INTAGEMMAL SPACES IN TASTE BUDS*

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With 10 Figures in the Text

(Received June 29, 1964)

Introduction

During a routine light microscopic examination of paraffin sections of taste buds of the dog lingual circumvallate papillae, frequent, more or less regular spaces were seen inside the buds. It was then decided to further investigate these spaces in detail. This investigation was primarily light microscopic, with some electron microscopic supporting data.

Material and Methods

Six mongrel dogs of variable age, sex and body weight were used in this study. From each dog three circumvallate papillae were removed for light microscopy and one papilla was removed for electron microscopy. For light microscopy tissues were fixed in formol-calcium or Zenker's fluid, serial paraffin sections were cut at 8 μ and stained with Delafield's alum haematoxylin and eosin. For electron microscopy tissues were fixed in cold Caulfield's fixative (CAULFIELD 1957), embedded in epon or methacrylate, sectioned on a Porter-Blum ultramicrotome and examined under an RCA-EMU 3D electron microscope.

Observations

Under the light microscope almost all the taste buds show peculiar empty spaces coursing between their cells regardless of the fixative used (Figs. 1--5). One, two or more of these spaces may appear in a single bud. Their outline is circular or elliptical in cross section and somewhat fusiform in longitudinal section. They average 10 μ in diameter and 20 μ in length, possess no endothelial lining and seem to be bordered directly by taste bud cells. They appear empty apart from an occasional leucocyte which may show up within their lumen. These spaces are not confined to a specific location, and may be found in any part of a taste bud. In the apical portion of a bud these intragemmal spaces are easily distinguishable from gustatory pores. The latter have a smaller diameter and a characteristic appearance and location. Some sections (Fig. 1) suggest the possibility of communication between the gustatory pore and the intragemmal spaces. Figs. 3—9 demonstrate the presence of delicate loops of blood capillaries bordering the taste buds and following their outline almost as far as the gustatory pore, thus coursing close to the intragemmal spaces. These capillaries originate from the blood vessels of the tunica propria and penetrate deep into the gustatory epithelium, cushioned by a scanty pad of connective tissue. There is no direct communication between these capillaries and the intragemmal spaces.

* Supported by Emory University Research Funds; Publication No. 650 of Division of Basic Health Sciences.
Fig. 1. Intragemmal spaces $S$ are cut in cross section and are easily distinguishable from gustatory pores $G$. In the middle bud the intragemmal space appears to communicate with the gustatory pore. $\times 325$

Fig. 2. Two intragemmal spaces $S$ are cut in longitudinal section inside the same bud. A leucocyte $L$ is infiltrating the adjacent epithelium. $\times 400$

Fig. 3. An intergemmal blood capillary $C$ coursing close to an intragemmal space $S$. The gustatory pore $G$ is seen. $\times 650$