

## Wild Yeast

Yeasts are present worldwide, in soils, in the air and on plant surfaces as well as on the skin. They are especially abundant wherever natural sugars occur such as in nectar and fruits – this is because sugar is yeast’s sole food intake.

There are hundreds varieties of yeasts. Certain strains are extremely useful, such as those used in the production of bread, beer and wine. Yeast is the first living thing that was domesticated for human use.



The white bloom on these plums indicates the presence of yeast

Some yeasts are mild to dangerous pathogens of the animal kingdom varying from annoying infections like athlete’s foot to the extremely painful and ultimately fatal infestations. Examples of a severe yeast infection include invasive candidiasis that affects the heart, liver and bloodstream in humans and various respiratory diseases that affect animals.

Yeasts are part of the fungi family. They grow as egg-shaped, single cells that need food, warmth and moisture to survive.

They are only visible with a microscope – one gram of yeast contains 20 billion cells. They develop by producing daughter cells either through budding (the budding yeasts) or by binary fission (the fission yeasts).

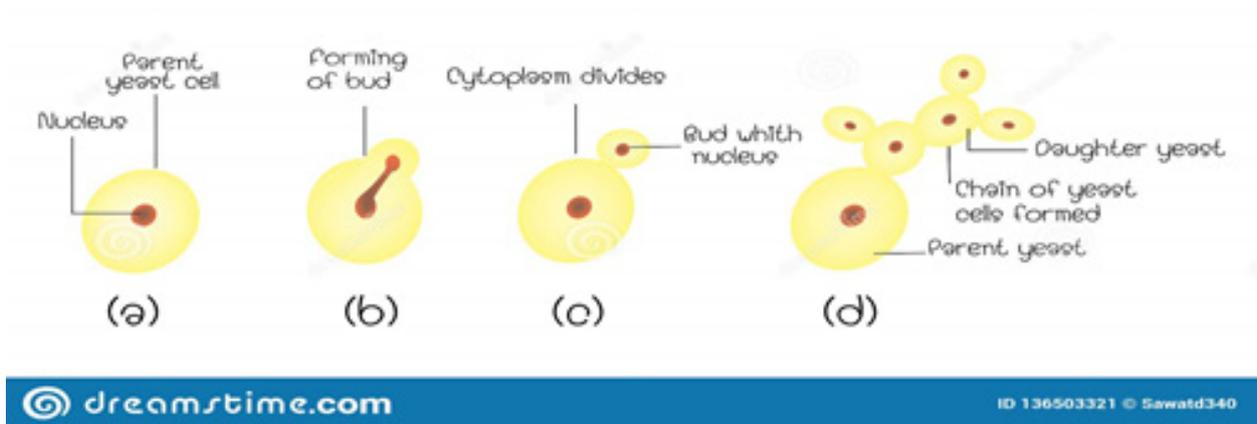


Diagram of budding yeast

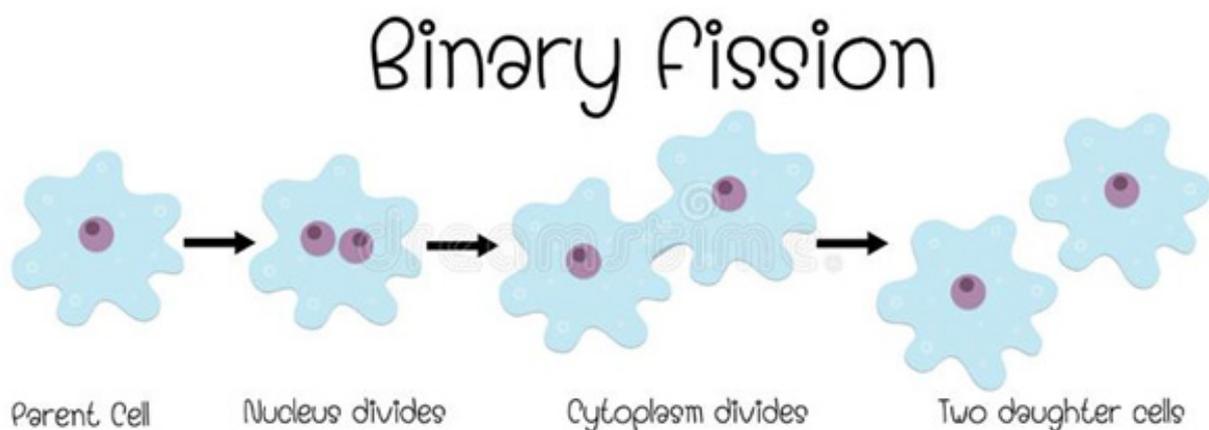


Diagram of fission yeast

The major difference between binary fission and budding is that in budding there is an outgrowth from the parent individual producing a bud, which is identical to its parent individual. The new individual cell forms on the old individual cell. In binary fission, there is no bud or outgrowth formation – the old individual cell splits into two new individuals.

There is evidence to suggest that Egyptians and Babylonians knew how to make raised bread, harnessing wild yeast. Before that, bread products were flat and compact in shape and density. It is likely that a batch of dough to make flat baked bread was forgotten and the wild yeast, naturally present in the environment, created a leavened dough that rose when baked.

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Middle Eastern flat bread



Egyptian leavened bread

The era of “mysterious fermentation” extended until the 19th century when Louis Pasteur, a French chemist and microbiologist, identified yeast as the micro-organism responsible for alcoholic fermentation and in leavened dough. Not long after that, yeast began to be manufactured on an ever larger scale.

Yeast organisms consume sugars in a flour, water and sugar mixture and produce ethanol and carbon dioxide as waste products. The carbon dioxide forms bubbles in the dough. Because the dough is elastic and stretchable, the carbon dioxide cannot escape. The expanding gas causes the dough to inflate or rise.

All ethanol contained in alcoholic beverages is produced by means of fermentation induced by yeast.



The action of yeast in wine making



Yeast fermenting to make beer

Wine is produced by fermentation of the natural sugars present in grapes; cider is produced by similar fermentation of natural sugar in apples. Beer, whiskey, and sometimes vodka are produced by fermentation of grain starches that have been converted to sugar by the enzyme amylase, which is present in grain kernels that have been malted (i.e. germinated)

Yeast is yet another relation in the fungi family whose complexity is quite astonishing. These handouts demonstrate that without the kingdom of fungi, the rest of the natural world would not exist in the way we know it.

Big Respect to Yeast!