AIGIALOSAURUS

A new lizard from the Cretaceous slates of the Island of Lesina with consideration of the previously described lacertids of Comen and Lesina

BY

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Aigialosaurus : Ein neue Eidechse a.d. Kreideschiefern der Insel Lesina
mit Rücksicht auf die bereits beschriebenen Lacertiden von Comen und Lesina.
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Remains of well-preserved lizards belong among the rarities and hence finds of this kind are always of great scientific value. -- When in the year 1873 Kornhuber described those remains of the the species *Hydrosaurus lesinensis* preserved on two slabs and reciprocally completing each other, this was at the time one of the best known fossil lizards. Through a lucky accident I set eyes on a larger and better preserved fossil of a lacertid, which likewise came from the island of Lesina. In the quarry of the village of Vrbanj the landowner, Ivan Racic by name, found a large slab with the skeleton of a lizard, of which only the anterior end of the snout and the greater part of the tail are broken away. The whole rest of the skeleton is normally articulated and remains very well preserved. -- This beautiful petrifaction is the property of the tireless Natural-history collector Herr I. Novak, a teacher in Zara.

In the Spring of last year I was sent to Dalmatia to collect petrifactions on behalf of the Directors of the National Mineralogical-Geological Museum, on which occasion I visited Herr Novak. I found at his place a large collection of fossil fish and some remains of reptiles (all from Lesina) among which was the fine lacertid mentioned. Herr Novak was so kind as to turn over all the still-undescribed material to me for the purpose of working it up scientifically, and I have for the time being selected from this interesting collection the one which seems to me most urgently and worthily to deserve a publication.

In the following I will spend a few words in order to allow easier understanding of the organisation and reciprocal relationships of our lizard from Lesina.

During the formation of the carbonate slates which today produce fish, there lived on the island of Lesina numerous lizards, which are distinguished by their long slender body and tail, though the limbs are variably developed. According to the manner of development of the latter, we can however follow that two sharply distinct genera lived on the said island. The representatives of one of these genera had shorter forelimbs and a small head (*Hydrosaurus*), while those belonging to the second genus (*Aigialosaurus*) had almost equally developed limbs and a long head. Both of these genera lived principally in water.

Beside these two well-marked lineages there lived yet a third (*Mesoleptos*), of which however I have nothing more to say, other than that the species of this genus were large and that they possessed a decidedly broader body (judging by the long ribs) than the representatives of the two preceding genera.

Very closely related lizards also lived at the time of the formation of the similar-aged deposits of Comen, which we will hence also discuss repeatedly. Thus there appears in Comen the genus *Acteosaurus* H. von Meyer, vicariating with the genus *Hydrosaurus* from Lesina, and if *Acteosaurus* did not possess those narrow neurapophyses on the caudal vertebrae, one would have to identify Kornhuber's *Hydrosaurus* with the genus *Acteosaurus* from Comen.

With respect to the genus *Adriosaurus* Seeley from Comen, I have to remark that it stands very close to the genera *Hydrosaurus* and *Acteosaurus*, though it must be differentiated from these on grounds which I will mention later.

The genus *Mesoleptos* Cornalia also lived around Comen and might, with regard to its proportionally long ribs and the two probably equally well developed pairs of limbs, connect more closely to the varanids than the previously mentioned genera.

In this paper the results to date of the stratigraphic and palaeontological investigation of the Comen and Lesina localities are mentioned, to which I also add the Hakel locality at Mt Libauen in Syria.

Moreover I have critically illuminated all the hitherto described lizards from Comen and Lesina, then finally added to the conclusion of this text a systematic overview of all these lizards provided with the necessary changes; as it has been seen that the current classification of the lizards of Comen to the family Dolichosauridae (see Zittel 1889: 606) is unnatural, while an unmistakeable relationship exists between these lacertids, the genus *Dolichosaurus* and the Lesina lizards, which I also recognised in the conclusion in the systematic part; so I created a new group within the suborder Lacertilia for all these lizards, which connects the said suborder with that of the Pythonomorpha.

Finally I express my warmest thanks to a highly honoured Presidium of the südslavische Akademie der Wissenschaften in Agram for cooperation, proved to me in a most liberal manner, in the publication of this text, and also the highly honoured Directors of the k.k. geologisch Reichsanstalt in Vienna for some works lent to me.

Overview of the literature used [q.v.]

I.
The stratigraphic and faunistic relationships of Lesina, Comen and Hakel.

The Lesina fish-producing *Plattenkalke* have already been investigated from two directions: faunistically and stratigraphically. Even though both studies gave similar conclusions, nevertheless the question of the age of these fish-producing slates is not yet definitively closed off.

The comparative studies of Prof. Bassani on the ichthyofaunas of Lesina, Comen, Hakel etc., which he published in the years 1879 and 1883, teach us that the faunas of the named localities are contemporaneous. Bassani designated them as Aptian and thought, especially for the fauna of Lesina, that it stood between those of Comen and Hakel. -- The stratigraphic findings also agree with these comparative results of Bassani, namely that the fish-slate horizons of the Karst localities (Comen, Salcano) and the island of Lesina lie below the Upper Cretaceous and belong to either the Cenomanian or the upper Urgonian ('piano Aptiano' according to Bassani) (Stache 1889: 41). -- But this just mentioned uncertainty in

the determination of the age of the calcareous slates of the Istrian localities, but especially those of the island of Lesina, come about because as yet not enough sufficiently well preserved material (Rudists) has been found in the limestones which lie above and below those calcareous slates with fish (Stache 1889: 40). The determination of the age of these fish-producing calcareous slates is also made difficult by the circumstance that one has to deal with numerous fish-horizons and indeed not only in a horizontal, but also in a vertical sense. -- As is well known, Bassani regarded the localities Comen, Lesina [etc.] as different stages within one and the same chronological section; the latest investigations of Stache teach us concerning the island of Lesina "that at Cittàvecchia we are dealing with two different-aged fish-slate horizons, of which one belongs as an interbedding to the upper section of the massive sandy dolomite mass, ... while the other ... lies above a massive sequence of rudist-limestone banks" (Stache 1891: 13). On this matter the view of Herr Stache with regard to Mt Lemes should also be noted, according to which the *Plattenkalke* of the said mountain probably represent a deeper level than those of the island of Lesina. I would also add to what has been said the more important fish localities on the coast of Syria: Hakel and Sahel-Alma, of which it was determined on the basis of faunistic and stratigraphic studies that Hakel is older than Sahel-Alma, so we see that there are (in Dalmatia, Istria etc.) not only numerous fish-gorizons within one and the same portion of the Cretaceous system, but also probably numerous horizons in the different regions of this system.

In the course of this explanation I have almost always mentioned the localities Comen, Lesina and Hakel, and this is because we will in future be concerned almost exclusively with the reptilian fauna of the first two mentioned localities, while I have included the last locality - Hakel - in these considerations because on the island of Lesina two new fish genera, previously unknown in the ichthyofauna of this island, have been found: *Chirocentrites* and *Aipichthys* Steindachner, which now tie the bonds of relationship even more tightly between the faunas of Comen, Lesina and Hakel.

Already in the year 1884 I mentioned that two specimens of the fish species *Chirocentrites coroninii* Heck. had been found on Lesina (Bassani did not mention this in his work), which species was just known from Comen. But not long ago I obtained for study from Herr. I. Novak a magnificent impression of a species of the genus *Aipichthys* Steind., which was likewise found on the island of Lesina. But both these fish species of the island of Lesina complement the material evidence that the faunas of Comen, Lesina and Hakel are closely related; they even express distinctly the uninterrupted transition from the older fauna of Comen to those of Lesina and Hakel. That this transition was not interrupted is witnessed by the shared genera and species of these three localities. I will show below the genera and species common to the named localities in tabular form, and add to this overview a list of the lizards of Comen and Lesina, for this group of animals too will show us the gross relationship and slight temporal difference which exists between the faunas of Comen and Lesina. One

must know especially that the lizards of these localities are much more closely related than has been thought to date.

From all that we have said so far, the following conclusions can be drawn, which - as we will see - are quite identical to those which my excellent colleague Bassani already published in 1879:

1. The faunas of Lesina, Comen and Hakel bear a unitary characteristic feature and belong to the same chronological interval.

2. The fauna of the island of Lesina is tied to the fauna of Comen by some types of older habitus, and again on the other hand to the fauna of Hakel by some common forms of younger habitus.

3. Hence it follows automatically that one must regard the deposit of Comen as the lower, that of Lesina as the middle, and finally the deposits of Hakel as the upper stage of one and the same chronological interval.

Finally I would remark concerning the ichthyofauna of Sahel-Alma in Syria, that I totally agree with the thoughts of Pictet, Humbert and Bassani, according to which the deposit of this locality has to be regarded as younger than that of Hakel.

Lesina	**Comen**	**Hakel**
Pisces:		
Belonostomus lesinensis, + *B. sp.*	*Belonostomus* sp	*Belonostomus* (?) *hakelensis*
Coelodus, 3 spp.	*Coelodus*, 2 spp.	
	Palaeobalistum goedoli	*Palaeobalistum goedoli*
Holcodon lycodon, + 2 spp.	*Holcodon lycodon*	
Leptolepis neocomiensis, *L. neumayri*	*Leptolepis neocomiensis*	*Leptolepis neneumayri*
Thrissops microdon, Th. exiguus	*Thrissops microdon, Th. exiguus*	*Thrissops microdon*
Chirocentrites coroninii	*Chirocentrites coroninii*	
Elopopsis haueri	*Elopopsis haueri*, + 3 spp	
Prochanos rectifrons		*Prochanos rectifrons*
Clupea brevissima, *Cl. gaudryi*, + 1 sp.	*Clupea brevissima*	*Clupea brevissima*, *Cl. gaudryi*, + 6 spp.
Scombroclupea macrophthalma	*Scombroclupea macrophthalma*	*Scombroclupea macrophthalma*
Beryx subovatus	*Beryx dalmaticus*	*Beryx vexillifer*
		Pseudoberyx syriacus, Ps. bottae
Aipichthys sp.	*Aipichthys pretiosus*	*Platax minor*

Reptilia:		
Hydrosaurus lesinensis	*Acteosaurus tommasinii*, *Adriosaurus suessi*	
Aigialosaurus dalmaticus, *A. novaki*		
Mesoleptos zendrini	*Mesoleptos zendrini*	

II.
Critical overview of the hitherto described lizards of Comen and Lesina.

Until now only the species *Hydrosaurus lesinensis* Kornhuber was known from the Cretaceous sediments of Lesina, and indeed from two slabs with reciprocally complementary skeletal remains. These slabs were found in the years 1869 and 1870 in Planivat near Vrboska, and presented by J. Begoni to the collection of the k.k. geologischen Reichsanstalt in Vienna. In the year 1873 Prof. Kornhuber described these remains under the title: "On a new fossil saurian from Lesina".

In the contemporaneous deposits of Comen in Istria lizards were also found, as we have already mentioned, and already in the year 1851 Cornalia described from there a fragment of a larger lizard under the name *Mesoleptos zendrinii*. -- In the year 1860 Herman v. Meyer published from the same locality a small lacertid under the name *Acteosaurus tommasinii*, and in the year 1880, i.e. after Kornhuber's publication, yet a third lizard from Comen was described, the *Adriosaurus suessi* Seeley.

We will discuss each of these Comen lizards and compare them with Kornhuber's species *Hydrosaurus lesinensis*, and with this opportunity emphasise especially the level of relationship of the Comen species with those from Lesina.

1. *Mesoleptos zendrini*, Cornalia.

1851. *Mesoleptos Zendrini*, Cornalia. - Giornale dell' I. R. Instituto Lombardo. - Tom. III., pg. 35. Tav. II.

1889. *Mesoleptos Zendrini*, Cornalia. - Zittel: Hadb. d. Palaeontologie. Bd. III. pg. 606.

Thus Cornalia designated a fragment of a larger lizard, of which a part of the dorsal section, with the partly preserved right hind limb, remains conserved. This fossil is distinguished by its large vertebrae and its simple, long ribs. -- While this lizard coming from Comen is already at first glance clearly distinguished from the other lizards from both Comen and Lesina, I mention it nevertheless, because in Cornalia's description I find some incorrect statements regarding the osteological characters of this lizard, which simply must be

corrected. -- Cornalia said that his *Mesoleptos* possessed "as it seems 5 lumbar-, behind which 9 caudal vertebrae follow". This statement is not only incorrect, rather it does not even correspond to possibility, because without doubt also sacral vertebrae were also present, since there is a posterior limb on the slab - and indeed, in its natural position. If this fossil really comes from a lizard (which otherwise can not be doubted at all), then it had no lumbar vertebrae at all, rather the dorsal vertebrae with their single-headed ribs extended back to the 2 sacral vertebrae. Since the slab is damaged immediately anterior to the limb, the posterior ribs have been lost purely by accident, as one can conclude from the illustration and the more posterior ribs which still remain preserved, which are in any case too long to count as the last ones.

Cornalia made a much bigger mistake if he said *Mesoleptos* were similar to *Raphiosaurus*, only that the latter had concave-convex vertebrae. First of all it must be emphasised that Cornalia's fragment lies on its back, and that the supposed convexity at the anterior end of the vertebra relates either to the upper edge of the vertebra, or the lower edge drawn forward, as above this there first occurs the concavity of the centrum. Herr Novak possesses a fossil from Lesina, seemingly identical to Cornalia's species, and this shows us precisely such a vertebra as does the fossil from Comen; but at the same time it is distinctly visible that the verterae are procoelous, which doubtless they were also in *Mesoleptos zendrini*. The triangular shape of the vertebrae which Cornalis describes is in no way significant, as this form depends directly on the position of the vertebral column. In this regard I refer to Kornhuber's *Hydrosaurus lesinensis*, specifically the illustration B (Pl. XX), on which we see wholly similar vertebrae; these however show us their undersides, while they present quite differently in profile. The vertebrae of Cornalia's species thus show us their undersides, because the animal lies on its back. -- As one may not identify the species *Mesoleptos zendrini* Corn. with any of the already described species of Comen or Lesina on account of its long ribs, so one has to regard this at any rate as an independent species of lizard.

2. *Acteosaurus tommasinii*, H. v. M.

1860. *Acteosaurus Tommasinii* H. v. M. -- Jahrb. der k. k. geol. R. A. Wien. (Verhandl. pg. 22-24).

1860. *Acteosaurus Tommasinii* H. v. M. -- Palaeontographica VII. pg. 223, Tab. XXIV.

1889. *Acteosaurus Tommasinii* H. v. M. Zittel: Handb. d. Palaeontol. Bd. III. pg. 606.

Is a very characteristically slender lizard, which distinguishes itself by its very reduced forelimbs (these are shorter by half than the hindlimbs), the long tail and the vertebral column built in the manner of the recent varanids. Unfortunately this beautiful lizard is missing the head, so that it is simply impossible to state the number of cervical vertebrae, which would however be necessary in order to be able to refer it to the Dolichosauridae - that

is, to a family of lizards distinguished by a high number of cervical vertebrae (over 9, *Dolichosaurus* 17!). I have therefore included the genus *Acteosaurus*, and also the following species (*Hydrosaurus lesinensis* Kornh.), on account of their quite analogously constructed skeletons, in a special family (Aigialosauridae m.) (see the systematic part).

3. *Hydrosaurus lesinensis*, Kornhuber

1873. *Hydrosaurus lesinensis*, Kornhuber. -- "Ueber einen neuen foss. Saurier aus Lesina". (Abhandl. d. k. k. geolog. Reichs. Anst. Bd V. Heft 4).

1889. *Hydrosaurus lesinensis*, Kornhuber. -- Zittel: Handb. d. Palaeontol. Bd. III. pg. 608.

I have already, in the introductory part of this work, put forward the gross relationship between this species of Kornhuber and the Comen species *Acteosaurus tommasinii* H. v. M., and only wonder how it was that Kornhuber totally overlooked the already published lizards of the nearby and contemporaneous locality Comen, but especially the genus *Acteosaurus* already published 13 years before his work! If we now compare the illustration of the small species *Acteosaurus tommasinii* H. v. M. with the large *Hydrosaurus lesinensis* Kornh., we will see that, while the two lizards seem very unalike wih respect to their size, yet in respect of their skeletal structure they are almost identical. Both lizards possess not only a long tail, a slender body, a vertebral column built almost the same, but also - which is yet more important - the limbs developed in the same manner: in one and the other lizard the proportion, particularly of the length of the humerus to that of the femur, is = 1:2. -- I would also like to remark that the greater part of the cervical vertebrae of both lizards bears no ribs. It is only the narrower neurapophyses of the caudal vertebrae of the Comen lizard that hold me back from an identification of Kornhuber's *Hydrosaurus* with the *Acteosaurus* from Comen.

4. *Adriosaurus suessi*, Seeley

1880. *Adriosaurus suessi*, Seeley. -- The Quarterly Journal of the Soc. -- London. Vol. XXXVII, pg. 52, Tab. IV.

1889. *Adriosaurus suessi*, Seeley. -- Zittel: Handb. d. Palaeontol. Bd. III, pg. 606.

Is related to the *Hydrosaurus lesinensis* Kornh., from which it is generically differentiated not on account of its lower number of vertebrae, rather through the presence of osteoderms on the underside of the tail. The vertebral number is (as we will see later), for example in the family Varanidae, a very variable factor with only specific significance.

Now that we have sketched the already described lizards of Comen and Lesina and provided the necessary remarks, we can immediately turn to our new Lesina lizard, which is interesting and important in so many respects. The properties of the limbs and the vertebral

column of our fossil, especially the circumstance that all the vertebrae are procoelous, that is anteriorly concave and posteriorly convex; the circumstance that there are no abdominal vertebrae, though two sacral vertebrae; then the simple single-headed ribs are present and the body was covered with scales, teach us that our fossil is a true lizard. The size of the body, the length of the tail, the structure of the head and the vertebrae with their apophyses, would speak for inclusion of our petrifaction in the family Varanidae, if on the other hand the shape of the quadrate bone, the presence of hypapophyses on the cervical vertebrae, the reduced limbs and the extremely elongate body did not remind us of the lizards of the group Pithonomorpha [sic.].

Now that we have thus sketched in general the chaacters of our new lizard, this spares us from comparing with it the otherwise similar species *Hydrosaurus lesinensis* Kornh. But studies going into these matters provide us with significant differences, on the basis of which we convinced ourselves that we are dealing with lizards of two different genera. The differences found consist of the following:

1. The *Hydrosaurus* has from head to tail 41 vertebrae, our fossil on the other hand only 29! -- If we subtract from this number for each lizard the cervical and sacral vertebrae, there remain for *Hydrosaurus* 30 and for our lacertid just 19 or 20 verterae.

2. The head of *Hydrosaurus* is in comparison to the body length shorter than that of our fossil, in which we glimpse a significant difference.

3. The *Hydrosaurus* possesses ribs (?) just on the posterior 3 cervical vertebrae, while on our reptile we find on all cervical vertebrae - maybe ribs, maybe hypapophyses.

4. While in *Hydrosaurus* the proportion of the humerus to the femur is as 1:2, the same ratio in our lizard is 1:1.1, which difference is to be regarded as of generic significance.

Now that we have convinced ourselves that our lizard is generically distinct from that described by Kornhuber, it becomes necessary to create a new genus for it, which I name:

***Aigialosaurus*,** Kramb. Gorj.

[detailed description omitted, pp. 13-25]

Fam. Varanidae

Gen. *Mesoleptos*, Cornalia

Mesoleptos cf. *zendrinii*, Cornalia

(Pl. III, Fig. 4)

Mesoleptos zendrini, Cornalia. -- loc. cit.

Mesoleptos zendrini, Cornalia. -- Gorjanovic-Kramberger: "*Aigialosaurus* novi guster". "Rad" der südsl. Akad. d. Wissenschaften und Künste. Agram. CIX., pg. 116. Tab. I, Fig.4.

The figured, very fragmentarily preserved skeletal fossil from the dorsal portion of the body seems to me to belong to this genus; it might relate to a large lizard and corresponds best, on account of its long ribs, with Cornalia's species *Mesoleptos zendrini* from Comen. The animal to which this fossil belonged lies on its back and shows us two complete and two half broken surfaces of vertebrae; the length of the distinctly procoelous vertebra measures 31.5 mm. The ribs are thin, long, curved, and measure over 90 mm. Beside the vertebral column and across the ribs lie the indistinct impressions of the forelimbs: humerus, radius, ulna and two metacarpals; all these bones together mesure 93.3 mm in length. This lizard no doubt had well developed limbs and if we also take the long, thin ribs into consideration, it corresponds in these properties very well with the varanids. -- Only better preserved finds will allow this to be determined definitively.

This fragment comes from the Cretaceous slates of the island of Lesina and is the property of Herr Novak.

The phylogenetic relationships of the recent varanids to the Cretaceous lizards of Lesina and Comen

As is well known, Kornhuber referred his lizard to the recent genus *Hydrosaurus* and indeed on the grounds that the representatives of the named genus have a very similarly constructed skull. H. v. Meyer compared his genus *Acteosaurus* (which, as we know, is closely related to Kornhuber's *Hydrosaurus*) with the genus *Dolichosaurus*, i.e. with a lizard which is distinguished by its slender, cylindrical body, whereby it is reminiscent of those lacertids which form the transition to the snakes. Such a lizard is also Seeley's *Adriosaurus*. -- It will hence be our task, on the one hand to ascertain the grade of relationship between our fossil lizard and the recent varanids, on the other hand to determine all the differences that exist between these lacertids. In order to do this I will first concern myself with comparisons of the skull of our fossil lizards (*Hydrosaurus* and *Aigialosaurus*) and remark at the same time that the skull of these lizards is in fact similar to that of the varanids, but especially to the skull of the *Varanus* from Sydney and the Nile, while the skull size of our fossil lizards is very different. Specifically the skull length in proportion to the body length (without tail) in the species *Hydrosaurus lesinensis* is as 1:7.2, while this proportion in the species *Aigialosaurus dalmaticus* is 1:4. -- Also the living varanids show great differences in this respect, ranging in this respect between the ratios 1:5 - 1:7. If there were no further differences than just the different head size, we would have to agree with Kornhuber's view regarding the referral of his lizard to the recent genus *Hydrosaurus*. We will however soon turn our attention to a very important cranial bone, namely the quadrate, which bone, as we have already remarked while describing the bones of the head, is of a quite different shape from the quadrate of the varanids.

I now pass to the vertebral column, of which for now we will just take into consideration the number of vertebrae and the shape of the ribs.

The living varanids possess a strong vertebral column, in which the number of elements is subject to great variations. Especially variable in tis respect are the dorsal and caudal vertebrae, while the number of cervical vertebrae can also not be called a constant. I will mention in this regard only some species already nominated by Cuvier in the Xth volume of his distinguished work, to which I will add the numbers from the skeleton of a 155.5 cm long recent specimen of *Varanus australis* [= *V. varius*] I have at my disposal for comparative purposes (see Table, p. 101). So that this overview will fully correspond to our purposes, I have also given the counts taken from the fossil lizards.

This overview demands no commentary, because it can easily be seen that the number of vertebrae - except the constant number of 2 sacral vertebrae - is otherwise a very variable factor, to which one may not attribute any more than just specific value.

	Number of vertebrae					
Names of species	Cer	Dor	Lu	Sac	Caud	Comments
I. Recent lizards:						
Monitor du Nil	9	30	0	2	83	
Monitor de Java	7	22	0	2	117	
Monitor de la Nouvelle-Hollande	8	22	0	2	65	
Monitor piqueté de blanc	8	21	0	2	-	incompl.
Varanus australis	8	21	0	2	68	
II. Fossil lizards:						
Hydrosaurus lesinensis	9	30	0	2	24+x	
Acteosaurus tomasinii	'8'	27	0	2	17+x	
Aigialosaurus dalmaticus	7	20	0	2	15+x	
Adriosaurus suessi	-	'12'	0	2	65+x	
[*Mesoleptos zendrini*	-	27	0	2	9+x	JS added]

Much more characteristic than the vertebrae are the ribs, which for example are built alike in the genera *Hydrosaurus* and *Aigialosaurus* and stand out by their unformity, proportional shortness and significant strength. It may further be remarked that the ribs are pointed at their ends. The ribs of the recent varanids are longer and thinner and of a different shape altogether. Judging by the different shapes of the ribs the form of the middle part of the body must also have been different; while this part of the body in our fossil lacertid was very elongate and cylindrical, in the recent varanids it is quite bulbous. The limbs too correspond to this construction of the vertebral column with the ribs. On the skeleton of recent varanids we see well developed limbs of unequal size, i.e. almost always the forelimbs

are somewhat shorter than the hind. The difference in length of the two limbs comes to 1/3 - 1/11. -- If we compare the length of the hindlimbs with the total body length, it turns out that they come to 1/5 to 1/6 part of the total length. -- We see unequal limbs also on our fossil lizard, only that here the ratio of the lrngth of the hindlimb to the total length is much larger [i.e. smaller!] = 1:11-14, but it is also clearly indicated that the extremities of this fossil lacertid are significantly reduced. This reduction goes so far in some genera, as *Acteosaurus* and *Hydrosaurus*, that these animals were almost unable of making regular movements on the shore, and their forelimbs, half as long, also bear an unmistakable character of their aquatic way of life.

The relationship of our fossil lacertid with the recent varanids is thus based mainly on the analogous structure of the head. Let us now also investigate the differences that exist between these lizards. First of all I mention the quadrate bone. This bone in the varanids is strong though rod-shaped, while the same for example in our *Aigialosaurus* is large and broad (like a D) and - apparently - perforated near the lower end. But we observe a quadrate of this kind in the Pythonomorpha, especially in the genus *Clidastes* (see *Clidastes tortor* -- Cope 1875: pl. XIV, fig.1), thus in a genus in which we observe strongly reduced limbs along with a very elongate body; all this clearly arranged for a way of life accommodated to water. There is yet another important factor which ties the genus *Aigialosaurus* to the Pythonomorpha, and this is the presence of hypapophyses provided with processes on the anterior cervical vertebrae, just as we observe them in the genus *Clidastes* (see *Clidastes stenops* -- Cope 1875: pl. XVII). Although the extremities are not yet as strongly reduced as in the Pythonomorpha, yet it is without doubt that it represents a transition to this suborder of Lepidosauria containing serpentiform forms. This transition expresses itself principally in the strongly elongated body, the distinctly expressed tendency to reduction of the limbs, the presence of hypapophyses and the 'outlined' quadrate bone.

With respect to the description of the skull bones I mentioned that I can not say with certainty whether the slender bone anterior to the angular (Pl. IV, Fig. 1: 'Op.') is the splenial. If that is the case, which I consider very probable on other grounds, we would have yet another piece of evidence that the *Aigialosaurus* is related to the Pythonomorpha, for these possess just such a long splenial as the one I suppose for my *Aigialosaurus*.

Although neither the quadrate nor anything positive about the presence of hypapophyses is known from Kornhuber's *Hydrosaurus*, the similarly constructed vertebral column and ribs imply that this genus belongs to the same family as the genus *Aigialosaurus*. We can also assert the same for the genera *Acteosaurus* and *Adriosaurus*. -- But it follows quite unambiguously from our considerations that one cannot refer the fossil genera mentioned to either the family Varanidae or directly to the Pythonomorpha. They are to some extent collective types which present characters of two suborders, i.e. Lacertilia and Pythonomorpha. A necessary result of our considerations is to state that the inclusion of Kornhuber's lizard in the recent genus *Hydrosaurus* (=*Varanus*), which it resembles just in

the similar head shape, is unnatural. I therefore let this generic name drop as unfitting and inappropriate, and instead of this choose a new one: "*Pontosaurus*." But for all the mentioned genera (with the exception of *Mesoleptos*), i.e. *Acteosaurus*, *Aigialosaurus*, *Pontosaurus* and *Adriosaurus*, I create a new family which I name after the most distinctive genus, "Aigialosauridae." But to this family I add that of the Dolichosauridae, for both of which I erect the new group "Ophiosauria", which one has to place as a transitional group between the suborders Lacertilia and Pythonomorpha. -- The genus *Dolichosaurus* includes especially long-necked, serpentiform lizards with moderately developed limbs (coming from the Upper Cretaceous of Buham [sic?] in Kent, England), which absolutely matches our Lesina and Comen lizards in its whole physiognomy. -- With respect to the genus *Mesoleptos* I remark finally, that with consideration of its long ribs and well developed extremities, I regard it as belonging to the family Varanidae.

Systematic overview of the Cretaceous lizards discussed

Order: Lepidosauria

Suborder: Lacertilia

Family: Varanidae

Genus: *Mesoleptos*, Cornalia

Mesoleptos zendrini , Cornalia. Comen, Lesina

Group: Ophiosauria

Small or large lizards with elongated body and long tail. Head small, or long and pointed. Neck elongate or short, with 7, 8, 9 or 17 vertebrae. Vertebra procoelous. Extremities more or less reduced, with five digits. [JS: 'Ophiosauria' preoccupied, see Boulenger 1893, Nopcsa 1903 etc.]

Ist Family: **Aigialosauridae**, Kramb. Gorj.

I divide it into two parts:

A. Lizards with a small, pointed head; anterior extremities about half as long as posterior.

Genus *Acteosaurus*, H. v. Meyer

Acteosaurus tommasinii, H. v. M. -- Comen

Genus *Adriosaurus*, Seeley

Adriosaurus suessi, Seeley -- Comen

Genus *Pontosaurus*, Kramb. Gorj.

Pontosaurus (=*Hydrosaurus*) *lesinensis* Kornhuber -- Lesina

B. Lizards with a long, pointed head and approximately equal extremities.

Genus *Aigialosaurus* , Kramb. Goj.

Aigialosaurus dalmaticus, Kramb. Gorj. -- Lesina

Aigialosaurus novaki, Kramb. Gorj. -- Lesina

IInd Family: **Dolichosauridae**

Genus *Dolichosaurus*, Owen

Dolichosaurus longicollis, Owen -- Buham.