

## SAURIANS IN CHINA AND THEIR RELATIONS

Friedrich von Huene

(University of Tübingen)

The knowledge of fossil Saurians from China is beginning to grow during the last years. Therefore an attempt is being made here to see them as part of the general knowledge. From Permian time hardly anything is known. But from Triassic to Cretaceous time there are a good many forms. With a single exception they are terrestrial.

**Upper Permian:**

*Urumchia* Young 1952 Singkiang Pristerognathidae Therocephalia.

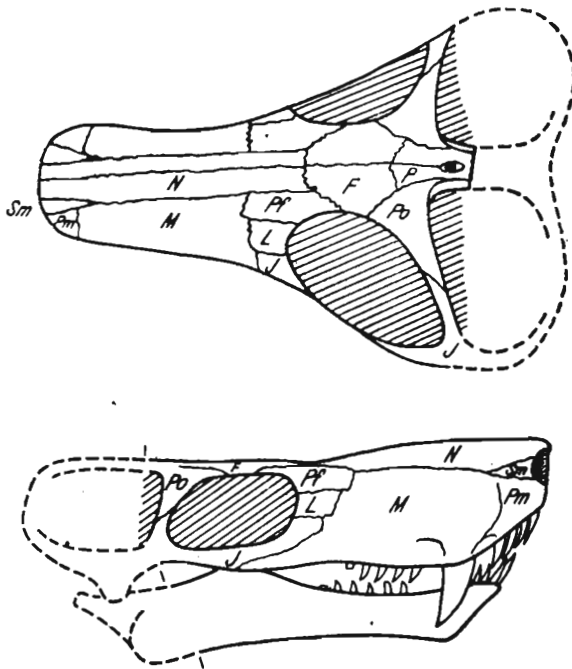


Fig. 1 *Urumchia lii* Young, Upper Permian of Singkiang. 1/2 nat. size.  
From above and right side views.

This is a primitive Therocephalian whose nearest relatives are in Russia, but specially more in South Africa. These Therocephalians are rapacious animals of

that epoch. Therefore plant-eating animals and smaller animals must have existed at that time as their food. But we do not know them from China.

### Lower Trias:

<i>Neoprocolophon</i>	Young	1957	Shansi	Nyctiphuretidae	Procolophonia
<i>Santaisaurus</i>	Koh	1940	Shansi	Nyctiphuretidae	Procolophonia
<i>Dicynodon</i>	Owen	1845	Singkiang	Dicynodontidae	Anomodontia
<i>Lystrosaurus</i>	Cope	1870	Singkiang	Lystrosauridae	Anomodontia
<i>Chasmatosaurus</i>	Haughton	1924	Singkiang	Proterosuchidae	Pseudosuchia

These genera go nicely together with those known from South Africa and from Russia of the same time. In South Africa this fauna contains a wealth of different forms. The three last-named genera are there as well. Similar Anomodonts also occur in Russia, and even in Tongking.

Footprints in "eo-mesozoic" in Mandschuria possibly lower Jurassic called *Jeholosauripus* Yabe 1940 are possibly made by three-toed Ornithopoda. Mentioned are also unidentified remains of Chelonia, without age and locality.

### Middle and Upper Trias:

<i>Keichousaurus</i>	Young	1958	Keichou	SW-China	Pachypleuro- sauridae	Sauropterygia
Dermal plates of Labyrinthodonts	Huene	1958	Shansi		Metoposauridae	
<i>Sinokannemeyeria</i>	Young	1937	Shansi		Kannemeyeriidae	Anomo- dontia
<i>Platyognathus</i>	Young	1944	Yünnan		Euparkeriidae	Pseudo- suchia
<i>Microchampsia</i>	Young	1951	Yünnan		Sphenosuchidae	Pseudo- suchia
<i>Bienotherium</i>	Young	1940	Yünnan		Ictidosauria	Therapsida
<i>Kumminia</i>	Young	1947	Yünnan		Ictidosauria	Therapsida
<i>Lufousaurus</i>	Young	1948	Yünnan		Podokesauridae	Coeluro- sauria
<i>Sinosaurus</i>	Young	1948	Yünnan		Teratosauridae	Carnosauria
<i>Gyposaurus</i>	Broom	1911	Yünnan		Thecodontosauridae	Pro- sauropoda
<i>Yunnanosaurus</i>	Young	1942	Yünnan		Plateosauridae	Prosauro- poda
<i>Lufengosaurus</i>	Young	1941	Yünnan		Plateosauridae	Prosauro- poda.

In the middle Trias of China is only the primitive Sauropterygian *Keichousaurus*, probably not a marine, but costal or sweetwater-animal. Its relatives are

in western Europe.

Metoposaurid sterospondyl Labyrinthodonts are largely distributed in western Europe, but also occur in India, and some more distant relatives in North America. In the famous region of Lufeng in Yünnan is the big fauna of Saurischians, similar with those in India, in South Africa and in Germany, England and eastern North America. One Chinese genus (*Gyposaurus*) is even identical with one in South Africa. The Pseudosuchia are also distributed through all of the named countries. Of the same importance are the Theromorphs: the Anomodont *Sinokannemeyeria* in Shansi and the Ictidosauria in Yünnan. This demonstrates, that all sorts of Theromorphs in fact are living through China as they specially did in South and East Africa, in India, and in all other continents. The Ictidosaurus due the root of the mammals, also in China, because in a somewhat later time primitive mammals also occur in China, as in other continents. The theromorphs in upper triassic time are at their end, but the Saurischians have their larger future in later periods.

#### Upper Jurassic:

<i>Sinocoelurus</i>	Young	1942	Szechuan	Coeluridae	Coelurosauria
<i>Mamenchisaurus</i>	Young	1954	Szechuan	Titanosauridae	Sauropoda
<i>Szechuanosaurus</i>	Young	1942	Szechuan	Allosauridae	Carnosauria
<i>Omeisaurus</i>	Young	1939	Szechuan	Astrodonitidae	Sauropoda
<i>Sanpasaurus</i>	Young	1944	Szechuan	Camptosauridae	Ornithopoda
<i>Hsisosuchus</i>	Young	1953	Szechuan	Protosuchidae	Protosuchia
<i>Peipehsuchus</i>	Young	1948	Szechuan	Pholidosauridae	Mesosuchia
<i>Sunosuchus</i>	Young	1948	Kansu	Pholidosauridae	Mesosuchia
<i>Monjurosuchus</i>	Endo	1940	Jehol	Sphenodontidae	Rhynchocephalia
<i>Yabeinosaurus</i>	Endo et Shikama	1942	Mongolia	Gekkenidae	Lacertilia
<i>Teilhardosaurus</i>	Shikama	1947	Mongolia	Agamidae	Lacertilia

Here is a continuation of the rapacious Saurischia and the Sauropoda come in addition. And this is the same in India, Europe and North America. the big Saurischians have the beginning of their great time everywhere. The first Chinese Ornithopode also come in, *Sanpasaurus* is a very early one. Among the smaller lizards there is only one Rhynchocephalian and two Lacertilia. The crocodiles have begun with three primitive forms. In other countries it is the same, but they are known more numerous.

#### Lower Cretaceous:

<i>Velociraptor</i>	Osborn	1924	Mongolia	Compsognathidae	Coelurosauria
<i>Saurornithoides</i>	Osborn	1924	Mongolia	Compsognathidae	Coelurosauria
<i>Euhelopus</i>	Romer	1952	Shantung	Astrodonitidae	Sauropoda
<i>Tienschanosaurus</i>	Young	1937	Singkiang	Astrodonitidae	Sauropoda

<i>Asiatosaurus</i>	Osborn	1924	Mongolia	Diplodocidae Sauropoda
<i>Mongolosaurus</i>	Gilmore	1933	Mongolia	Diplodocidae Sauropoda
<i>Iguanodon</i>	Mantell	1825	Mongolia	Iguanodontidae Ornithopoda
<i>Proiguanodon</i>	Osborn	1923	Mongolia	Psittacosauridae Ornithopoda
<i>Psittacosaurus</i>	Osborn	1923	Mongolia	Psittacosauridae Ornithopoda
<i>Sauroplices</i>	Bohlin	1953	Kansu	Nodosauridae Thyreophora
<i>Shamosuchus</i>	Mook	1924	Mongolia	Crocodylidae Crocodylia

The big rapaceous Saurischia have not been found yet in China, except two small Compsognathids. But some big Sauropods are there as everywhere in that time; they are similar of American forms. As in Europe and in North America the Ornithischia are well represented in Iguanodontids and Psittacosaurus. And one heavy Nodosaur is also there. These Thyreophora are living in herds in North America. And only a single true crocodile has been found. The future will probably show more of them.

#### Upper Cretaceous:

<i>Chienkosaurus</i>	Young	1958	Shantung	Allosauridae Carnosauria
<i>Majungasaurus</i>	Depere	1955	Mongolia	Dinodontidae Carnosauria
<i>Tarbosaurus</i>	Malejev	1955	Mongolia	Dinodontidae Carnosauria
<i>Tyrannosaurus</i>	Osborn	1905	Mongolia	Dinodontidae Carnosauria
<i>Alectrosaurus</i>	Gilmore	1933	Mongolia	Dinodontidae Carnosauria
<i>Chiayusaurus</i>	Bohlin	1953	Kansu	Titanosauridae Sauropoda
<i>Taninus</i>	Wiman	1929	Shantung	Prohadrosauridae Hadrosauria
<i>Mandschurosaurus</i>	Riabini	1930	Amur	Hadrosauridae Hadrosauria
<i>Saurolophus</i>	Brown	1905	Mongolia	Saurolophidae Hadrosauria
<i>Tsintaosaurus</i>	Young	1958	Shantung	Lambeosauridae Hadrosauria
<i>Bactrosaurus</i>	Gilmore	1933	Mongolia	Saurolophidae Hadrosauria
<i>Niponosaurus</i>	Nagao	1936	Sachalin	Lambeosauridae Hadrosauria
<i>Protoceratops</i>	Granger et Gregory	1923	Mongolia	Kansu Ponderopoda
<i>Microceratops</i>	Bohlin	1953	Kansu	Protoceratopsidae Ponderopoda
<i>Pentaceratops</i>	Osborn	1923	Mongolia	Ceratopsidae Ponderopoda
<i>Stegosauroides</i>	Bohlin	1953	Kansu	Acanthopholinae Thyreophora
<i>Lametasaurus</i>	Matley	1923	Mongolia	Nodosaurinae Thyreophora
<i>Peishansaurus</i>	Bohlin	1953	Kansu	Nodosaurinae Thyreophora
<i>Syrmosaurus</i>	Malejev	1953	Mongolia	Nodosaurinae Thyreophora
<i>Vimincaudus</i>	Malejev	1952	Mongolia	Nodosaurinae Thyreophora
<i>Talarurus</i>	Malejev	1952	Mongolia	Nodosaurinae Thyreophora
<i>Heishansaurus</i>	Bohlin	1953	Kansu	Nodosaurinae Thyreophora
<i>Pinacosaurus</i>	Gilmore	1933	Mongolia	Nodosaurinae Thyreophora
<i>Telmasaurus</i>	Gilmore	1943	Mongolia	Varanidae Lacertilia
<i>Isodontosaurus</i>	Gilmore	1943	Mongolia	Anguidae Lacertilia

*Sinophiosaurus* Young 1944 Szechuan Pliosauridae Sauropterygia

In upper Cretaceous time there must have been a good communication between China and America as Saurischia and Ornithischia demonstrate near relationship. The Carnosaurian *Tyrannosaurus* and the Ponderopode *Pentaceratops* are in both countries. The Thyreophore *Lametasaurus* occurs in China and in Central India. The Lacertilia are not in any way interesting. There is in Szechuan a single marine Plesiosaurian quite isolated.

### Tertiary:

<i>Asiatosuchus</i>	Mook	1940	Upper Eocene	Mongolia	Crocodylidae	Eusuchia
<i>Tienosuchus</i>	Young	1948	Eocene	Hunan	Crocodylidae	Eusuchia
<i>Lianghsuchus</i>	Young	1948	Eocene	Hunan	Alligatoridae	Eusuchia
<i>Arretosaurus</i>	Gilmore	1943	Eocene	Mongolia	Arretosauridae	Lacertilia
<i>Shinisaurus</i>	Ahl	1931	Paleocene	Mongolia	Placosauridae	Lacertilia
<i>Placosaurus</i>	Gervail	1848	Eocene	Mongolia	Placosauridae	Lacertilia
<i>Glyptosaurus</i>	Marsh	1871	Eocene	Mongolia	Anguidae	Lacertilia
<i>Crythiosaurus</i>	Gilmore	1949	Oligocene	Mongolia	Amphisbaenidae	Lacertilia

The above enumeration of Chinese fossil saurians demonstrates the present beginning of our knowledge of the faunal history in eastern part of Asia and for the future we expect a good augmentation, especially in the older formations.