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Artikel: New Theridomyidae (Rodentia, Mammalia) in the Oligocene Molasse of Switzerland and Savoy
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single specimen, and this can be compared by using the logarithmic method of plotting. As an exception, where V is very high because there are too few specimens, it will be considered useless to mention it.

Terminology

The terminology for the teeth of STEHLIN & SCHAUB (1951) has been followed. I am also using some terms described in previous papers (1981, p. 1011 and 1983, p. 832, 833 and 898, Fig. 54) although this is with reference to other genera (Fig. 1).

Pseudograben is the union in the upper teeth between the sinus and some syncline, or in the lower ones between the sinusid and some synclinid. This union is variable. Its deepness changes with the genera and species. Generally, all the Oligocene generic taxa of Theridomyidae – with the exception of Isoptychus – follow this evolutionary tendency. Although in mosaic: with different rhythm and on different teeth. The pseudograben is an intermediary step. Its union occurs during the evolutionary process from a shallow to a relatively deep depth. Its presence in some teeth (for instance in M^1–M^2) or absence in others (e.g. P^4 or M^3) shows the differences among or within different lines of evolution. The pseudograben always permits us to see, at less at some point in its stage of wear, the union of the sinus with some syncline, or the sinusid with some synclinid. At some posterior stage of wear, the sinus or the sinusid will be separated from the syncline or synclinid. The sinus could be joined in a pseudograben in the upper teeth with the following syncline: in *Toeniodus* – although only shallowly – with I or II syncline; in *Protechimys, Archaeomys, Monarchaeomys, Rhombarchaeomys, Issiodoromys, Nesokerodon* and *Oensingenomys* with the II syncline. The sinusid is joined in the lower teeth with the following synclinids: *Toeniodus* with IV synclinid (see explanation p. 1070–71). *Theridomys, Trechomys* and *Blainvillimys* also with the IV synclinid but only shallow in depth. *Protechimys, Issiodoromys, Nesokerodon* and *Oensingenomys* with the III synclinid. The pseudograben stage in the lower teeth of *Archaeomys, Monarchaeomys* and *Rhombarchaeomys* is as yet unknown (Fig. 1).

Graben is a posterior evolutionary stage. The union between sinus or sinusid respectively with a syncline or synclinid is fully developed. The pseudograben is now transformed into a graben, and the separation of the sinus or sinusid with the syncline or synclinid does not occur any more in any stage of wear (Fig. 1).

Semigraben is sinus-like or sinusid-like, but very much longer. It appears when the labial aperture of the graben in the upper teeth, or the lingual in the lowers, is closed by abrasion. The extrasinus or extrasinusid distance (see below, p. 1005) is generally very small. The presence of graben and pseudograben and sinus or sinusid and semigraben is shown in some species, with a distinct boundary or grade of evolution in the same population. In such rare cases it will be designated in an arbitrary way as "semigraben" or "sinus" and "sinusid", depending of the predominant evolutionary stage in the population (see below, p. 1005 and Fig. 1).

Tubular syncline or synclinid is a relatively "primitive" stage of evolution in Theridomyidae (see MAYO 1980, p. 1014, Fig. 2 and 1983, p. 898, Fig. 54). In unworn teeth it is generally very broad. In the worn stage it is a more or less broad island of enamel on the occlusal surfaces. It is typical for Theridomyinae, Issiodoromyinae and some synclines of Archaeomyinae.

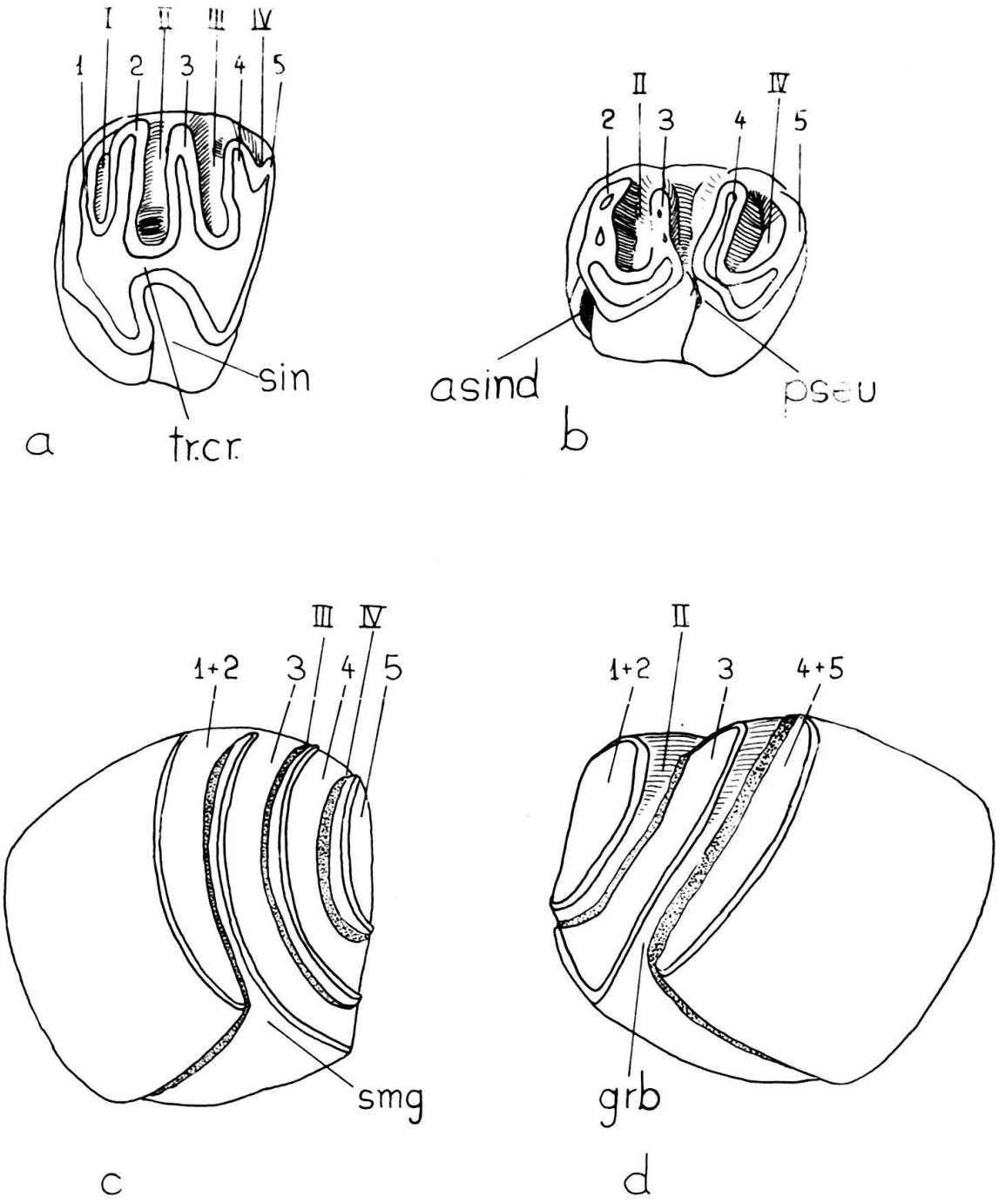

Fig. 1. Dental nomenclature of the teeth. – a = left upper molar. b = left lower molar of *Nesokerodon*. c = left upper molar. d = left lower molar of *Archaeomys*. Abbreviations: 1,2,3,4 and 5 = antyclines or antyclinids; I, II, III, IV and V = synclines or synclinids; pseu = pseudograben; sin = sinus; sind = sinusid; grab = graben; semig = semigraben Tr.cr. = transversal crest.

Pseudolaminar syncline or synclinid in unworn teeth is narrower or somewhat laminar, but in the worn stage is even tubular. It occcurs in *Theridomys, Blainvillimys,* primitive Archaeomyids and in earlier stages of evolution of *Archaeomys (Archaeomys)*.

Laminar syncline or synclinid is an evolved stage. In unworn teeth the synclines or synclinids are narrower. In the completely worn stage they clearly maintain the laminar stage, and the tubular stage does not appear and more. Generally in the evolution of this stage, the syncline or synclinid begins to fill partially with cellular cement. It is typical for the earlier stages of evolution of Archaeomyinae, but occurs in mosaic; also in some synclines and synclinids of Theridomyinae.

Filling laminar syncline or synclinid. – The synclines or synclinids are filled with a relative fine lamina of cellular cement.

Fully filling laminar syncline or synclinid is the upper most stage of evolution. Only in unworn teeth at a shallow level could there be some space without cellular cement. Soon, in the worn stage there appears a thick lamina of cellular cement sandwiched between a thick border of enamel, and another very much finer. This lamina of cement occurs together with the dentine in the assymetrical excavation which occurs between the enamel crests of the occlusal surface in worn stage.

Hypsodontic teeth. – Teeth with post-eruptional growth. I am following MONES (1968, p. 14 and 1982, p. 107) which recognizes two types: protohypsodont and euhypsodont.

Protohypsodontic teeth. – Teeth with a high crown and limited growth.

Euhypsodontic teeth. – Teeth with an ever growing high crown.

Semihypsodontic teeth. – This term seems to have been introduced by VIANEY-LIAUD (1976, p. 34) but not in a constant sense (cf. VIANEY-LIAUD 1976, p. 5). I am using it in a sense closer to PATTERSON & WOOD (1982, p. 416) for design cheek teeth that display unilateral hypsodonty. The upper teeth are lingually high crowned but with limited growth and almost brachyodont or lower crowned labially. In the semihypsodontic teeth of the Theridomyidae (and this is a difference of views from VIANEY-LIAUD and PATTERSON & WOOD), the crown does not have significant post-eruptional growth. The sinus or sinusid are completely closed at the moment of eruption by its base. Then, only the roots are growing. Nevertheless, it is quite possible that in Issiodoromyinae at some moment of its evolution from semihypsodontic teeth toward protohypsodontic teeth there appears the grade of posteruptional growth. In this case I suggest the use of MONES's term: protohypsodontic teeth.

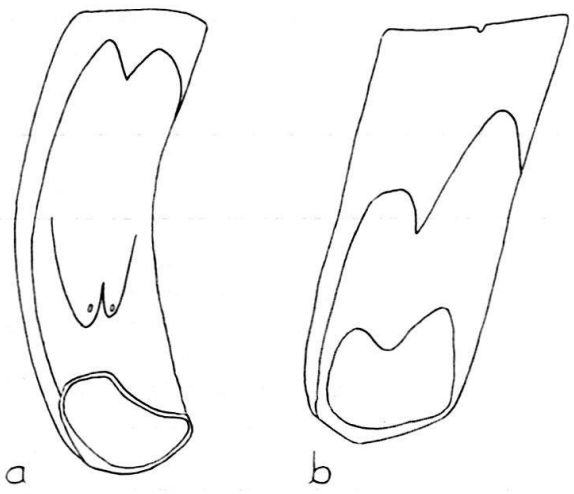

Fig. 2. Lobules on the teeth of *Issiodoromys*. – a = labial lobules of the upper teeth. b = lingual lobules of the lower teeth.

Lobules. They occur in pairs on the labial border of the upper teeth or in the lingual of the lowers (Fig. 2). By their morphology, they are key generic or subgeneric characters. On the other hand, their increase or reduction in size are useful at interspecific level. It is possible to separate them as follows:

1. Lobules without enamel: 1.1 small and narrow: *Nesokerodon*. 1.2 small and broad: *Oensingenomys* n. gen. 1.3 long and narrow: *Issiodoromys (Issiodoromys)*.

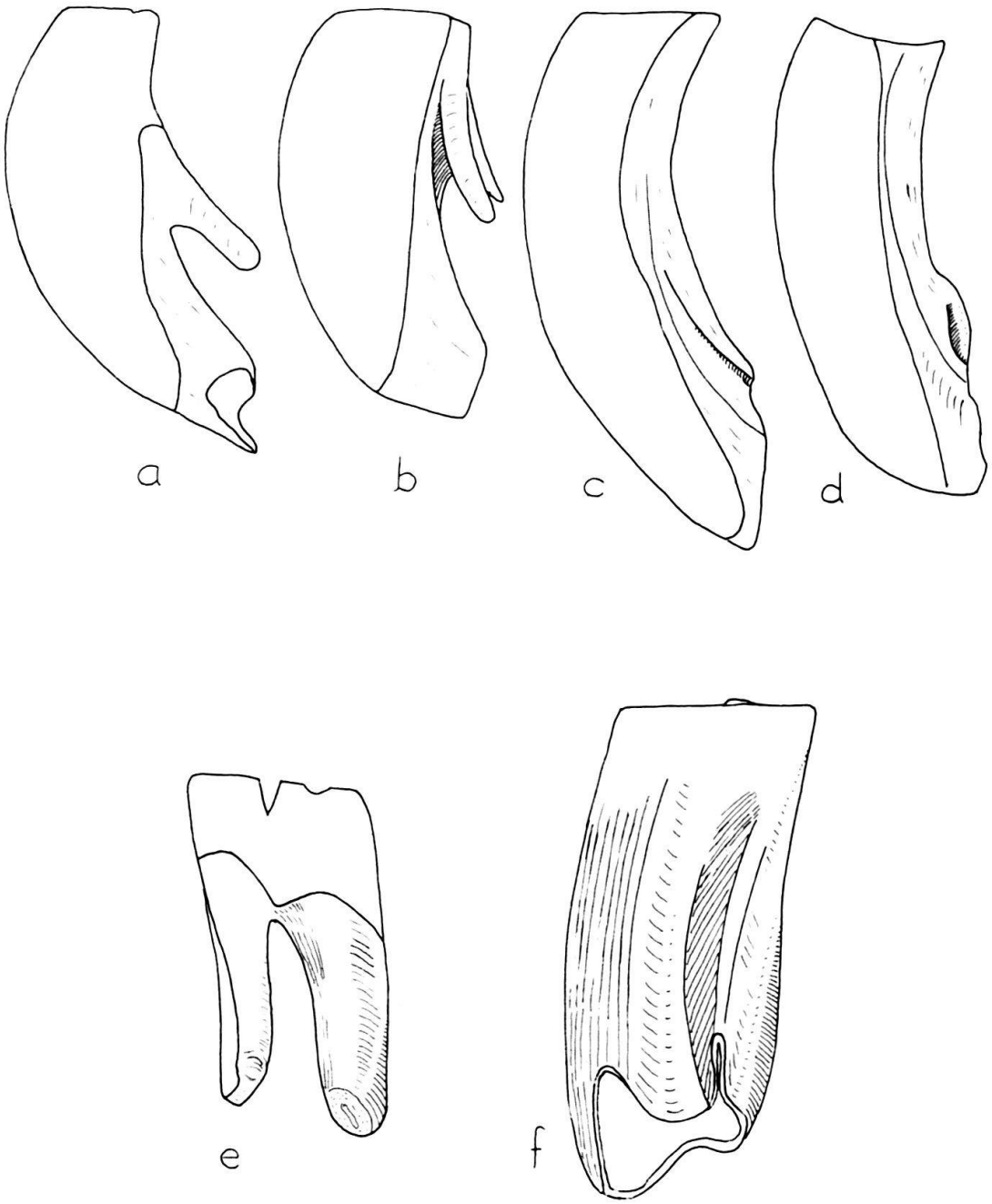

Fig. 3. Process of atrophication of the roots in Issiodoromyinae. – a = normal upper labial roots in *Nesokerodon*. b = normal lower roots in *Nesokerodon*. c = semiatrophied upper labial roots. d = atrophied upper labial roots. e = verstigial upper labial roots. f = slipping crest on lingual lower roots.

2. Lobules with enamel present but very reduced: 2.1 long and narrow: *Issiodoromys (Saboyanomys)* n. subg. The last one (2.1) is, probably, an intermediate stage prior to 1.3.

Normal roots. Roots without signs of atrophy due to hypsodontic (protohypsodontic) processes (Fig. 3).

Semiatrophied roots. – In the upper teeth the small labial roots show some part of their basal root body fused with the cylinder of the crown. The rest of the root is free. With the increase of the hypsodonty, the tendency is to increase the fused part, and to reduce the free part (Fig. 3).

Atrophied root. – Most of the part of the body is fused with the cylinder of the crown (Fig. 3).

Fully atrophied roots: – The roots are completely fused to the cylinder of the crown, but they are still distinguishable (Fig. 3).

Vestigial roots. – The roots are very reduced, only represented by a stump (Fig. 3).

Slipping crest. – The fused part of the root with the loss of its semioval form to acquiere a sharp morphology (Fig. 3).

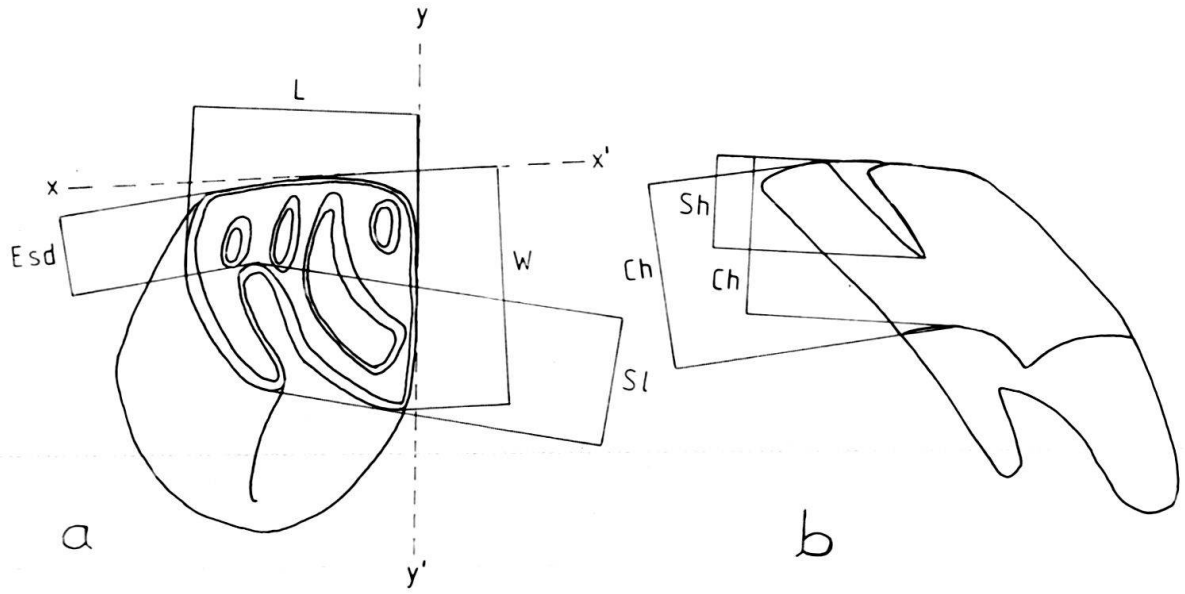

Fig. 4. Measurements of the teeth. – a) Measurements on the crown surface: L = length: the teeth are orientated along an ideal line (y–y') from labial to lingual border of the crown. The length is measured perpendicularly to this line. W = width: The teeth are orientated along an ideal line (x–x') parallel to the labial border in the upper teeth and parallel to the lingual border of the lowers. The width is measured perpendicularly to this line. Sl = sinus length: the length of the sinus is measured perpendicularly to an ideal line which joins the anterior with the posterior border of the sinus or the semigraben in the upper teeth. Sld = sinusid length (not figured): it is the same measurement as Sl but for the lower teeth. Esd = extrasinus distance: it is the measure of the shorter distance between the labial border of the crown and the sinus or semigraben end. Esdd = extrasinusid distance (not figured): is the same measurement as Esd for the lower teeth. b) Measurements in lingual view for the upper teeth (or in labial view for the lowers). Sh = sinus height: the sinus height of the upper teeth is measured between the sinus base and the occlusal surface on an ideal join of the anterior and posterior border of the sinus. Sdh = sinusid height: is measured in the same way as the sinus height but on the lower teeth. Ch = crown height: (for Archaeomyids): the upper teeth are measured between the posterior border of the sinus on the crown surface and the low border of the crown, oriented on a line which carry over the basis of the sinus. For the lower teeth the measurement is the same as the anterior one, but taken from the anterior border of the sinusid on the occlusal surface. For the Theridomyinae, Issiodoromyinae and *Toeniodus* the crown height is taken as in sinus or sinusid height but from the low crown border.