

Neurons of the trigeminal mesencephalic nucleus (Mes V) and ganglion innervating the periodontium of incisor, canine and molar teeth in 10 monkeys and 10 baboons were counted and mapped using the horseradish peroxidase (Hrp), retrograde axonal transport method. Periodontal afferent neurones of all these teeth were well represented in the Mes V, although the incisors had a significantly higher number of labelled neurones than the canines or molars. The primary cell bodies of the periodontal afferents were located mainly in the caudal part of the ipsilateral Mes V from the level of the inferior colliculus to the floor of the fourth ventricle in the pons. The caudal periodontal Mes V neurones may be favourably located to make collateral connections with the trigeminal motor nucleus for jaw reflexes. Incisors and canines had a large and predominantly ipsilateral representation of Hrp-labelled neurones in the ganglion. In contrast, molar representation in the ganglion was sparse and all labelled neurones supplied ipsilateral teeth. The maxillary and mandibular teeth had a somatotopic distribution within the respective maxillary (middle) and mandibular (posterolateral) compartments of the trigeminal ganglion. It is suggested that the anterior teeth with greater connections to the Mes V and the ganglion may impart greater sensory perception and be involved in jaw reflexes to ensure a good occlusal relation during mastication, while the afferent connections of the molars may initiate complex jaw reflexes during the occlusal phase of mastication.