

**By Tehreem, Arfa
and Fellow
friends**

**This file is for
everyone, anyone
can use it**

**We Wish you best
of luck, remmbr
us in Prayers**

**Admin of Msc
Zoo 1st,2nd,3rd,
4rth Nationwide**

- 5) Organisms cannot convert to any of the other forms of energy (heat)
- 6) Animals use energy to make organic molecules (chemical bond)
- 7) Light and chemical bond energy are converted to heat at every step. (partially)
- 8) Earth is an having constant and equal exposure to light. (open system)
- 9) Earth's incoming and outgoing flows of radiant energy must be equal for global temperature to (stay constant)
- 10) Heat is radiated into outer space at invisible infrared (wavelength)

7) population size is controlled by availability of (resources)

8) Community is group of populations occupying same space in particular (Time)

~~9)~~ Lecture no 2

1) All organisms need to function (energy)

2) Energy is exist different forms (several)

3) plants use energy in photosynthesis (light)

4) Energy is neither created nor destroyed in the (biosphere)

Lecture no 3

- 1) Synthesis of the organic compounds of their bodies from inorganic precursors such as CO_2 , H_2O , NO_3 . (Autotrophs)
- 2) Autotrophs using energy from an like light, inorganic oxidation and reactions. (Abiotic source)
- 3) Photosynthetic organisms are (Photoautotrophs)
- 4) plants, algae and cyanobacteria are the examples of (photoautotrophs)
- 5) Main input of into the biosphere. (Free energy)

- 6) Chemoautotrophs occurs in habitat. (dark)
- 7) obtain energy by means of inorganic oxidation reactions. (Chemoautotrophs)
- 8) Chemoautotrophs convert toxic molecules into (glucose)
- 9) Microbes and Mussels are the examples of (chemoautotrophs)

Lecture no - 4

- 1) Heterotrophs cannot synthesize from inorganic precursors. (organic compounds)
- 2) for metabolic use in glycolysis, kreb's cycle and electron transport chain. (chemical bond energy)

- 3) Herbivore, Carnivore, Omnivore are the types of
(consumers)
- 4) source is plant based
(primary food)
- 5) Herbivore's digestive system capable of handling large amounts of plant
(Material)
- 6) Herbivores depending upon different
(Feeding habits)
- 7) are also food source is animal based.
(carnivore)
- 8) Digestive systems of carnivore are more efficient in
(protein digestion)
- 9) primary food source is both plant and animal-based
(Omnivore)

10) Frugivores, insectivores and granivores are the types of (Omnivore)

Lecture no - 5

1) break down or decaying organisms (Heterotrophs)

2) Heterotrophs absorb nutrients directly through chemical and biological processes without (Assimilation)

3) Fungi are decomposer. (primary)

4) Fungi release digestive enzymes by their (hyphae)

5) Fungi absorb organic matter and release (CO₂)

6) plays important role in nitrogen and carbon cycles

Lecture no - 6

- 1) Food energy passes through different like plants, grasshoppers → frog → snake → hawk. (Sequence)
- 2) Many species eaten by insects (plants)
- 3) Many insects species eaten by (Frog)
- 4) level of an organism is position it occupies in a food chain. (Trophic)
- 5) Food chain is linear network of links to pass in form of food (energy)
- b) Feeding level complexity is organized by (ecologists)

- 6) Effect flows down through a _____ (trophic chain)
- 7) Effect flows up through a trophic chain. From primary producers to higher _____ (trophic level)
- 8) _____ Subset of the food web dynamics is impacted by a change in population numbers (Species level cascade)
- 9) Community level cascades are change in population numbers has a dramatic effect on the entire. _____ food web.
- 10) Trophic cascade occurs. When a trophic level in a food web is _____ (suppressed)

7) Detritivore and decomposers return nutrients back soil to the available for (producers)

Lecture no - 7

1) Food web complexity interconnected food chain in an ecological (community)

2) Food web represent tiny portion of the complexity of real (ecosystem)

3) indirectly increase plants growth (predators)

4) The net effect of direct and indirect relations is called (Trophic cascades)

5) Removal of the top predator can alter the food web (dynamics)

Lecture no - 8

- 1) Energy is lost through respiration at every level
- 2) Organic matter produced by photosynthesis
- 3) PP is the function of various factors: like water, temperature, soil (PP)
- 4) Raw rate at which the primary producers synthesize new organic matter called Gross primary productivity
- 5) NPP varies with seasonal change (NPP)
- 6) Net primary productivity Measured in mass-1 unit / area / year (Net primary productivity)

7) Some fraction of this energy is used by primary producers for _____
(cellular respiration)

8) The remaining fixed energy is referred to as _____
(net primary production)

9) _____ is the rate that new organic matter is made by means of individual growth and reproduction in all the herbivores.
(Secondary productivity)

Lecture no-9

- 1) Small fraction of solar energy _____ is consumed in photosynthesis.
(1%)
- 2) Solar energy is converted into _____ (heat)
- 3) Synthesized chemical bond energy is _____ absorption of nutrients, growth, body functions. (consumed)
- 4) Chemical bond energy is passed from one _____ level to the next. (heterotrophic)
- 5) loss of _____ energy from one level to next (90%)
- 6) Top level carnivores have large individual _____ (body size)

2) _____ plays important role in
nitrogen and carbon cycles
(Decomposition)

3) Breaking down of
tissues by the body's own
internal chemicals and
enzymes. (Autolysis)

4) Nitrogen and phosphorous
releases by (Proteolysis)

5) _____ releases compounds such
as cadaverine and putrescine.
(Putrefaction)

6) Putrefaction breakdown of
tissues by (bacteria)

(Lecture no 1) By → Arfa Amjad

- 1) Community of living organisms in conjunction of its non-living components Ecosystem
- 2) Community is group of population
- 3) Community is group of populations occupying..... space in particular time (Same)
- 4) population is group of belonging to same species occupying same space in particular time (Individuals)
- 5) External factors are independent of..... (Internal)
- 6) Internal factors are controlled by (Feedback loop)

BT101

LECTURE #26

LESSON # 26 to 30

BY **AYESHA AISH**

SYMBIOSIS

1. Relationship between two different species living together is **Symbiosis**
2. Symbiosis can be of two kinds **Obligative or Facultative**
3. **Obligative** — Always needs host to survive
Facultative — Don't always need host to survive
4. Symbiosis has **3** types named as **Mutualism, Commensalism, Parasitism.**
5. In **mutualism**, both individuals get benefit. e.g., **Hermit crab & Sea anemone**
6. When one species gain benefits, while other species neither benefited nor harmed is called **Commensalism.**

7. Example of Commensalism is
Remora fish side attached to
Sharks.

2

8. When one species gain benefits and other species is harmed, this relationship is called **Parasitism.**

9. Parasitism has **intimate** contact
(feed off host).

10. Example of parasitism, **wasp larvae**
eat caterpillars.

11. There are **4** types of parasites.

12. **Microparasites** reproduce inside host.
e.g. bacteria, viruses

13. **Macroparasites** release juvenile outside host.
e.g. Trematodes

14. **Endoparasites** live inside its host.
e.g. Liver Fluke, Tapeworm, Nematodes

15. **Ectoparasites** live on the outside of its host. e.g. Ticks, mites, Fleas, Mosquito, lice.

3

LECTURE # 27

PARASITISM

16. There are **5** evolutionary strategies of Parasitism.

17. In **Parasitic castrators**, partly or completely damages the **reproductive system** of host.

18. **Host's energy is used for parasite growth** in parasitic castrators.

19. In **directly transmitted** strategy, there is no need of vector for transmission to host.

• It is **single host** life cycle.

20. In **vector transmitted** strategy,

- There is a need of vector for transmission to final host.

4

- Its life cycle involves an **intermediate host**.

- It do **not sexually reproduce** in intermediate hosts.

21. In **Parasitoids** strategy, there are mostly **insects**. Sooner or later, they kill their host.

22. There are **2** types of parasitoids:
(i) Idiobiont (ii) Koinobiont

23. The parasitoids that sting their prey on capture and either kill them outright or paralyse them immediately are **Idiobiont** parasitoids.

viii Wastewater is any water that has been affected by human use.

ix: Pathogens, salts, acids, bases and metals are components of waste water.

x: In agricultural waste water 69 to 90% of global fresh water use in agriculture.

xi: Stormwater runoff is the number one cause of stream impairment in urban areas.

xii Wastewater is classified on the basis of contamination into two groups.
(Gray and Black water)

xiii All types of wastewater act as pollutant.

xiv Mines specially gold and coal mines are responsible for large quantities of acid water.

24. The parasitoids that lay their eggs inside young host, usually larvae and allowed hosts to grow are called **Koinobiont** parasites.

25. In **Micropredator's** strategy, parasites attacks **more than one** host, reducing each host's fitness.

26. Most micropredators are **hematophagic** feeding on blood.

LECTURE # 28

CAMOUFLAGE-I

27. Use of any combination of materials, coloration or illumination is called **Camouflage**.

28. Camouflage is also called as **Cryptic coloration**.

28. There are **3** principles of camouflage
(i) Crypsis (ii) Mimicry (iii) Motion dazzle

29. In **Crypsis**, objects hide and hard to see.

30. In **Mimicry**, disguising them as something else.

31. In **Motion dazzle**, using visual illusions and protect without hiding.

32. Examples of crypsis are **Egyptian night jar** and **parrot**.

33. Strongly contrasting, non-repeating markings such as spots or stripes occur in **disruptive coloration**.

34. Examples of disruptive coloration are **Leopard** and **Giraffe**.

35.

35. The characteristics; flattened bodies, sides thinning to edge, animals habitually press their bodies to the ground and sides are fringed with white scales; are of **Eliminating shadow.**

36. Example of eliminating shadow is **Horned lizard.**

37. High-contrast markings which attract the predator's gaze is occur in **Distraction.**

38. Example of Distraction is **Bushbuck.**

LECTURE # 29

CAMOUFLAGE - 2

39. Decorating with materials such as twigs, sand or pieces of shell, match their ~~own~~ backgrounds occur in **Self Decoration.**

40. Example of Self Decoration is **Decorators crabs.**
41. Animals actively change their skin patterns and colors. The change can be **rapid** or **seasonal.**
42. **Chameleon** rapidly changes its color.
43. **Arctic fox** changes from brown to grey in the **summer** and white in the **winter.**
44. Shadow makes upper side **darker** and underside **lighter**; and make Animals darker **below** and lighter **above** in **COUNTERSHADING.**
45. Examples of countershading are **gazelles, grasshoppers, Sharks, dolphins.**

LECTURE # 30

CAMOUFLAGE - 3

9

46. In **Counter-illumination**, producing of light to match a background that is brighter than an animal's body occur.
47. Light-producing organs (**photophores**) scattered all over its underside in counter illumination.
48. Examples of counter-illumination are **Hatchet fish & Firefly squid**.
49. In **Transparency**, few marine animals float near the surface are highly transparent.
50. Transparency makes them **invisible** to predators at certain distance. They are more efficient in **deeper water**.
51. Example of transparency is **Jelly fish**.

52. **Silvering** makes body reflective. Light comes from above reflected by mirror like body.

53. Silvering make fish invisible from **side**.

54. Example of silvering is **Herring fish**

55. Example of motion dazzle is **Zebra**.

10

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L = (18)

1) Types of ~~Factor~~ ^{Factor} Limiting the Population size and growth are (2)

2) ~~Food~~ ^{Food} is example of density dependent factor.

3) higher density Population may attract Predators who wouldn't bother with a Sparser Population.

4) Disease is more likely to Break out and result is death when more individual are living together.

5) High Population density can lead to accumulation of harmful waste products that Kills individuals

6) natural disasters, severe weather, Pollution Density independent limiting factors.

7) Density independent factors cause abrupt shift in Population size.

8) Density independent and density dependent factor regulates Size of Population in any environment.

L. No \approx 19

9) Community is group of Population living in a habitat.

10) Communities characterized by Species Richness and Primary Productivity

11) Species appear and disappear according to their ecological needs

~~structure~~ Structure of communities ~~varies~~ ^{Varies} with time

12) integrated and functioning as a whole unit is Hollistic concept of communities

L = 16

- 1) Carrying capacity of environment affect Population growth
- 2) Growth rate becomes smaller as it approaches carrying capacity
- 3) Logistic Population show S-shaped or sigmoidal curve
- 4) Lag Phase Phase show gradual increase in number of individual
- 5) wild life, yeast are common example of Logistic growth
- 6) Logistic growth has 4 Phases

L = 17

- 1) R selected species show high growth rate and produce many offspring
- 2) Bacteria, grasses, Cephalopods, rodents are Examples of R-selected species.
- 3) K-selected species fewer number offspring but Probability of surviving to adulthood
- 4) Humans is example of K-selected species.
- 5) Body size of K-selected species is larger

⇒ Lecture 56 - 58 :-

1. Any Chemical and Physical change in water that has harmful effects on human beings.
2. Water pollution is a global issue.
3. The release of waste water from drains is Sewage.
4. High levels of plants and algal nutrients increase in Biological oxygen demand.
5. Unenriched, clear water that supports small population of aquatic organism is Oligotrophic.
6. Estuary enriched by inorganic plants and algal nutrients is Eutrophic.
7. Chemicals that contain carbon atom organic compound.
8. The great patch of garbage is in Pacific Ocean.
9. The great Pacific patch of garbage is known as Dead zone.
10. Atoms of unstable isotopes that emit radiation Radiactive substances.
11. When heated water produced during industrial process and released into water is Thermal pollution.

BT101 : Ecology, Biodiversity & Evolution
Lecture NO: 54 - 58.

⇒ Lecture NO. 54 :-

1. Contamination into the natural environment that cause adverse change **Pollution**

2. Land pollution can be classified in to **two** main sources.

3. Single identifiable source of pollution **Point Source**

4. Resulting from many diffuse sources of pollution is **Non Point Source**

5. Types of pollution. **All / air, water, land, light, noise**

6. Deposition of solid or liquid waste material on land is **Land pollution**.

7. Land pollution is comprised of **Solid waste & Soil pollution**.

8. Solid or SemiSolid matter that is created by humans is **Solid waste**

⇒ Lecture NO 55 :-

1. Herbicides, insecticides and pesticides are source of **Solid pollution**.

2. **Land pollution** indirectly effects the respiratory system of human beings.

3. Item used for domestic purpose must be **recycle**

6. Plastic which are not recycled. 60%
7. In 2009 more than 120,000 beaches were closed as a result of land pollution.
8. Each year, Americans add 1.8 billion disposable diapers.
9. Much land pollution is caused by
Agriculture activities
10. Over 80% of items in landfills can be recycled, but they are not.

Made By :-

Sabba Urooje

12. Agriculture is leading source of water pollution.

13. Chemical added into the atmosphere due to natural or human activities is

Air pollution

14. Two Categories of air pollutants.

15. Harmful substance that is directly emitted into the atmosphere Primary air pollution.

16. Harmful substance formed into atmosphere Secondary air pollution.

17. Nitrogen Oxides are causing Green house gases.

18. Gases produced by the chemical interactions between sulfur and oxygen is Sulfur oxide.

=> Vedio Lecture MCQS :-

1. During 1991-2012 motorcars increase in Pakistan 650%

2. During 1991-2012 motorcycle increase in Pakistan 450%

3. Lahore has 30x more than save limit air pollution.

4. 60,000 People die due to air pollution.

5. Ocean covers almost 3/4 of our planet.

Answer BBB

32: Natural habitats may be adversely affected by humans in _____

- A) Three ways B) Two ways C) Four ways

Answer AAA

Lec#49 & 50

33: If 90% area of agriculture is cleared, 50% of species will be lost.

- A) 40% B) 50% C) 60%

Answer BBB

34: About _____ of Earth's land surface is covered by forests.

- A) 31% B) 30% C) 33%

Answer AAA

35: Tropical deforestation is responsible for approximately _____ of world greenhouse gas emissions.

- A) 30% B) 40% C) 20%

Answer CCC

36: Which is causes to leaks pollutants

- A) Deforestation B) Trwaling C) Mining

Answer BBB

37: Pulling a fishing net through the water behind one or more boats is _____.

- A) Trawling B) Mining C) non of these

Answer AAA

38: the biomass of trees within 100 m of the forest edge decreased by _____ in the first 17 years after fragment isolation.

- A) 37% B) 35% C) 36%

Answer CCC

39: Population on edges are more exposed to _____.

- A) Air B) sunlight C) both of these

Answer BBB



Topics 35 to 43

- ⇒ Permanent gases of Atmosphere : relative Percentages remain constant up to 80 to 100 km high.
- ⇒ Turbulent mixing causes atmospheric composition to be fairly homogeneous called as Homosphere.
- ⇒ In composition of Atmosphere how many variable gases 4
- ⇒ In composition of Atmosphere how many Permanent gases 3 (Nitrogen, 78%, oxygen 21%, Argon 1%)
- ⇒ Small Percentage of total atmosphere 38 ppm
- ⇒ upper atmospheric ozone is vital to blocking harmful radiation.
- ⇒ In upper atmosphere ozone concentration can reach ~15 ppm
- ⇒ Near the surface ozone concentration about 0.04 - 0.15 ppm
- ⇒ Aerosols are not synonymous with Pollution
- ⇒ Air Pressure and density decrease with Altitude
- ⇒ Temperature is useful tool to distinguish atmospheric layers.
- ⇒ Atmosphere can be divided into five layers.
- ⇒ Troposphere is the lowest layer
- ⇒ composition of air is homogenous except water vapours

- ⇒ vapour pressure drops due to gravity.
- ⇒ Pressure of the atmosphere is maximum at sea level and decreases with altitude.
- ⇒ The orange layer is Troposphere.
- ⇒ The white layer is Stratosphere.
- ⇒ The blue layer is Mesosphere.
- ⇒ The layer above the troposphere and below the mesosphere is called Stratosphere.
- ⇒ Ozone is important gas.
- ⇒ 100 tons of space debris strikes earth every single day.
- ⇒ Ozone filters most of the UV rays.
- ⇒ Bacterial life survives in the Stratosphere making is a part of biosphere.
- ⇒ Which layer is called as "near space" Mesosphere.
- ⇒ Human body is 20% carbon by weight.
- ⇒ Synthesize the carbon containing organic compounds and process sometimes known as Carbon fixation.
- ⇒ Small mismatches in carbon cycle have large consequences.
- ⇒ Life depends on the presence of water.
- ⇒ Condensation occurs when a gas is changed into liquid.
- ⇒ An water cycle Percolation is important process.
- ⇒ The process of evaporation through plant leaves is called Transpiration.

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12) integrated and functioning as a whole unit is Hollistic concept of communities

xv If the pollution load is high, this process can lead to low oxygen levels and **eutrophication**.

xvi Clean water flows out of tank into ground water through **subsurface** drains.

xvii **Two** methods are used for conventional sewage treatment.

xviii Two types of separated sewers are **Sanitary** and **Storm**.

xix. In secondary sewage treatment bacteria gather on stones, multiply and consuming **ODW**.

xx. In secondary treatment sludge with raw sewage lowering **ODW** and **BOD**.

xxi In advance tertiary treatment bleaching are used to remove **coloration**.

xxii Activated sludge sewage mixture is called **mixed liquor**.

25: Optimal pH for Nitrification is between 6.6-8.0

- A) 6.6-8.0 B) 8.0-6.6 C) 3.5-7.7

Answer AAA

26: If pH < 6.0 then ____ and if pH < 4.5 then ____

- A) reaction is inhibited, rate is slowed B) rate is slowed , reaction is inhibited
C) rate is increased, reaction is inhibited

Answer BBB

27: In denitrification ____ is electron donor and ____ is the terminal electron acceptor

- A) Glucose, Water B) Ammonia Nitrate C) Glucose, Nitrate

Answer CCC

Lec#47

28: The ____ cycle is slowest cycle

- A) Phosphorus cycle B) Nitrogen cycle C) Water cycle

Answer AAA

29: Which of the following cannot found in air in gaseous state

- A) Nitrogen B) phosphorus C) Carbon

Answer BBB

Lec#48

30: Moment of extinction is death of the last individual of the species

- A) First B) Any C) Last

Answer CCC

31: ____ is the most important cause of modern-day extinction.

- A) Pollution B) Habitat loss C) Predation

Answer BBB

32: Natural habitats may be adversely affected by humans in ____

- A) Three ways B) Two ways C) Four ways

Answer AAA



16: A living organism is ___nitrogen by weight. Atmosphere is ___nitrogen by volume

- A) 16%, 78% B) 78%, 16% C) 12%, 40%

Answer AAA

17: Two commonly used nitrogen sources ____

- A) Ammonia and nitrite ions B) Ammonia and nitrate ions C) Nitrite and nitrate ions

Answer BBB

18: Sources of Nitrogen ____

- A) Animal Residues B) Organic fertilizers C) Both

Answer CCC

19: Phases of Nitrogen cycle are__

- A) 6 B) 5 C) 4

Answer BBB

Lec# 46

20: ___Happens when nitrogen is limiting in the environment

- A) Immobilization B) Mineralization C) Both of these

Answer AAA

21: Nitrogen limitation is governed by ____

- A) N/C ratio B) N/N ratio C) C/N ratio

Answer CCC

22: if $C/N < 20$ ___ and if $C/N > 20$ ___

- A) Immobilization, Mineralization B) Mineralization, Immobilization
C) Non of these

Answer BBB

23: In Cyanobacteria and in Rhizobium legume, the Nitrogen Fixation is

- A) 200-300, 2-25 B) 30-40, 2-25 C) 200-300, 1-2

Answer AAA

24: In free living and in Cyanobacteria-moss, the Nitrogen fixation ratio is

- A) 1-2, 500-300 B) 30-40, 1-2 C) 100-150, 45-50

Answer BBB

Lecture no - 10

1) Trophic level are boxes
_____ on top of each other

(Stacked)

2) Width the box is proportional
to _____ of that level.

(productivity)

3) pyramid of energy flow
in herbivore is _____

($596 \text{ kcal/m}^2 \text{ year}$)

4) pyramid of biomass in
photo synthetic plankton

(807 g/m^2)

Topic: 61 BT 101 Misc

- 1) Sound that is unwanted or distressing. One quality of life is called Noise.
- 2) Noise can damage Physiological and Psychological health.
- 3) World health Organization stated that Noise must be recognize as a major threat to human being.
- 4) Transportation system also the main source in urban area.

Topic: 62

- 5) Unpolluted rain has acidic but usually no lower than 5.7.
- 6) Volcanic eruption release SO₂ in the air.
- 7) At lower pH than 5 most fish eggs will not hatch and lower pH can kill adult fish.
- 8) Soil can damage by Hydrochloric which can mobilize aluminum encouraging leaching of minerals and carbon.

- Model Mimicry
- Mimic Viceroy butterfly
- Mimics usually smaller than models
- Dis tasteful species that may or may not be related Mullerian
- In Mullerian mimicry 2 equally species evolve
- Polymorphism is infrequent.

32.

- Appearance of an animal that warns predators aposematism
- Types of signals primary & secondary
- In reverse countershading reverse countershading makes it conspicuous.

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- Solar nebula is a disc of dust and gases

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Lecture 9

- Small fraction of **solar energy (1%)** is consumed in **photosynthesis**.
- **99%** solar energy is converted into heat.
- **Solar energy** Transformed into chemical-bond energy in photosynthesis.
- Synthesized chemical-bond energy is consumed as a **Absorption of nutrients** Growth (tissue formation, **Body functions**).
- Chemical-bond energy is passed from one **heterotroph** trophic level to the next.
- Loss of **90%** energy from one level to next.
- **Exponential** decline of chemical-bond energy in a trophic chain **limits** the Lengths of trophic chains and Number of **top level** carnivores.
- Variability in Net Primary Productivity between ecosystems in Wetlands and tropical rain forests: **2000 g/m²/ year**,
- **Temperate forests**: 1200 - 1300 g/m²/ year, **Savanna**: **900 g/m²/year**, Deserts: **90 g/m²/ year**.



→ variable gases

→ water vapour 0 to 4%

→ CO_2 0.038%

→ Methane 0.00017%

→ Ozone 0.000004%

→ water vapour percentage varies
b/w < 1% in desert to 4%

in tropics

→ Mid latitude value is about
1-2%

→ CO_2 comprises small %age of
380 ppm

→ Near the surface ozone
concentration 0.04 - 0.08 ppm

→ Methane concentrations about 1.7 ppm

→ CH_4 is 21% times more powerful
than CO_2

36.

→ Air pressure

→ Tropopause regions

→ Tropopause 9 km over polar regions

38.

→ Second major layer of atmosphere is stratosphere.

→ Temperature range from -51°C near tropopause.

→ Aircrafts fly near lower troposphere to take benefit of low air density.

→ Bacterial life survives in stratosphere.

→ Boundary b/w stratosphere and mesosphere is stratopause.

→ Stratopause height is 50 to 55 km, 1/1000 pressure, temperature -15°C.

39.

→ Above stratosphere is thermosphere & below mesosphere.

37.

- The lowest layer is troposphere
- The total average height is 13 km
- Temperature of troposphere decreases with altitude
- Tropopause boundary between troposphere and stratosphere.
- Tropopause 17 km above equatorial regions
- Tropopause 9 km over polar regions

38.

- Second major layer of atmosphere is stratosphere.
- Temperature range from -51°C near tropopause.
- Aircrafts fly near lower troposphere to take benefit of low air density.

36.

→ Air pressure and density decrease with altitude.

→ Exosphere 700 to 10,000 Km high

→ Thermosphere 80 to 700 Km

→ Mesosphere 50 to 80 Km

→ Stratosphere 12 to 50 Km

→ Troposphere 0 to 12 Km.

- Mesosphere lower boundary is 50 to 65 km
- Upper boundary is called near space.
- Boundary between mesosphere and thermosphere is mesopause.
- Mesopause height is 85 - 100 km
in temperature is 100 - 102 °C.

40.

- Layer directly above mesosphere and below exosphere is thermosphere
- Thermosphere height is 80 km
- Also known as ionosphere

34.

- About 541 million years ago, O₂ made stable 15% of atmosphere.
- These are 3 generations of evolution in atmosphere.

35.

- Atmosphere comprised a mixture of invisible permanent gases, variable gases and suspended microscopic particles or aerosols.
- permanent gases 78% nitrogen
21 O₂ 4 <1% argon.
- %age of permanent gases remain constant up to 80-100 km high.
- Turbulent mixing makes atmosphere homogenous called as homosphere.

→ First atmosphere is aged 4 billion years ago

→ CO_2 during emissions react with calcium and magnesium metals

→ Water related sediments dated early from 3.8 billion years ago.

→ Activity of photosynthesizing cyanobacteria known as "Great oxygenation Event"

34.

→ About 541 million years ago, O_2 made stable 15% of atmosphere.

→ There are 3 generations of evolution in atmosphere.

35.

Quiz preparation

Code BT101 Topics 31 to 40

- Resemblance of one species to another mimicry → 2 types Batesian, Mullerian.
- Species possess the inherent protection called Model.
- Species lack the basic protection but resemble with model called mimic.
- Model: Monarch butterfly
- Mimic: Viceroy butterfly
- Mimics usually smaller than models
- Distasteful species that may or may not be related Mullerian
- In Mullerian mimicry, 2 equally species evolve
- Poly-morphism is infrequent.

Quiz preparation

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- First ago
- CO₂ de
- Calcium
- Water
- early ago.
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- The of

12. Agriculture is leading source of water pollution.

13. Chemical added into the atmosphere due to natural or human activities is

Air pollution

14. Two Categories of air pollutants.

15. Harmful substance that is directly emitted into the atmosphere Primary air pollution.

16. Harmful substance formed into atmosphere

Secondary air pollution

17. Nitrogen Oxides are causing Green house gases

18. Gases produced by the chemical interactions between sulfur and oxygen is Sulphur oxide.

⇒ Vedio Lecture MCQS :-

1. During 1991-2012 motorcars increase in Pakistan 650%

2. During 1991-2012 motorcycle increase in Pakistan 450%

3. Lahore has 30X More than safe limit air pollution.

4. 60,000 People die due to air pollution.

5. Ocean covers almost 3/4 of our planet.

(1)
"BT101 : Ecology, Biodiversity & Evolution"

Lecture NO: 54 - 58.

⇒ Lecture NO. 54 :-

1. Contamination into the natural environment that cause adverse change Pollution
2. Land pollution can be classified in to two main sources.
3. Single identifiable source of pollution Point Source
4. Resulting from many diffuse sources of pollution is Non Point Source
5. Types of pollution. All / air, water, land, light, noise
6. Deposition of solid or liquid waste material on land is Land pollution
7. Land pollution is comprised of Solid waste & Soil pollution.
8. Solid or semi-solid matter that is created by humans is Solid waste

⇒ Lecture NO 55 :-

1. Herbicides, insecticides and pesticides are source of Solid pollution.
2. Land pollution indirectly effects the respiratory system of human beings.
3. Item used for domestic purpose must be recycle

=> Lecture 56 - 58 :-

1. Any Chemical and physical change in water that has harmful effects on human beings.
2. Water pollution is global issue.
3. The release of waste water from drains is Sewage.
4. High levels of plants and algal nutrients increase in Biological oxygen demand.
5. Unenriched, clear water that supports small population of aquatic organism is Oligotrophic.
6. Estuary enriched by inorganic plants and algal nutrients is Eutrophic.
7. Chemicals that contain carbon atom organic compound.
8. The great patch of garbage is in Pacific ocean.
9. The great pacific patch of garbage is known as Dead zone.
10. Atoms of unstable isotopes that emit radiations Radioactive substances.
11. When heated water produce during industrial process and released into water is Thermal pollution.

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- 6. Plastic which are not recycled. 60%
- 7. In 2009 more than 20,000 beaches were closed as a result of land pollution.
- 8. Each year, Americans add 1.8 billion disposable diapers
- 9. Much land pollution is caused by Agriculture activities
- 10. Over 80% of items in landfills can be recycle, but they are not.

Made By :-
Sabba Urooje

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Also see ppt for this
8..infectious disease are **dengue & malaria**

9..Recent trends in pakistan are

- **Rise in mean temperature of 0.6-1.0°C in arid coastal areas, arid mountains and hyper arid plains.**
 - **0.5 to 0.7% Increase in solar radiation over southern half of country.**
- 3-5% decrease in cloud cover in central Pakistan with increase in sunshine hours.**
- **5% increase in net irrigation water requirement with no change in rainfall.**



lecture 64-68 - Read-only



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4. Ban on the use of CFCs since 1996

Lecture 66

- 1) **Temperature** has risen 1c since 1900
- 2) **Earth climate** being ever stable over pas 400,000 years
- 3) **Temperature** has increased about 30% in few centuries from 270 ppm -370 ppm

1. **CO₂ concentration and temperatures in the past can be inferred by several different methods:**

1 Tree-ring

2 Deep ocean sediment

3 Ice core records

4, Corals

5. CO₂ is thermostat of earth

6. reduced CO₂ concentration cause **weakened green house effect**

Lecture 67

- 1) Global warming effect are **physical environmental effect, effect on biosphere and effects on human**
- 2) Decrease in sea ice per decade since 1978 is **2.7%**
- 3) **Frozen ground** decreased in northern hemisphere since 1900 is by **7%**
- 4) Rise in sea level in 21st century is 5mm per year
- 5) **CO₂ concentration and temperatures in the past can be inferred by several different methods:**
 - Tree-ring**
 - Deep ocean sediment**
 - Ice core records**
 - Corals**

6. changes in ecosystem includes

- Earlier spring events
- Poleward upward shift of animals and plants
- Desert expansion
- Sea acidification

7. impact of global warming on human are

- Change in respiration pattern
- Global economic equality
- Change in length of growing season
- Warming of low latitudes
- Food security etc



lecture 64-68 - Read-only



Read Only - You can't save changes to t...



Lecture 64

1. Ground is heated by **visible and infrared light** from sun
2. Heated surface emit **infra red light**
3. Majority of the earth atmosphere are not good **green house gas**
4. Co₂, methane, No₂ and water vapours are **green house gases**
5. Co₂ emission stem from fossil fuels **40%**
6. CO₂ emission from burning of gasoline in cars and truck **20% And 13%**
7. **Aviation** Causes of global warming **3.5%**
8. Buliding structure cause emission of co₂ **12%**
9. Cutting of trees cause how much co₂ emission **25%**
10. Green hose effect cause by water vapours **36 -70%**
11. **How much** methane is effective in heat trapping than co₂ **20 times**
12. **No₂** is naturally produced by **oceans & rainforests**

Lecture 65

1. **How much** ozone is in stratosphere **90%**
2. **Ozone** absorb which band of ultraviolet radiations **UVB**
3. **What** are the ozone depleting substances

Ozone Depleting Substances

- **Halocarbon refrigerants**
- **Solvents**
- **Propellants in aerosols**
- **Chlorofluorocarbons**
- **Hydro chlorofluorocarbons**
- **Methyl bromide**
- **Carbon tetrachloride**
- **Methyl chloroform**

LEC 52 and 53

2 / 3

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 - **Over exploitation** mean over harvesting of resources.

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BT 101...
Yesterday, 8:39 pm



LEC 52 and 53

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1 / 3

BT 101

Lectures 49

- **Habitat destruction** is a process in which natural habitat becomes incapable of supporting its nature species.
- **Human** activities are responsible for habitat destruction.
- **All** causes are responsible for habitat destruction (**Deforestation, mining, trawling Urbanization**).
- If 90% area is cleared **50%** of species will be lost.
- **31%** of Earth land Surface is covered by forests.
- Diminishing biodiversity some estimate that **4 to 6** thousand rainforest species goes extinct in each year.
- Tropical deforestation is responsible for approximately **20%** of world greenhouse gas emission.

Lecture 50 and 51

- **Habitat fragmentation** is breading up of one patch of habitat in to several smaller patches.
- By habitat fragmentation population is divided into **unconnected patches**.
- Forest provide habitat for over **80%** of the plant and animals that live on land.
- The biomass of tree within 100m of the forest edge decreased by **36%** in the first 17 year after fragment isolation.
- Inbreeding increases the level of **homozygosity**.
- Fragmentation facilitating the expression of **deleterious alleles** that reduce fitness.

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Yesterday, 8:34 pm



BT 101

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Sumaira Zoni

Yesterday, 4:00 pm



- viii Wastewater is any water that has been affected by **human** use.
- ix: Pathogens, salts, acids, bases and **metals** are components of **waste water**.
- x: In agricultural waste water **69 to 90%** of global fresh water use in agriculture.
- xi Stormwater runoff is the number one cause of stream impairment in **urban** areas.
- xii Wastewater is classified on the basis of contamination into **two** groups:
(**Gray and Black water**)
- xiii All types of wastewater act as **pollutant**.
- xiv Mines specially gold and coal mines are responsible for large quantities of **acid water**.



Sumaira Zoni

Yesterday, 4:01 pm



By Zonish Khan
BT 101 M.C.Q.s
Lectures 69 - 73

1. Lecture 69 • Biomagnification

- i. Increasing concentration of toxic substance is **biomagnification**
- ii. Concentration of the persistent toxins increase **higher up** the food chain.
- iii. Biomagnification occurs **across** trophic levels.
- iv. Bioaccumulation occurs **within** a trophic level.
- v. Bioconcentration **occurs** when uptake from water is **greater** than excretion.
- vi. **DDT** is used to control Malaria and typhus.
- vii. DDT saves millions of lives annually in **Africa**.

37). Bioconcentration occurs when uptake from water is greater than excretion.

38) In DDT Insecticides use to control malaria and typh by killing mosquitoes and lice.

39). DDT Interferes with metabolism of calcium

40). Concentration of DDT is 10 million times.

25) Earth Temperature atmosphere since last 100 years.

26) CO₂ ^{Carbon cycle} is the thermostat of Earth.

The atmospheric concentration of CO₂ measured from Antarctic ice core data implies that Earth climate has been pretty stable over the past 400,000 years.

27) Scientist drill through the deep ice to collect ice core.

Topic: 6.7

28) During the 21st century the sea-level rise 5mm per year.

29) Average rate of Global sea level rise 2.8mm per year

30) ~~Man~~ Man. area of seasonally frozen ground decreased by 7% in the Northern hemisphere since 1900.

1) Moments made of calcium carbonate with
react with acid rain to
↳ gypsum

1) 14 of the Topic: 63 7 largest

4) Transportation system
Source in urban area.

Topic: 62 Acid Rain:

5) Unpolluted rain has acidic pH
but usually no lower than
5.7.

6) Volcanic eruption release SO₂
in the air.

7) At lower pH than 5 most
fish eggs will not hatch and
lower pH can kill adult
fish.

8) Soil can damage by hydrochloric
which can mobilize aluminum
encouraging leaching of
minerals and nutrients

Noise:- Topic: 61

BT 101 M.C.Q.

- 1) Sound that is unwanted or distressing one quality of life is called Noise.
- 2) Noise can damage physiological and Psychological health.
- 3) World health Organization stated that Noise must be recognize as a major threat to human being.
- 4) Transportation system are the main source in urban area.

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water in 1969 (Biomagnification)

35) Bioaccumulation is the increase in the concentration of substance in certain tissues of organism's body.

36) . DDT Banned in US in 1972

20 century.

Effects of Global warming Topic: 6.8

- 31) Rise in mean temperature of 0.6-1.0°C in arid coastal area, arid mountain and hyper arid. Plains.
- 32) 0.5 to 0.7% Increase in solar radiation over southern half country.
- 33) Oxygen level decrease because oxygen is less soluble in warmer water. An effect as Ocean deoxygenation.
- 34) _____ of global fresh water in agriculture 69 to 90

to collect ice core.

Topic: 6.7 Effects of Global Warming

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20) Which one of the are sensitive of UV light can directly damage crops Cyanobacteria

Topic: 6.6 Global Warming

24) In Global warming - gradual increase in average

18) 1970
10.0 Last year.

Topic: 6.5 Ozone Depletion:

19) Ozone absorb a band of Ultra
violet radiation called UVB.

20) Nearly 90% of the Earth's
Ozone in the Stratosphere.

21) Ozone bluish gas difficult to

24) breath Ozone filter UV rays.

22) Malignant melanoma skin cancer

related to UV and UVB

23) ↳ Which one of the are
sensitive of UV light can
directly damage crops Cyanobacteria

16) 20% and 13% of carbon-dioxide are produced of burning of gasoline in the engine.

7) Methane is more than 20 times as effective as CO₂ at trapping heat in the atmosphere.

14.5% increase in the CO₂ last year.

9) Mon

10) U

11)

19)

Moments made of calcium carbonates..

react with acid rain to

Gypsum.

14 of the Topic: 63 Disruption of
world's water cycle ecosystem
largest at
cities are located along the mi-
Coast.

Precipitation bring all the
toxic chemical to the air
back of the surface runoff.

1) Toxic chemicals are recycle
in water cycle through Evaporation
mm.

2) Decaying many deliver excess
of fresh water, soil of waste and
pollutants to the coastal areas.

1) 40% Topic: 64 Greenhouse effect
of the carbon dioxide
emission stem from burning
of fossil fuel of the Purpose
of electrical generation.

5) Aviation cause 2.5% of
global warming and the
figure could rise to
15% by 2050.

1) Moments made of calcium carbonates with
react with acid rains to

↳ gypsum

2) 14 of the Topic: 63 17 largest Disruption of water cycle & coast cities are located along the largest of all ecosystems coast.

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8:39 PM



BT 101...



1 / 3

BT 101

Lectures 49

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2 / 3

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SHAZINE NOOR

MCQS Lecture #74

- 1- Preserving populations and species in danger of decline or extinction.
- 2- Pristine Restoration In ecosystems where all species have been effectively removed.
- 3- University of Wisconsin–Madison Arboretum has pioneered restoration ecology.
- 4- The restoration of the prairie was at an early stage in November 1935.
- 5- Sometimes the habitat has been destroyed by a single introduced species.
- 6- Habitats are seriously degraded by chemical pollution.
- 7- Cleanup and Rehabilitation Example is Nashua River in New England.
- 8- Captive Breeding Programs is also called Recovery programs
- 9- Captive Breeding Programs Particularly focused to on one or a few species.

Lecture #7

- ① Complexly interconnected food chains in an ecological community are called **Food Web**.
- ② Food Web represent **Tiny** portion of complexity.
- ③ Direct or Indirect, balance b/w resources and consumption is known as **Consumer Resource System**.
- ④ Predators **Indirectly** increase plant growth.
- ⑤ The net effect of direct and indirect relations is called **Trophic Cascades**.
- ⑥ Powerfull **Direct Interactions** that can control ecosystem.
- ⑦ Trophic Cascades occurs when a trophic level in a food web is **Supressed**.
- ⑧ Removal of the top predator can alter the food web **Dynamics**.
- ⑨ Effects flow down through a trophic chain are called **Top-Down Effect**.
- ⑩ Effects flow down from apex predator to lower trophic level. **Top-Down Effect**.
- ⑪ Effect flow up from primary producer to higher trophic levels. are **Bottom-Up Effect**.

⑫ Subset of the food-web dynamic is impacted by a change in a population number. **Species level Cascade.**

⑬ Change in population numbers has a dramatic effect on the entire food web is called **Community level Cascade.**

⑭ Distribution of Plant Biomass is an example of **Community level Cascade.**

⑮ Impact of climate and human activity on ecosystem are of **Four (4) types.**

L = (18)

- 1) Types of Factor
(2) ~~Factor~~ Limiting the population size and growth are
- 2) ~~Food~~ Food is example of density dependent factor.
- 3) higher density population may attract Predators who wouldn't bother with a Sparser population.
- 4) Disease is more likely to Break out and result is death when more individual are living together.
- 5) High population density can lead to accumulation of harmful waste products that Kills individuals
- 6) natural disasters, severe weather, pollution Density independent limiting factors.
- 7) Density independent factors cause abrupt shift in population size.
- 8) Density independent and density dependent factor regulates Size of Population in any environment.

L. No \neq 19

- 9) Community is group of population living in a habitat.
- 10) Communities characterized by Species Richness and Primary Productivity
- 1) Species appear and disappear according to their ecological needs
- ~~structure~~ Structure of communities ~~varies~~ Varies with time
- 2) integrated and functioning as a whole unit is Hollistic concept of communities

L ≠ No 19

Concept about complexity of communities are two types individualistic and Holistic

Communities Composition changes across Landscapes

ecologist support individualistic concept.

Douglas fir Disappear in Ecotone

Hawkweed surviving in Serpentine Soil

L ≠ No 20

Ecosystem is made up different communities.

interspecific competition occurs between Two species to use same resources.

Sometimes species cannot utilize their entire Niche

The entire niche that a species is capable of using based on its physiological tolerance limits and resources need is called fundamental niche

specific functional role and place called its niche

17. Nitrosomonas, Nitrobacter are two step reaction that occurs together in nitrification.

18. Nitrification optimal temperature is b/w 6.6 – 8.0

19. Nitrification $\text{pH} < 6.0$ \square rate is slowed

$\text{pH} < 4.5$ \square reaction is inhibited

20. Denitrification perform by Facultative anaerobic bacteria

21. Lctr 47

22. IMPORTANT COMPONENT OF NUCLEIC ACIDS

MEMBRANE PHOSPHOLIPIDS, ATP IS PHOSPHORUS.

23. THE SLOWEST CYCLE IS PHOSPHORUS.

24. PHOSPHORUS IS RELEASED FROM ROCKS BY WEATHERING.

25. THE DYING OUT OF THE GROUP OF ORGANISM OR A SPECIE IS CALLED EXTINCTION.

26. CAUSES OF EXTENCTION ARE LOSS OF GENETIC VERICATION
HUMAN ACTIVITIES, POLLUTION, POPULATION GROWTH ETC.



7. Organic compound synthesized by **plants algae or other microbs**
8. Prokaryotic microbes can synthesize **ammonia** and nitrate from N_2 in the atmosphere.

9. **Sources of Nitrogen**

- Lightning
- Inorganic fertilizers
- Nitrogen Fixation
- Animal Residues
- Crop residues
- Organic fertilizers

10. Ammonification, Immobilization, Nitrogen Fixation, Nitrification, denitrification all are **phases of nitrogen cycle**,

11. Read it;-

Nitrogen Reservoir	Metric tons nitrogen	Actively cycled
Atmosphere	3.9×10^{15}	No

16. Rete of nitrogen fixing



N ₂ fixing system	Nitrogen Fixation (kg N/ <u>hect</u> /year)
Rhizobium-legume	200-300
Cyanobacteria- moss I	30-40
<u>Rhizosphere</u> associations	2-25



Ocean \diamond soluble salts		Yes
Biomass	$6.9 \cdot 10^{11}$	Yes
	$5.2 \cdot 10^8$	
Land \diamond organic matter		Slow
\diamond Biota	$1.1 \cdot 10^{11}$	Yes
	$2.5 \cdot 10^{10}$	

12. Lctr46

13. To restrict the freedom of movement of material.

14. C/N typical for soil microbial biomass is 20

15. Energy intensive process is **nitrogen fixation**.

16. Rete of nitrogen fixing

Fixation (kg N/hect/year)

Lctr 44

1. **Percolation** is an important **process**.
2. Some of the water **percolates** underground and is called **ground water**.
3. Water moves through the **soil and rock** layers.
4. Water evaporate through the leaves, process known as **transpiration**.
5. Water moves from the **roots** through the **stems** to the **leaves**.

Lectr no 45

1. **Nitrogen** is a component of all **proteins and nucleic acids**.
2. By weight nitrogen in living organism is _____, 16%
3. Nitrogen in atmosphere by volume _____ ---78%
4. **Atmospheric** nitrogen is in its **elemental** form.
5. commonly used nitrogen sources are **ammonia (NH₃)** and **nitrate ions (NO₃⁻)**
6. Ultimate source of nitrogen is nitrogen containing **organic compounds**
7. Organic compound synthesized by **plants algae or other microbs**
8. **Prokaryotic** microbes can synthesize **ammonia** and **nitrate** from N₂ in the atmosphere.
9. **Sources of Nitrogen**

L ≠ 16

- 1) Carrying capacity of environment affect Population growth
- 2) Growth rate becomes smaller as it approaches Carrying capacity
- 3) Logistic Population show S-shaped or sigmoidal curve
- 4) Lag Phase Phase show gradual increase in number of individual
- 5) wild life, yeast are common example of Logistic growth
- 6) Logistic growth has 4 Phases

L ≠ 17

r selected species show high growth rate and produce many offspring

Bacteria, grasses, Cephalopods, rodents are Examples of r-selected species.

K-selected species fewer number offspring but Probability of surviving to adulthood

Humans is example of K-selected species.

Body size of K-selected species is larger

Lecture: 6

- ① Energy passes through different Sequence.
- ② Plants species eaten by Insects.
- ③ Insects species eaten by Frog.
- ④ Trophic level of an organism is position it occupies in a food chain.
- ⑤ Linear network of links to pass energy
- ⑥ in form of food is called Food Chain
- ⑦ Food chain simplified abstraction of Real
- ⑧ food web, But complex in their Dynamics
- ⑨ Feeding levels Complexity is organized by Ecologists
- ⑩ Detritivores and decomposers can be at Trophic level as well.
- ⑪ Detritivores returns nutrients back in soil to be available for Producers.
- ⑫ Food chain only follow a Direct linear pathway of one (1) animal at a time.
- ⑬ Each level of food chain represent different Trophic level.
- ⑭ There are Five (5) Trophic levels in food chain.
- ⑮ 5th Trophic level of food chain is Apex Predator.

- In many species evolve is infrequent.
- Polymorphism is infrequent.

32.

- Appearance of an animal that warns predators aposematism
- Types of signals primary & secondary
- In reverse countershading reverse countershading makes it conspicuous.

33.

- Atmosphere of earth is a layer of gases
- Solar nebula is a disc of dust and gases.

Feature of:

- ~750 Tropical fig species.
- Figs are not fruit.
- They are specialized inflorescences with hundreds of unisexual flowers.
- Fig are shape ostiole
- Fig are complete cycle One month - 6 weeks.
- Attina Ants grow fungi in their colonies.
- Fungi produce nutritional "Gongyldia"
- Coevolution exists from 50 million years.



* Lecture 21 :-

- The first community to become established is an area Pioneer Community.
- Each Successional stage is called as Seral stage.
- The final community is the Climax Community.

* Lecture 22 :-

- Herbivory are Consumers of Plant.
- Anatomically and Physiologically adapted to eating plant material.
- Grazers Feeds on plant such as Grass.
- Browsers Feeds are non-grass plant material.
- How many type of grazing two and name Graminivory & Coprophagy.
- Graminivory Grasses in family Poaceae.
- Heavy grazing for half an hour of grazing period.
- Herbivorous of chemical defense Terpenes, also phenols, alkaloids.
- Best taste plants.

Lecture 23:

- Albatross make foraging flights within the prey range of 700 - 3000 km.
- It has a Ballistic interceptions.
- Handling prey can be dangerous.
- Sharp and Poisonous spines.
- Solitary predation example hawk.

Lecture 24:

- Intraspecific members of same species.
- Interspecific members of different species.
- Intraspecific are limited source.
- It is logistic population growth curve.
- Inter-specific are various of source.
- Aphid - Fordinae geica out compete F. formicaria by 84%.

⇒ Lecture 56 - 58 :-

1. Any Chemical and physical change in water that has harmful effects on human beings.
2. Water pollution is global issue.
3. The release of waste water from drains is Sewage.
4. High levels of plants and algal nutrients increase in Biological oxygen demand.
5. Unenriched, clear water that supports small population of aquatic organism is Oligotrophic.
6. Estuary enriched by inorganic plants and algal nutrients is Eutrophic.
7. Chemicals that contain carbon atom organic compound.
8. The great patch of garbage is in Pacific ocean.
9. The great pacific patch of garbage is known as Dead zone.
10. Atoms of unstable isotopes that emit radiations Radioactive substances.
11. When heated water produce during industrial process and released into water is Thermal pollution.

L79 to L83 by Teheem

- 1) Molecular biology has yielded wealth information Evolutionary relationships
- 2) Related animals have similar DNA derived from common ancestor.
- 3) Sequencing of DNA & protein help accurately to locate the similarities b/w different Taxa
- 4) Extraction & analysis of structure of protein from animal tissue & compare DNA of different animal.
 - ① disimilarities in structure of related protein & DNA
 - ② By assuming relatively constant mutation rates

L: '80

- ① Jean Baptiste Lamarck 1744 - 1829
- ② Lamarck rejected Fixity. He proposed Theory of Evolution
- ③ He "Lamarck" noticed organism adapted to particular niche, had well developed organs.
- ④ Vestigial organs are non functional small organs like apendix in human, hind limb of whale
- ⑤ Lamarck proposed if organs use become strengthen. If not use become atrophy. He called this use & disuse.

⑥ → Weismann's theory of germ plasm (1896-1910)

⑦ Modern genetic confirmed germ plasm theory

L: 81

① Charles Robert Darwin 1809-1882 in England

② It took him 22 years to publish his history "Origin of species" in 1859.

③ Adjacent layers in fossils record contain similar organisms

L: 82

① Darwin based three major evidences

① Geology ② fossils Evidence ③ Galapagos Island

② changes in earth's crust through history have resulted from actions of uniform, continuous processes.

③ Gradual changing over time with changing environment was foundation of natural selection.

L: 83

① Fossil evidences in Argentina is Pampas

② Extinct hippopotamus called Toxodon.

③ Horse like animal 2/2 Thoanthesium