

Microbiology $\Rightarrow$ UNIT = 5

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Types of Spoilage, Factors affecting the microbial Spoilage of Pharmaceutical pdt.

[DEPTH OF BIOLOGY]

It refers to a form of Substandard or Process Spoilage especially the deterioration of food & other perishable goods.
 (खराब होना) (खराब होने वाले)

OR

Spoilage is referred as Change in Physical & Chemical properties of Pharmaceutical & drugs product in such a way that they are not suitable for use.

[DEPTH OF BIOLOGY]

Types of Spoilage

Microbial Spoilage

Non-Microbial Spoilage.

— Spoilage due to contamination of any microbial cell (microorg).

Eg = Bact., Fungi, Virus etc.

— Physical Spoilage.

— Chemical Spoilage.

— Enzymatic Spoilage

— others ---

[DEPTH OF BIOLOGY]

Non-Microb. Spoilage $\Rightarrow$ Spoilage due to any other factor as like as physical, chemical etc --- (not due to microorg)

① Physical $\Rightarrow$ Spoilage due to any physical factor like pressure, Temp. etc -

Eg $\Rightarrow$ Spoilage of Salt due to Water [Moisture]

② Chemical $\Rightarrow$ Spoilage due to any Chemical rxn.

Like Oxidⁿ, redⁿ etc.

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③ Enzymatic $\Rightarrow$ Spoilage due to any Enzyme like as Lipase

Protease, Maltase etc.

Eg $\Rightarrow$ Hydrolysis of Lipid due to Lipase etc.
(Ghee)

Microbial Spoilage $\Rightarrow$

* It is Spoilage of any Pharmaceutical product or drug due to Contamination of Microorg. & their products which further Not Intended for Use. [DEPTH OF BIOLOGY]

* Pharmaceutical product maybe considered to be Microbiologically Spoiled. If Low level of Pathogenic Microbes or toxic Microbial Metabolites are Present & detectable Physical or Chemical Changes have occurred in the products. [DEPTH OF BIOLOGY]

Types of Microbial Spoilage $\Rightarrow$

① Infection Induced by Contaminated Pharmaceutical Products $\Rightarrow$

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- Pharmaceutical product maybe contaminated by pathogenic Microorg. Mainly from Raw Material or at the time of Preparation (which cause serious infection to patient)
eg $\Rightarrow$ Septicaemia due to pseudomonas.

[DEPTH OF BIOLOGY]

② Physio Chemical Spoilage $\Rightarrow$

Due to microbial contamination there are change in Physical & Chemical prop. of drug.

[DEPTH OF BIOLOGY]

③ Observable effect of Microbial attack $\Rightarrow$
On ppts.

Microbial spoilage of diff. dosage form may be detected by Organoleptic Test.

These spoiled product may release very unpleasant smelling & tasting metabolites such as 'Sour' 'fishy' etc.

④ Ingredients Susceptible to Microbial attack ⇒

⑤ Therapeutic Agents ⇒

Many drugs are capable of ~~gross~~ degradation by a wide variety of Microorg.

eg ⇒ Aspirin may be converted to Salicylic Acid & Penicillin
[DEPTH OF BIOLOGY] (by β -lactamase^{enzyme}),

⑥ Preservative & Disinfectant ⇒

Most organic disinfectant are metabolised readily by Bact. & fungi.

eg → Pseudomonas species have metabolised

4-Hydroxy Benzoate ester (Preservative in eye drops) &
Cause Serious Eye Infection.

⑦ Sweetening, flavouring & colouring Agents ⇒

Many sugar & other Sweetening agents - used in pharmacy are ready substrate for Microbial Growth.

eg ⇒ flavouring agent such as peppermint H₂O & Chloroform support

Growth of Bacteria & Yeast.