

Today, there are thousands of dental hygiene products on the market, including mouthwashes, toothpastes, and gums, to cure halitosis, commonly known as bad breath. This condition is mentioned as far back as the Talmud and has serious implications on both marriage laws and the work of the *kobanim*. The Talmud in *Berachot* 43b writes, “What is it that the soil enjoys but the body does not? It is the sense of smell.” The sense of smell is connected to a human’s memory and emotions [1]. Bad breath, a condition of which millions of people suffer, is considered to be a serious medical problem since the time of the Talmud until today.

Almost 90% of bad breath cases stem from the mouth, while only 5-10% originate from the nasal passages. Bad breath arising from the oral cavity is related to decomposition of glycoproteins by Gram-positive bacteria. Bacterial deglycosylations of glycoproteins result in proteins that subsequently undergo proteolysis by enzymes secreted by Gram-negative bacteria. Degradation of these proteins leads to free amino acids, which, upon further decomposition, result in foul odors. Degradation of amino acids produce unpleasant-smelling molecules, such as hydrogen sulfide (from cysteine), methyl mercaptan (from methionine), cadaverine (from lysine), and indole and skatole (from tryptophan), all of which contribute to bad breath. The most common site in the oral cavity for malodor production is the tongue, stemming from postnasal drip. Food and epithelial cells collect on the back of the tongue and are broken down by the resident bacteria on the tongue. In addition, gingivitis, mouth dryness, and sleep can contribute to oral malodor [2]. In the times of the Talmud, there were different causes of halitosis, such as acetone breath from uncontrolled diabetes, oral infections, which were a common cause of death, and insufficient water supply, which led to oral dryness [3].

The *kobanim* with bad breath were disqualified from working in the Temple. The Talmud in *Ketubot* 75a recommended that the priests place a pepper in their mouths to rid themselves of bad breath so that they could continue to work in the Temple. Furthermore, bad breath was considered to be legal grounds for divorce. A husband was allowed to annul his marriage if he detected a serious disability in his spouse that was not divulged before the wedding. Serious disabilities included ungainly breasts, a thick voice, non-obvious lesions of the head and neck, sweat, and oral malodor (*Ketubot* 75a). Although the right to divorce was in the hands of the husband, bad breath was considered such a major problem that a woman could divorce her husband if he had oral malodor (*Ketubot* 77a). Bad breath even exempted a woman from *yibum*, a situation in which a husband dies childless and the widow is obligated to marry her husband’s brother (Deuteronomy

25:5-10). Maimonides, a 12<sup>th</sup> century philosopher, commented that the wife was allowed to declare that she was able to tolerate the oral malodor of her husband, but not of his brother (*Hilchot Ishut* 25:13). Although chewing pepper was a remedy for the *kobanim* to work in the Temple, this did not apply to marriage laws because, according to *Rashi*, an 11<sup>th</sup> century biblical commentator, the husband was always in the presence of his wife so chewing pepper was not adequate to block the smell.

The earliest remedies in the Talmud for bad breath—mastic gum and oil-water mouthwash—reflect the antibacterial approaches used to cure this condition today. Mastic, a hard gum from the *Pistacia lentiscus* tree, has been used since the times of the Talmud as a breath freshener and an antibacterial balm [4]. The *Tosefta Shabbat* (8:7) mentioned that it is prohibited to chew mastic on the Sabbath, but it is permitted when it is used to prevent bad breath. Research today has shown that mastic gum kills an array of microorganisms which reside in the oral cavity [5]. Another ancient remedy for oral malodor is oil-water mouthwash. There is a story in the Talmud about Rabbi Yohanan, who suffered from bleeding gums, which caused bad breath. A Rabbi recommended a combination of leavening water mixed with oil and salt as a remedy (*Yoma* 84a; *Avodah Zara* 28a). In the 1980’s scientists developed a bactericidal oil-water mouthwash. Unaware of the story in the Talmud, the scientists produced this mouthwash that was mentioned in ancient times. This mouthwash contains cetylpyridinium chloride, which performs the same emulsification of the bacteria as does the leavening water [3]. Other Talmudic cures for bad breath included oral fresheners that cover up the odor, such as ginger and cinnamon (*Shabbat* 65a), which are some of the ingredients used in today’s breath sprays.

Clearly, bad breath has been a major issue since Talmudic times from both a medical and social perspective. The remedies for this condition are found in the Talmud and have been modified with modern chemicals to enhance their effectiveness. Halitosis can be controlled through the numerous products on the market, but, more importantly, maintenance of oral hygiene is the key to good breath [2].

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