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Course : M.Sc. Part-1

Paper : 1

Topic : Biodiversity and distribution of biodiversity hotspots

Prepared By : (Prof.) Dr. Jainendra Kumar (jainendrak@gmail.com)

Coordinated By: (Prof.) Dr. Shyam Nandan Prasad



Global pattern of biodiversity hotspots

What is biodiversity?

जैव वैविध्य क्या है?

To understand what is it, just go to buy brinjals from the vegetable market. Buy as many types as you find - cylindrical types, oval, round, larger or small showing varying colours, green ones with varied shapes, white ones of differing shades etc. You may at least collect twenty varieties of brinjal with varied shapes, colour, and size. That shows you the biodiversity of brinjal. Now, you should search online for different endemic varieties of brinjal (Eggplants) belonging to different regions of the world. You will have a very large number of types and varieties of the eggplant fruits. The World Vegetable Centre, Taiwan has 3,200 accessions of the germplasm of the three cultivated species of eggplant with their more than thirty wild relatives.

Where did brinjal originate and when did it come under domestication by man?

According to N. I. Vavilov, the brinjal had its origin in Indo-Burmese region. The plant is thought to have originated under cultivation from a wild *Solanum* species i.e. *Solanum incanum*.

Most species (about 80%) under the genus *Solanum* had their origin in Americas. The three cultivated and related species kept under the common name of Eggplants are *Solanum melongena* (brinjal eggplant or aubergine), *Solanum aethiopicum* (scarlet eggplant) and *Solanum macrocarpon* (gboma eggplant). They with their wild relatives are endemic to the old world. So,

where will you hope to find most varieties of the eggplants?

In India, Asia, Indo-Burma? Yes, you are right. The Indo-Burma region is the place where eggplant took its origin under cultivation some 5,000 years ago. It radiated into at least three species with many distinct varieties and phenotypes to cause its novel intraspecific biodiversity and spread worldwide. But, we consider the term 'biodiversity' in wider perspective. Overall, a region or area showing diverse species of plants and animals is marked as an important zone in terms of biodiversity.

The Indo-Burma region has more than 13,500 vascular plant species among which 7,000 are endemic.

This region is one of the more than 30 biodiversity hotspots identified all over the world.

What are biodiversity hotspots?

Biodiversity hotspots are regions rich in diverse plant species. They are, however, greatly endangered due to human habitation and other reasons connected to man.

CEPF (Critical Ecosystem Partnership Fund) is a joint effort for the conservation of biodiversity by French Development Agency AFD, EU, Conservation International, GEF (Global Environment Facility), World Bank and Government of Japan.

According to CEPF, a biodiversity hotspot is the Earth's biologically rich - yet threatened - terrestrial region. There are currently 36 biodiversity hotspots. To qualify as a biodiversity hotspot, an area must meet two important criteria -

1. It must contain 1,500 species of endemic vascular plants (not found anywhere in the world).
2. It must have lost 70% of its native vegetation in the past.

These are the minimum for any region to be added to the list. Few regions may have more endemic plant species. Sundaland has above 15,000 endemic flora. Many hotspots might have lost much of its vegetation. Loss is as much as 90-95% in few of them.

Biodiversity hotspots are diversely distributed globally but sustain their ecosystems on a very small part of the earth. They lie on just about 2.4% of the total earth surface.

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 Pattern of biodiversity hotspots:

If we draw a map of the regions of the world having the recognised biodiversity hotspots, the distributional pattern can be seen continent/zone-wise like this -

South Asia:

1. Eastern Himalayas
2. Indo-Burma region
3. Western Ghats and Sri Lanka

East Asia:

1. Japan
2. Mountains of Southwest China

West Asia:

1. Caucasus
2. Irano-Anatolian

Central Asia:

1. Mountains of Central Asia

South East Asia and Asia Pacific

1. East Melanesian islands
2. New Caledonia
3. New Zealand
4. Philippines
5. Polynesia-Micronesia
6. Eastern Australian temperate forests
7. Southwest Australia
8. Sundaland and Nicobar islands of India
9. Wallacea

Africa:

1. Cape Floristic region
2. Coastal forests of Eastern Africa
3. Eastern Afromontane
4. Guinean forests of West Africa
5. Horn of Africa
6. Madagascar and Indian Ocean islands
7. Maputaland-Pondoland-Albany
8. Succulent Karoo

Europe:

1. Mediterranean basin

The Caribbean

1. The Caribbean islands

South America

1. Atlantic forest
2. Cerrado
3. Chilean winter rainfall-Valdivian forests
4. Tumbes-Choco-Magdalena
5. Tropical Andes

North and Central America:

1. California Floristic province
2. Madrean Pine-Oak woodlands
3. Mesoamerica
4. North American coastal plain

The article is accompanied by an authentic map of 34 biodiversity hotspots recognised till 2005. In 2011, forests of East Australia were added as 35th hotspot. In 2016, North American Coastal plain was added as the 36th. Read the following page of Conservation International to know why are biodiversity hotspots important!

<https://www.conservation.org/priorities/biodiversity-hotspots>

Conservation of these endangered vegetational belts which are also rich in fauna is of utmost priority. Funding and conservation efforts for these are coordinated by several bodies and agencies. Most important are Conservation International, WWFN (World Wide Fund For Nature) and CEPF.