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A comparative genomic analysis of the 250-million-year-old halophilic archaeon *Halosimplex carlsbadense* with related species

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1
00:00:04,470 --> 00:00:02,790
hello my name is avery fulford and today

2
00:00:07,110 --> 00:00:04,480
i'll be discussing my senior thesis

3
00:00:09,910 --> 00:00:07,120
entitled a comparative genomic analysis

4
00:00:14,070 --> 00:00:09,920
of the 250 million year old halophilic

5
00:00:16,790 --> 00:00:14,080
archaeon halo simplex carlsbadency

6
00:00:19,510 --> 00:00:16,800
so in the year 2000 four organisms were

7
00:00:21,990 --> 00:00:19,520
extracted from 250 million year old salt

8
00:00:22,790 --> 00:00:22,000
crystals in new mexico by vreeland at

9
00:00:24,390 --> 00:00:22,800
all

10
00:00:26,230 --> 00:00:24,400
one of these samples has been named as a

11
00:00:28,470 --> 00:00:26,240
novel species named halo simplex

12
00:00:30,630 --> 00:00:28,480
carlsbadency which is a halophilic

13
00:00:31,910 --> 00:00:30,640

archaeon or a microbe adapted to extreme

14

00:00:33,750 --> 00:00:31,920

salinity

15

00:00:36,150 --> 00:00:33,760

we aligned and compared the genome of

16

00:00:38,389 --> 00:00:36,160

this organism to its 17 most closely

17

00:00:40,310 --> 00:00:38,399

related halophiles to identify the

18

00:00:41,750 --> 00:00:40,320

adaptations involved in its long-term

19

00:00:43,910 --> 00:00:41,760

survival

20

00:00:45,910 --> 00:00:43,920

we found that dna repair membrane

21

00:00:48,150 --> 00:00:45,920

transport and oxidative stress response

22

00:00:49,510 --> 00:00:48,160

mechanisms are required for long-term

23

00:00:51,750 --> 00:00:49,520

salt entrapment

24

00:00:54,069 --> 00:00:51,760

dna repair combats the rearrangement of

25

00:00:55,830 --> 00:00:54,079

pyrimidine bonds by hypersalinity

26

00:00:58,229 --> 00:00:55,840

membrane transport proteins protect

27

00:01:00,069 --> 00:00:58,239

against hypertonic conditions and

28

00:01:02,150 --> 00:01:00,079

oxidative stress response mechanisms