslands and agricultural fields from various parts of Jammu (J & K). Apart from the earlier known species *Exitianus indicus* Distant and *Exitianus nanus* Distant, seven new species viz., *Exitianus jammuensis*, *Exitianus bhaghwatiensis*, *Exitianus tawlai*, *Exitianus bahuensis*, *Exitianus bittui*, *Exitianus aspinosa*, *Exitianus monospinosa* have been described in the present account.

37. Determination of Difethialone toxicity against Indian desert gerbil, *Meriones hurrianae* (Jerdon).

KANAN SAXENA AND Y. SAXENA
 Department of Zoology, University of Rajasthan, Jaipur 302004, India.

The present study was conducted to determine the efficacy of Difethialone at 0.00093% concentration against *Meriones hurrianae*. Choice and No-choice tests were conducted in the laboratory. Cent per cent mortality was observed after 24 hrs. of exposure in the No-choice test while 50 per cent mortality resulted in the choice test. In the choice test, poisoned bait was preferred over plain bait. The poison bait was more palatable but its intake was not significantly different.

38. Protozoa-trophic st

A. WANGANE, I. V. SU
 Impact Assessment Uni
 462026, India

The protozoan C worked out in order to waterbody having BO protozoans like *Arcella* a BOD value of 89 mg *Bodo* and *Choenia* as th and *Colpidium* specie recording a BOD and

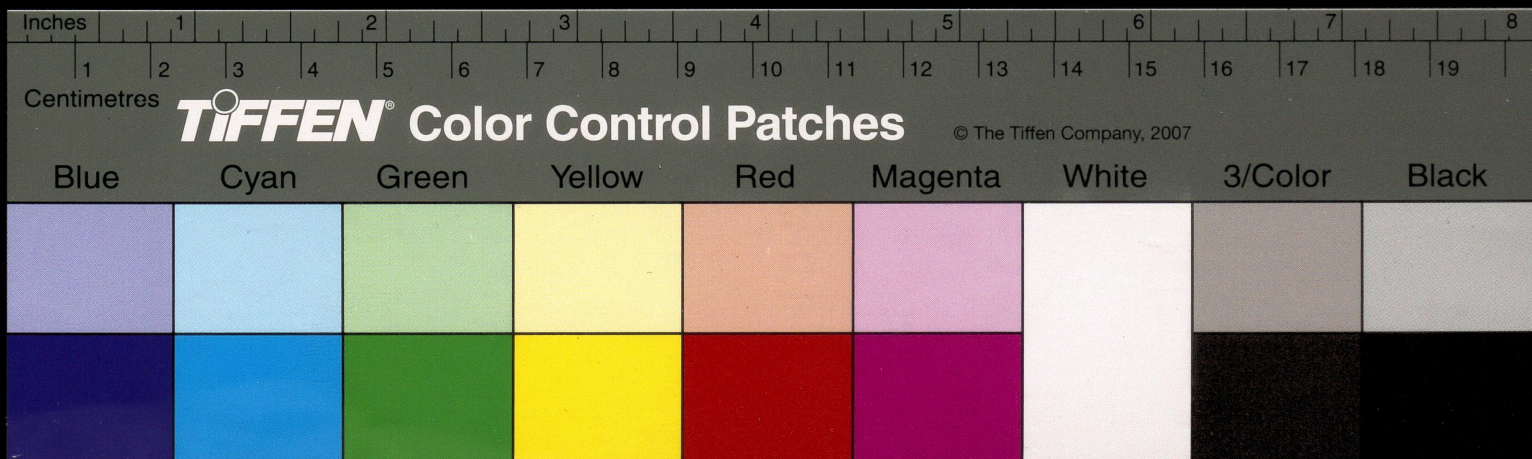
The presence of correlated to their tro

39. Studies in mac a fish stream

Y. R. MALHOTRA,
 Department of Bios

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The relatio dissolved oxygen, and seasonal var this communicati



38. Protozoa-trophic status of water bodies

A. WANGANEO, I. V. SURESH, S. PANI, M. J. NANDAN AND NEETA BHATT

Impact Assessment Unit, Department of Limnology, Barkatullah University, Bhopal-462026, India

The protozoan component of the aquatic systems in Bhopal region has been worked out in order to understand the degree of pollution. It has been found that waterbody having BOD 48.0 mg l^{-1} and COD 45.0 mg l^{-1} contains the dominant protozoans like *Arcella*, *Diffugia*, *Loxodes* and *stenter* and the waterbody recording a BOD value of 89 mg l^{-1} and COD value of 66.5 mg l^{-1} contains *Amoeba*, *Trinema*, *Bodo* and *Choenia* as the main protozoans. *Chochliopodium*, *Valkamfia*, *Pleuromonas* and *Colpidium* species of protozoa are found predominantly in the water ways recording a BOD and COD value of 180 mg l^{-1} and 85 mg l^{-1} respectively.

The presence of different forms of protozoa in these waterbodies has been correlated to their trophic status.

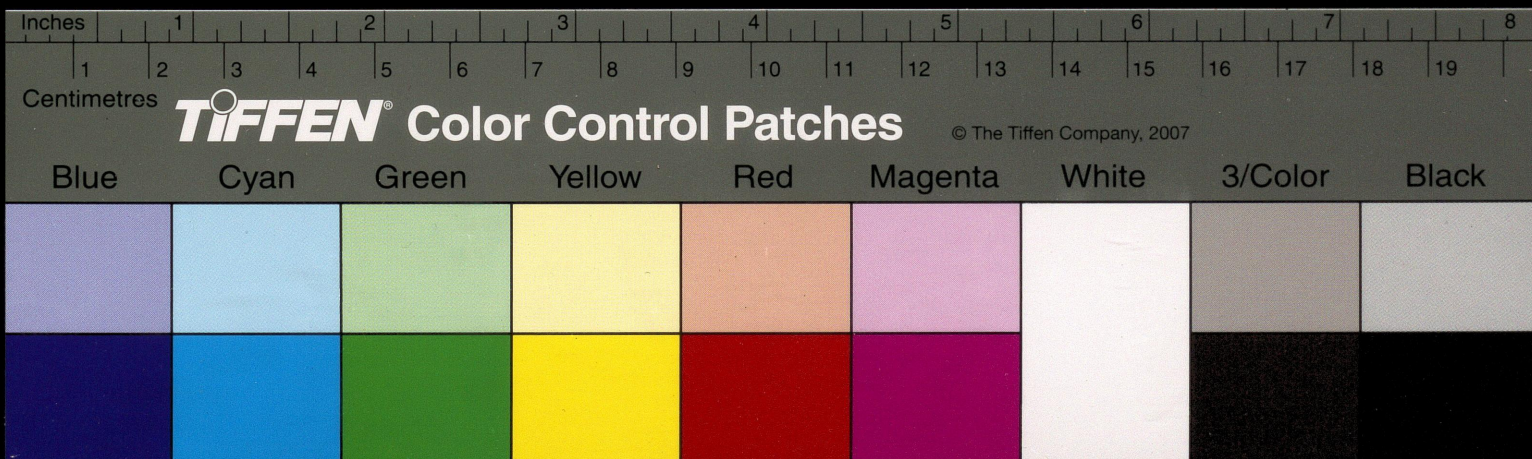
39. Studies in macrozoobenthos in relation to physico-chemical parameters inhabiting a fish stream of Jammu.

Y. R. MALHOTRA, K. K. SHARMA AND M. R. THAKIAL

Department of Biosciences, University of Jammu, Jammu-180004.

A detailed investigations of macro-zoobenthos of stream located at Chack Bala, R. S. Pura, $74^{\circ} 8' \text{ E}$; $32^{\circ} 57' \text{ N}$ have been conducted from September, 1989 to August, 1991. A total of 14 benthic forms were collected belonging to Oligochaeta, Insecta and Mollusca (Gastropoda and Pelecypoda). Mollusca was found to be the dominant group of the benthic communities investigated, followed by Insecta and Oligochaeta. The benthic organisms registered their maxima in the summer months and minima during the winter season.

The relationship between physico-chemical factors like temperature, pH dissolved oxygen, free Carbon dioxide, bicarbonate, chloride, calcium and magnesium and seasonal variations in macrozoobenthos distribution has also been discussed in this communication.



40. Evaluation of macrobenthic community through species diversity index

Y. R. MALHOTRA, K. GUPTA AND ANIL KHAJURIA

Department of Biosciences, University of Jammu, Jammu-180004

Community structure of both micro and macrobenthic organisms form one of the important constituents of aquatic ecosystem. In the present communication macrobenthic community at four sampling sites differing in physico-chemical characteristics and biotic interference has been presented for one of the Shivalik lakes of Jammu the lake Mansar. Species diversity has been used as the criteria for assessment of the community structure and was calculated for all the sampling sites by using Shannon and Weaver Equation. The index has been found to be minimum (1.2796 bits/ind.) at profundal zone of site No. 2 while maximum (2.8747 bits/ind.) at littoral zone of site no. 1. It is significant to mention that low diversity index reflects greater stress of the environment for space and resource. While higher values of index indicate prevalence of comparatively favourable conditions. The role of species diversity index in determining the community conditions of lake are discussed at length in the text.

41. Observation on the freshwater Gastropods (Mollusca) of Jammu province, J&K state.

P. L. DUDA, ANIL K. VERMA, P. S. PATHANLA AND RANVIJAY

P. G. Department of Biosciences, University of Jammu, Jammu, J&K State—180004.

Although there were a few earliest studies on the freshwater gastropod molluscs of Kashmir valley, J and K State; there were no detailed studies on these molluscan forms, particularly of the Jammu province. In surveys conducted during last two and a half years an attempt has been made to study the malloco-fauna of state with particular reference to the gastropods. Twenty one species of freshwater snails, belonging to 11 families and 15 genera have been recovered from the diverse habitats of the region. A brief description of the species, measurements of shell and information on the recorded distribution are provided.

42. Limnology of F

S. P. S. DUTTA, S. I

Department of Bio-

Monthly res macrobenthic inver comprising of oligo odonate nymphs, qualitative and qu annual highest cou June highest and M 2.667) has indicate (r) of total macro results.

43. Mutagenicity

I. S. GROVER, AN

*Department of Bo***Department of C*

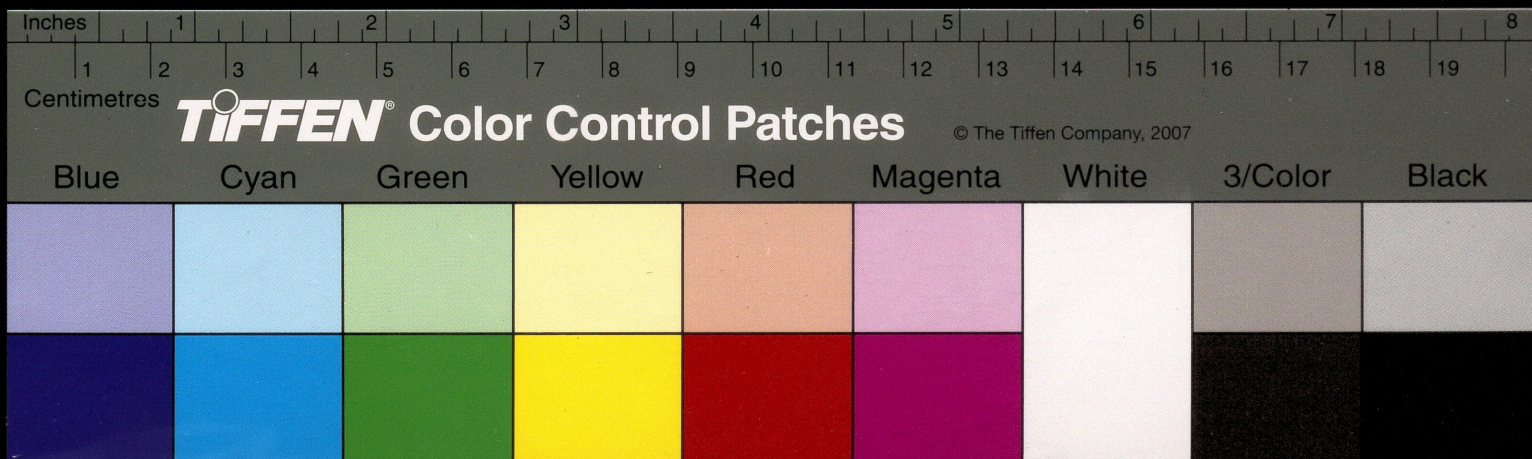
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44. Evaluation and Swiss

Y. SAXENA, RA

Department of

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45. Embryology of interspecific crosses in *Sesamum* L.

S. POORNIMA AND K. K. LAKSHMANAN*

Department of Botany, Bharathiar University, Coimbatore-641 046

*Kongu Nadu Arts and Science College, Coimbatore-641 029

Interspecific crosses have been carried out by several workers in *Sesamum orientale*, an important oil-crop to introduce disease and pest resistance from wild species. But so far different cross combinations have resulted in the failure or in the formation of shrivelled/inviable seeds. Hence embryological investigation are undertaken to study the causes for failure in the interspecific and reciprocal crosses between cultivated *S. orientale* ($2n=26$) and its wild species *S. alatum* ($2n=26$), *S. laciniatum* ($2n=32$), *S. radiatum* ($2n=64$). The cross between *S. orientale* \times *S. alatum* is a complete failure showing pre-fertilization, inhibition. But the reciprocal cross resulted in low seed set suggesting unilateral incompatibility among the two species. The other two species *S. laciniatum* and *S. radiatum* differ widely in their chromosome numbers. Their crosses and reciprocal crosses with *S. orientale* show inhibition at pre-and post fertilization level and low percentage of healthy and sterile seeds which indicates bilateral incompatibility. Irrespective of the direction of the cross abnormalities are the same both at pre-and post fertilization stages. All types of abnormalities such as inhibition of pollen germination, nondirectional growth of the pollen tube, pollen tube burst at different levels of the style, lack of fertilization, zygote and endosperm degeneration, persistence of endothelium are observed. Together normal pollen germination, tube growth, fertilization, embryo and endosperm development also observed in one and the same ovary. It is discussed that if the pollen and pistil characters are matching there is normal development, otherwise inhibition occurs depending upon the level at which the barrier operates, so there must be multiple crossing barriers among the species of *Sesamum* which indicate a high degree of incongruity.

46. *Triumfetta rhomboidea* Jacq., a tolerant species to coal-smoke pollution

S. SAHEED., F. A. LONE, A. PARVEEN AND A. K. M. GHOUSE

Department of Botany, Aligarh Muslim University, Aligarh-202 002

Several Workers in the past have Screened a number of weeds to the injurious effect of Coal-Smoke pollutants around the Thermal Power Plant Complex of Kasimpur. None of the investigated species has been shown to have tolerance to Coal-smoke pollution. However the present study on *Triumfetta rhomboidea* Jacq., a member of Tiliaceae has revealed that this common weed has highly tolerant traits with regard to leaf number and shoot and root biomasses, leaf area, number of branches and floral buds, leaf dry weight etc., although the length of shoot and root has been significantly susceptible for the coal-smoke hazards.

47. Phytochemical s

B. B. DUTTA, S. S. C

Department of Botany

Department of Botany

Department of Botany

Qualitative and flavonoids and alkaloids viz. *Butea manosperma*, *C. juliflora*, *C. gangeticum* (L.) DC, *Sesbania* L. and *Sesbania* L. naphthoquinone is present in three species with identical phytochemical composition importance.

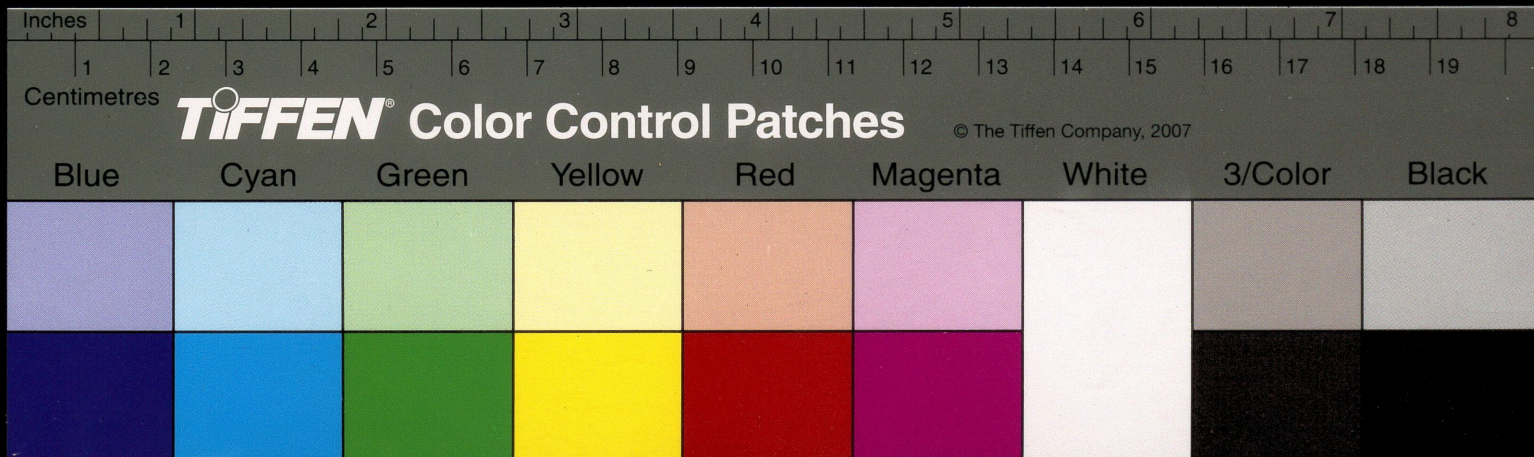
48 Effect of aut

M. C. ARJUNAN,

Department of Botany
Tamil Nadu

Effect of autoclaving on the control growth of fully coated with tation, duration of

Anatomical studies in *L. esculentum* trichomes is decreased only in normal plants *esculentum* and width of the trichomes of the leaf in plants. Heavy irrigation in turn, reduces



49. Aeromycological studies in Indoor environments of Nagpur, II-Residential quarters

A. A. SAOJI AND S. K. GIRI

Department of Botany, Institute of Science, Nagpur-440 001

Aeromycological studies were carried for six month (Jan 1993-June 1993) in residential quarters at Nagpur, (M. S.). Samples were collected at fortnightly intervals using Rotorod samplers and also a culture plate method. Twenty five spore types belonging to 25 genera were indentified from the rotorod sampler and forty species representing 20 genera isolated from exposed petriplates.

Aspergillus spp. spores were found to be predominant in the residential quarters and this was followed by *Penicillium*, *Allernaria*, *Curvularia*, *Cladosporium* and *Chaetomium* on exposed petriplates in that order. Other fungi were also commonly found in residential quarters such as *Mucor*, *Rhizopus*, *Botrytis*, *Candida*, *Heliminthosporium*, *Monilia*, *Trichothecium* and *Verticillium*.

It was intresting to note that the percentage contribution of aeroallergenic fungal spores in the air inside residential quarters was nearly 67%.

50. Studies on soil algae of cotton fields of Vidarbha VII : aerophycological flora of Nagpur district

V. S. LIKHTOKAR AND J. L. TARAR

Deptt. of Botany, Institute of Science, Nagpur-440 001.

The present investigation reveals airborne algae of cotton fields of Nagpur District of Maharashtra State. Culture plates were exposed at different sites chosen from cotton fields. Overall 23 taxa were noted, out of which 13 belonged to Cyanophyceae, 7 to Chlorphyceae and rest 3 to Bacillariophyceae encountered during Jan. to June, 1993. *Oscillatoria*, *Gloeocapsa* and *Nitzschia* were most commonly enumarated. Whereas *Nostoc* recorded least occurence during the present study.

51. Ethnobotanical studies of Damoh and Chhatarpur District (M. P.)

GYANESH SHUKLA AND B. K. VERMA

Department of Botany University of Allahabad, Allahabad-211002

Damoh and Chhatarpur districts are adjacent and form the central part of Madhya Pradesh. During ethnobotanical survey of the districts, 42 plant species have been recorded which are commonly used by tribal and rural people for the cure of various diseases. The botanical name, local name, parts used and mode of administering the drugs are provided with each plant species.

52. Comparative efficacy of chickpea seeds

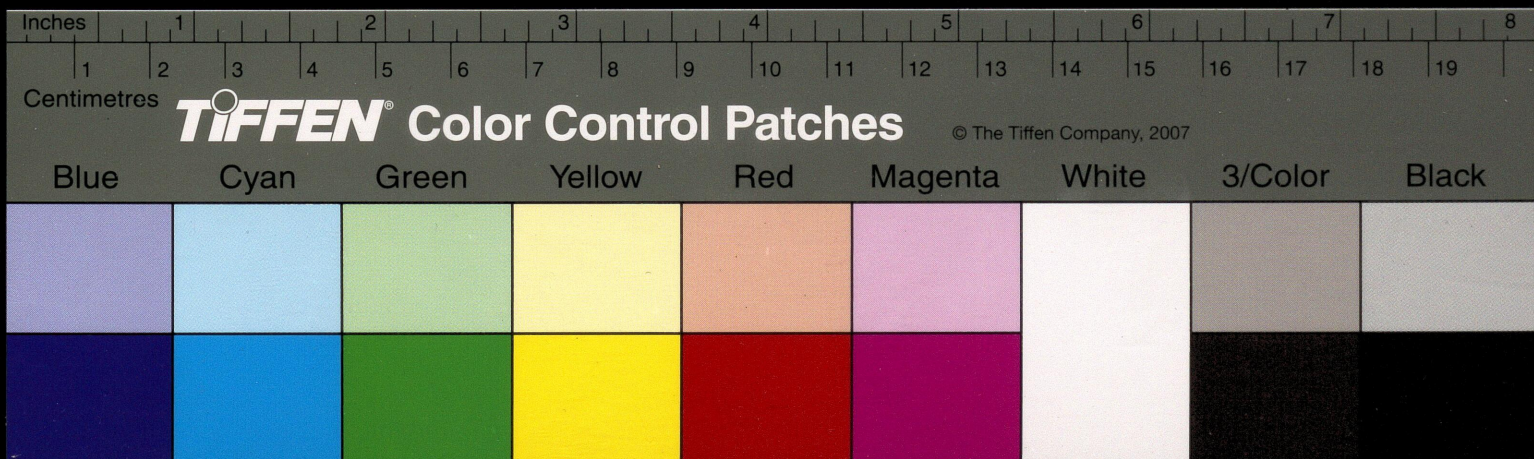
NASEER H. SHAH, MOHD. Section of plant Pathology University, Aligarh 2020

A comparative study was conducted on chickpea seeds (*Cuscuta reflexa*, *Solanum Thiram*, Thiovit and Su (var. JG-62, JG-1263, J were isolated from the v ecountrered in the var. *gillus fumigatus*. *Botrytis* were recorded from all v observed for *R. nigrican* tested in the present inv cating the fungal specie treatment of seeds with percent garmination. T and *E. pulchirrema* amo

53. Growth pattern of

MS. PRAMILA RAJPUT A Department of Botany,

Atriplex belongs variation in their grow while *A. barclayana* a were observed in *A. u* spreading and prostrat on planting in the field spreading form than t more suitable in the fi the anchorage of noda system. *A. undulata*, species, while *A. Ves* spreading type, show value (10.2 ± 0.57 cm cover gives shelter to climatic conditions of



52. Comparative efficacy of certain chemicals and plant products on mycoflora of chickpea seeds

NASEER H. SHAH, MOHD. IMRAN KHAN AND M. F. AZAM

Section of plant Pathology and Nematology, Department of Botany, Aligarh Muslim University, Aligarh 202002, India.

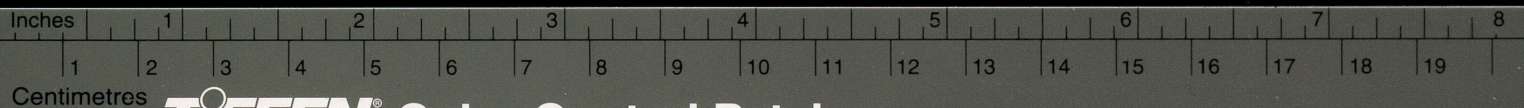
A comparative study of the efficacy of plant products (*Azadirachta indica*, *Cuscuta reflexa*, *Solanum nigrum* and *Euphorbia pulcherrima*) and fungicides (Calixin, Thiram, Thiovit and Sulfex) was made on the seed mycoflora of chickpea seeds (var. JG-62, JG-1263, JG-315, H-208 and BG-246). In all, 21 fungal species were isolated from the varieties tested. The maximum number of species (15) were encountered in the var. JG-1263. *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus fumigatus*, *Botrytis cinerea*, *Macrophomina phaseolina* and *Rhizopus nigricans* were recorded from all varieties. The highest frequency of occurrence (18.0) was observed for *R. nigricans* in the var. JG-62. All chemicals and plant products tested in the present investigation were proved effective either in minimizing or eradicating the fungal species associated with the seed, but to varying degree. Also, treatment of seeds with chemicals and plant products proved boon in enhancing percent germination. The best result was obtained for Calixin amongst fungicides and *E. pulcherrima* amongst plant products.

53. Growth pattern of some introduced species of *Atriplex* L. in Indian desert

MS. PRAMILA RAJPUT AND DAVID N. SEN

Department of Botany, J.N.V. University Jodhpur-342 001, India

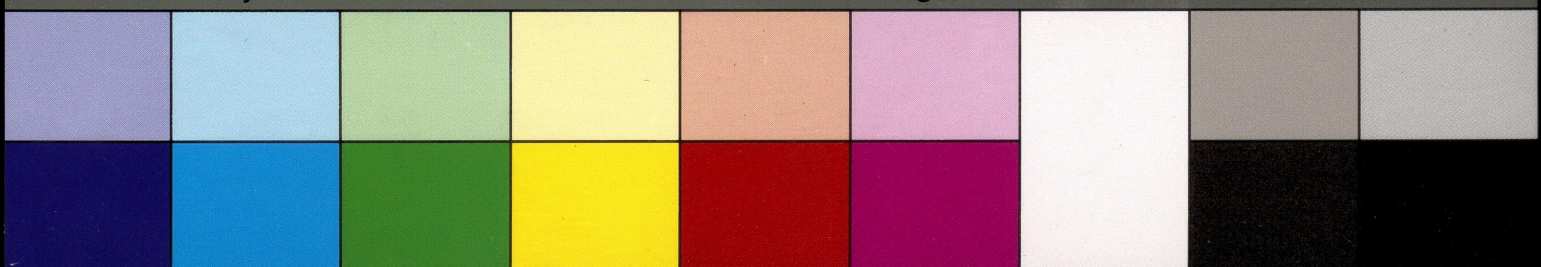
Atriplex belongs to family Chenopodiaceae and different species showed much variation in their growth pattern. *A. argentina* is small erect and bushy in habit while *A. barclayana* and *A. vesicaria* are spreading in nature. Two types of plants were observed in *A. undulata*: One is erect growing, while the other was more spreading and prostrate. This may be an ecotypic variation and may prove beneficial on planting in the field condition as nodal root production will be more in the spreading form than the erect one. The plant with prostrate habit will prove to be more suitable in the field as it can withstand the grazing pressure more easily due to the anchorage of nodal roots and the increased water due to more profuse root system. *A. undulata*, an erect type, attained maximum height (1.0 m) among all species, while *A. Vesicaria* showed the minimum (14.7 ± 0.03 cm), *A. undulata*, spreading type, showed maximum (22.2 ± 0.5 cm) canopy radius, while the least value (10.2 ± 0.57 cm) was observed in *A. barclayana*. The increased canopy cover gives shelter to small animals, birds and also helps to ameliorate the micro-climatic conditions of the soil.



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54. Arid zone tree species in agroforestry program me

MANOJ MEHTA AND DAVID N. SEN

Laboratory of Plant Ecology, Department of Botany, J. N. Vyas University, P. O. Box-14 Jodhpur—342 001, India

Agroforestry involves the interaction of trees with crop plants. During the initial establishment stage of trees, it is important to investigate the underneath vegetation in comparison to nearby area free from canopy effects. In the present study in semi-arid zone of Rajasthan, a comparative investigation was carried out for a year in *Acacia tortilis*, *Azadirachta indica*, *Prosopis cineraria* and *Prosopis juliflora* tree stands and their respective nearby areas. The results indicate that *P. cineraria* and *A. indica* do not cause any hinderance to the underneath vegetation, whereas *P. juliflora* and *A. tortilis* exhibit some exclusion mechanism which needs further investigation. Maximum biomass was observed under *P. cineraria* throughout the year.

55. Effect of a new strain of petunia mottle virus on the growth and photosynthetic pigments of *Petunia hybrida* vilm

A. B. RASHID MALIK, FAROOQ A. LONE AND QAMAR A. NIAQVI

Department of Botany, A. M. U., Aligarh-202002, U. P.; India

Petunia mottle virus (PMV) is quite prevalent on petunias in the University campus of Aligarh. Further studies on petunia mottle disease revealed the involvement of a new strain of PMV. In the present investigation the effect of this new strain on the population of *Retunia hybrida* Vilm, has been found to cause significant reductions in the plant growth and the chlorophyll contents. whereas, the concentration of carotenoids observed a marginal increase.

56. Effect of acid scarification on seed germination of *pulicaria crispa* (cass.) Benth. & Hook. F.

VINOD K. KHANDELWAL AND DAVID N. SEN

Ecology Laboratory, Botany Department, J. N. V. University, P. O. Box-14, Jodhpur 342 001, India.

In the present study, an attempt has been made to observe the effect of different concentrations and durations of sulphuric acid pre-treatment on seed germination of *Publicaria crispa*. The seeds of this species showed dormancy as no germination was found under control. Acid scarification in all the selected concentrations and durations enhanced the germination percentage, although maximum (53.3%) germination was observed after 2 min (50% H_2SO_4) pre-treatment.

57. Comparative study

M. SHARMA, P. C. BISU
Department of Bio-chem
Bhubaneswar-751003

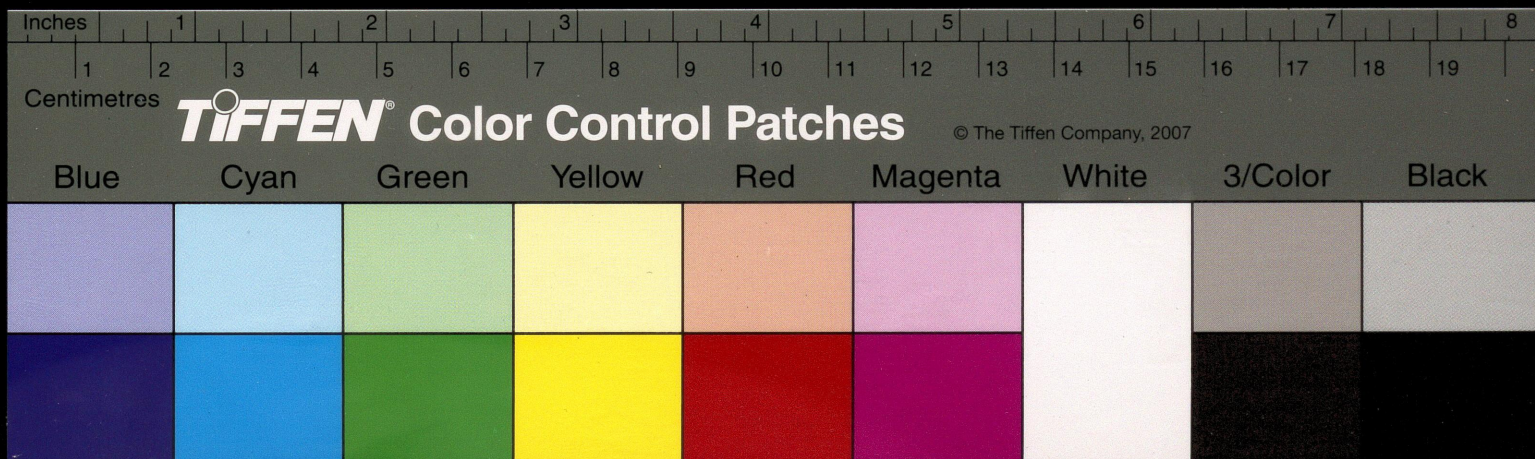
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58. Biochemical cons

D. K. SINGH, F. M. I
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57. Comparative study of serum constituents of crossbred and indigenous calves

M. SHARMA, P. C. BISUN, M. MOHAPATRA AND A. MOHANTRY

Department of Bio-chemistry, College of veterinary Science and Animal Husbandry, Bhubaneswar-751003

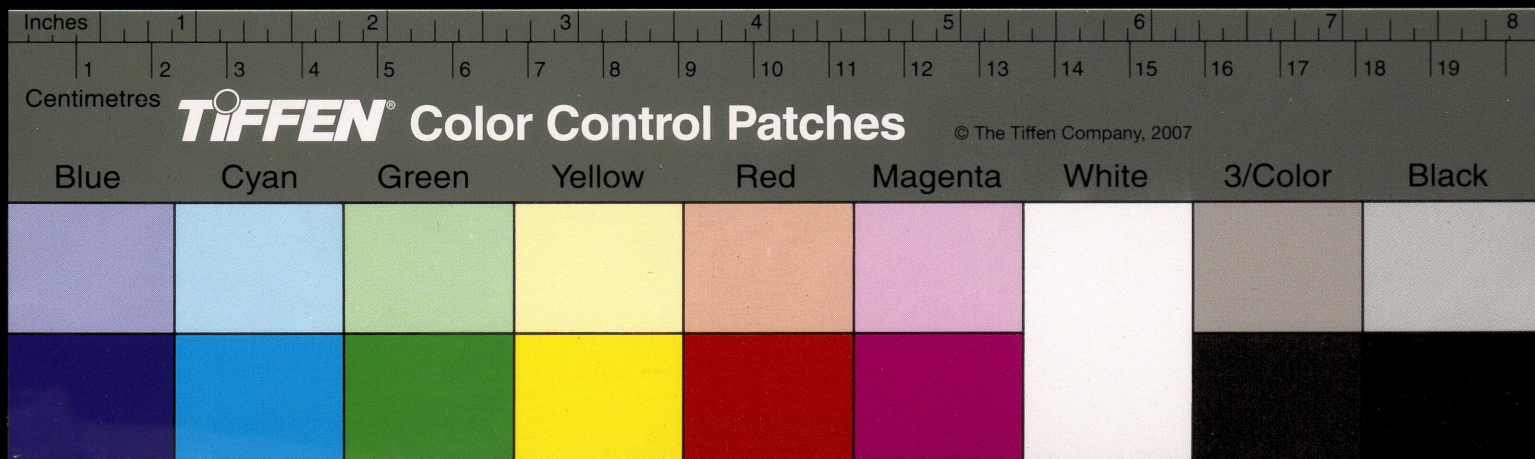
Biochemical constituents like total protein, albumin, globulin, urea, uric acid, creatinine cholesterol, calcium and inorganic phosphorus of serum and enzymes like AST, ALT, ALP, ACP, LDH, PGI and Ache activities were measured in non-descriptive indigenous and cross-bred calves (0-6 months) of both sex. Indigenous male calves had significantly higher amount of uric acid, ALP and LDH enzyme and significantly higher amount of Ca^{++} than crossbred male calves. Significantly higher amount of ALP, LDH and PGI enzymes and globulin were found in indigenous female calves than crossbred but the concentration of calcium was lower. In between sex in indigenous group female calves showed higher activity of LDH and lower activity of ACP but in crossbred the concentration of creatinine and calcium was higher in female calves.

58. Biochemical constituents of tomato fruit affected by gibberellic acid and boron

D. K. SINGH, F. M. PRASAD AND G. K. SINGH*

*Deptt. of Agricultural Biochemistry, Allahabad Agricultural Institute, Allahabad-211030***Department of Horticulture, R.B.S. College, Bichpuri, Agra*

A pot experiment was laid out in department of Agricultural Biochemistry, Allahabad Agricultural Institute, Allahabad to evaluate the effect of different levels of boron and gibberellic acid on different biochemical parameters in tomato. It is evident from the data that the fruit sizes, fruit yield, ascorbic acid, lycopene, TSS and dry matter content in fruit significantly increased over control with the rise in boron and gibberellic acid levels. The per cent acidity did not remarkably increase at higher concentration of boron and gibberellic acid, it tremendously reduced at B_1G_1 levels where boron and gibberellic acid were sprayed at the rate of 0.1% and 25 ppm respectively. It is also quite obvious from the observations by increasing the concentration of boron and gibberellic acid. The above parameters relatively reduced due to higher concentration of boron along with gibberellic acid. It is revealed from the correlation coefficient study that positive and significant correlations were observed between acidity vs. lycopene and carotene, and ascorbic acid vs. acidity and total soluble solids (TSS).



59. Response of iron and manganese interaction in wheat crop

AJAY KUMAR BARANWAL AND M. M. VERMA

Sheila Dhar Institute of Soil Science, University of Allahabad, Allahabad

In field trials involving application of nine Fe and Mn combinations along with NPK fertilizers on wheat crop showed that the growth and yield of wheat grain and straw got significantly increased over the control. Fe and Mn at 20:10 kg ha⁻¹ level was found to affect synergistically the growth and yield of the crop, whereas their combination at 20:20 kg ha⁻¹ gave antagonistic response. It was noticed that when Mn concentration was increased, it resulted in lower uptake of Fe by the crop and higher concentration of Fe did not show any significant response over the uptake of Mn by wheat grains and straw.

60. The fern genus *Cheilanthes* in the west Himalaya.

S. P. KHULLAR

Department of Botany, Panjab University, Chandigarh-160014

The genus *Cheilanthes* Sw. belongs to the family Sinopteridaceae. While some workers have used the genus *Aleuretopteris* Fee for many species others have stuck to the name *Cheilanthes*. The species without a farina have been transferred to *deptolepidium*. In the west Himalaya 13 species occur mainly between 900-4000 m altitude. They are small sized plants and generally inhabit slopes or rock crevices. Taxonomically, the distribution width and colour of scales on rhizome rachis, costae and cestules, presence or absence of hairs and farina. (its colour) and margin of indusia are important characters. The present paper discusses the nomenclature and taxonomy of the west Himalayan species of the genus *Cheilanthes*.

61. Some observations of fungal attack on museum and allied objects

N. R. SHAH, R. P. SHAH AND ARUN ARYA¹*Department of Museology, Faculty of Fine Arts, M. S. University, Baroda-390002.*1. *Department of Botany, Faculty of Science, M. S. University of Baroda, Baroda-390002*

Among the various museum and allied objects, organic objects and paintings are mostly affected by fungi. As the Department of Museology is situated near the bank of river Vishwamitri the relative humidity remains very high, i. e. above 90% during monsoon months. In the museum of the Department of Museology several objects were found affected by fungi. Repeated isolations were made in order to study various species of fungi. Among the numerous fungal species *Aspergillus* species and *Penicillium* species are found to be predominant in the affected museum and allied objects studied.

62. Floral organogenesis

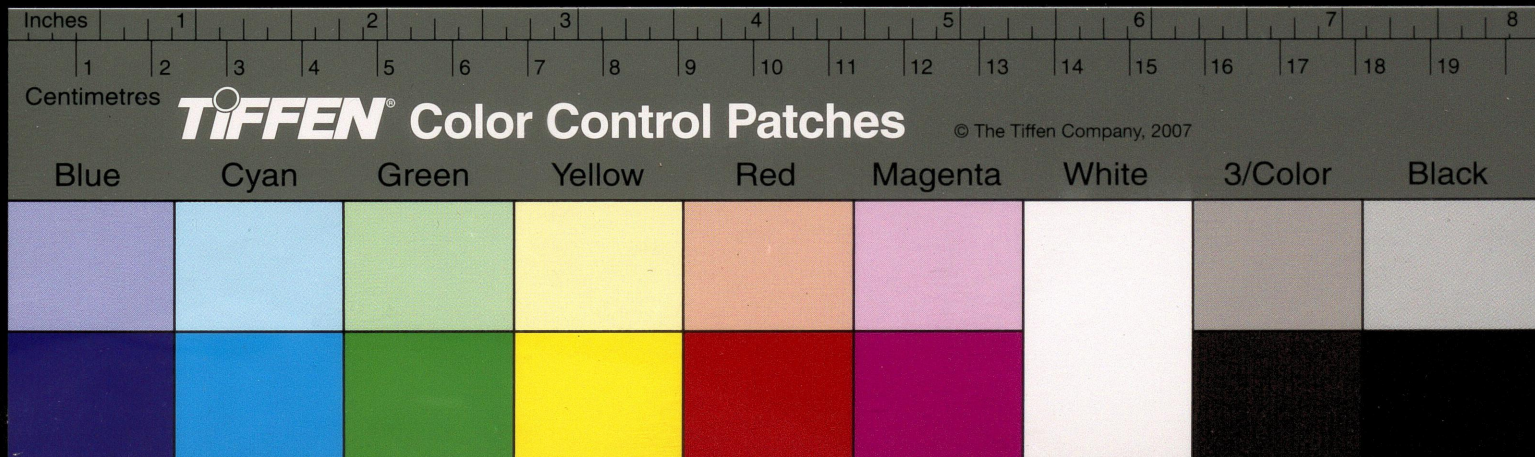
ILA PRAKASH AND V. S. ...
Department of Botany,

There is an acro... of sepal primordia pro... apex. Interprimordia... which grows further b... are formed nearly sin... abaxial to the adaxia... of petal primordia an... common bases of pet... corolla tube. The u... growth of the interpr... petal margins. Tho... adaxial stamen pri... gynoecium is initiat... sionally three) regio...

63. A new tobamovirus

QAMAR A. NAQVI,
Department of Botany,

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64. Effect of foliar application of MH on pollen germination of successive flowers of *Phaseolus aureus* ROXB—I

S. A. SALGARE

Department of Botany, Institute of Science, Bombay—400 068, India

The crop of *Phaseolus aureus* Roxbis was treated with 5, 10, 25, 50, 100, 200-200-1000, 1000-1000-5000 $\mu\text{g/ml}$ MH at its pre-flowering stage (3 weeks old crop). At the stage of its uniform flowering (3 weeks after treatment) pollen germination of its successive flowers (*viz.* F, F-24, F-48, F-72 series *i. e.* open flowers and the flower buds which require 24, 48, 72 hours to open respectively) was studied in an optimum concentration of sucrose. The results are analysed statically applying 't' test.

Potentiality of pollen germinability was found in F, F-24, F-48, F-72 series of *Phaseolus aureus*. F-24 and F-48 series shows higher percentage of MH above of pollen germination than F series. All the concentrations 200 $\mu\text{g/ml}$ prevented flowering in *Phaseolus aureus*. Lower Conc. of MH *i. e.* 5 and 10 $\mu\text{g/ml}$ stimulated pollen germination in all the 4 series. Pollen germination of F, F-24, F-48 series was inhibited by 25 and 50 $\mu\text{g/ml}$. Germination of pollen of F-72 series was inhibited by 25 $\mu\text{g/ml}$ MH and prevented by 50 $\mu\text{g/ml}$. Germination of pollen of all the 4 series was suppressed by 100 and 200 $\mu\text{g/ml}$ MH.

65. Development without destruction ; guidelines for forest resources management with special reference to Sardar Sarovar Project

PAWAN KUMAR AND A. K. MALHOTRA

Narmada Control Authority, Indore (M. P.)

Forests are powerful ecological Unit and are expected to play a positive role in the development of Country's resources. National forest policy has laid down guidelines for best utilization of forest resources, attributing protective and productive functions. An assessment of Country wide forest cover reveals that India's forests are in a high state of degradation and are unable to meet the functions attributed. The present communication analyses the impact of loss forests on livestock, agriculture, and human population to suggest remedial actions. Attention has also been focused on imperative need for harnessing of water resources for alleviating the ills responsible for degradation of forests with special reference to Sardar Sarovar Project.

An analysis of the forest resources coming under submergence, along with socio-economics of the people to be displaced by submergence of the project, has been made. To mitigate the loss of forest due to submergence, compensatory measures undertaken by project authorities with reference to national objectives are discussed. Besides, the guidelines for managing the forest resources with regional objectives are delineated.

66. Effect of pollution

S. A. SALGARE AND
Department of Botany

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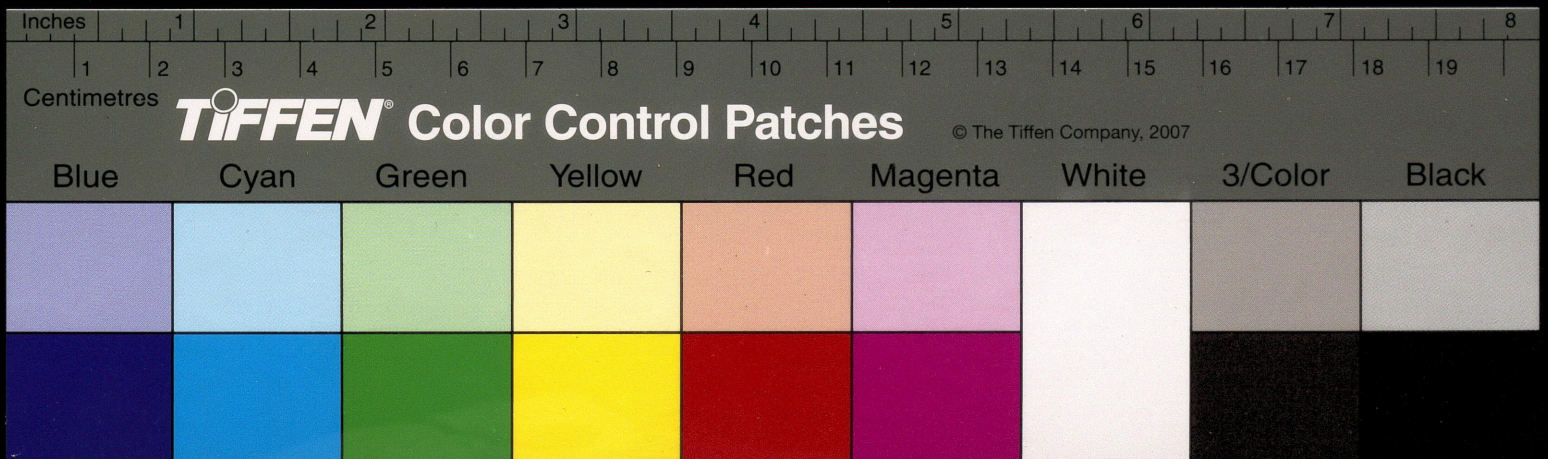
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67. Effect of so
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NEENA JHANDA
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68. Influence of storage method on germination and mycoflora of sesame (*Sesamum indicum* L.) seed

S. K. U. CHARJAN AND J. L. TARAR

Department of Botany, Institute of Science, Nagpur—440 001

Sesame (*Sesamum indicum* (L.) cv. Phule Til No. 1) seeds were tested for total fungal incidence and germination potential after 6, 12 and 18 months during storage. A direct correlation was obtained between total mycoflora and germination. With the advance of storage period, the field fungi showed a decline while storage fungi proportionately increased. *Aspergillus flavus*, *Aspergillus niger*, *Curvularia lunata*, *Fusarium moniliforme*, *Fusarium oxysporum*, *Macrophomina phaseolina*, *Penicillium oxalicum* and *Rhizopus nigricans* were the most commonly occurring fungi irrespective of storage period and containers. *Alternaria sesmi*, *Chaetomium globosum* and *Corynespora cassicola* on the other hand occurred rarely. Storage in polyethylene bag is recommended for better germinability and lesser seed fungal invasion than other containers such as jute and cloth bags. Thiran (0.3%) showed over all superiority in respect to germination as compared to fungicides used.

69. Genetic analysis of certain yield traits in gram (*Cicer arietinum* L.)

H. K. JAISWAL

Institute of Agricultural Sciences, B. H. U., Varanasi

A line \times tester analysis involving six lines and four testers was carried out in Bengal gram. The analysis revealed that days to first flower, number of primary branches, number of secondary branches, pods/plant and seeds/pod were predominantly under the control of additive genetic effects; days to maturity and plant height were more influenced by dominant genetic effects, while for 100-seed weight both additive and dominant gene effects were equally important. In general early maturing F_1 's showed poor heterosis for yield/plant and component characters. However, four crosses recorded high heterosis for yield/plant and two of these crosses were early maturing. It also indicates the feasibility of recovering early maturing, high yielding cultures but with much effort and from a very large number of crosses.

70. Effect of leaf leachate

D. P. KUSHARI, AND A. S.

Department of Botany, BU

In order to harness in p-enriched water body field as a biofertilizer, the very common plantation effect of leaf leachate on tance. The leachate of young leaves was distinctly produced some inhibitory observed, one in September of large quantity of growth rate in summer when treated with prom

71. Effect of temperature caused by *Aspergillus*

PURNIMA SAXENA AND

Botany Department, Al

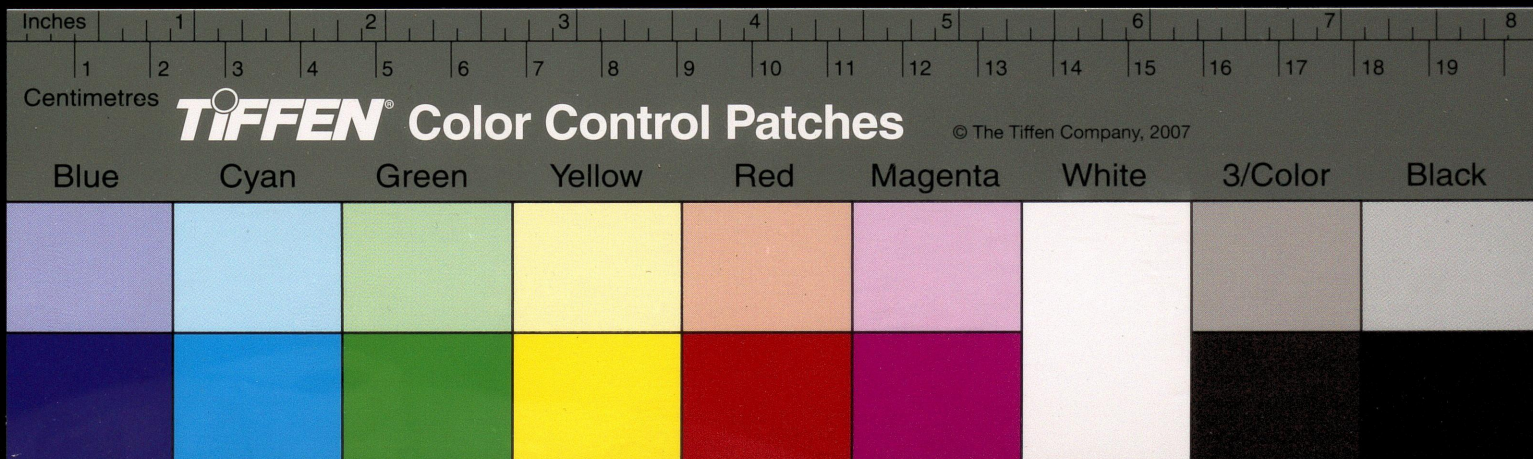
Studies have been and relative humidity of *Aspergillus niger* in the presence of the insecticide. The presence of the insecticide relative humidity above 70% did not only the rotting

72. Effect of heavy metal

N. RAMAKRISHNAN

Department of Botany

Comparative studies on (Ni), Cadmium (Cd) and Productivity of *Phytolacca* was undertaken. From in Cd treatment (2.4 mg hr⁻¹). As far as the was observed—Cd, 2



70. Effect of leaf leachate of *Bambusa indica* on the growth of *Azolla pinnata*

D. P. KUSHARI, AND A. SINHABABU

Department of Botany, Burdwan University, Burdwan 713 104, West Bengal

In order to harness the technique of large-scale production of *Azolla inoculum* in p-enriched water bodies under the canopy of suitable trees for inoculating rice field as a biofertilizer, there is a scope to upgrade the technique. *Bambusa indica* is a very common plantation on the banks of such water bodies. So the study on the effect of leaf leachate of this plant to the growth of *Azolla* has paramount importance. The leachate of young, mature and senescent leaves of *Bambusa indica* showed a wide variation in effects on the growth rate of *Azolla pinnata*. Leachate of young leaves was distinctly promotive while the leachates of mature and senescent leaves showed some inhibitory effect. Two periods of maximum growth promotion were observed, one in September-October and the other in March-April when the requirement of large quantity of inoculum for dry season rice is badly felt. Moreover, the growth rate in summer months was relatively higher than that of the winter months when treated with promotive leaf leachate.

71. Effect of temperature and relative humidity on the development of fruit of tomato caused by *Aspergillus niger* in the presence of *Drosophila Busckii*

PURNIMA SAXENA AND S. K. SAXENA

Botany Department, Aligarh Muslim University, Aligarh

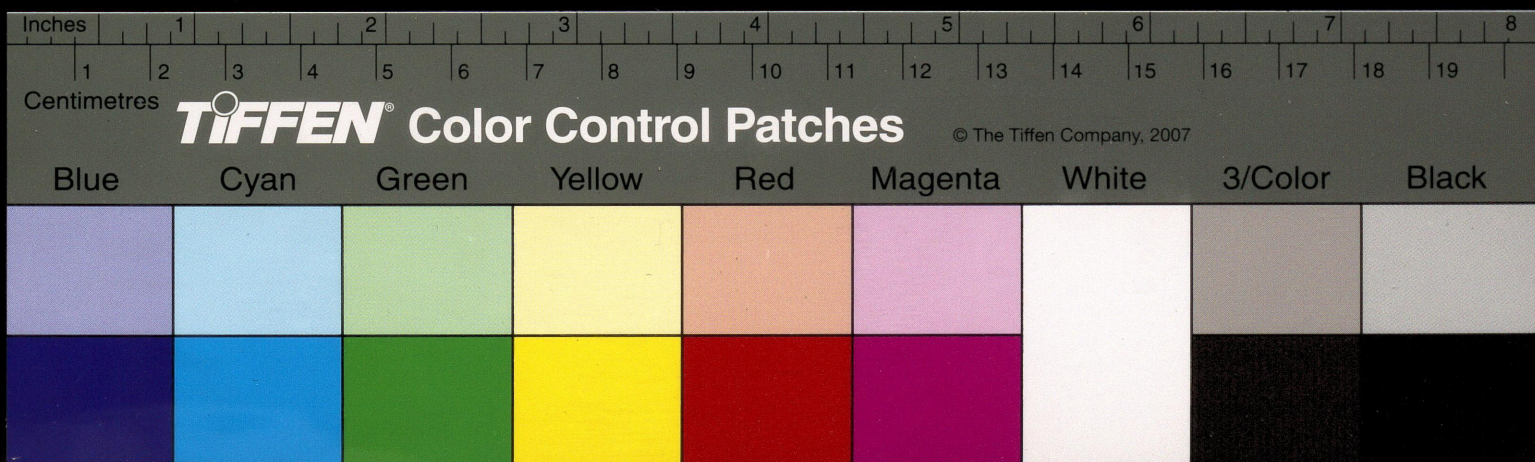
Studies have been carried out to determine the effect of different temperature and relative humidity on the development of fruit rot of tomato, caused by *Aspergillus niger* in the presence of the insect, *Drosophila busckii*. The rotting was more in the presence of the insect. The optimum temperature for rotting of the fruit in the presence of the insect was 30°C. Highest rotting of tomato fruits was observed at relative humidity above 95 per cent. At the optimum temperature and relative humidity not only the rotting was more but the onset of the rotting was early.

72. Effect of heavy metals on primary productivity of fresh water pond

N. RAMAKRISHNAN

Department of Botany, Government Arts College, Tiruvannamalai, Pin 606 603 T. N.

Comparative study of the effect of four heavy metals like Lead (Pb.), Nickel (Ni.), Cadmium (Cd.), and Zinc (Zn) at the Concentration of EC_{20} on the Primary Productivity of Phytoplankton Community in a fresh water pond at Tiruvannamalai was undertaken. From the study of these four metals maximum GPP was noticed in Cd treatment ($2.485 \text{ gCm}^{-3} \text{ hr}^{-1}$) While lowest was noticed in Lead ($1.065 \text{ gCm}^{-3} \text{ hr}^{-1}$). As far as the Community respiration is concerned, the following sequence was observed—Cd, Zn, Ni, and Pb.



77. Effect of *Salvinia Natans*, submerged leaf extract on morpho-anatomy of roots of maize plants.

BABITA YADAY AND A. C. SHUKLA

Biopollution Study Centre, Christ Church College, Kanpur.

Influence of different concentrations (0.5, 1, 2 and 5 per cent) of water extracts of *Salvinia natans* submerged leaves on anatomical structure of roots maize seedlings was studied. Different concentrations of extracts increased diameter of roots, number of vascular bundles, diameter of steles number of metaxylem, and size of metaxylem. Twelve hrs pre-roasting seed treatment has more pronounced effect than six hrs treatment. Results emphasize an overall change in morpho anatomy of roots to provide better conduction and absorption likely to facilitate better vegetative growth and yield.

78. Eco-physiology of *Cassia italica* Mill Lamk. ex Anders in Indian desert

SHER MOHAMMED, PAWAN K. KASERA AND DAVID N. SEN

Department of Botany, JNV University, P. O. Box-14, Jodhpur-342001, India

Cassia italica (Caesalpinaceae) is a perennial herb growing well throughout the Indian desert. The plants emerge through seeds after 2-3 rains, because of hard seed coat dormancy. This plant grows very well at the transitional zone of saline and nonsaline areas of this region. In the present investigation an attempt has been made to assess the metabolic responses by this species under prevailing conditions of the desert. For this, plants samples were collected from two different sites, viz., Pachpadra (site I, saline site) and Jodhpur (site-II, nonsaline site). The results reveal that the maximum (50.99 mg/g d. wt.) sugar content was found at site-I in May, which gradually decreased from July and became minimum (28.37) in January. Plants at site-II possessed higher amount (60.37) of sugar in October and least (34.23) in August when moisture content was comparatively more. The maximum, i.e., 35.5% and 34.37% values of crude protein at site-I & II, respectively were recorded in June. The minimum (10.47%) value at site-I was in January, while it was in November at site-II (14.81%). The value of pigment contents at site-I was maximum (4.76 mg/g f. wt.) in September and minimum (2.58 mg/g) in February. However, at site-II, it exhibited higher (3.76) value in March and minimum (1.68) in December. *C. italica* at site-I showed higher value (50.01 μ g/g f. wt.) of proline in October as compared to site-II (40.35) in June. Both sites exhibited minimum values in July being 5.43 and 3.45 at sites-I & II, respectively.

79. Improved symbiotic *Rhizobium leguminosarum*

R. K. SINGH

Department of Genetics and Plant Breeding, Banarasi Hindu University, Varanasi

Twenty three au... isolated by Tn5 mutagenesis... fixing ability on field pea... RLD 81 were performed... RLD 1. Plants nodulate... as compared to wild ty...

80. Some morpho-physiological characters in different combinations

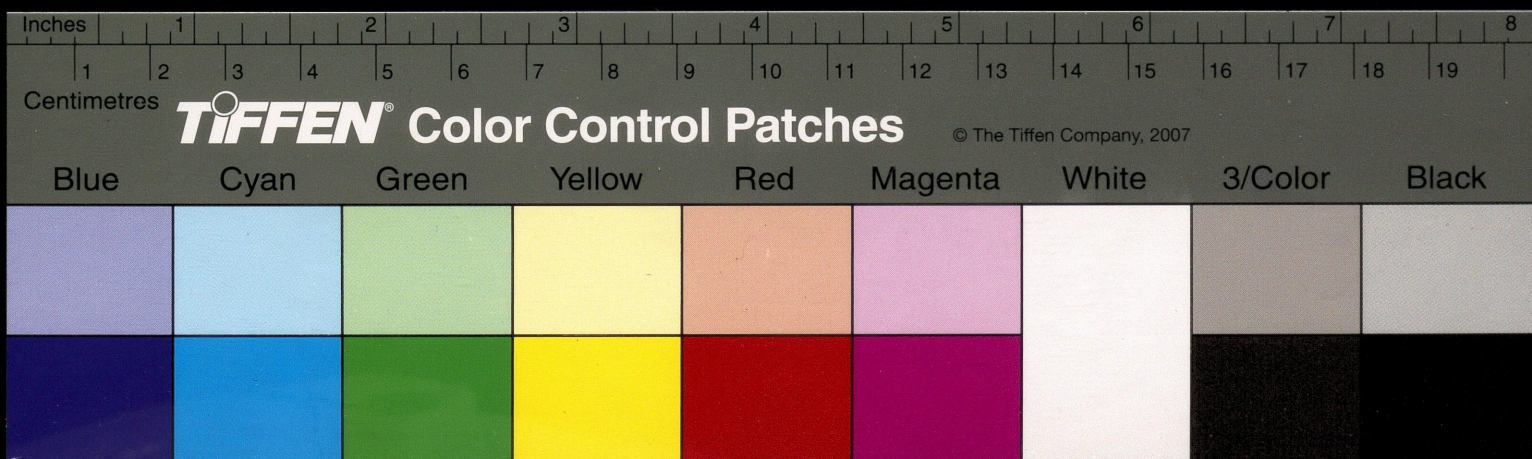
AVIJIT SEN AND PRITHVI KANT SINGH
Department of Agronomy, Banarasi Hindu University, Varanasi-221 005

A field trial was conducted at Banarasi Hindu University with four nitrogen levels (0, 15, 30 and 05 kg/ha) to study the effect on the growth characters nitrogen fixation observed at 90 kg/ha. On the other hand carbon weight, NAF, chlorophyll increase in grain yield and carbofuran could not...

81. Response of Indian oilseed rape to S and P levels

S. N. MISHRA*, ANAND KUMAR
Department of Soil Science and Plant Nutrition, Banarasi Hindu University, Varanasi
* College of Agriculture, Banarasi Hindu University, Varanasi

A field experiment was conducted to study the response of Indian oilseed rape to S and P levels had on yield and oil content. Total oil yield of the crop was compared to control. The relationship between these two factors at P₂05/ha treatment was antagonistic.



82. Accumulation of heavy metals in sewage-sludge irrigated soils of K. A. P. G. College Experimental Farm, Allahabad

S. G. MISRA AND DINESH MANI

Sheila Dhar Institute of Soil Science, University of Allahabad

Soils samples were collected from soils of Kulbhaskar Ashram Postgraduate College (KAPG) Experimental Farm, Allahabad from different depths i. e. 0-10, 10-20, 20-30 and 30-40 cm and analysed for four heavy metals i. e. Cd, Cr, Pb and Zn. For the available content of these heavy metals, soils samples extracted with DTPA, and for total content, samples were digested in di-acid mixture and directly analysed by Atomic Absorption Spectro-photometer.

Total concentration of Cadmium in sewage irrigated and non-sewage irrigated soils at 0-10, 10-20, 20-30, 30-40 cm. depths was found 1.8, 1.4, 0.9, 0.3 and 0.8, 1.0, 0.1 mg/kg N. D. respectively. The DTPA extractable concentration of Cd in sewage irrigated and non-sewage irrigated soils at same depths varied in range of 1.5, 0.6, 0.3, 0.08 and 0.2, 0.2 mg/kg, N. D., N. D. respectively. The total Cr-content in sewage irrigated and non-sewage irrigated soils at same depths was observed 4.8, 3.2, 1.8, 1.2 and 2.4, 1.6, 0.8, 0.5 mg/kg respectively. The DTPA-extractable concentration of Cr in sewage irrigated and non-sewage irrigated soils at same depths varied in range of 0.14, 0.16, 0.09, 0.04 and 0.08, 0.04, 0.05, 0.03 mg/kg respectively. The total Pb-content in sewage irrigated and in non-sewage irrigated soils at same depths was found 3.8, 3.0, 2.6, 1.1 and 1.00, 0.90, 0.40, 0.36 mg/kg respectively. The DTPA-extractable concentration of Pb in sewage irrigated and in non-sewage irrigated soils at same depths varied in range of 2.5, 1.7, 1.3, 0.8 and 0.80, 0.32, 0.16, 0.09 mg/kg respectively. The total concentration of Zn in sewage irrigated and in non-sewage irrigated soil, at same depths was observed 105.00, 99.00, 88.00, 86.00 and 104.00, 100.20, 68.60, 62.50 mg/kg respectively. The DTPA extractable concentration of Zn in sewage irrigated and non-sewage irrigated soils at same depths varied in range of 6.20, 3.50, 4.60, 2.20 and 2.60, 2.70, 2.10, 1.50 mg/kg respectively.

Thus it is obvious that Cd, Cr, Pb and Zn accumulate in soils as a result of repeated applications of sewage water or sludge over a long period increase their level in the upper (top) layer.

83. Clinical investigation

U. P. PAITHANKAR AND

Department of Botany,

Parthenium hysterophorus weed in India. Its pro- diseases.

The present work The estimation of pote private allergy clinic, test. The test indicat *Parthenium* pollen anti 46.1% were female, ou 16-30 years followed l group of 1-15 and 60

Clinical investig *Parthenium hysteroph*

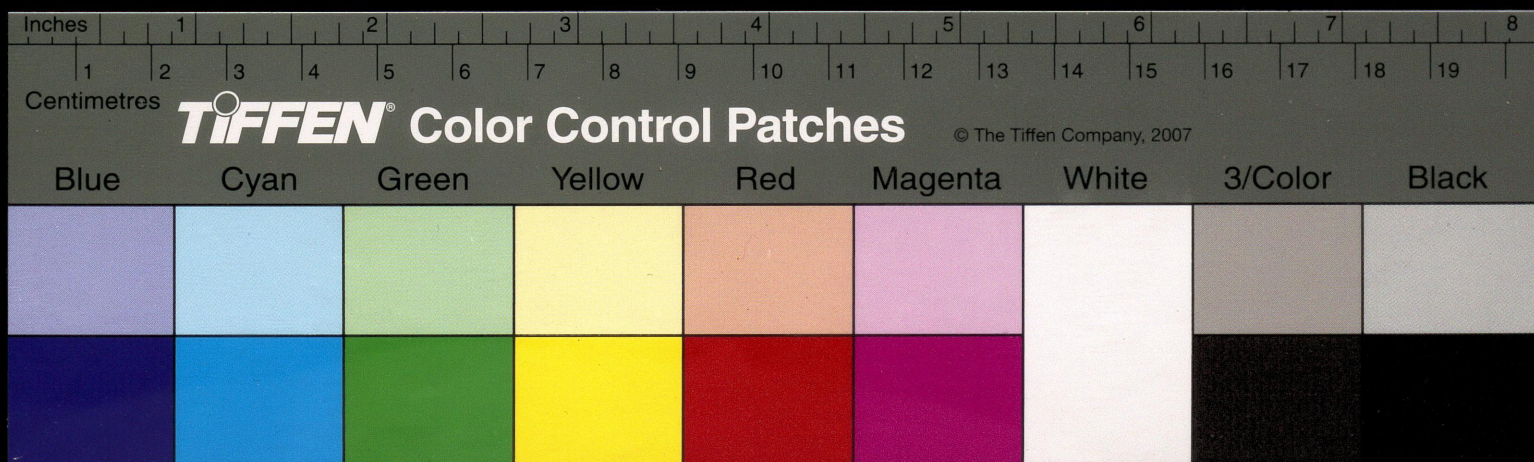
84. Effect of phosho peas (*Pisum sativ*)

S. P. SINGH, LAL SINGH

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Deptt. of Agril. Chem

An experimen Kulbhaskar Ashra of phosphorus (varieties (V_1 =Arke investigation. The phorus increases th Arkel. Applicatio increased the seed P_2O_5 /ha. Varieties seed yield was obt Arkel. Highest n Mater-1 followed content were trem followed by $V_3 \times A$ result the best dos was Azad Mater-1



85. Biochemical transformation in tomato plant affected by different levels of boron and gibberellic acid

D. K. SINGH, F. M. PRASAD AND A. K. SINGH*

Department of Agricultural Biochemistry, Allahabad Agricultural Institute, Allahabad-211007

*Deptt. of Horticulture, R. B. S. College, Bichpuri, Agra

A pot experiment was conducted in the Department Agricultural Biochemistry Allahabad Agricultural Institute, Allahabad to study the effect of varying levels of boron and gibberellic acid through foliar application on total phenol, sugars, nitrogen, protein and potassium content in tomato. The data clearly showed that very low and very high concentration of boron and gibberellic acid did not effectively increase the various biochemical constituents in tomato plant at various successive stages. It is obvious from the observation that the B_2G_3 levels of boron and gibberellic acid through foliar application effectively increased total phenol, reducing sugars, non reducing sugar, total sugar, nitrogen and protein at different intervals of plant growth, except in case of potassium where the B_2G_2 levels of boron and gibberellic acid were found to be superior over others. Thus it is inferred from the observations that the combination of boron and gibberellic acid @ 0.2% and 75 ppm may be more encouraging to enhance the quality of tomato.

86. Response of Oil seed crops to sulphur levels and sources in alluvial sandy loam soils of Allahabad

S. B. LAL¹ AND S. S. SINGH²

1. Asstt. Prof. of Agronomy

2. Head of Agronomy Deptt., Allahabad Agril. Institute, Allahabad-211007

An experiment of sulphur levels and sources was conducted in sandy loam soils of Allahabad Agricultural Institute Research Plot during the year 1991-92. The soil had 8.2 pH and 8 ppm available sulphur. The test crops were groundnut, mustard, sunflower. Four levels of sulphur 0, 10, 15 and 20 kg/ha were applied through Amonium sulphate, Gypsum and Pyrite. It was observed that groundnut gave better response to Gypsum at all the levels of sulphur application, but mustard responded better to Pyrite irrespective of the doses. Whereas sunflower had no response to either levels or sources of sulphur application indicating that residual effect of sulphur was found upto the second crop only. It was further observed that increase in the yield was linear with the sulphur levels, highest being under 20 kg sulphur/ha irrespective of the sources. The increase in groundnut yield was about 38.5 per cent under 20 kg as per ha over control; in Mustard 20.5 per cent over control but sunflower did not show any significant effect. The crops were grown under all recommended Agro. techniques.

87. Effect of buffering action, activities of tation in (*Vigna rad*

R. P. SINGH

Department of Genetics Varanasi-221 005

Tissue culture media acetate, succinate and calli were transferred phenol accumulation polyphenol oxidase regeneration was studied media containing 0.1 culture media with p significantly improved on buffered media e buffered media incre and polyphenol oxid succinate buffered m were found in culture media did not show a ration was inhibited Phosphate buffered of the cultures in co

88. Histomorphology *Perionyx sansib*

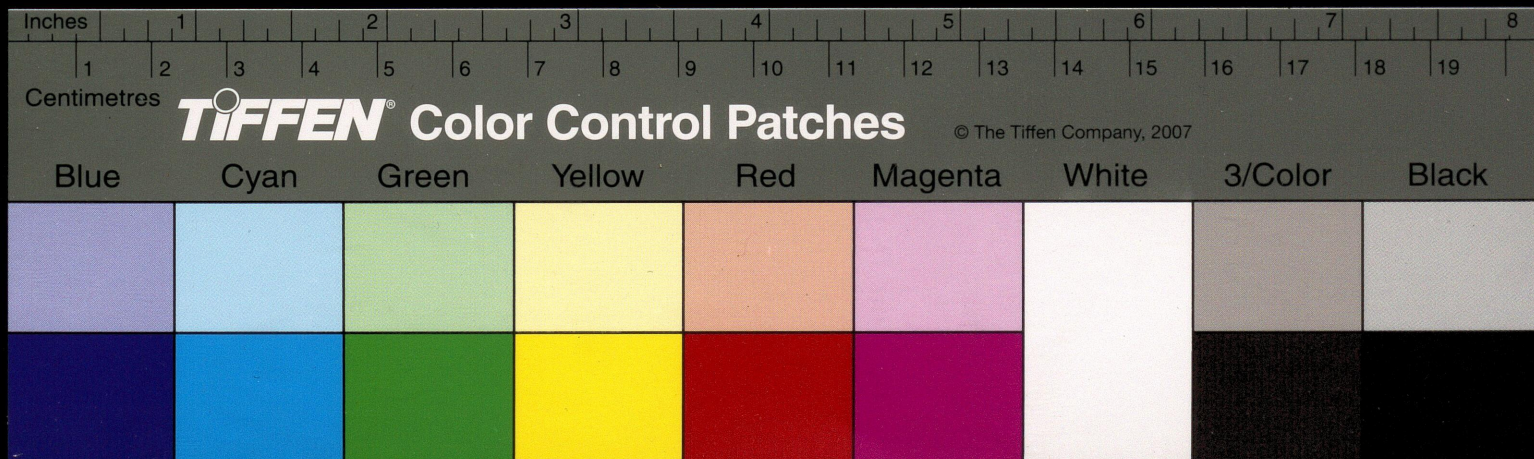
PAWAN KUMAR* AND Zoology Department *Narmada Control A

The present discharge of secretory ration activities un

Clitellate and of 50 worms each. segment. Both an upto a specified ti under study was ex

It was observed suboesophageal g whereas PF positiv nerve exhibited i once the amputate

A comparison revealed that the amputation, show



87. Effect of buffering of tissue culture media on callus growth polyphenol accumulation, activities of peroxidase and polyphenol oxidase enzymes and shoot regeneration in (*Vigna radiata* L. wilczek) tissue cultures

R. P. SINGH

Department of Genetics and Plant Breeding, Banaras Hindu University,
Varanasi-221 005

Tissue culture media P_5 was buffered with phosphate (0.01, 0.02, 0.05 M), acetate, succinate and citrate (0.001, 0.002 and 0.005 M) buffers. The growing mung calli were transferred on these buffered media. The data on callus growth and polyphenol accumulation were recorded after 30 days after culture and peroxidase and polyphenol oxidase activities were determined after 20-days of culture. Shoot regeneration was studied by transferring first passage shoot tips calli on buffered P_5 media containing 0.1 mg/l benzyl adenine and 0.1 mg/l NAA. Buffering of tissue culture media with phosphate and succinate buffer 0.02 and 0.002 M respectively significantly improved callus growth in comparison to control. The cultures grown on buffered media exhibit higher polyphenol accumulation than control. Acetate buffered media increased polyphenol accumulation in cultures two fold. Peroxidase and polyphenol oxidase enzyme activities were relatively higher in cultures grown on succinate buffered media (0.002 and 0.005 M) and less activities of these enzymes were found in cultures grown on acetate buffered media. Buffering of tissue culture media did not show any significant improvement in shoot regeneration. Shoot regeneration was inhibited in cultures grown on acetate and citrate buffered media. Phosphate buffered media showed slight improvement in shoot regeneration in some of the cultures in comparison to control.

88. Histomorphological changes in neurosecretory cells during regeneration in *Perionyx sansibaricus michealsen*

PAWAN KUMAR* AND OM PRASAD

Zoology Department, Allahabad University, Allahabad

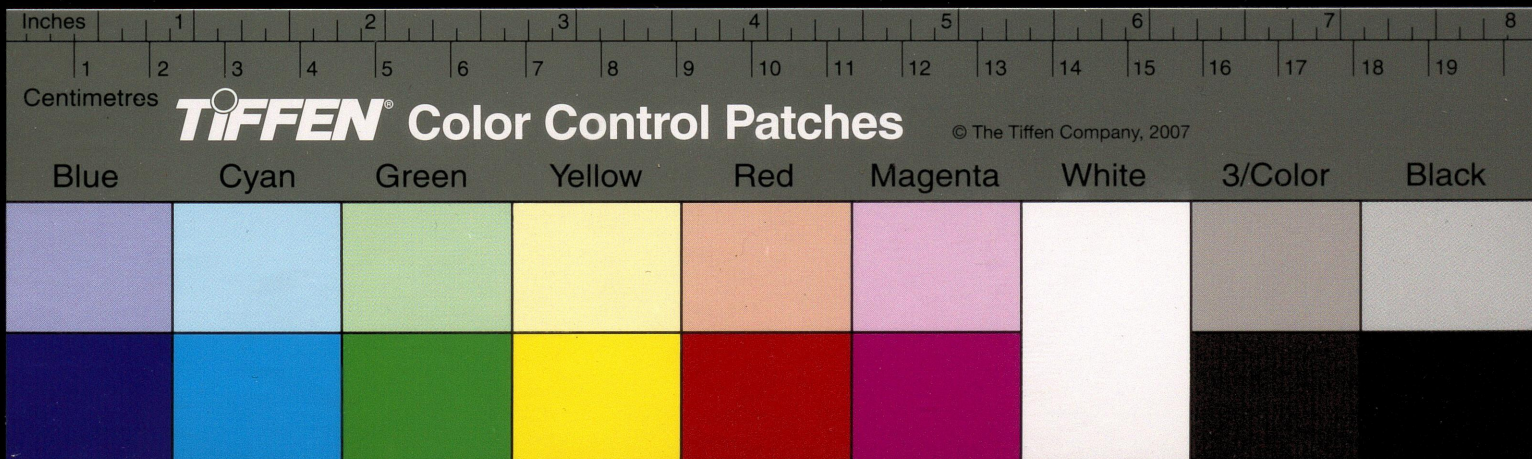
*Narmada Control Authority, Indore

The present investigation was directed towards assessing the synthesis and discharge of secretions of the neurosecretory cells found to be associated with regeneration activities under experimental conditions.

Clitellate and a clitellate worms were collected locally and divided in 6 groups of 50 worms each. Worms of the first five group were amputated below the 16th segment. Both anterior as well as posterior segments were allowed to regenerate upto a specified time interval of 24 hr. till one month. Synthetic cycle of the cell under study was examined through routine histological methods.

It was observed that group of neurosecretory cell situated laterodorsally in the suboesophageal ganglion showed decreased discharge of neurosecretory material, whereas PF positive cells situated in each segment at the base of paired segmental nerve exhibited increased synthesis and discharge. The discharge however ceases once the amputated segment has regenerated.

A comparison of synthetic cycle of these cells in experimental and control revealed that the synthesis of neurosecretory material significantly increases after amputation, showing their possible role in regeneration activity.

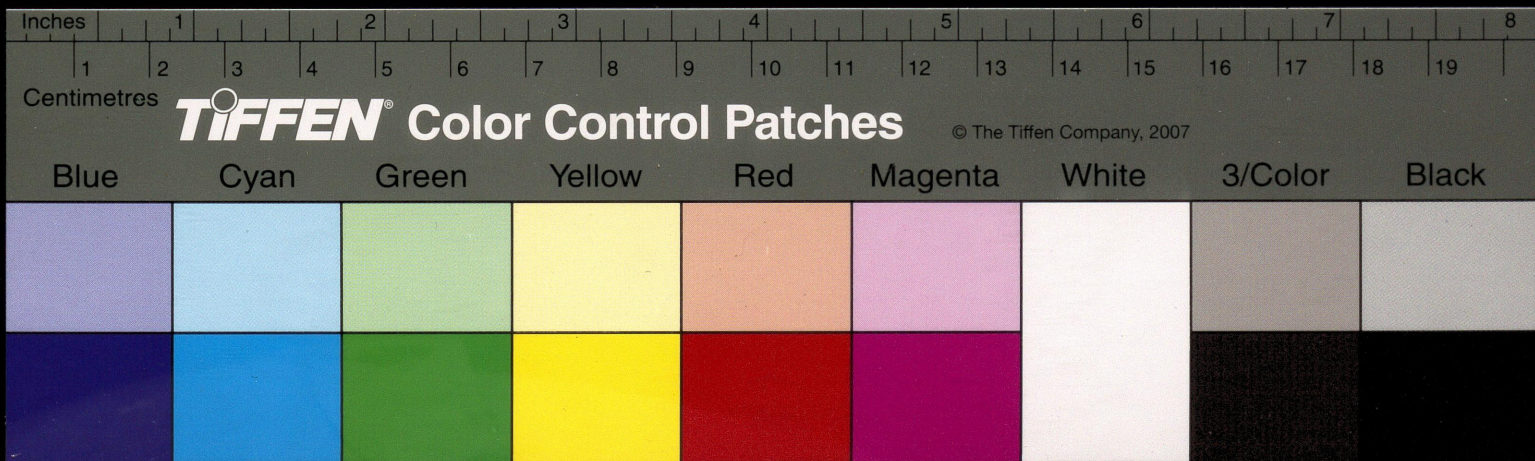


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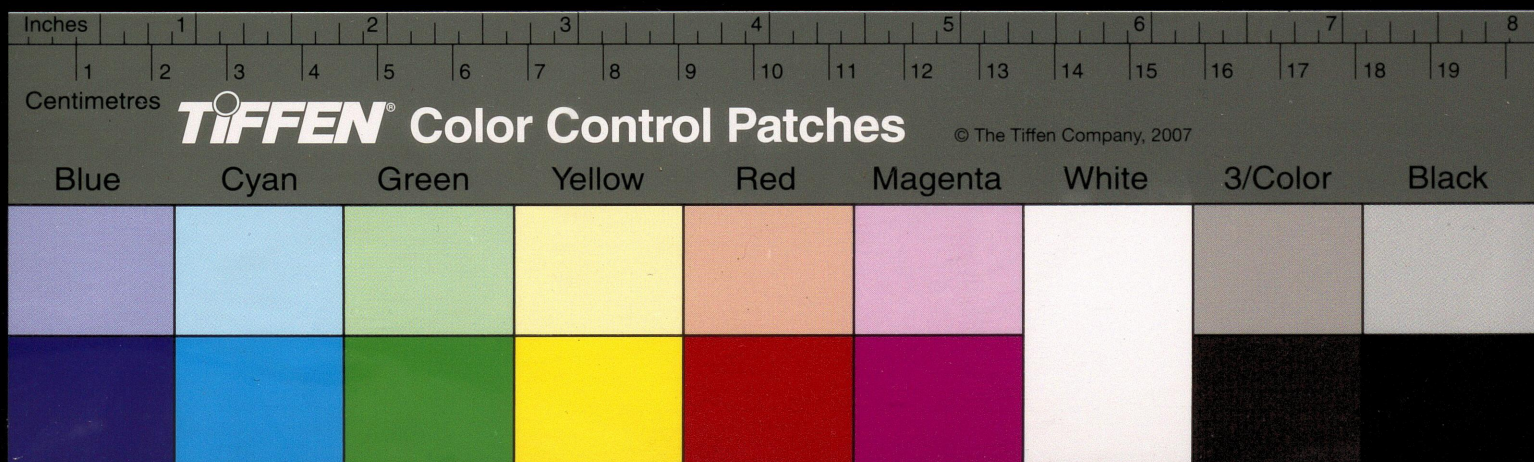
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