論文審査の要旨

報告番号	総研第 729 号	学位申請者	Haider Md Yasin
審査委員	主査 田松 裕一	学位	博士（歯学）
	副査 松口 徹也	副査	笹平 智則
	副査 中田 国宣	副査	嶋 香織

Developmental investigation on molar morphology and cusp homology using a mammalian basal model organism

（基盤的な哺乳類の実験動物を使った、臼歯群の歯冠形態と咬頭の相同性に関する発生学的研究）

The evolution of mammalian dentition progressed from reptilian single-cusped teeth to complex tribosphenic molars, involved in the gradual adding of new cusps. Developmentally, complex mammalian molars formed through the dynamic interaction between dental epithelium and mesenchyme, particularly within the future enamel-dentin junction. This region became intricate with the addition of signaling centers known as enamel knots, which dictated the positions of future cusps. There was anticipated parallelism between the developmental process and the evolutionary history of multi-cusped mammalian teeth, as hypothesized by the degree applicant. However, the 'premolar analogy theory' suggested homology between specific premolar and molar cusps in humans, although there was a lack of substantial evidence to support this claim. The research aimed to uncover the evolutionary origins of cusp formation and their developmental relationships and explore the homology among these cusps.

In this study, the applicant focused on investigating the developmental process of multi-cusped teeth in the house shrew (*Suncus murinus*), a placental mammal species with molar morphologies considered to be less derived from the tribosphenic prototype compared to other mammals.

The study revealed the following findings.

- The first secondary EK was maintained in the original position of the primary EK, which determined the evolutionarily oldest cusps, the paracone in the upper and the protoconid in the lower.
- The order of cusp mineralization was not necessarily consistent with that of EK formation.
- The developmental process of the first molar in the house shrew mirrored the evolutionary progression of mammalian molars.
- The buccal cusp of the premolar, the single cusp of the canine, and the mesiobuccal cusp of the molar were homologous.
- During morphogenesis, the structure of the molar was shaped by replicating the premolar configuration towards the distal direction.

The research revealed a new understanding of dental homology among the cusps in the house shrew's teeth, emphasizing the complexity of tooth development and providing a new angle on the evolution of dental cusps.

Therefore, this research was judged to have sufficient value as a doctoral thesis.