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NEW CARNIVOROUS MAMMALS FROM THE OLIGOCENE OF EGYPT

By

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ABSTRACT

Recent Yale expeditions to the Oligocene Gabal el Qatrani Formation, Fayum Province of Egypt, collected several new specimens of small carnivorous mammals. *Masrasector aegypticum, gen. et sp. nov.*, is a proviverrine hyaenodontid possibly related to *Anasinopa* from the Miocene of East Africa. A newly discovered mandible of the poorly known *Ptolemaia lyonsi* differs from the only previously known specimen in retaining a second premolar. Material previously referred to *Ptolemaia* by Schlosser is here redescribed as the new genus and species *Qarunavus meyeri*. *Ptolemaia* and *Qarunavus* are referred to the family Ptolemaiidae, order *Incertae sedis*.

INTRODUCTION

The recent Yale expeditions to the Fayum Province of Egypt have added greatly to our knowledge of early African primates and other mammals (Simons, 1968). The carnivores which have been collected are mostly species of *Apterodon*, however one microfaunal quarry, Yale Quarry G, has yielded several specimens of a new proviverrine hyaenodontid which is described below.

A mandible found near the American Museum Quarry A is here referred to *Ptolemaia lyonsi* although it differs in dental formula from the type specimen of *P. lyonsi*. Schlosser (1910, 1911) referred a juvenile jaw and other fragments of a distinctive genus and species to *Ptolemaia*. Matthew (1918) noted that this juvenile jaw is clearly not congeneric with *Ptolemaia*. Recently Van Valen (1966) restated that *Ptolemaia* and the juvenile are generically distinct and further that both should be excluded from the Creodonta (= Deltatheridia of Van Valen, 1966). We recently examined a juvenile mandible in the British Museum (Natural History) which is identical to the figure and description of the jaw Schlosser referred to *Ptolemaia*. This juvenile

mandible is described below as a new genus and species, and together with *Ptolemaia* referred to the revised family Ptolemaiidae Osborn. The possible affinities of this family are discussed; final ordinal placement must await further material.

Abbreviations used in this paper are : AMNH, American Museum of Natural History, New York; BMNH, British Museum (Natural History), London; CGM, Cairo Geological Museum, Cairo; YPM, Peabody Museum of Natural History, Yale University, New Haven.

SYSTEMATICS

Class MAMMALIA
Order CREODONTA Cope 1875
Family Hyaenodontidae Leidy 1869
Subfamily Proviverrinae Matthew 1809

Definition : Hyaenodontidae with narrow skull and long face; $M\frac{3}{3}$; molars tritubercular above, tuberculo-sectorial below ; metaconids present on lower molars; carnassial specialization little advanced (After Matthew, 1909).

Distribution : Eocene of North America and Europe, Oligocene of North America and Egypt, Miocene of India (occurs in the Chinji beds which are Miocene, see Simons, Pilbeam and Boyer, 1971) and East Africa.

Masrasector, new genus.

Type species : *Masrasector aegypticum*, new species.

Distribution : Quarry G, Gabal el Qatrani Formation, Oligocene of Egypt.

Diagnosis : Differs from *Sinopa*, *Metasinopa*, and *Anasinopa* in having comparatively broader trigonids, and from *Sinopa* and *Anasinopa* in possessing very high and massive paraconids. Differs from *Metasinopa* in having relatively larger and longer talonids, more distinct metaconids, and a comparatively shallower horizontal ramus. The crowns of the upper and lower premolars were typically worn flat at an early age. Wear in the basin of the talonid indicates that a propalinal component was present at the end of a masticatory stroke.

Etymology : *Masr* (Arabic), Egypt, and Sector (Latin), cutter.

Masrasector aegypticum, new species.

(Figure 1 C, D)

Type : CGM 30978, left lower jaw with P_3, M_{1-3}.

Hypodigm : Type, and provisionally YPM 30030, right maxillary fragment with P^{3-4}; YPM 30029, right M^1 or M^2; YPM 30019, right P^4; YPM 30020, broken right M_2; YPM 30031, crown of right P^3.

Diagnosis : As for the genus. Tooth measurements are given in Table 1.

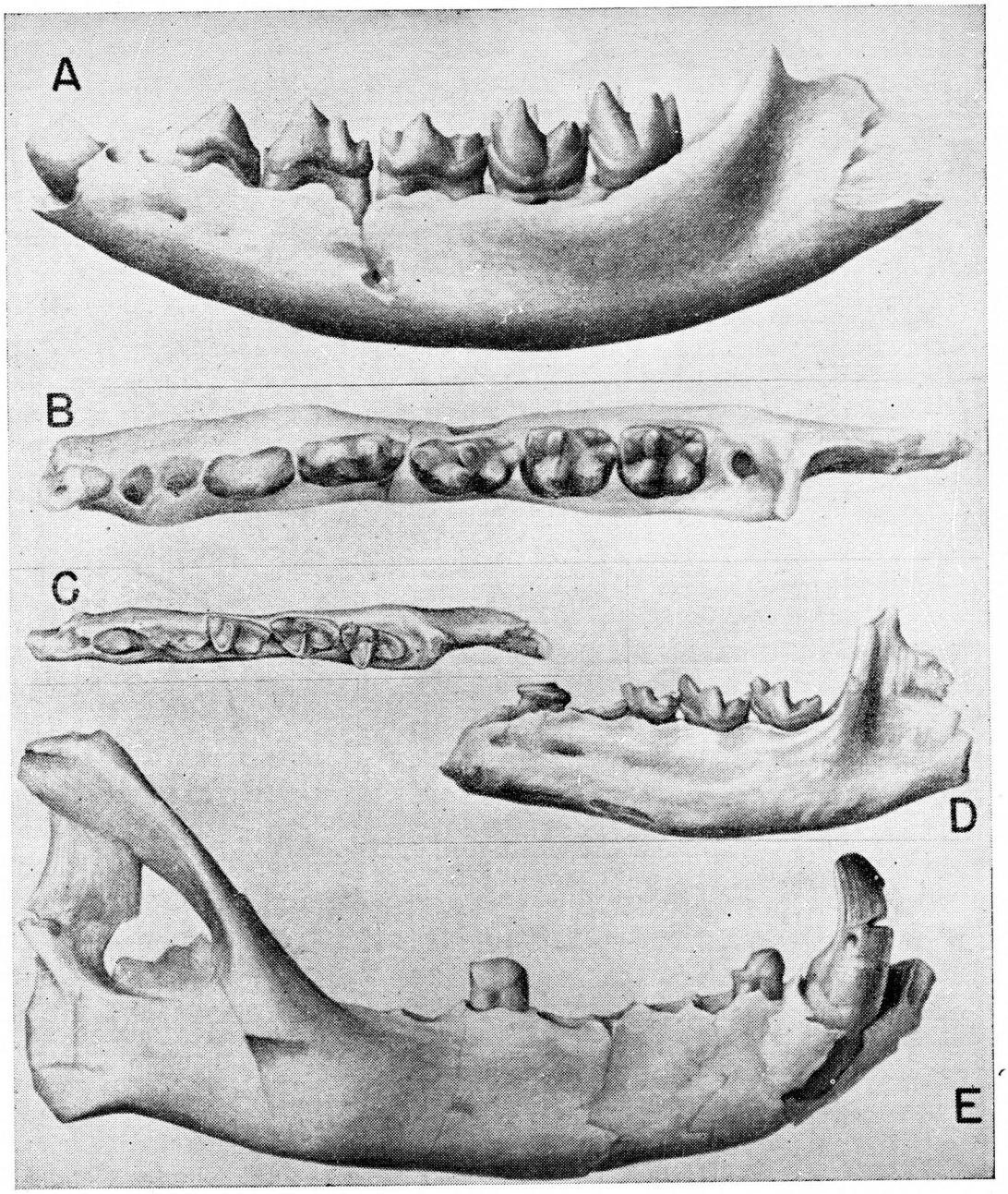
Distribution : All known specimens are from Yale Quarry G, Gabal el Qatrani Formation, Oligocene, Egypt.

Table 1. Measurements (in mm) of the teeth of *Masrasector aegypticum* CGM 30978

	Length	Width
P_3	5.4	2.5
M_1	5.8	2.8
M_2	6.8	4.0
M_3	6.9	3.7

A slightly smaller mandible (YPM 18026), edentulous except for a broken M_3, is known from near AMNH Quarry A, Lower fossil wood beds. When better material is known it may be necessary to include this specimen in *M. aegypticum* and to extend the stratigraphic range of the species to include the lower beds of the Gabal el Qatrani Formation. A partial mandible with M_{1-2} (YPM 20944) about one half the size of *M. aegypticum* has been found together with it in Quarry G. Thus a second species of *Masrasector* may be present at this level.

Masrasector appears to represent a stage or grade of evolution between an ancestral Eocene *Sinopa* or *Proviverra* and *Metasinopa* of the African Oligocene and Miocene. The predominant structural modifications of the lower molars in the sequence *Proviverra* or *Sinopa* - *Macrasector* - *Metasinopa* are the progressive enlargement of the paraconids, of the metaconids and protoconids. The result is a shift from balanced prevallid and postvallid shear to predominantly prevallid shear. *Masrasector* is structurally intermediate in this transition.



(Figure 1)

New Oligocene mammals from Egypt.

A. Lateral view of mandible of *Qarunavus meyeri*, BMNH M-10189, type.
B. Occlusal view of same, both × 1.5
C. Occlusal view of mandible of *Masrasector aegypticum*, CGM 30978, type.
D. Lateral view of same, both × 1.5
E. Lateral view of new specimen of *Ptolemaia lyonsi*, YPM 18117, × 1.2

Anasinopa leakeyi (Savage, 1965) from the Miocene of East Africa shares with *M. aegypticum* a distinct metaconid, broad and shallowly basined talonids, and early development of a flat wear facet on M_1, suggesting possible relationship of these two genera. More complete material of *Masrasector* is necessary to confirm this.

ORDER INCERTAE SEDIS

Two mammalian species with lower jaws about the size of a medium - sized dog are now known from the Gabal el Qatrani Formation. Both are of uncertain ordinal affinity. Both have previously been discussed in the literature on Fayum faunas but one, representing a new genus and species, has never been named. Their consideration here is appropriate since both were interpreted as representing hyaenodont carnivores by Schlosser (1910, 1911) and they have since been dealt with primarily in papers relating to carnivores.

Family Ptolemaiidae Osborn 1908

(*Non* Ptolemayidae Kretzoi 1945)

Amended diagnosis : Placentals typically showing in the lower dentition small posterior molars, high molar trigonids, unreduced lingual paraconids on the molars; enlarged premolars, P_3 with three anteroposteriorly aligned cusps decreasing in size from front to back as in some pinnipeds; occlusal molar outline has a central constriction; horizontal ramus is elongate and shallow, deep and well-defined masseteric fossa; condyle is at the level of the tooth row.

Distribution : Lower fossil wood beds, Gabal el Qatrani Formation, Oligocene of Egypt.

Referred genera : *Ptolemaia*, and *Qarunavus gen. nov.*

Although Schlosser (1910, 1911) thcught that the type mandible of *Qarunavus meyeri* (described below) was referable to *Ptolemaia lyonsi*, there is little similarity in comparable parts of the two species, and the dental formula and molar structure differ greatly. *Qarunavus meyeri* is here placed provisionally in the Ptolemaiidae but further material is needed for a more certain allocation.

Ptolemaia Osborn 1908

Type species : *Ptolemaia lyonsi* Osborn 1908

Diagnosis : As for the family, but differs from *Qarunavus*, which may have possessed only one permanent lower incisor (and clearly not more than two), in retaining three lower incisors; in lacking basal molar cingula; and in having M_2 markedly smaller than M_1. Lower dental formula : 3, 1, 2 or 3, 3.

Ptolemaia lyonst Osborn 1908

(Figure 1 E)

1908 *Ptolemaia lyonsi* Osborn : 267, figures 1,2.

Type : AMNH 13269, a left mandible with canine alveolus, P_3, alveolus of P_4, M_{1-3}.

Hypodigm : Type, and provisionally YPM 18117.

Distribution : American Museum Quarry A and at a slightly higher horizon 600 yards northwest of Quarry A, Gabal el Qatrani Formation, Oligocene, of Egypt.

Diagnosis : As for the genus.

The second specimen (YPM 18117) of *Ptolemaia*, here referred to as *P.* cf. *P. lyonsi*, was found by the Yale Expedition in 1961. The Yale specimen is approximately the same size as Osborn's type and supplements it in showing mandibular structures more clearly, especially in the anterior portion. The Yale specimen possesses an intact canine, and an anterior premolar (P_2) not present in the type. Three incisor alveoli are preserved. The canine is relatively large and recurved, with numerous parallel grooves or bands on the crown running vertically from the apex to the base of the crown. A large wear facet is present along the posterior edge of the crown suggesting occlusion with an upper canine of equal size. The two mandibles are very similar in a number of features, notably in the size of the horizontal and ascending mandibular rami, in the size and spacing of the premolar and molar alveoli, and in the structure and wear of the only common tooth M_1. However, the type specimen has no trace of a P_2, apparently had a somewhat smaller P_3 than the Yale specimen had, and had a more protruding canine. M_1 in YPM 18117 is much broader than in the type specimen and shows less of a constriction between trigonid and talonid. Until more material is known the reason for these differences will not be fully apparent. On the basis of the present evidence we should not like to draw a species distinction between the two individuals.

Qarunavus, new genus.

Type species : *Qarunavus meyeri*, new species.

Distribution : Lower fossil wood beds, Gabal el Qatrani Formation, Oligocene of Egypt.

Diagnosis : M_{1-2} are unlike *Ptolemaia* in showing distinct trigonids with well-separated, high metaconids and paraconids, and internal and external basal cingula (absent in *Ptolemaia*) well developed. Dental formule : 1 or 2, 1, 4, 3.

Etymology : *Qarun* (Arabic), name for Lake Moeris, and *avus* (Latin), ancestor.

Qarunavus meyeri, new species

(Figure 1 A , B)

1911 *Ptolemaia lyonsi* (in part), Schlosser : 148, Pl. 9, 10, 10 a.

Type : BMNH M-10189, a left lower jaw of a subadult with dC, alveolus for dP_1, dP_{2-4}, M_{1-2}, and I and M_3 in the process of erupting.

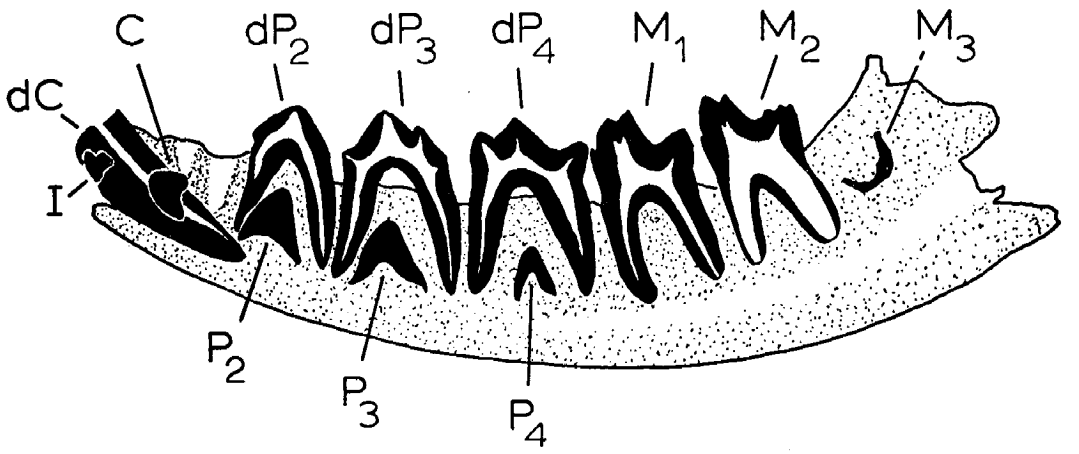
Hypodigm : Type, Schlosser's figured specimen, and provisionally Schlosser's additional referred material of *Ptolemaia* in Stuttgart.

Diagnosis : As for the genus. Tooth measurements are given in Table 2.

Etymology : Named for Grant E. Mayer of the Yale Peaboby Museum staff, whose able assistance in the field contributed much to the success of the last five Yale Egyptian expeditions.

Table 2. Measurements (in mm.) of the teeth of *Qarunavus meyeri*, BMNH M-10189

	Length	Width
dP_2	7.8	3.6
dP_3	10.3	4.3
dP_4	10.7	5.4
M_1	9.0	6.5
M_2	8.7	6.8



(Figure 2)

Stage of dental eruption of British Museum mandible of *Qarunavus meyeri*, BMNH M-10189 (type), revealed by x-ray photographs, × 1.5

The type specimen of *Qarunavus meyeri* is a left mandible. Schlosser's figured specimen is a right mandible. Dr. Theya Molleson kindly made X-ray photographs of the British Museum type specimen which show that it is of the same dental age as the specimen Schlosser figured (see fig. 2). It is possible that these two mandibles are parts of one individual, although we have not been able to compare them directly and confirm this.

Ptolemaia and *Qarunavus* differ in dental formula and in details of molar structure, and are certainly at least generically distinct. They are similar in the structure of P_3 and dP_3 respectively, in the constriction between molar trigonid and talonid, in having molar size decrease posteriorly, and in the shape of the horizontal mandibular ramus. Because of these similarities *Qarunavus meyeri* is here provisionally placed in the Ptolemaiidae, but further material is needed for a more certain allocation.

In discussing the affinities of *Ptolemaia*, Osborn (1908) was unable to place it in any existing order and suggested that recovery of further material might require definition of a new order of Mammalia for the group it represents. Schlosser (1910, 1911) first maintained that *Ptolemaia* and the specimens here described as *Qarunavus* were related to *Palaeosinopa*, which he called a hyaenodontid. Matthew (1909) however showed that *Palaeosinopa* was a pantolestid, order Insectivora. Matthew (1918) first pointed out that *Ptolemaia* and the material here described as *Qarunavus* could not belong to nearly related species. He suggested that the *Qarunavus* material might belong to an aberrant hyaenodontid. He also suggested that the molars of *Ptolemaia* resembled the Tillodontia, and in some degree the Pantolestidae, but not sufficiently to warrant any suggestion of affinity. Schlosser (1923) later referred *Ptolemaia* (with the *Qarunavus* specimens) to the Pantolestidae, order Insectivora. Recently Van Valen (1966) suggested that the material here described as *Qarunavus* and *Ptolemaia* is probably pantolestid. He also suggested possible relationship of the tupaioid *Anagale* from the Oligocene of Mongolia and of the taeniodont *Onychodectes* from the North American Paleocene to *Ptolemaia*. While *Onychodectes* is vaguely similar to *Ptolemaia*, so are many other Paleocene mammals. The suggested relationship to *Anagale* is only a little less than absurd. The canine in *Anagale* is reduced and incisiform while that of *Ptolemaia* is quite large relative to the size and robusticity of the mandible. The shapes of premolars, horizontal rami, angular and coronoid processes, and position and conformation of the articular condyle are entirely different in the two; they share only flat molar wear. McKenna and Coombs (see Coombs, 1971) ally the Ptolemaiidae with pantolestids and apheliscids in the superfamily Pantolestoidea.

Alternatively *Ptolemaia* may possibly be related to the stock which gave rise to the tubulidentates. Although tubules have not been detected in the teeth of *Ptolemaia lyonsi*, its dental wear pattern suggests an insectivorous diet. Broad mandibular and dental similarities exist between it and species of *Orycteropus* and *Myoryeteropus* from the Miocene of Kenya (see MacInnes, 1956). These are :

1. Molar length decreases posteriorly.

2. Trigonid and talonid are somewhat separated by lateral constrictions.

3. Molar crowns are rapidly worn down to a nearly flat suface.

4. The horizontal mandibular ramus is long and shallow with an elongate symphyseal region.

5. The mandibular condyle and coronoid processes of the mandible are relatively gracile. The retention of strong canines in *Ptolemaia* possibly parallels the condition in the aardwolf *Proteles* where the cheek teeth are completely reduced and strong canines retained.

The much amplified knowledge of the mammals of the Egyptian Oligocene which we now have only serves to emphasize that when first known most African early Tertiary land mammals had long been pursuing independent evolutionary courses. Were the Paleocene and Eocene mammal faunas of North America no better known than those of the Paleocene and Eocene of Africa, a whole series of archaic mammalian families and even orders would not yet be known. Thus it is not surprising to find forms in the African Oligocene such as *Ptolemaia* and *Qarunavus* which appear to represent otherwise unknown indigenous African higher taxa that differentiated there in the early Tertiary. In the broadest sense *Ptolemaia* and *Qarunavus* have some molar resemblance to known pantolestids, anagalids, tillodonts, and taeniodonts. Hewever, in view of the great differences, we do not want to support a range extension of any of these otherwise holarctic higher taxa on the evidence provided by the known material of *Ptolemaia* and *Qarunavus*. The Ptolemaiidae are best considered of unknown ordinal position at present.

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