BRANCHES OF BIOLOGY

1. **Palynology -** Study of structure of pollengrains.

   - Father of Palynology is **Erdtman.**
   - Father of Indian Palynology - **P.K.K. Nair.**

2. **Palaeobotany -** Study of fossil plants. Father of Palaeobotany- **Seward**

   - Father of Indian Palaeobotany - **Birbal Sahani.**
   - Birbal Sahani institute of Palaeobotany (National Institute of Palaeobotany) located at Lucknow.

3. **Pharmacognosy -** Study of medicinal plants. Father of Pharmacognosy - Dioscorides. Indian contributors

   - **Rishi Charak** wrote **"Charak Sanhita"**
   - **Rishi Parashar -** he wrote **"Vriksha Ayurveda"**

4. **Plant Pathology -** Study of pathogenic diseases of plants. Genetic diseases are studied under genetics.

   - Deficiency diseases are studied under plant physiology.
   - Father of plant pathology - **De Bary**
   - Father of Indian plant pathology - **E.J. Butler**

5. **Plant physiology -** Study of mechanism of plant processes.

   - Father of plant physiology - **Stephan Hales**
   - Father of Indian plant physiology - **J.C.Bose.**
   - Professor Nanda and Professor Ranjan are other famous Indian plant physiologists.

6. **Plant Embryology -** Study of embryogenesis in plants. It also includes the study of sporogenesis, developement of gametophytes, Pollination of fertilization.

   - Father of plant embryology - **Wolff.**
   - Father of Indian plant embryology - **Panchanan Maheshwari.**
   - S.C. Maheshwari, the son of late P. Maheshwari, is famous Indian plant embryologist.

7. **Plant ecology -** Study of plant in relation to their environment.

   - Father **- Reiter.**
   - Indian Father - **R.Misra**
   - Prof. T.N. Khushoo is famous Indian Environmentalist.

8. **Plant breeding -** Science which deals with the development of new varieties of plants.

   - Plant breeding in an application of Genetics
   - Father of Genetics and plant breeding **- Mendel**
   - Indian Father - **B.P.Pal**
   - Father of Green Revolution - **Norman Borlaugh.** He developed Mexican varieties of wheat and several high yielding varieties of potato. For this contribution, Norman Borlaugh was awarded Nobel prize for international peace (1970).
   - Father of Green Revolution in India - **M.S. Swaminathan.** By mutation breeding he developed high yielding and Rust-resistant varieties of wheat like **Sharbati sonora.**

9. **Phytosociology -** Study of structure of plant community.

10. **Phytogeography -** Study of geographical distribution of plants.

11. **Phytochemistry (Biochemistry)**- Study of plant chemicals and their reactions.

- Father of Biochemistry – **Leibig**

12. **Molecular biology -** Study of Nucleic acids.

13. **Phycology -** Study of algae.
- Father of phycology - **Fristch**
- Fristch wrote a book **"Structure and Reproduction of Algae".**
- Father of Indian phycology - **M.O.P. Iyengar.**

14. **Mycology or Mycetology -** Study of fungi.
- Father of Mycology - **Mitcheli,** Mitcheli wrote a book **"Nova Plantarum Genera".**
- Father of Modern Mycology - **De Bary.**
- **Fries -** Linnaeus of Mycology. Book of Fries is **"Systema Mycologicum".**
- Father of Indian Mycology - **B.B.Mundker/E.J. Butler**
- **E.J. Butler** is also considered as father of Indian Mycology and plant pathology.
- **T.S. Sadasivan, C.V. Subramanian** and **B.C. Lodha** are Indian mycologists of international fame.

15. **Bryology -** Study of Bryophytes.
- Father of Bryology - **John Hedwig and Cavers**
- Father of Indian Bryology - Professor **Shiv Ram Kashyap**
- Professor Shiv Ram Kashyap was oldest Indian Botanist. Professor Birbal Sahani and Professor K.C. Mehta were students of Shiv Ram Kashyap. The name of Shiv Ram Kashyap is still alive through his cine actress daughter Kamini Kaushal.

16. **Pteridology -** Study of Pteridophytes.
- Father - **Bower**
- Indian Father - **S.S.Bir**

17 **Gymnospermology -** Study of Gymnosperms
- Father - **Chamberlain**
- Indian Father - **Dogra.**

18. **Plant taxonomy -**
- Father of Indian plant taxonomy - **Father Santapau**
- Father Santapau was associated to Indian Botanical Garden, Calcutta.

19. **Spermology -** Study of seeds.

20. **Pomology -** Study of fruits

21. **Anthology -** Study of flowers

22. **Dendrology -** Study of trees and shrubs

23. **Dendrochronolgy -** Determination of age of trees.

24. **Silviculture -** Study of forest cultivation

25. **Arboriculture -** Cultivation of ornamental trees.

26. **Horticulture -** Cultivation of vegetables (Olericulture), fruits (Pomiculture) and flowers (floriculture).

27. **Pedology or Edaphology -** Study of soil for crop cultivation.

28. **Agronomy -** Study of agricultural practices like preparation of fields, sowming of seeds, Irrigation, manuring, harvesting etc.

29. **Limology -** (Fresh water ecology) - Ecological study of fresh water lakes.

30. **Ethanobotany -** Study of folk uses of plants (uses of plants by tribal peoples).
    - Father of Ethanobotany - Hrshberger

31. **Microbiology -** Study of microbes (Bacteria, viruses, Mycoplsma etc).
    - Father of Microbiology - **Louis Pasteur / Leeuwenhoek**
    - Father of modern Microbiology - **S.A. Waksman** (Soil microbiologist)

32. **Bacteriology -** Study of Bacteria.
    - Father of Bacteriology - **Leeuwenhoek / Louis Pasteur.**
    - Father of modern Bacteriology - **Robert Koch**

33. **Virology -** Study of viruses
    - Father of virology - **Iwanowsky**

34 **Aerobiology -** Study of air borne living things like pollengrains, spores, Bacteria etc. Most abundant living organisms in air are bacteria.

35. **Space biology -** study of effects of space conditions of living beings.

36. **Actinobiology or Radiation biology -** Study of effects of radiations on living beings.

37. **Phenology -** Study of seasonal variations in plant communities.

38. **Bio-nomics -** Study of interactions of plant like the symbiosis, predation parasitism etc.

39. **Ethalogy -** Study of behaviour of organisms.

40. **Anthropology -** The science of man and mankind, including the study of the physical and metal constitution of man his cultural development, social conditions, as exhibited both in the present and the past.

41. **Entomolgy -** A branch of zoology which deals with structure, habits and classification of insects.
42. **Fishery -** The occupation or industry of catching fish or other products of the sea, lakes or rivers.
43. **Poultry Science -** Science dealing with domestic fowls, such as chickens ducks and geese.
44. **Sericulture -** The breeding and treatment of silkworms for producing raw silk.
45. **Apiculture -** The rearing of bees; beekeeping especially for commercial purposes.
46. **Dairy Technology -** The application of science for the manufacture of milk products.
47. **Psychology -** The branch of knowledge which deals with the human mind, its behaviours and mental qualities.
48. **Forensic science -** Application of scientific knowledge to the questions of civil and criminal law (includes use of finger-prints, blood typing, identification of narcotics, etc.)
49. **Human Reproductive Biology -** The science of understanding and regulating human reproduction.
50. **Physiotherapy -** The treatment of diseases, bodily weakness, or defects by physical remedies, such as massage and exercise.

51. **Genetic Engineering -** Involves genetic manipulations to produce an organism with a new combination of inherited properties.

52. **Biomedical Engineering -** Production of spare parts for man, implants, artificial limbs, heart-lung machines etc.

53. **Phytophysics (Biophysics) -** Study of physical activities of plants.

54. **Bio-matrics or Bio-statistics -** Use of statistics in Biology, like the statistical analysis of data obtained form experiments.

55. **Agrastology -** Study of grasses and grass lands.

56. **Cecidology -** Study of pathogenic tumors in plants.

57. **Exobiology or Xenobiology -** Study of life on other planets.

58. **Cryobiology -** Study of effects of low temperature on living beings. Cryopreservation is technique concerned with preservation of living things t low temperature for e.g. the preservation of semen in liquid nitrogen.

59. **Speleology -** Study of fauna (animals) and flora (plants) of caves.

60. **Gerontology -** Study of aging, i.e., effects of age of living beings.

61. **Teratology -** Study of abnormalities in embryo.

62. **Physiognomy -** External appearance of community (vegetation). It is determinated by the growth form of dominant species.

SOME GENERAL BRANCHES

1. **Eugenics -** Improvement of individuals **yet to borne** by the application of genetic principles like selective mating. Father of Eugenics - Galtan and Peerson.

2. **Euthenics -** Science of better living - Improvement of individuals **already borned** by providing better environment, good food, education and Training.

3. **Euphenics -** Study of control of genetic diseases.

Ecospecies - It contains one or more ecotype which although interfertile (capable of interbreeding), do not produce viable offsprings due to some natural interruption (mountain, ocean etc.).