

Stability Testing of Herbal Medicines

Meaning of Stability Testing:

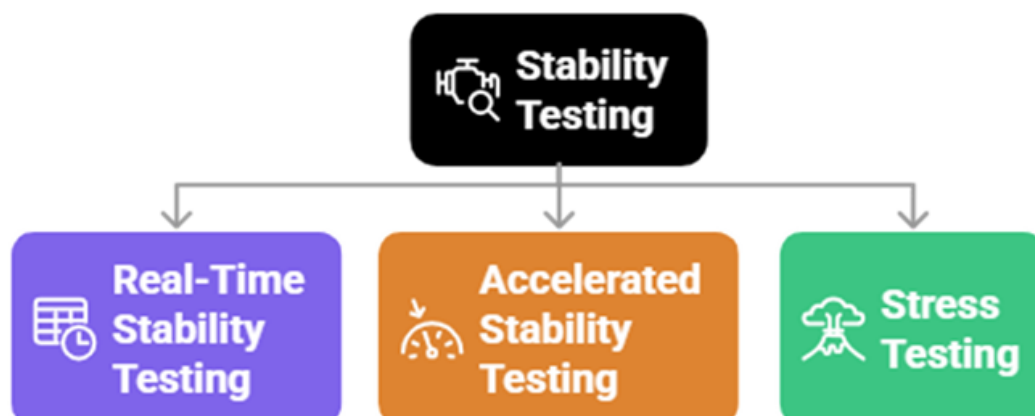
- Stability testing means checking how long a herbal medicine stays effective and safe under different environmental conditions like temperature, humidity, and light.
- This helps to determine the **shelf life** of the product (i.e., how long it can be stored without losing its quality).

Why Stability Testing is Important for Herbal Medicines?

- Herbal medicines are made from plant materials, which are natural and complex.
- They can be easily affected by:
 - Air (oxygen)
 - Moisture (humidity)
 - Light (especially sunlight)
 - Heat (temperature)
 - Microorganisms (like bacteria and fungi)
- Because of these factors, herbal products may:
 - Lose their effectiveness (less active ingredients)
 - Change their color, smell, or taste
 - Form toxic substances
 - Get contaminated with microbes
- So, **stability testing** helps ensure that:
 - The herbal product remains **safe, effective, and acceptable** till its expiry date.
 - The **dosage form** (tablet, capsule, syrup, etc.) maintains its quality over time.
 - There is **no degradation** or unwanted chemical changes in the product.

Types of Stability Testing:

There are mainly three types of stability testing:



1. Real-Time Stability Testing

- Samples are stored under **normal storage conditions** (e.g., 25°C and 60% humidity).
- Duration: Usually 12, 24, or 36 months.
- Helps determine the **actual shelf life**.

2. Accelerated Stability Testing

- Samples are stored under **harsh conditions** (e.g., 40°C and 75% humidity).
- Duration: Usually 6 months.
- Helps **predict the shelf life faster**.

3. Stress Testing

- Samples are exposed to **extreme conditions** like high heat, light, pH changes, and oxidation.
- Helps understand how the product degrades.
- Useful for identifying **potential degradation products**.

What Parameters Are Tested in Herbal Medicines?

1. Physical Parameters:

- Color, odor, texture
- Moisture content
- Weight variation in tablets
- Disintegration time
- pH of liquid preparations

2. Chemical Parameters:

- Active ingredient content (like alkaloids, flavonoids)
- Presence of degradation products
- Total ash, acid-insoluble ash
- Extractive values

3. Microbial Parameters:

- Total bacterial count
- Fungal count
- Presence of pathogens like *E. coli*, *Salmonella*, etc.

Special Challenges in Stability Testing of Herbals:

- Herbal products are **complex mixtures** – difficult to identify all active compounds.



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