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# SOME ASPECTS OF EVOLUTION IN DERMOCHELYIDAE (REPTILIA, TESTUDINES)[1]

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RESUMEN:- Sistemática, evolución y relaciones de parentesco entre los representantes del género *Psephophorus* H.v.Meyer, 1847 (Chelonii, Dermochelyidae) son problemas que todavía no están resueltos por completo. La morfología del húmero ofrece criterios útiles para aclarar la cuestión. Partiendo de ello, los resultados de la comparación de las especies paleárticas de *Psephophorus* permiten conclusiones sobre su parentesco y evolución.

ABSTRACT:- Systematics and evolutionary relationships among the Dermochelyidae genus *Psephophorus* H.v.Meyer, 1847 are a still unsolved problem. The morphology of the humerus yields a characteristic criterion to clearify this question. A comparison of the humerus morphology reflects the relationships between palaeaertic *Psephophorus* species and their evolution to the recent *Dermochelys*.

RÉSUMÉ:- La systématique, l´évolution et la perenté chez les Dermochelyidae genus *Psephophorus* H.v.Meyer 1847 posent un problème encore non résolu. La morphologie des humérus offre des critères utiles á l´éclaircissement de cette question. La comparaison de la morphologie des humérus des espèces *Psephophorus* palaearctiques permet de déduire des conclusions en ce qui concerne leur évolution et leur parenté.

[1] Text version of a poster demonstration at the II Palaeocheloniological Symposium 1987 in New York. I am grateful to Dr. H.H.Schleich from Munich for its representation at the Congress.

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**Palabras clave: Dermochelyidae, *Psephophorus*, *Dermochelys*, morfología húmero, evolución.**

**Key words: Dermochelyidae, *Psephophorus*, *Dermochelys*, humerus morphology, evolution.**

## INTRODUCTION

Among the hitherto valid Dermochelyidae genera *Cosmochelys* Andrews, 1919, *Eosphargis* Lydekker, 1889, *Dermochelys* Blainville, 1816 and *Psephophorus* H.v.Meyer, 1847 the classification of *Psephophorus* is very problematic, but this latter genus is important for an understanding of the evolution of the recent species *Dermochelys coriacea*.

The genus *Psephophorus* wich was described by H.v.Meyer 1847 with the generotypus *Psephophorus polygonus* from the Miocene of Czechoslovakia, is based on a median part of the epitecal shell including several connected dermal placoids (review see in BROIN & PIRONON, 1980; DAMES, 1894; HUENE, 1956, 1959; MLYNARSKI, 1969, 1976; LYDEKKER, 1889; MÜLLER, 1968; and interpretation in GAFFNEY & MEYLAN, 1988).

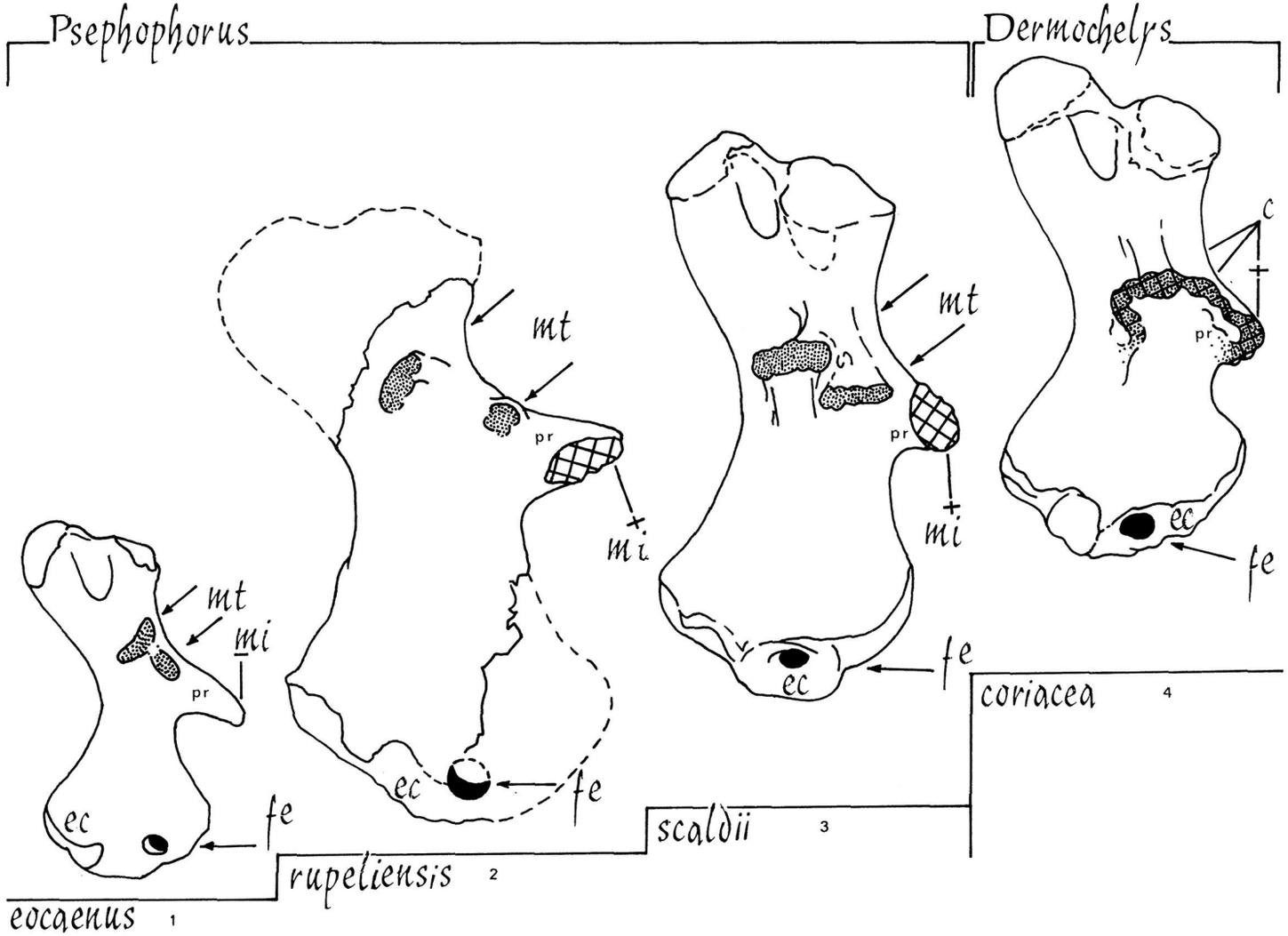
Most species of *Psephophorus* are mainly classified according to the morphology of dermal plates and humeri, and the difficulties with respect to systematic position are mainly caused by differences of preserved bones. Those species which are founded only by dermal bones cannot be revised until more details are know about size, thickness, shape and structure of single plates in different regions of the shell. On the other hand, the *Psephophorus* species are well demarcable by the morphology of extremity bones. Especially by means of the structure of the processus radialis at the humerus, the evolution from *Psephophorus* to *Dermochelys* is reconstructable.

This preliminary note is a proposal for discussion of this topic.

## STUDY OF DEVELOPMENT

The dermochelyid evolution will exclusively be demonstrated by the humerus morphology of *Psephophorus* and *Dermochelys* and for these genera only.

The humerus of *Psephophorus* shows a very distinct processus radialis and two separated median tuberculi which are not in connection with a muscle insertion on the processus (1). The processus radialis is also present in *Dermochelys*, but short and the median tuberculi and the muscle insertion of the processus are fused and




Figures 1-4: Schematics of position of the median tuberculi (mt), the muscle insertion (mi) of the processus radialis (pr) and crista (c), foramen ectepicondylare (fe) and epicondylus (ec). 1: *Psephophorus eocaenus*; 2: *Psephophorus rupeliensis*; 3. *Psephophorus scaldii*; 4. *Dermochelys coriacea*. (according DACQUÉ, 1912 and DOLLO, 1888).

form a crista (2). In the first genus are some characteristics present between the separated species. *Psephophorus eocaenus* Andrews, 1901 shows a very long processus radialis without a muscle insertion, two median tuberculi are at a rim in direction to the processus and the foramen ectepicondylare situated outside the epicondylus (3). In contrast to this, a muscle insertion on the processus is present and developed in *Psephophorus rupeliensis* (Van Beneden, 1863) and *Psephophorus scaldii* (Van Beneden, 1871). The foramen ectepicondylare is situated in connection with or inside the epicondylus by these (4). The median tuberculi of *Psephophorus rupeliensis* are situated at proximal and distal butresses (5), and *Psephophorus scaldii* shows both median tuberculi straighy and crista- like situated perpendicular to the axis of the corpus on distinct butresses (6) (see figures).

## CONCLUSIONS

The criteria mentioned permit a differentiation between the genera *Psephophorus* and *Dermochelys*. Two separated tuberculi are characteristics of *Psephophorus*, whereas *Dermochelys* shows a fused groin only. The different *Psephophorus* species represent distinct evolutionary stages, and the transition to the recent *Dermochelys coriacea* probably took place at the late Pliocene.

The most primitive known species is *Psephophorus eocaenus* showing the longest processus radialis and the foramen ectepicondylare situated outside the condylus.

The evolution and relationships of the discussed species shows the cladogram (numbers see text).

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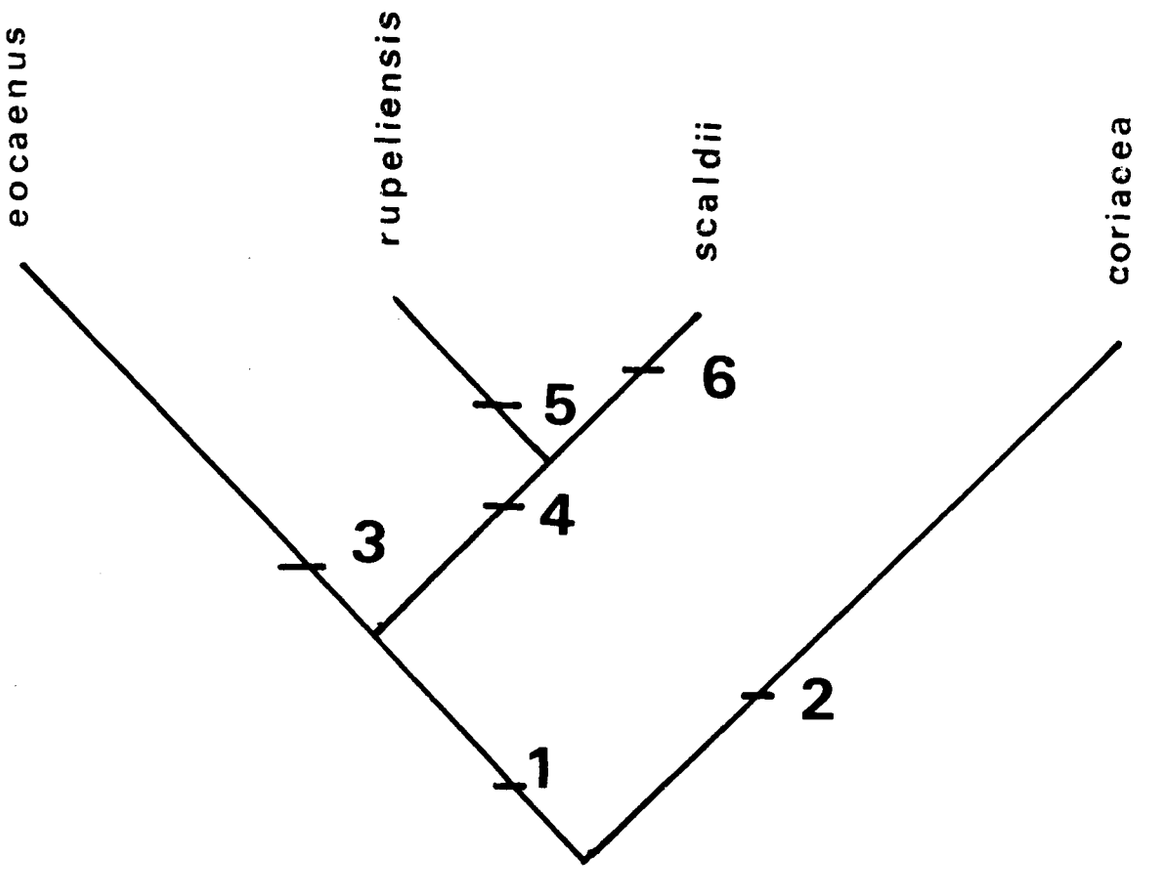


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