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GLIMPSE OF GENETICS & PLANT BREEDING

Dr. Sujit Kumar - Dr. Divya Srivastava - Dr. Nilofer
Dr. Mayank Srivastava



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Contents

S. No.	Chapters	Page No.
1.	Molecular Organization of Chromosomes <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	01-16
2.	Population Genetics <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	17-25
3.	DNA Transcription <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	26-40
4.	Introduction to Plant Breeding <i>(Sujit Kumar, Nilofer, Divya Srivastava and Anand Mohan Choudhary)</i>	41-46
5.	History of Plant Breeding <i>(Niharika Yaduvanshi, Rishabh Gupta and Upendra Kumar Mishra)</i>	47-55
6.	Mendelian Principles of Heredity <i>(Shailja Chauhan, Upasna Mishra, Rakesh Kumar Yadav and Ruchi Asati)</i>	57-63
7.	Role of Inheritance in Crop Improvement <i>(Javed, Kamlesh Kumar, Rishabh Gupta and Mohammad Salman)</i>	65-72
8.	Concept of Gene <i>(Govind Mishra, Mohammad Salman and Anand Mohan Chaudhary)</i>	73-82
9.	Fine Structure of Gene <i>(Divya Srivastava, Nilofer, Sujit Kumar and Mohammad Salman)</i>	83-88
10.	Breeding Objectives and its Importance <i>(Govind Mishra, Mohammad Salman and Anand Mohan Chaudhary)</i>	89-97
11.	Centre of Origin of Crop Plants <i>(Shivam Tripathi)</i>	99-104
12.	Quantitative Inheritance <i>(Nilofer, Divya Srivastava, Sujit Kumar and Anand Mohan Choudhary)</i>	105-112
13.	Mass Selection <i>(Rakesh Kumar Yadav, Ruchi Asati, Shailja Chauhan and Shruti Paliwal)</i>	113-117
14.	Recurrent Selection for Specific Combining Ability <i>(Recurrent Selection for Specific Combining Ability)</i>	118-125

15. Heterosis Breeding	127-135
<i>(Rishabh Gupta, Ajeet Kumar Gupta and Niharika Yaduvanshi)</i>	
16. Resistance to Biotic Stresses Insect Resistance	137-145
<i>(Javed, Mohammad Salman, Niharika Yaduvanshi, Kamlesh Kumar and Anuj Kumar)</i>	
17. Breeding for Abiotic Stress	147-152
<i>(Sujit Kumar, Nilofer, Divya Srivastava and Anand Mohan Choudhary)</i>	
18. Plant Biofrotification	153-160
<i>(Zeenat Aman, Javed, Mohammad Salman and Anuj Kumar)</i>	
19. Breeding Methods in Self-pollinated Crops	161-170
<i>(Sujit Kumar, N.A. Khan, Javed, Nilofer and Divya Srivastava)</i>	
20. Breeding Methods in Cross-pollinated Crops	171-182
<i>(Rudra Pratap Mishra, Dharmendra Kumar, Amit Kumar Singh and Soyal Kumar)</i>	
21. Green Revolution	183-194
<i>(Nilofer, Divya Srivastava, Mayank Srivastava, Sujit Kumar and N. A. Khan)</i>	
22. New Concepts in Maintenance of Plant Breeding Promises and Prospects	195-202
<i>(Divya Srivastava, Nilofer, Javed and Mohammad Salman)</i>	
23. Current Trends in Plant Breeding	203-215
<i>(Niharika Yaduvanshi and Shashi Kant)</i>	
24. Techniques of Plant Tissue Culture	217-226
<i>(N.A. Khan, Javed, Kamlesh Kumar and Sujit Kumar)</i>	
25. Crop Improvement through Genetic Engineering	227-234
<i>(Soyal Kumar, Nakul Kumar, Vikrant and Rudra Pratap Mishra)</i>	
26. Somaclonal Variations	235-250
<i>(N.A. Khan, Javed, Sujit Kumar and Nilofer)</i>	
27. Multiple Factor Hypothesis	251-256
<i>(Nilofer, Divya Srivastava, Sujit Kumar and Anand Mohan Choudhary)</i>	
28. Breeding Concept and Crop Improvement in Chickpea	257-270
<i>(Ruchi Asati, Rakesh Kumar Yadav, Shailja Chauhan and Kirti Singh)</i>	
29. Genome Editing: Procedure and Application	271-279
<i>(Syed Kulsoom Fatima Jafri, Devesh Yadav and Upendra Kr. Mishra)</i>	

Contents

S. No. Chapters	Page No.
1. Molecular Organization of Chromosomes <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	01-16
2. Population Genetics <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	17-25
3. DNA Transcription <i>(Sujit Kumar, Kamlesh Kumar and Nilofer)</i>	26-40
4. Introduction to Plant Breeding <i>(Sujit Kumar, Nilofer, Divya Srivastava and Anand Mohan Choudhary)</i>	41-46
5. History of Plant Breeding <i>(Niharika Yaduvanshi, Rishabh Gupta and Upendra Kumar Mishra)</i>	47-55
6. Mendelian Principles of Heredity <i>(Shailja Chauhan, Upasna Mishra, Rakesh Kumar Yadav and Ruchi Asati)</i>	57-63
7. Role of Inheritance in Crop Improvement <i>(Javed, Kamlesh Kumar, Rishabh Gupta and Mohammad Salman)</i>	65-72
8. Concept of Gene <i>(Govind Mishra, Mohammad Salman and Anand Mohan Chaudhary)</i>	73-82
9. Fine Structure of Gene <i>(Divya Srivastava, Nilofer, Sujit Kumar and Mohammad Salman)</i>	83-88
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13. Mass Selection <i>(Rakesh Kumar Yadav, Ruchi Asati, Shailja Chauhan and Shruti Paliwal)</i>	113-117
14. Recurrent Selection for Specific Combining Ability <i>(Recurrent Selection for Specific Combining Ability)</i>	118-125

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<i>(Rishabh Gupta, Ajeet Kumar Gupta and Niharika Yaduvanshi)</i>	
16. Resistance to Biotic Stresses Insect Resistance	137-145
<i>(Javed, Mohammad Salman, Niharika Yaduvanshi, Kamlesh Kumar and Anuj Kumar)</i>	
17. Breeding for Abiotic Stress	147-152
<i>(Sujit Kumar, Nilofer, Divya Srivastava and Anand Mohan Choudhary)</i>	
18. Plant Biofrotification	153-160
<i>(Zeenat Aman, Javed, Mohammad Salman and Anuj Kumar)</i>	
19. Breeding Methods in Self-pollinated Crops	161-170
<i>(Sujit Kumar, N.A. Khan, Javed, Nilofer and Divya Srivastava)</i>	
20. Breeding Methods in Cross-pollinated Crops	171-182
<i>(Rudra Pratap Mishra, Dharmendra Kumar, Amit Kumar Singh and Soyal Kumar)</i>	
21. Green Revolution	183-194
<i>(Nilofer, Divya Srivastava, Mayank Srivastava, Sujit Kumar and N. A. Khan)</i>	
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<i>(Soyal Kumar, Nakul Kumar, Vikrant and Rudra Pratap Mishra)</i>	
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<i>(N.A. Khan, Javed, Sujit Kumar and Nilofer)</i>	
27. Multiple Factor Hypothesis	251-256
<i>(Nilofer, Divya Srivastava, Sujit Kumar and Anand Mohan Choudhary)</i>	
28. Breeding Concept and Crop Improvement in Chickpea	257-270
<i>(Ruchi Asati, Rakesh Kumar Yadav, Shailja Chauhan and Kirti Singh)</i>	
29. Genome Editing: Procedure and Application	271-279
<i>(Syed Kulsoom Fatima Jafri, Devesh Yadav and Upendra Kr. Mishra)</i>	

Chapter - 27

Multiple Factor Hypothesis

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Chapter - 27

Multiple Factor Hypothesis

Nilofer, Divya Srivastava, Sujit Kumar and Anand Mohan Choudhary

Multiple Factor

Mendel's Laws of inheritance determine the inheritance of qualitative features. These are distinct characteristics that produce two extremes in the flower colour (purple or white), seed form (round or wrinkled), and seed colour, for example (yellow or green). There isn't a phenotypic in between. Discontinuous variation describes variations in qualitative traits.

However, some other significant characteristics of domesticated animals and cultivated plants, such as the production of eggs, milk, or meat by animals, among others, do not fall into two distinct categories and all gradations appear between the two extremes (for instance, between the colour of red and white wheat grain and the colour of black and white skin in humans). Quantitative characters are what these characters are known as. Continuous variation is the name for variation in quantitative traits.

These numerical features exhibit continual variation. Because the traits are so continuously variable and don't appear to separate out in the offspring of hybrids, Mendel's method of analysis is difficult to use.

H. Nilsson-Ehle, a Swedish botanist, and E.N. East, an American scientist, tackled the issue of the inheritance of quantitative character in 1908. (1910, 1916). These researchers demonstrated that this apparent "blending inheritance" may be explained by supposing that continuously changing traits are caused by the combined or cumulative action of numerous genes, each of which has a minor influence on the same trait. These genes are referred to as polygenes, cumulative genes, or additive genes.

A cumulative gene is one that, when combined with another gene that is identical or similar, changes the level of expression of a quantitative characteristic. In other words, multiple genes (= polygenes) control a quantitative characteristic at the same time, and the effect or action of these genes is cumulative or additive in nature. The multiple-factor hypothesis is yet another name for this. Multiple-factors are gene pairs that interact with one