MICROSCOPICA

ISSUE - 2

2013 - 2014

24-01-2014
<table>
<thead>
<tr>
<th>S.R. No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Microbiology Poem</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Wisdom</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Eliminate Dengue Our Challenge</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>News Corner</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>What...... if microbes talk?</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Word Game</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>News Corner</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Word Puzzle</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>News Corner</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>Laugh &amp; make others laugh</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>Quiz</td>
<td>13</td>
</tr>
</tbody>
</table>
Use time as a tool, not as a couch.
We see things as we are, not as they are.
Winning is not everything but the effort
to win is.
You cannot be anything if you want to be everything.
Be not afraid of growing slowly, be afraid only of standing still.
Challenges are what make life interesting; overcoming them is what makes life meaningful.
Do not go where the path may lead, go instead where there is no path.
Nothing unattempted remains impossible.

by S.S. Shalgov
**ELIMINATE**

**DENGUE**

**OUR CHALLENGE**

Dengue Fever is an infectious tropical disease caused by Dengue virus. The Dengue virus is transmitted by several species of mosquitoes within Genus - Aedes, principally:

- *Aedes aegypti* (female)
  - This mosquito likes to live near humans, in cool shaded places under tables, etc.
- *Aedes aegypti* acquires the Dengue virus from a dengue-infected person and transmits it to another person.

The biggest tragedy is, no vaccine is available so far to cure this danger.

*Wolbachia* is a bacterium that lives naturally in up to 70% of different species of insects, including some mosquitoes that bite people but not in dengue-carrying mosquitoes - *Aedes aegypti*.

*Wolbachia piipientis* was first observed in the ovaries of testes of the mosquito Culex piipientis in the 1920s.
Early studies showed that it was not a pathogen of mammals but instead a naturally occurring, harmless, symbiotic bacterium. Wolbachia lives only within insect cell & is passed from one generation to the next through the insect’s eggs.

The latest research says, we can transfer Wolbachia from a fruit fly into Aedes aegypti mosquito with the help of microinjection. In doing so, when Wolbachia is present in the mosquito, it reduces their ability to transmit Dengue Virus. Thus, Wolbachia acts as a Vaccine for the mosquito by blocking dengue virus transmission & thereby preventing human infection of dengue disease.

How Wolbachia spreads in the wild mosquito popl?

- Female
- Male
- Wolbachia
In this strategy, we have to seed *Wolbachia* into wild mosquito population, where dengue is endemic. These Wolbachia infected mosquitoes will then breed with the further wild mosquito population. Thus, *Wolbachia* can be passed from one generation to the next, through the mosquito eggs. And thus there would be an effective biocontrol to disrupt Dengue transmission between people.

However, there are different kinds of control approaches like insecticide application, cleanliness of surrounding & all.... but Wolbachia based strategies have several advantages.... an ;

1. It could be the ‘effective future vaccine’....
2. The *Wolbachia* method also has potential to be used on other insect transmitted diseases.
   Wolbachia infections in mosquitoes reduce their ability to transmit other human viruses such as chicken coryza, yellow fever, malaria... etc.
3. *Wolbachia* based strategies represent the dengue suppression with high potential for area wide implementation at low cost.

- by [SURYA](Akshay S. Surya)
No human DNA in tiger scat: lab report

‘Other evidence enough to prove that it fed on humans’

Special Correspondent

BANGALORE: Scat samples of the tiger captured in Bandipur Tiger Reserve, where three people were killed earlier this month, “do not show the presence of human DNA,” concludes the first scientific analysis conducted to forensically confirm that the animal was indeed a man-eater and had fed on humans.

The DNA test was conducted by the National Centre for Biological Sciences (NCBS) and commissioned by the Forest Department and the Mysore zoo where the tiger is now housed.

This result, however, does not imply that a wrong tiger had been captured, said Uma Ramakrishnan, an ecologist with NCBS in whose lab the test was carried out. “There are several reasons why human DNA was not traceable in the sample. For instance, the scat sample was collected from the forest and could have been old, or not properly preserved,” she told The Hindu.

NCBS is also yet to conduct a second test to confirm that the scat sample matches the captured tiger to rule out the possibility that it could have belonged to another individual, Dr. Ramakrishnan added. “But, if human DNA had been found in the tiger scat, we would have had irrefutable evidence that it had preyed on humans.”

There was enough circumstantial evidence to suggest that the captured tiger was the one that killed three people between November 27 and December 3, said B.P. Ravi, executive director of Mysore zoo. “The tiger was found close to the site of its latest human attack, and the animal was also in poor health,” he said.

It is also unclear how much the tiger actually fed on its human prey, Mr. Ravi said. “But there is no doubt that the tiger we have got is the one that killed three people.” NCBS conducted the extraction of DNA using HiMedia DNA protocol. Blood and scat samples have also been sent to the Centre for Cellular Molecular Biology in Hyderabad for a similar DNA analysis.

A press release from the zoo said the tiger had maggot-infested wounds, and porcupine quills embedded in its mouth and abdomen. The animal has been treated with antibiotics and antifungal drugs over a week. “The wounds have completely healed and the infection has come down,” it said and added that the animal “appeared healthy.”

ACUPUNCTURE, REAL OR NOT, EASES SIDE EFFECTS OF CANCER DRUGS

NEW YORK: Both acupuncture and sham acupuncture were effective in reducing menopausal symptoms in women being treated with aromatase inhibitors for breast cancer, a small randomized trial found. Joint and muscle pain, hot flushes and night sweats are common side effects of those estrogen-lowering drugs. The trial published online in Cancer, randomized 47 breast cancer patients to eight weekly sessions of either real or sham acupuncture. Those assigned to real acupuncture received treatment with needles in recognized acupuncture points in the back, neck and hands.

Scat and blood samples were sent to NCBS and CCMB to detect traces of human DNA to confirm that the captured tiger was indeed individual that had killed and eaten human prey.

NCBS will now conduct a second test to see if the scat sample collected from the forest matches the DNA of the captured tiger.

THE TIGER WAS 10 YEARS OLD, WITH BROKEN TEETH AND INJURIES FROM A PORCUPINE QUILL IN ITS MOUTH

NOV. 27: Basavaraju (45) is killed by a tiger near Nidavangle village on the fringes of Bandipur Tiger Reserve, where he had taken his cattle to graze.

NOV. 29: Tiger kills its second victim 35-year-old Chelewa in Seegavadhi. Witnesses describe the tiger as ‘emaciated and weak.

DEC. 3: A third person, Basappa (70), was killed by the tiger. His partly eaten body was found 100 m away from the site of the attack. Angry residents protest against Forest Department.

DEC. 5: Forest Department issues ‘shoot on sight’ orders, even as tiger is finally declared ‘man eater.’

Tiger was captured with the help of tranquilizer darts, in the vicinity of where it had attacked its third victim Basappa in Chikabalgudi forests of Bandipur Tiger Reserve and transported to Mysore zoo.

There are several reasons why human DNA was not traceable in the sample. For instance, the scat sample was collected from the forest and could have been old, or not properly preserved.

UMA RAMAKRISHNAN, ecologist, NCBS

We have enough evidence to suggest that the captured tiger is the one that killed three persons. The tiger was found close to the site of its latest human attack, and the animal was also in poor health.

B.P. RAVI, executive director, Mysore zoo

by- S.S. Shalgar.
Stop!! According to "Intellectual Property Rights", I may permit you to study me only if you stain me with my FAVORITE COLOUR.

Here's my new eight-pack body? Isn't it like "AJAY DEVGAN" from Bol Bacchaan!

Don't try to imitate him. "Kahin nikal naa jaaye tumhare body se praan re..."

You fool!! Bd you can't understand who I am 'STOP STARRING AT ME.'

fun by - Surya
(Akshay Surya)
Word Game

Arrange the sequence of letters by using clue leading to a meaningful word:

1. Broad spectrum Antibiotic - PLARHINHECOGLON
2. Scientist who isolated DNA initially - ERMHCSIE
3. Sporulating genus of bacteria - TSIDMUCLRI
4. Acidic stain - INOGIRSNIE
5. Viral disease affecting liver - SIPHEATHT
6. Degree of Pathogenecity - NIRCUVLEAE
7. Sulphur containing amino acid - TIMNEHEONI
8. Chemical mutagen - MODRYIHYLAXNE
9. The component of Electron Transport Chain - EVAPOLINFROT
10. The class of Enzyme - ASIOMESRE

by - N. J. Joshi
S.V. Jamkhale
A look at the Genetic Research Centre, Mumbai, and the Microbial Containment Complex, Pune, under the ICMR

**Genetics and microbes**

by S.S. Shahgar

Genetic disorders are common in India. In the National Institute of Mental Health and Allied Sciences in the Indian Capital, huge numbers of people with genetic disorders are treated. The Indian government has established a national institute of mental health and allied sciences. The institute has developed many new techniques and methods.

Areas of thrust

- Chromosomal abnormalities
- Genetic counselling
- Stem cell therapy
- Antisense molecules
- DNA recombinant technology
- Protocols for gene therapy
- Bioinformatics

**Microbial Containment Complex**

The complex was established in 1986 to contain bacterial, viral and fungal infections. This is the first such institute in the country. The complex has the capacity to store bacteria, viruses, fungi, and other pathogens.

**New genetic marker to predict bird flu severity**

Australian scientists have discovered a genetic marker that could help predict the severity of the H5N1 bird flu virus. The marker could help doctors treat patients more effectively.

As many as 20 children were not given the polio vaccine, according to the WHO. It was found in 11 of the 20 children. The government says it is investigating the matter.

As part of their vaccination programme, WHO said that it is conducting small-scale trials soon.

A new vaccine is being developed to cure polio. As many as nine children were not vaccinated. The government is investigating the matter.
Word Puzzle

Search vertically, transversally & backwardly in the grid given below for names of 12 blood components.

<table>
<thead>
<tr>
<th>AIR</th>
<th>STR</th>
<th>KE</th>
<th>DUT</th>
<th>ENT</th>
<th>MPE</th>
<th>EA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CML</td>
<td>PIL</td>
<td>OJ</td>
<td>ETI</td>
<td>GFK</td>
<td>KIT</td>
<td></td>
</tr>
<tr>
<td>TSAL</td>
<td>BUM</td>
<td>IN</td>
<td>NHL</td>
<td>HIS</td>
<td>HISH</td>
<td></td>
</tr>
<tr>
<td>ILSE</td>
<td>AMS</td>
<td>KL</td>
<td>RUS</td>
<td>BLO</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>LIMUS</td>
<td>STM</td>
<td>ROB</td>
<td>LRIE</td>
<td>SE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YH</td>
<td>AC</td>
<td>OPI</td>
<td>S</td>
<td>SOM</td>
<td>MO</td>
<td>HIEIV</td>
</tr>
<tr>
<td>MPC</td>
<td>OPI</td>
<td>LN</td>
<td>PBL</td>
<td>SN</td>
<td>NTI</td>
<td></td>
</tr>
<tr>
<td>PORCH</td>
<td>HAEM</td>
<td>O</td>
<td>GLOBIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HND</td>
<td>YIF</td>
<td>FC</td>
<td>UBC</td>
<td>CIS</td>
<td>GR</td>
<td>AJ</td>
</tr>
<tr>
<td>OIPTL</td>
<td>LAT</td>
<td>DYL</td>
<td>LIE</td>
<td>AYA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSH</td>
<td>ESY</td>
<td>AR</td>
<td>RTKONT</td>
<td>SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YOASV</td>
<td>M</td>
<td>SOE</td>
<td>EMA</td>
<td>MTKP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEG</td>
<td>KSL</td>
<td>LIP</td>
<td>PHSHI</td>
<td>TALJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EOEAX</td>
<td>JU</td>
<td>HEOB</td>
<td>BDJLES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDEL</td>
<td>GSO</td>
<td>I</td>
<td>MASTCELL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPOR</td>
<td>RH</td>
<td>TILAS</td>
<td>IOSMKS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

by - S.V. Jambhale
N.J. Joshi
Laugh and World will laugh with you.

Teacher is telling the children about monkeys that live in India. Suddenly he notices that Susan isn’t listening him, “Susan, stop whatever you are doing and look at me, otherwise you will never know what a monkey looks like.”

Professor:— Fools ask so many questions which make a wise man go mad.

Student:— You are absolutely right sir. We go through similar situations during viva.

by—S.S. Shalgar
Test Your Knowledge

Do all animals have brains?
Which mammal lives the longest?
How many mammal families are there?
How long, a monkey’s arms or legs?
Why do cats have whiskers?
How much can a camel drink at one time?
Which bird has the most feathers?
What is the world’s smallest bird?
What animal makes the loudest noise on Earth?
Which bird builds the biggest nests in the world?
How long can birds survive without returning to land?
How long can a penguin stay under water?
What proportion of the world’s birds migrate each year?
Which bird lays the largest eggs?
What is the tail of a fox called?
What are rabbit babies called?
ISSUENO: 1

MICROSCOPICA

ACADEMIC YEAR

2013 - 2014

Contribution by: [Signature]
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Content</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>We are proud of</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Career in Molecular Biology</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>News Corner [Aware about Diseases]</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>News Corner [Donate the “Blood”]</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Useful Micro-organisms</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Harmful Micro-organisms</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>Test your knowledge</td>
<td>7</td>
</tr>
<tr>
<td>8.</td>
<td>Puzzle Corner</td>
<td>8</td>
</tr>
</tbody>
</table>
We are proud of

<table>
<thead>
<tr>
<th>Class</th>
<th>Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Sc. III</td>
<td>Miss. Bandare P.P.</td>
<td>76.20%</td>
</tr>
<tr>
<td>B.Sc. III</td>
<td>Miss. Konapure A.M.</td>
<td>75.48%</td>
</tr>
<tr>
<td>B.Sc. III</td>
<td>Miss. Joshi S.G.</td>
<td>71.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class</th>
<th>Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Sc. II</td>
<td>Mr. Lagshetti A.C.</td>
<td>90.5%</td>
</tr>
<tr>
<td>B.Sc. II</td>
<td>Miss. Mandave A.A.</td>
<td>87%</td>
</tr>
<tr>
<td>B.Sc. II</td>
<td>Miss. Bhoj S.I.</td>
<td>86.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class</th>
<th>Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Sc. I</td>
<td>Miss. Shrivichappi P.V.</td>
<td>88%</td>
</tr>
<tr>
<td>B.Sc. I</td>
<td>Miss. Magesh D.S.</td>
<td>86%</td>
</tr>
<tr>
<td>B.Sc. I</td>
<td>Mr. Sura A.S.</td>
<td>86%</td>
</tr>
</tbody>
</table>
Career in Molecular Biology
USEFUL MICROORGANISMS

SACCHROMYCES CEREVISIAE

- **Saccharomyces**
  
  Saccharomyces cerevisiae is called Baker's yeast.
  
  Saccharomyces produced in large quantities for baking industry.
  
  The substances containing carbohydrate such as fruit juice,
  potatoes, barley, cereals, honey can be used as substrate.

- **Bacillus Thuringiensis**
  
  There are certain species of bacteria & fungi that possess
  pathogenic property against insects or pests. Such cells are
  called biopesticides.
  
  They widely used as insect larvicide.
  
  Bacteria is also cultivated using submerged culture technique.

- **Methylophilus Methyloptrophus**
  
  There are few bacteria that utilize methylophilus methyloptrophus.
  
  High aeration of the medium is required.
  
  Bacterial mass is continuously removed.
HARMFUL BACTERIA

STREPTOCOCCUS PYOGENS:

The streptococcus pyogenes is the bacteria responsible including mild skin infection and sore throats. The bacteria is spherical shape growing in chain and existing in the human body where the temperature is right for its growth. This bacteria is responsible for serious condition such as multiple.

ESCHERICHIA COLI

Commonly known as E.coli this bacteria is the cause of gastrointestinal disease diarrhoea and symptoms associated with food poisoning. This bacteria exists in various plains and naturally exists in the body in intestines. The best way to prevent the condition is to avoid under cooked food.

VIBRIO CHOLERAE

The vibrio cholerae is the bacteria responsible for outbreak of cholera killing many people throughout the course of history. The disease is marked with symptoms similar to the common cold, including high fever, runny nose vomiting and diarrhea.
TEST YOUR KNOWLEDGE...

1. Which of the following is the study of fungi.
   (a) Mycology  (b) Phycolgy  (c) Virology  (d) Bacteriology.

2. After the decolouriser has been applied during gram stain but before safranin has been applied gram negative bacterial cell would appear.
   (a) Pink  (b) Blue  (c) Violet  (d) Colourless.

3. Which of the following correctly describes a cluster of spherical cells.
   (a) Streptococci  (b) Staphylococci  (c) Diplococci  (d) Spirochete.

4. Which bacterial genera produce endospore.
   (a) Salmonella  (b) Lactobacillus  (c) Bacillus  (d) Enterobacter.

5. Who is the inventor of electron microscope.
   (a) Ruska  (b) Robert Hooke  (c) Robert Koch  (d) Louis Pasteur.

6. Which of the following is not basic stain.
   (a) Basic fuchsin  (b) Saffron  (c) Crystal violet  (d) Nigrosin.

7. Which of the following is an incorrect pair.
   (a) Endospore - Bacillus  (b) Anaerobic - Clostridium.
   (c) Motile - Shigella  (d) Normal flora - Intestine E. coli.