CORRESPONDENCE

Comment on L-Ornithyltaurine, a New Salty Peptide

Sir: We would like to respond to the question of salty peptides and, in particular, to our disagreement with Dr. Okai in Japan concerning the salty taste of ornithyltaurine hydrochloride (OT·HCl).

To recap briefly, the story began when Dr. Okai's group claimed, in a paper titled "L-Ornithyltaurine, a New Salty Peptide", that OT·HCl was as salty as NaCl (Tada et al., 1984). They also claimed that their OT·HCl contained no Na ion. In view of the undoubted interest of salt substitutes in food and nutrition, we resynthesized OT·HCl as described by Tada et al. (1984). It did indeed taste salty, but we found that it contained 8.5% w/w Na ion. When we modified the method, and scrupulously avoided the use of all Na salts in the workup, we obtained OT·HCl completely free of Na, but equally free of any salty taste. We concluded that pure OT·HCl is not salty and that the salty taste found earlier by the Japanese group was due to contamination with NaCl, present in their OT·HCl as an artifact of their workup procedure. This included washing one of the intermediates with an NaCl solution and drying over sodium sulfate. All of this we have already reported in detail (Huynh-Ba and Philippossian, 1987).

Dr. Okai's group has recently contested our findings (Seki et al., 1990). However, their arguments would indicate that they may have misread our paper, and we now wish to clarify this.

They first claim that we made a calculation error. They suggest that we should have found 4.83% w/w Na ion in the OT·HCl prepared according to their method, instead of the 8.5% w/w we reported. They do not say how they arrive at this value of 4.83%, but this is irrelevant to some degree, since our value of 8.5% was not calculated. It was measured analytically by atomic absorption spectroscopy.

The value we did calculate was the 21.7% w/w for NaCl in the contaminated OT·HCl, on the basis of the assumption that all of the Na ion we measured was present in the form of NaCl. This is almost double the value of 12.28% w/w Dr. Okai's group calculates we should have found. Our value of 21.7% is supported by our organoleptic results. This level of NaCl contamination in OT·HCl would mean that the nominal 1% w/v OT·HCl solution we tasted would in fact contain 0.783% OT·HCl, codissolved with a 0.217% w/v solution of NaCl. Within experimental error, 0.217% corresponds well to the 0.25% NaCl solution described by our taste panel as being closest to the saltiness of the contaminated 1% w/v OT·HCl solution. The "contradiction" in taste perception to which Seki et al. (1990) refer seems to reflect their own calculation rather than ours.

Apart from the question of calculation, they also argue that if the saltiness of OT·HCl is due to NaCl contaminating the molecule, then homologues of OT·HCl prepared identically (where the chain length of the ornithine moiety is varied) should also taste salty because they would contain the same amount of NaCl as an artifact. They report that homologues they have synthesized have no salty taste and therefore cannot contain salt. They then infer that there is no reason to suppose that their OT·HCl contains salt, because its homologues do not, and therefore OT·HCl must taste salty. (This argument confused us as well!)

We cannot answer this argument directly from our earlier work as the only taurine dipeptide we studied was OT·HCl, claimed in the title of the first Japanese publication to be "a new salty dipeptide". However, we did characterize our pure OT·HCl by elemental analysis and a variety of spectroscopic methods, and we did find 8.5% Na ion in the OT·HCl prepared as described by Tada et al. (1984). Surprisingly, neither of the two publications from Dr. Okai's group reports any chemical or spectroscopic analyses of their OT·HCl.

Further, we would point out that many recorded properties of small peptides depend critically on the amino acid chain length. One methylene group more or less can change a sweet peptide into a bitter one or vice versa. During the synthesis of OT·HCl, its precursor may just have the right polarity to solubilize NaCl in an organic solvent, whereas precursor homologues may not. In the absence of further evidence from Dr. Okai's group, we look on the argument of homologous peptides as a red herring.

Finally, the recent publication of Seki et al. (1990) adds no further direct experimental evidence for or against the saltiness of OT·HCl. Unless they can clarify this, please excuse us for our skepticism.

LITERATURE CITED

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