

Life from 2000-year-old seed in Israel

By Steven Erlanger

Israeli doctors and scientists have succeeded in germinating¹ a date seed that is nearly 2,000 years old.

The seed, nicknamed Methuselah², was taken from an excavation³ at Masada⁴, the cliff fortress where, in A.D. 73, 960 Jewish zealots⁵ died by their own hand⁶ rather than surrender to a Roman assault.

The point of growing the seed is to find out what was so exceptional about the original date palm of Judea⁷, much praised in the Bible and the Koran for its shade, food, beauty and medicinal qualities, but long ago destroyed by the crusaders⁸.

"The righteous shall flourish like the palm tree," says Psalm⁹ 92. "They shall still bring forth fruit in old age. They shall be fat and flourishing."

Dr. Sarah Sallon, who runs a project on Middle Eastern medicinal plants, said the date-palm tree in ancient times symbolized the tree of life. But Dr. Elaine Solowey, who germinated the seed and is growing it in quarantine¹⁰, says plants grown from ancient seeds "usually keel over¹¹ and die soon," having used most of their nutrients in remaining alive.

The plant is now 11.8 inches, or 30 centimeters, tall and has produced seven leaves, one of which was removed for DNA testing. Radiocarbon dating in Switzerland on a snip¹² of the seed showed it to be 1,990 years old, plus or minus 50 years. So the date seed dates from 35 B.C. to A.D. 65, just before the famed Roman siege.▶



The ancient Hebrews called the date palm the tree of life. "Methuselah," shown here, was planted Jan. 25; the seed was discovered during an excavation of Herod's palace.

以色列学者和科学家已成功地使一颗近 2000 年前的海枣种子发芽。

这颗种子被昵称为“玛士撒拉”，取自于马察达的出土物中。马察达是个悬崖要塞，公元 73 年，960 名狂热派犹太教徒面对罗马人的进攻，不愿投降而自尽身亡。

使该种子发芽成长的意义

在于发现朱迪亚原种海枣树的不同寻常之处，其树荫、果实、树姿以及其医用价值在《圣经》和《可兰经》中均不乏美誉，只是这种海枣树早已被十字军所毁。

《圣经·诗篇》第 92 篇有云：“义人要发旺如棕树，……他们年老的时候仍要结果子。要满了汁浆而常发育。”

负责中东药用植物项目的莎拉·萨伦博士说，在古代，海枣树是生命之树的象征。但是使这颗古代海枣种子发芽并把它隔离培育的伊莱恩·索罗韦说，由古代种子发芽而长大的植物，因其种子要维持生命，已将大部分养分耗尽，“通常很快就会枯萎并死亡”。

该植株已有 11.8 英寸（即 30 厘米）高，长出了七片叶子，其中一片已拿去做 DNA 检验。在瑞士，通过放射性碳年龄测定法对种子的切片测定表明，这颗种子有 1990 岁，前后误差 50 年。即这颗海枣种子的时间约在公元前 35 年到公元 65 年，正好在著名的罗马人围攻之前。▶

以色列 2000 年前的种子获得新生

1. germinate ['dʒɑːmineɪt] vt. 使发芽；使生长（或发育）
2. Methuselah [mɪˈθjuːzələ] 玛士撒拉（《圣经·创世记》中以诺之子，据传享年 969 岁）；非常高寿的人
3. excavation [ˌekska'veɪʃən] n. 挖掘；出土文物
4. Masada 马察达（死海东岸的山地要塞）
5. zealot ['zelət] n. （尤指宗教或政治的）狂热分子，狂热者；[Z-]（公元 6~70 年间反抗罗马统治的犹太教派中的）狂热派，吉拉德人
6. die by one's own hand 自杀

7. Judea [dʒuːˈdiə] = Judaea 朱迪亚（古巴勒斯坦的南部地区，包括今巴勒斯坦的南部地区和约旦的西南部地区）
8. crusader [kruːˈseɪdər] n. 十字军战士
9. Psalm [sɑːm] n. 诗篇（基督教《圣经·旧约》中《诗篇》卷 150 篇中的任何一篇）
10. quarantine ['kwɒrəntɪn] n. 隔离区
11. keel over 倾覆；翻倒；倒下
12. snip [snɪp] n. 剪下的小片；片段，碎片

Three date seeds were taken from Level 34 of the Masada dig¹³. They were found in a storeroom and are presumably from dates eaten by the defenders, Sallon says.

Mordechai Kislef, director of botanical archeology at Bar-Ilan University, had some date seeds from Ehud Netzer, who excavated Masada in the 1970s.

Sallon recalled that "They were sitting in a drawer, and when I asked for one, he said, 'You're mad,' but finally gave me three." She then gave the seeds to Solowey, an expert on arid¹⁴ agriculture and dates. Solowey took them even though "I didn't have much hope that any would *come up¹⁵."

Sallon is the director of the Louis L. Borick Natural Medicine Research Center at Hadassah Medical Organization, which she set up 10 years ago to study natural products and therapies, from Chinese medicine to the indigenous medicinal plants of the Middle East. The idea is to preserve these plants and their oral histories in a modernizing region, and also to domesticate them, evaluate them scientifically and then try to integrate them into conventional medicine.

Solowey, who teaches agriculture and sustainable farming at the Arava Institute for Environmental Studies, based at Kibbutz Ketura in the southern Negev, works on finding new crops for arid and saline areas like Jordan, Gaza and Morocco. She also works with Sallon to domesticate indigenous plants that appear to have medicinal uses.

Solowey planted the date seeds at the end of January after trying to draw them out of their deep dormancy¹⁶. She first soaked the seeds in hot water to soften the coat, then in an acid rich in hormones, then in an enzymatic¹⁷ fertilizer made of seaweed and other nutrients.

"I've done other recalcitrant¹⁸ seeds," she said. "It wasn't a project with a high priority. I had no idea if the food in the seed was still good, but I put them in new pots in new potting soil and plugged them into drip irrigation and kind of forgot about them."

About six weeks later, she said, "I saw the earth cracked in a pot and, much to my astonishment, one of these came up."

The first two leaves looked odd, she said, very flat and pale. "But the third looked like a date leaf with lines, and every one since has looked more and more normal—like it had a hard time getting out of the seed." ►

三颗海枣种子取自马察达考古发掘地的第34层。萨伦说,它们是在一个储藏室被发现的,据推测是防守者吃掉海枣后所留下的。

巴伊兰大学的植物考古学主任莫迪凯·克斯莱夫从埃胡德·内策处得到了一些海枣种子。埃胡德于20世纪70年代在马察达进行过考古发掘。

萨伦回忆道:"它们躺在抽屉里,当我提出要一颗时,他说,'你疯了',但最后还是给了我三颗。"随后她把种子给了索罗韦——一位研究旱地农业和海枣树的专家。索罗韦收下了它们,尽管"我对种子发芽不抱太大的希望。"

萨伦是哈大沙医学组织下属的路易·L.博里克自然医学研究中心的主任,她于10年前创立该机构,研究从中药到中东的本土药用植物等一些天然产品和自然疗法。其用意在于,在一个逐渐现代化的地区,保护这些植物及其口头流传下来的历史,同时人工培植这些植物,从科学的角度做出评价,并且设法将它们与传统医药结合起来。

索罗韦在阿拉瓦环境研究院教授农业和可持续耕作,该学院位于内盖夫南部的基布兹凯图拉。她在寻找新的作物品种,以适应约旦、加沙和摩洛哥那样的干旱和盐碱地区。同时,她与萨伦合作,人工培植有潜在医药用途的本土植物。

索罗韦于1月底播下这些海枣种子,设法将它们从沉睡中唤醒。她先把种子浸泡在热水中,使外壳软化,然后放在富含激素的酸溶液中,最后再放入由海藻和其他养分组成的酶复合肥中。

她说:"我处置过其他一些难发芽的种子。这个项目我当时并不看重。我不知道种子中的养料是否还有效用,但我还是把它们放在装有新的盆栽土的新盆里,并把它们塞进滴灌系统中,后来我几乎忘了它们。"

大约六周后,她说:"我看见一个盆里的泥土裂开,让我非常吃惊的是,其中的一粒种子发芽了。"

她说,头两片叶子看上去怪怪的,叶片非常扁平且颜色浅淡。"但第三片看上去就很像海枣叶,上面也有纹路,之后长出的每一片叶子看上去越来越正常——像是从种子中奋力钻出来的。" ►

Lotus seeds about 1,200 years old have been sprouted in China, and after the Nazis bombed London's Natural History Museum in World War II and a lot of water was used to put out the fire, seeds about 500 years old also germinated. "But no one had done it from 2,000 years old," Sallon said.

In the time of the Roman naturalist *Pliny the Elder¹⁹, forests of date palms covered the area from Lake Galilee to the Dead Sea and made Jericho²⁰ famous; a date palm is featured on ancient coinage, as it is on the current Israeli 10-shekel coin.

The date palm symbolized ancient Israel; the honey of "the land of milk and honey²¹" came from the date. It is praised as a tonic²² to increase longevity, as a laxative²³, as a cure for infections and as an aphrodisiac²⁴, Sallon said. But the dates of Judea were destroyed before the Middle Ages, and what dates Israel grows now were imported in the 1950s and '60s from California and originated elsewhere in the Middle East.

The Prophet Muhammad considered the date of great importance for medicine, food, construction and income, and it is described in the Koran as a "symbol of goodness" associated with heaven.

Dates need to grow 30 years to reach maturity and can live as long as 200 years. But it is the female date that is considered holy, and that bears fruit. "Men are rather superfluous²⁵ in the date industry," Sallon said.

"O.K., I have a date plant," Solowey said. "If it lives, it will be years before we eat any dates. And that's if it's female. There's a 50-50 chance. And if it's a male, it will just be a curiosity²⁶." ■

在中国,曾使约 1200 年前的莲种发芽;而二战时纳粹轰炸伦敦的自然历史博物馆后,人们曾用了大量的水来灭火,致使约 500 年前的种子也发了芽。“但是从未有人使 2000 年前的种子发芽,”萨伦说。

在罗马博物学家老普林尼生活的年代,海枣林从加利利湖一直延伸到死海,使耶利哥因此出名;古硬币和现在流通的以色列 10 谢克尔硬币一样,都印有海枣树。

海枣树是古代以色列的象征;“奶与蜜之地”中的“蜜”即指海枣。萨伦说,海枣作为长寿补品、通便剂、治疗感染的灵丹以及壮阳剂,尽得美誉。但是朱迪亚的海枣却在中世纪前就被毁,以色列现在种植的海枣都是在 20 世纪五六十年代从美国加州引进的,原产于中东的其他地区。

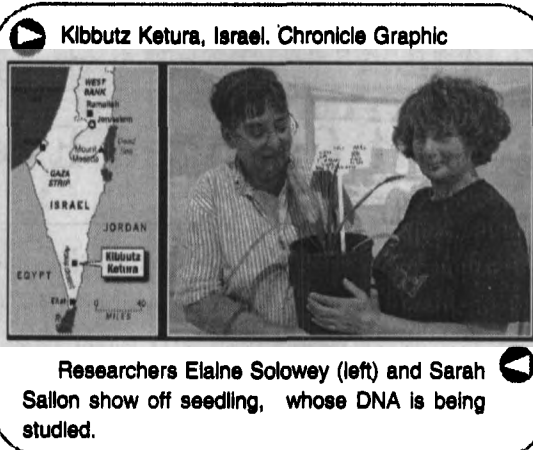
先知穆罕默德认为海枣之重要,在于其可以入药、可以食用、可用于建筑并且可创收,而在《可兰经》中,海枣被描述成与天堂有关的“善的象征”。

海枣树需要长 30 年才会成熟,生存期可长达 200 年。但是只有雌性海枣树才被认为是神圣的,才会结果实。“在海枣业中,雄性是相当多余的,”萨伦说。

“好的,我有一棵海枣树啦,”索罗韦说。“如果它存活,我们要过好些年才能吃上枣子,并且它还得是雌性植株。可能性是一半对一半。而如果是雄性植株,那它就仅仅是株珍贵植物了。”

(赵海燕 摘译自

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Researchers Elaine Solowey (left) and Sarah Sallon show off seedling, whose DNA is being studied.

13. dig [dɪɡ] n. <□> 考古发掘;发掘的遗迹;发掘地点
14. arid ['æɪrɪd] a. (气候、地区等) 干旱的,干燥的
15. come up (从地里)长出,出芽
16. dormancy ['dɔːmənsɪ] n. 睡眠;冬眠
17. enzymatic [ˌenzaiˈmætɪk] a. (生化) 酶的
18. recalcitrant [rɪˈkælsɪtrənt] a. 难处理的;顽固的;反抗的
19. Pliny the Elder 老普林尼(23-79, 古罗马作家, 共写作品 7 部, 现仅存百科全书式著作《博物志》37 卷)

20. Jericho ['dʒerɪkəʊ] 耶利哥(西亚死海以北古城);据《圣经》载,祭司吹响号角,该城城墙即神奇地塌陷
21. the land of milk and honey 典出《圣经·出埃及记》第 3 章第 17 节
22. tonic ['tɒnɪk] n. 补药,补剂,滋补品
23. laxative [ˈlæksətɪv] n. 轻泻剂,通便剂
24. aphrodisiac [ˌæfrəʊˈdɪziæk] n. 催欲剂;激发性欲的食物
25. superfluous [sjuːpəˈfluəs] a. 过剩的,过多的;多余的
26. curiosity [kjuəriˈɒsəti] n. 珍品,奇物