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**Objective:** The object of this study was to examine changes in the expression of taste receptor genes in patients who had loss of taste and those who had phantogeusia.

**Methods:** The subjects of this study consisted of 40 patients with loss of bitter taste and 43 patients with phantogeusia. The patients with loss of bitter taste consisted of 18 males and 22 females, with an average age of 61 years (range, 25 to 86 years). The patients with phantogeusia consisted of 17 males and 26 females, with an average age of 55 years (range, 39 to 65 years). The phantogeusia patients consisted of 26 patients who complained of phantogeusia of bitter taste and 17 patients who complained of phantogeusia of an abnormal taste other than bitterness. A control group consisted of healthy subjects comprised of 24 cases, 6 males and 18 females, with an average age of 68 years (range, 55 to 83 years) with no complaints of taste disorders.

**Methods:** The tongues were collected from the subjects post mortem by a simple scraping method, and total RNA was extracted using TRIzol (Life Technologies). cDNA synthesis and subsequent PCR was performed using Ex Taq (Takara Bio, Inc.). The expression was analyzed using a Bio-Rad GeneTools and the presence or absence of gene expression of T2R9, T2R10, T2R13, TAS2R40, TAS2R42, TAS2R43 and TAS2R48 was examined. The difference between the groups was analyzed by using Fisher’s exact test probability test.

**Results:** The patients with loss of bitter taste showed a significant decrease in the frequency of expression of taste receptor genes T2R9, T2R10, T2R13, TAS2R40, TAS2R42, TAS2R43 and TAS2R48 compared to the control group (Figure 1).

**Discussion:** In this study, the expression of 10 genes belonging to the T2R gene family were examined in patients who had loss of taste and those who had phantogeusia. Phantogeusia is a unique taste disorder in which abnormal taste sensation occurs. It is likely the absence of taste is in the mouth. From the results obtained in this study, it is shown that the expression of some taste receptor genes is increased in the patients with phantogeusia. The expression of other receptor genes, which showed significantly increased expression, were not observed in healthy subjects (Table 1). In the patients with phantogeusia, the expression of some genes was decreased in patients with hypogeusia compared to healthy subjects, which showed a high expression of some genes compared to healthy subjects. A decrease in the expression was observed in accord with the clinical findings of hypogeusia. These 6 genes are highly likely involved in taste sensation in humans as taste receptor genes.

**Conclusion:** Among the 10 genes examined in this study, expression of some genes was decreased in patients with loss of taste and expression of other genes was increased in patients with phantogeusia. It is likely that the expression of some genes is increased in the patients with phantogeusia. Further understanding of the pathogenesis of taste disorders will be possible with receptor level studies in the future.