A new paper published in *The Quarterly Review of Biology*, entitled "Taste and Smell: A Unifying Chemosensory Theory," proposes the unification of all chemosensory modalities into a single sense, moving toward an interconnected perspective on the gradual processes by which a wide variety of chemicals have become signals that are crucially important to communication among and within cells, organs, and organisms in a wide variety of environmental conditions. The paper thus envisages a rupture with what emerges as one of the most deeply rooted confirmation biases in the scientific literature: the differentiation between gustation (taste) and olfaction (smell).

Authors Ernesto Mollo, Ferdinando Boero, Josep Peñuelas, Angelo Fontana, Mary J. Garson, Vassilios Roussis, Carlo Cerrano, Gianluca Polese, Alberto Maria Cattaneo, I Wayan Mudianta, Gregory Genta-Jouve, Orazio Taglialetela-Scafati, Giovanni Appendino, Pietro Amodeo, and Michael T. Ghiselin offer abundant evidence that does not harmonize with a precise differentiation between olfaction and gustation, proposing that the spatial, molecular, anatomical, and neurophysiological criteria commonly adopted to separate 'a priori' the two chemical senses are contradictory and excessively anthropomorphic.

"We argue that anthropomorphic biases have fostered the neglect of key processes shaping ecological and evolutionary scenarios, thus profoundly hampering our research efforts for a better understanding of the evolution of chemosensation, especially during the transition both from aquatic to terrestrial life, and from single cell to multicellular organisms," they write. Most importantly, the authors propose that the intellectual habit of differentiating the two sensory modalities has favored prejudiced patterns of thought in the design and interpretation of experiments, in the classification of chemosensory genes and receptors, and in the morphological and zoological nomenclature. While the taste-smell distinction fits rather well with the human condition, the authors argue that biologists strictly need to incorporate information from the study of the diversity of living organisms and their ecological interactions when approaching the complex theme of the evolution of chemical communication and especially when designing experimental protocols.

The authors thus propose unifying all chemosensory modalities within a comprehensive theoretical framework that opposes the current nomenclature. "Our vision is that there is no taste and no smell in nature, no chemesthesia and no vomerolfaction, but a vast and blurred variety of modes of chemical communication that could be collectively called 'chemosensation,' which always starts from the interactions between ligands and receptors, two chemical entities both occurring in an immense structural variety in nature," they write.

"The time has come to abandon the differentiation between the chemical senses and start asking better questions about the complex, nuanced, and interconnected manners by which a vast variety of chemicals have become signals crucially important to survival," the authors write.


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