
Abstract
Gurmarin (Gur) is a peptide that selectively suppresses responses of the chorda tympani nerve to sweet substances in rats and mice. In the present study, we examined the effect of Gur on behavioral responses to sweet substances in C57BL mice. To accomplish this, we developed a new short-term lick test and measured numbers of licks for 10 s for sweet substances mixed with quinine hydrochloride (QHCl) in water-deprived mice. Numbers of licks for sucrose mixed with 1 or 3 mM QHCl increased with increasing concentration of sucrose from 0.01 to 1.0 M. Oral infusion with 30 μg/ml Gur produced significant decreases in responses to concentration series for sucrose mixed with 3 mM QHCl, whereas no such effect by Gur was observed in responses to QHCl alone or QHCl-mixed HCl, NaCl or monosodium glutamate. The Gur suppression of QHCl-mixed sucrose responses, which otherwise lasted for 2–3 h, rapidly returned to ~80% of control levels after oral infusion with β-cyclodextrin. These results are comparable to neural data previously found in chorda tympani responses, and thereby provide further evidence for Gur as a sweet response inhibitor in C57BL mice. In the other aspect, our newly developed short-term test can also provide a tool for measurements of taste-guided behavioral responses to sweeteners.

Gurmarin (Gur), a polypeptide isolated from a plant Gymnema sylvestre