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Zusammenfassung

Die verschiedenen Elemente der Körperbedeckung alt- und neuweltlicher Stachelschweine werden in Habitus- und Microphotos gezeigt. Sie sind teilweise bei der Bestimmung der Arten nützlich.

Summary

The various coat-elements of Old World and New World porcupines are discussed and shown in habitus photos and microscopic slides. Some of them are useful to point out systematical differences.

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Supernumerary Teeth in the Deer Mouse, *Peromyscus*

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In mammalian species the number of teeth is usually constant, but supernumerary teeth are occasionally reported. Extra teeth in muroid rodents are of interest because of their possible bearing on the homologies of the molariform teeth.

It is usually thought that the three molariforms of muroids represent the three original molars and that all four premolars have been lost. An occasional skull has a fourth tooth behind the third molar, and this has been interpreted as a reappearance

of the true third molar. If this interpretation is correct the so-called first molar must be a premolar, and it has been interpreted as the fourth deciduous premolar (Hinton, 1923; Johnson, 1952). The correct muroid dental formula then would be 1012/1012, rather than the usually accepted 1003/1003.

In examining some 2800 skulls of *Peromyscus* (Family Cricetidae) for systematic purposes I have noticed two cases of supernumerary molariform teeth. A female *P. maniculatus austerus* (WS 1313, from 1500 feet on Mt. Seymour, British Columbia, Canada) has a simple peg tooth behind M_3 (Fig. 1). The other molars of both upper and lower jaws are normal in size and shape. None of 14 other specimens from this locality have supernumerary teeth.

A male *P. maniculatus macrorhinus* (British Columbia Provincial Museum 3311, from Lowe Inlet, B. C.) has four teeth in the molar row in each upper jaw. Twenty other skulls from Lowe Inlet have only the usual complement of molars.

The most striking feature of PM 3311 is that on both sides the entire tooth row is involved. None of the upper molars are entirely typical in size and shape, and the two sides are not symmetrical. The lower jaw has the usual three molars on each side, but one of these is atypical in form.

The typical cricetid upper molar has prominent paracone, protocone, metacone, and hypocone, with distinct anterior cingulum and smaller posterior cingulum (Wood and Wilson, 1936; Hooper, 1957). Often there are accessory lophs and styles. In *Peromyscus* M^2 shows this form, but M^1 is much elongated by the development of the anterior cingulum into a large anterocone. M^3 is much reduced in size, principally by the great reduction of metacone, hypocone, and posterior cingulum. See Figure 2.

Usually M^1 is elongate, but in PM 3311 both right and left M^1 are circular in shape (Fig. 3). The anterocone is much reduced, and there are five cusps arranged in a circle around a central cusp of uncertain homology, perhaps the paracone. The left M^1 is distinctly smaller than the right (2.1 mm long vs 2.5, typical condition — 3.3). The right tooth has four roots instead of the usual three.

In the second tooth on the left side the paracone is detached from the margin, and the anterior cingulum is extended around labial to it. The second tooth on the right side and the third on the left are fairly typical M^2. Apparently during development the tooth bud for M^1 on the left split, producing two deformed teeth.

On the right side the third tooth is similar to the usual M^3, and the fourth tooth is a small version of the third. Perhaps on this side M^3 has been duplicated, but the roots of the third and fourth teeth are entirely different.

Typically the upper molars have two roots on the labial side and a single root on the lingual side. In PM 3311 not all of the roots can be seen clearly. The molars on the left side seem to have the usual three roots, but in M^1 they are placed somewhat differently because the tooth is shorter. On the right side M^1 has three roots along its anterior border, and apparently one posterior root. Right M^2 seems to have the usual three roots. The third tooth has two roots, one anterior to the other. The fourth tooth has two roots, side by side.

The lower molars of *Peromyscus* are similar to the upper ones, but the four major cusps are termed protoconid, metaconid, hypoconid, and entoconid. M_2 is typical, and M_1 is lengthened by a large anteroconid. M_3 is less reduced than M^3, and the posterior cusps are much better developed.

The lower molars of PM 3311 are typical except for the left M_3. This tooth is short and the posterior cusps are not developed. The other teeth have the usual two roots, anterior and posterior, characteristic of the lower jaw, but left M_3 seems to have only one root.

In spite of the unusual nature of the molars of PM 3311 they occlude well and all of them show wear. The pattern of wear is a bit unusual, making it difficult to com-

pare certain parts of the molars with the typical condition. This mouse was at least several months old when trapped, and of average size, so must have been able to feed without difficulty.

The attempt to interpret supernumerary molars as atavistic reappearances of teeth that have been lost in the course of evolution has been criticized (Diamond, 1952, p. 192; Krutzsch, 1953). Among the arguments against it are the fact that in various mammals there may be an excess number of any kind of tooth, including canines. Since there was never more than one canine a second one could not represent one that had been lost. Furthermore, supernumerary teeth often closely resemble one of the normal teeth, and presumably represent a duplication of that tooth. Certainly the atavistic theory seems unlikely on genetic grounds.

In the two skulls reported here, the fourth tooth in WS 1313 and the extra tooth on the right side in PM 3311 could conceivably represent a lost third molar, but the extra tooth on the left side in PM 3311 could not. Nor could the unusual size, molar pattern, and roots of right and left M^1 and left M^2 and M_3 in PM 3311 be explained on this basis.

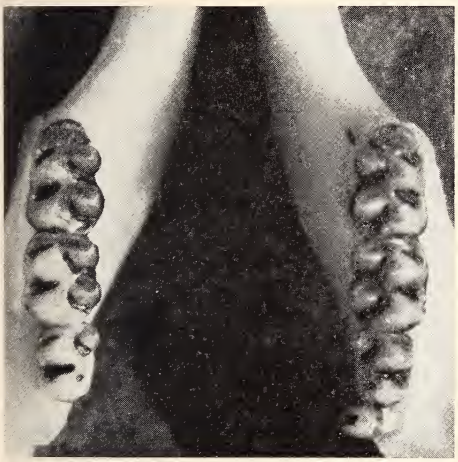

Fig. 1. The mandible of *P. maniculatus austerus* (WS 1313). The supernumerary tooth is in the lower right corner.

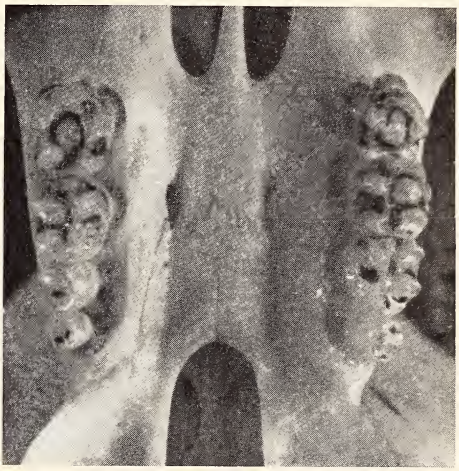

Fig. 3. Upper molars of *P. maniculatus macrorhinus* (PM 3311) showing extra teeth and abnormal cusp patterns. Right M^1 is in the upper left corner.

Fig. 2. Normal upper molars of *P. maniculatus austerus*

In the evolutionary history of a tooth there is a time when it occurs in almost all individuals. If for some reason the genes necessary for its development begin to be lost by the population the tooth will appear less and less frequently and eventually it will be quite rare. The third molars of man and the canines of some ungulates seem to be in different stages of this process.

Eventually all genetic basis for the tooth will be lost and the tooth will dis-

appear from the population. If a tooth later appears in the same place it will be because of either a new mutation or some developmental accident without genetic basis. It will not be a reappearance of the lost tooth, though in practice it probably will be impossible to distinguish these two situations.

It should be noted that this interpretation of supernumerary teeth does not imply rejection of the idea that the first molariform in these mice represents the fourth deciduous premolar. This idea rests primarily on other grounds.

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Summary

Three supernumerary teeth are described from two skulls of *Peromyscus maniculatus*. In the skull with an extra upper molar on each side some of the molars are markedly deformed. It is concluded that these extra teeth were caused by developmental anomalies and do not represent vestigial third molars.

Zusammenfassung

Drei überzählige Zähne von zwei Schädeln von *Peromyscus maniculatus* werden beschrieben. Ein Schädel hat einen extra Oberbackenzahn an jeder Seite, und einige merklich deformierte Backenzähne. Diese überzähligen Zähne scheinen durch Entwicklungsanomalien verursacht zu sein und stellen nicht verkümmerte dritte Backenzähne dar.

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