Selection and evolution – 2023 November Biology A2 9700

1. Nov/2023/Paper 9700/42/No.2

Yeasts are unicellular organisms from the kingdom Fungi. Saccharomyces cerevisiae is one species of yeast that can carry out either asexual reproduction by mitosis or sexual reproduction by meiosis.

Budding in S. cerevisiae is a process where a small daughter cell forms as a bud on the parent cell. The bud contains a copy of the parent cell nucleus and it eventually separates from the parent cell to form a new cell.

S. cerevisiae can exist in two forms: haploid cells or diploid cells.

- Haploid cells can be one of two different mating types: \mathbf{a} and $\boldsymbol{\alpha}$.
- Haploid cells can only mate with other haploid cells of the opposite mating type.

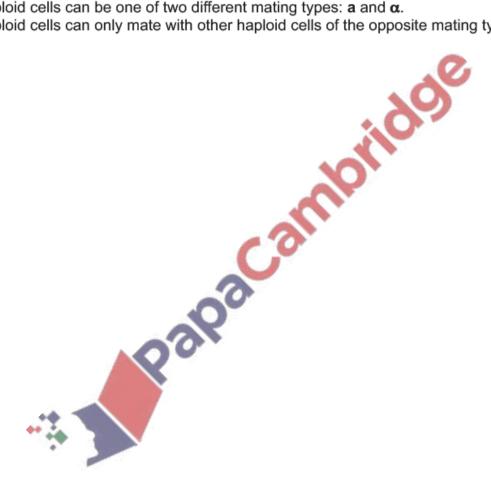


Fig. 2.1 shows the life cycle of S. cerevisiae with its asexual and sexual reproductive stages.

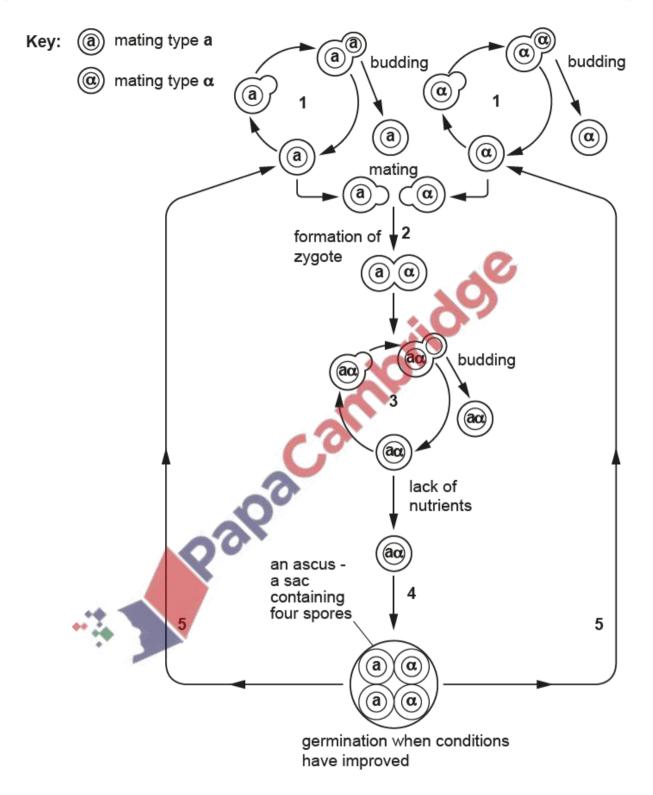
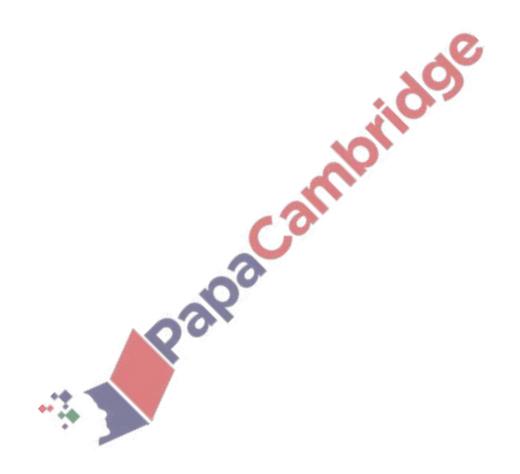


Fig. 2.1

(a)	With reference to Fig. 2.1, state th	e numbers of the stages 1–5 that:
	involve mitosis	
	involve meiosis	
	produces new genetic variation	
	shows only haploid cells	
	shows only diploid cells	[
(b)	When there is a lack of nutrients, of which germinate only when conditions	cells made in stage 3 will carry out stage 4 to make spore ions improve.
	Suggest and explain how the ty advantageous for <i>S. cerevisiae</i> in	pe of reproduction that makes spores during stage 4 a changing environment.
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(c)		evisiae can carry out asexual reproduction.
		sive mutation may not have a damaging effect on: ulation of haploid cells of <i>S. cerevisiae</i>
		ulation of diploid cells of <i>S. cerevisiae</i> .
		r

(d)	State two features, other than reproduction using spores, of the kingdom Fungi.		
	[2]		

[Total: 14]



	earch suggests that selective breeding began about 10 000 years ago. Selective breeding has n important in satisfying the global demand for food.
(a)	The introduction of disease resistance to varieties of wheat is an example of selective breeding.
	Outline the steps involved in the introduction of disease resistance to varieties of wheat.
	XO*
(b)	Suggest two possible disadvantages of selective breeding.
(D)	Suggest two possible disadvantages of selective breeding.
	[2]

2. Nov/2023/Paper_9700/42/No.3