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A NEW MIOCENE SPECIES OF PELUSIOS AND THE EVOLUTION OF THAT GENUS

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Among the reptilian remains from the island of Rusinga in Lake Victoria, Kenya Colony, sent for determination to the British Museum (Natural History) are the greater part of the carapace and a smaller part of the plastron of an apparently new species of *Pelusios*.

Dr. W. E. Swinton, who suggested that I examine the unidentified chelonian remains from British East Africa, has kindly consented that I describe the new form. Accordingly I name it:

PELUSIOS RUSINGAE, new species

Type: Coryndon Museum Ru F3617 — a partial carapace and plastron.

Horizon: Miocene of Rusinga Island, Lake Victoria, Kenya Colony.[1]

Diagnosis: A *Pelusios* belonging to the *adansonii-gabonensis* section of the genus, distinguished by the following combination of characters: a very depressed shell (height included in length about four times); the carapace expanded posteriorly; the vertebral region very shallowly excavated, quite without keel; first vertebral scute much larger than vertebral 2 and wider than long; vertebrals 2, 3, and 4 slightly longer than wide; mesoplastra extremely narrowed medially, barely meeting.

The living species of *Pelusios* fall into two sections:

One, which is northern and western in distribution, comprises two species, *P. adansonii* and *P. gabonensis*. This group is characterized by having the anterior lobe of the plastron relatively long and the abdominal scutes relatively short, so that the sulcus between the abdominal scutes is included more than twice in the length of the anterior lobe. Also the mesoplastra are more or less tapered medially, so that the hyoplastra anteriorly and the hypoplastra posteriorly (or the hypoplastra only) are longer medially than laterally, projecting

[1] For a summary of the geology and the Miocene fauna of Rusinga and adjacent areas see Kent (1944).

into and filling up the interval left by the tapered margins of the mesoplastra.

The other group within the living members of the genus is less restricted in distribution. One of its species — *P. subniger* — overlaps most of the range of the first group and in fact extends beyond that range on the west to the Cape Verde Islands. On the east this same species extends to Zanzibar, the Seychelles, Mauritius and Madagascar. On the north, however, this species does not extend beyond British East Africa into the Sudan range of *P. adansonii*.

The group typified by *P. subniger* is distinguished by having the anterior lobe shorter and the abdominal scutes longer so that the sulcus between the abdominal scutes is included less than twice in the length of the anterior lobe, and by having the mesoplastra not tapered and presenting straight transverse contacts with both hyo- and hypoplastra.

The relationships of *P. rusingae* are clearly with the first of these two living groups: the tapered mesoplastra clearly indicate this position. From *P. adansonii*, however, *P. rusingae* differs (1) in the more depressed shell, (2) in the absence of any vertebral keel, (3) the first vertebral wider than long, (4) greater size. From *P. gabonensis* it differs in (1) the posterior expansion of the shell, (2) the absence of any trace of vertebral keel, (3) the second to fourth vertebrals longer than wide. From both species it differs in the more extreme medial narrowing of the mesoplastra. The table below summarizes the shell characters of the two Recent and the fossil species (I utilize the data of Loveridge, 1941, which I have, however, verified on other material).

P. adansonii	*P. gabonensis*	*P. rusingae*
Sulcus between humerals 3–4 times as long as that between pectorals.	Sulcus between humerals 1½–2 times as long as that between pectorals.	Unknown
Mesoplastra tapered medially only posteriorly, thus a transverse hinge with the hyoplastra but an oblique suture with the hypoplastra.	Mesoplastra tapered medially both anteriorly and posteriorly, thus an oblique suture with both hyo- and hypoplastra.	Mesoplastra strongly tapered medially anteriorly and posteriorly, hardly meeting.
A keel on the anterior four vertebrals throughout life.	A nodose keel in the young, lost in the old.	No keel, the vertebral region somewhat depressed.

Vertebrals about as long as broad in adults.	At least vertebrals 1 to 3 broader than long in adults.	Vertebral 1 wider than long, vertebrals 2–4 longer than wide.
Height in length about 2.6 times.	Height in length 2.3 to 3.8 times.	Height in length about 4 times.
Shell distinctly broadened posteriorly.	Shell not broadened posteriorly.	Shell distinctly broadened posteriorly.
Known maximum size: 185 mm.	Known maximum size: 259 mm.	Estimated size: 245 mm.

P. rusingae thus contrives to combine some of the characters of both the two living members of its group. It occurs, also, outside — south and east — though not far outside, the present limits of its group. Only *P. subniger* of the alternative group is known from Lake Victoria today.

Three fossil species of *Pelusios* have been previously described: *P. rudolphi* Arambourg from the Lower Pleistocene of Omo, founded on a partial plastron and carapace (type in Paris Museum); *P. dewitzianus* v. Reinach represented by fragments from the Middle Pliocene of Wadi Natrun (type formerly in Munich, now destroyed); and *P. blanckenhorni* Dacqué, a skull from the Lower Miocene of Moghara (type in Berlin?). In addition and not previously recorded there are abundant fragments (Nairobi Museum) and a complete shell (British Museum No. R 5761) of *P. sinuatus* (a still living species of the *P. subniger* group) from Bed I, Pleistocene of Olduvai.

The fossil *P. sinuatus* need not be compared with *P. rusingae*. The Olduvai material is clearly referrable to the Recent species which still occurs in this area.

P. rudolphi needs as little attention. The type (examined at the Paris Museum) resembles closely old specimens of Recent *P. sinuatus*. It may provisionally be accepted as ancestral to the *P. sinuatus* of the later Pleistocene and of the Recent.

P. dewitzianus was originally described on quite inadequate material which, however, was still sufficient to place it as a member of the *P. subniger* group. It was redescribed from much better material by Dacqué (1912), who at the same time discovered that a supposed Pliocene species of *Pelomedusa* (*P. pliocenica* v. Reinach) was a synonym of this species. *P. dewitzianus* as a member of the alternative

group requires no comparison with *P. rusingae*.

There remains, however, *P. blanckenhorni*, which is from a deposit apparently equivalent in age and very similar in fauna to that of the Lower Miocene of Rusinga Island, but 2000 miles distant. *P. blanckenhorni* and *P. rusingae* cannot be compared, since one is based on a skull, the other on a shell. The skull of *P. blanckenhorni*, inadequately described and figured only in dorsal view by Dacqué, seems similar to that of *P. gabonensis*. It may, therefore, belong to the same group within the genus as *P. rusingae*, and it is not impossible that the latter is a synonym. But to hazard the identity of forms 2000 miles distant from one another and represented by incomparable parts would be without substantial basis.

Furthermore, a special element of doubt attaches to species belonging to this section of the Pelomedusidae which, as with *P. blanckenhorni*, are founded solely upon the skull. It is a remarkable fact that *Pelusios* and *Pelomedusa*, though quite distinct in shell characters, have extremely similar skulls. The skulls of the two Recent genera can be told apart only by characters which in many other groups would be counted of specific value only. Reference of a fossil skull, therefore, to either genus is a doubtful procedure unless there is the confirmation of an associated shell. In the present case this leaves us with the possibilities that *P. blanckenhorni* may be either specifically identical with *P. rusingae*, or specifically different, or it may belong to a different genus. This conclusion may appear as absurd as it is unsatisfactory, but this is a dilemma not uncommon in paleontology, and it is decidedly worthwhile to recognize and emphasize the difficulty of evaluation of fossil species based on parts not comparable. All that can be suggested as a method of decision, which, while arbitrary, is still not devoid of reasonableness, is that material from deposits of the same or equivalent ages and geographically close may be provisionally associated if any apparently valid grounds for such association exist; but geographic distance or difference in geologic age carry with them a presumption of distinctness which must be countered by stronger arguments than those that — for the moment — suffice in the other case.

P. rusingae and *P. blanckenhorni* (if this is really a *Pelusios*), occurring in the Lower Miocene, are the oldest members of this genus. It will be useful to consider them against the background of the early history of the family of which they are a part.

The family *Pelomedusidae* is certainly very old; it probably stems

ultimately from the pleurosternids of the Upper Jurassic and the Cretaceous. Unfortunately the form which has been suggested as the oldest representative of the family, *Platycheloides nyassae* Haughton, is incompletely known and doubtful as to age. It has small laterally placed mesoplastra and is therefore not an obviously primitive form. Mesoplastra meeting in the midline are certainly primitive for turtles and *Pelusios* would therefore be more primitive in this respect, *unless* the larger mesoplastra of *Pelusios* are a secondary development (see below). The single known character in which *Platycheloides* differs from *Pelomedusa* as ordinarily conceived — the absence of the median plastral fontanelle — does not in fact separate it from that genus, since, as I have been able to determine on British Museum specimens from Uganda and the Sudan, the median fontanelle is sometimes lacking in even small specimens of *Pelomedusa*. The beds from which *Platycheloides nyassae* derives are Cretaceous in age, but to what part of the Cretaceous they belong is not known. This African form is therefore not certainly older than the better known pelomedusids of the Upper Cretaceous of North and South America and Europe, though it is probably as old. Widespread already in the Cretaceous, the pelomedusids continued so in the early Tertiary with representatives in North and South America, England, Italy (del Zigno, 1887), Egypt, Congo and India.

It is a curious fact that every one of these older members of the family that are sufficiently known is pelomedusine in type rather than pelusiine, that is: the mesoplastra are small and lateral elements, as in *Pelomedusa* and *Platycheloides*, not large elements meeting in the center of the plastron as in *Pelusios* and the pleurosternids. Nor is it at all likely that this observation is an artifact resulting from a failure to recognize as pelomedusids those with complete mesoplastra. A pelomedusid with large complete mesoplastra is immediately distinguishable from a pleurosternid by the total absence of inframarginal scutes.

The uniformity in the condition of the mesoplastra in the oldest members of the family is an intimation that the pelomedusine type of mesoplastra (small and lateral) may be primitive for the family and that the pelusiine type (large and centrally meeting) may be secondarily derived from the pelomedusine.

With this suggestion the known facts about *Pelusios* are fully congruent. The members of the genus *Pelusios* form a structural series in regard to the size of the mesoplastra, *P. rusingae* having the most

reduced mesoplastra, *P. gabonensis* the next, *P. adansonii* next, and the *P. subniger* group the most fully developed mesoplastra. A structural series is always ambiguous unless the time dimension can be added, but *P. rusingae* as the oldest shell belonging to the genus seems to provide this time element.

The similarity of the skulls of *Pelomedusa* and *Pelusios* further suggests relationship, and the existence of a species of *Pelomedusa* (*P. progaleata* v. Reinach) anterior in time (Lower Oligocene) to the earliest (Lower Miocene) *Pelusios* further supports the view that *Pelusios* is a relatively late and specialized genus directly derived from *Pelomedusa*.

P. rusingae is thus a fortunate discovery, offering a much needed term in an evolutionary series — a series apparently affording an example of the reversal of an evolutionary trend.

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