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辽宁中华弓鳍鱼(*Sinamia*)一新种[1)]

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摘要：记述了辽宁西部九佛堂组和义县组中华弓鳍鱼一新种：辽宁中华弓鳍鱼*Sinamia liaoningensis*, 并与该属的其他种进行了比较。新材料具有中华弓鳍鱼科的3个定义特征：单一的顶骨，三对额外肩胛骨和膜质翼耳骨短并与顶骨等长，无疑应归入该科。新种的后眶下骨较小，背鳍长大，鳞片菱形，因此，归入中华弓鳍鱼属。辽宁中华弓鳍鱼在以下几个方面不同于中华弓鳍鱼的5个已知种：体型短粗，吻骨较短，鼻骨近四方形，围眶骨较多(6), 前鳃盖骨强烈弯曲，背鳍条较少(18), 尾鳍条较多(16), 臀鳍鳍基起点到鱼体背缘的鳞列较多(32), 鳞片后缘不具锯齿，尾鳍具有纤维状的角质鳍条。

关键词：辽宁西部，早白垩世，义县组，九佛堂组，中华弓鳍鱼

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A NEW SPECIES OF *SINAMIA* FROM WESTERN LIAONING, CHINA

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Abstract A new species of sinamiid fish, *Sinamia liaoningensis*, is described from the Barremian-Aptian Yixian and Jiufotang formations of western Liaoning, China and the morphology of the sinamiid fishes is reviewed. The new materials reveal three synapomorphies of the Sinamiidae proposed by Grande and Bemis (1998): the presence of only a single median parietal; three pairs of extrascapular bones; and short dermopterotic about equal in length to parietal length. The new species was attributed to *Sinamia* because it has three synapomorphies of the genus: relative small postinfraorbitals, a long dorsal fin and rhombic scales. The new species is a big podgy fish and it differs from all other species of the genus in the shape of the rostral, nasal, preopercle, the size and shape of infraorbitals, more subinfraorbitals (3), less dorsal fin rays (18), more caudal fin rays (16), more scale rows (32) between the origin of the anal fin and the dorsal margin of the body, and lack of serrated scales. The anterior half of the caudal fin rays of *S. liaoningensis* sp. nov. has remains of thin fibrous actinotrichia.

Key words western Liaoning, Early Cretaceous, Yixian Formation, Jiufotang Formation, Amiidae

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1 Introduction

Sinamia was first described by Stensiö (1935) based on materials collected by Tan and Zdansky from the Early Cretaceous Mengyin Series of Shandong Province in 1923 (Fig.1). He named the fish *Sinamia zdanskyi.* The fish is embedded in fine grained, grey or grey-green sandstone. Besides the fish, terrestrial plants, freshwater molluscas, *Lycoptera sinensis*, dinosaurs and turtles were also found in the series. In 1950s, a great number of well preserved *Sinamia zdanskyi* were found in Gansu, Shannxi, Ningxia and Nei Mongol around the Ordos Plateau. Liu and his colleagues (1963) restudied the fish on these new materials. Su (1973) reported a new species of *Sinamia*, *S. huananensis*, from the Early Cretaceous Yangtang Formation of Anhui Province. Wei (1976) described *Sinamia chinhuaensis* based on a specimen from the Early Cretaceous Guantou Formation of Zhejiang Province. Li (1984) named *Sinamia luozigouensis* according to the two specimens from Luozigou Formation in Jilin Province.

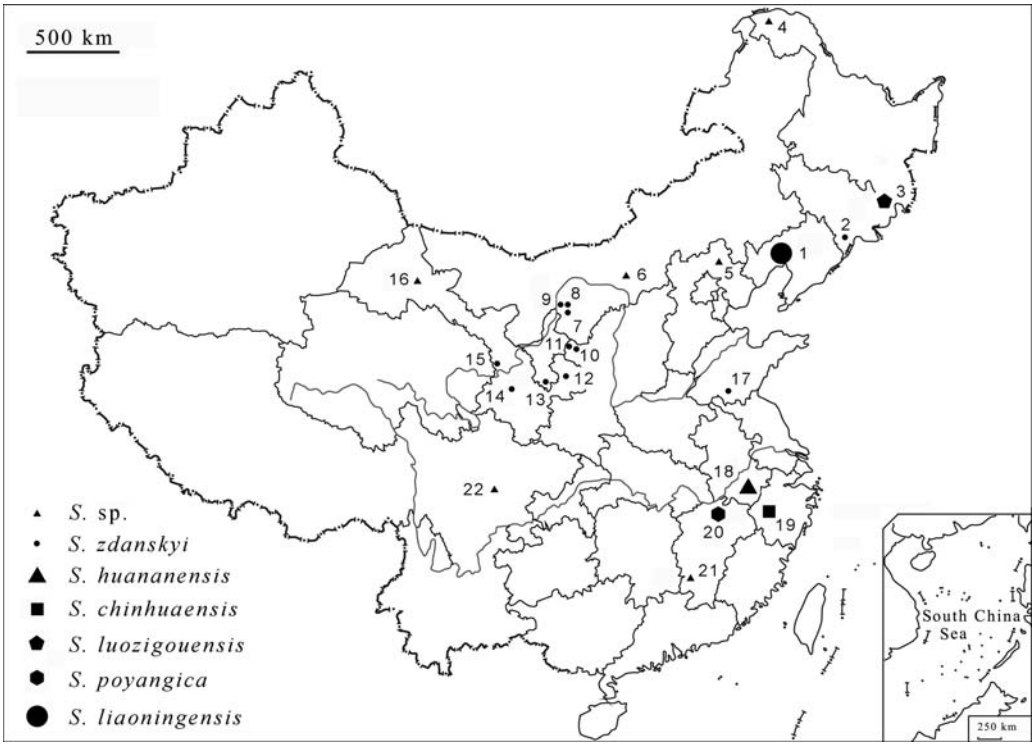

Fig. 1 Distribution of *Sinamia* in China

1. Yixian and Beipiao, Liaoning Province; 2. Tonghua; 3. Wangqing, Jilin Province; 4. Tahe, Heilongjiang Province; 5. Luanping, Hebei Province; 6. Guyang; 7—9. Vicinity of Etuokeqi, Nei Mongol; 10—11. Wuqi, Shaanxi Province; 12. Huanxian, Gansu Province; 13. Guyuan, Ningxia Hui Autonomous Region; 14. Lintao; 15. Lanzhou; 16.Yumen, Gansu Province; 17. Mengyin, Shandong Province; 18. Shexian, Anhui Province; 19. Jinhua, Zhejiang Province; 20. Yiyang; 21. Taihe, Jiangxi Province; 22. Meishan, Sichuan Province

The skull of the specimen is severely damaged, providing nothing valuable information. The postcranial skeleton is very similar to that of *Sinamia zdanskyi*. Therefore, the validity of this species is not reliable. Su and Li (1990) erected the fifth species of the genus, *Sinamia poyangica*, based on the materials from the Early Cretaceous Shixi Formation of Jiangxi Province. Besides these five species, *Sinamia* sp. was reported from Jilin, Hebei, Nei Mongol, Sichuan and Jiangxi Provinces (Liu and Su, 1983). *Sinamia* has not been found from outside China until recent years. Lionel et al. (2007) reported three articulated partial skulls and some isolated bones of a sinamiid fish from the Early Cretaceous Sao Khua Formation, Northeast of Thailand. Yabumoto et al. (2006) reported remains of *Sinamia* sp. from the Early Cretaceous Kuwajima Formation in Ishikawa Prefecture, Japan. His specimens include 18 skull bones and 211 detached scales. A recently found *Sinamia* sp. from the Sanlianhe Coal Mine site, Helongjiang Province represents the northernmost distribution of the genus (Li et al. 2010). In addition to *Sinamia*, fossil amiids were also found in China recently (Chang et. al. 2010) implying the palaeobiogeographical significance of East Asia on study of Amiiformes.

Sinamia from Liaoning was first reported by Jin et al. (1995) from the Jiufotang Formation, including a nearly complete specimen from Chaoyang County and some detached scales from Fuxin County. They referred the specimens to *S. zdanskyi*. Thanks to the extensive excavations for feathered dinosaurs and birds in recent years, many specimens of *Sinamia* were discovered from both the Jiufotang and Yixian formations of western Liaoning and neighboring areas, including some exceptionally well preserved ones. This makes it possible to carry a detailed morphological study of the fish.

The materials studied were first reported in the Fourth International Meeting on Mesozoic Fishes (Zhang, 2005), and this paper provides a detailed description.

2 Materials and methods

The specimens studied are deposited in the collection of the IVPP (Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences). The specimens were collected in the last decade during the field works in western Liaoning, in which some were discovered by Dr. Wang Xiaolin and his field team. Most specimens are skeletons but one from Dijiagou and one from Toudehe of Yixian are impressions. The scales for microscopic structure study were taken from the anterior part of the left side of a large detached specimen. The following comparative materials were examined: *S. zdanskyi* (IVPP V 1141.1), *S. huananensis* (IVPP V 4087), *S. chinhuaensis* (Zhejiang Museum M. 20-1), *S. luozigouensis* (IVPP V 6760-1, 2). Except for M. 20-1, which is deposited in Zhejiang Museum, other specimens are all deposited in IVPP. Fossils were prepared using fine needles under a Wild TYP 308700 microscope.

3 Systematic paleontology

Division Halicostomi Regan, 1923 (*sensu* Patterson, 1973)
Subdivision Halecomorphi Cope, 1872 (*sensu* Patterson, 1973)
Order Amiiformes Hay, 1929 (*sensu* Grande & Bemis, 1998)
Superfamily Amioidea Bonaparte, 1838 (*sensu* Grande & Bemis, 1998)
Family Sinamiidae Berg, 1940
Genus *Sinamia*, Stensiö, 1935

Type species *Sinamia zdanskyi* Stensiö, 1935.

***Sinamia liaoningensis* sp. nov.**

Sinamia zdanskyi Jin et al., 1995, pp.169-193, figs.1-11, pl.I-II
Sinamia sp. Zhang, 2005, p.277

Diagnosis A species of *Sinamia* different from other species of the genus in the shape of the body, rostral bone, nasal bone, and preopercle; the size and shape of infraorbitals; more subinfraorbitals (3), less number of dorsal fin rays (18), more caudal fin rays (16), more scale rows (32) from the beginning of the base of the anal fin to the dorsal margin of the body, and no serrated scales. Anterior half of the caudal fin rays with remains of thin fibrous actinotrichia.

Holotype IVPP V 14608, a well preserved complete skeleton.

Additional materials IVPP V 12700.1-2, V 12700.4B, V 17973A-B, V 17974, V 18332.1-2.

Horizon and locality V 14608, V 12700.1-2, V 18332.1-2 from Jiufotang Formation, Xierhuqiao, Yixian County, Liaoning Province (type locality); V 17973A-B from Jiufotang Formation, Dijiagou, Yixian county, Liaoning Province; V 12700.4B from Yixian Formation, Toudaohe, Yixian County, Liaoning Province; V 17974 from Yixian Formation, Sihetun, Beipiao City, Liaoning Province.

4 Description

The holotype (Fig.2) is well preserved and its standard length is 36.5 cm and the total length is 42.5 cm. The specimens V 17973A-B (Fig.3), represented by impressions, are somewhat curved and therefore some of its measurements are approximate. The specimens V 12700.1-2 are larger than the specimens mentioned above with a total length of about 48 cm. These two specimens (V 12700.1-2) were glued together from broken pieces and therefore were not measured in detail. Ray counts: pectoral fin, 12-14; dorsal fin, 18; pelvic fin, 6; anal fin, 5-6; caudal fin, 16. For measurements and meristics, see Table 1.

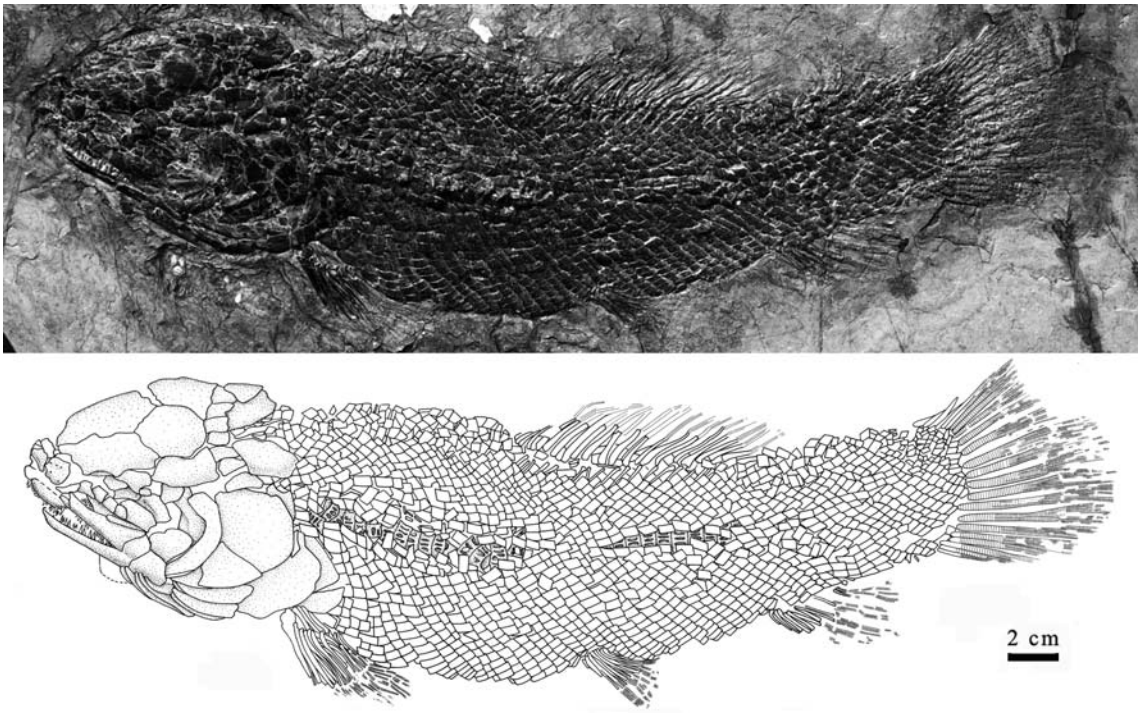

Fig. 2 *Sinamia liaoningensis* sp. nov., holotype IVPP V 14608 in left lateral view

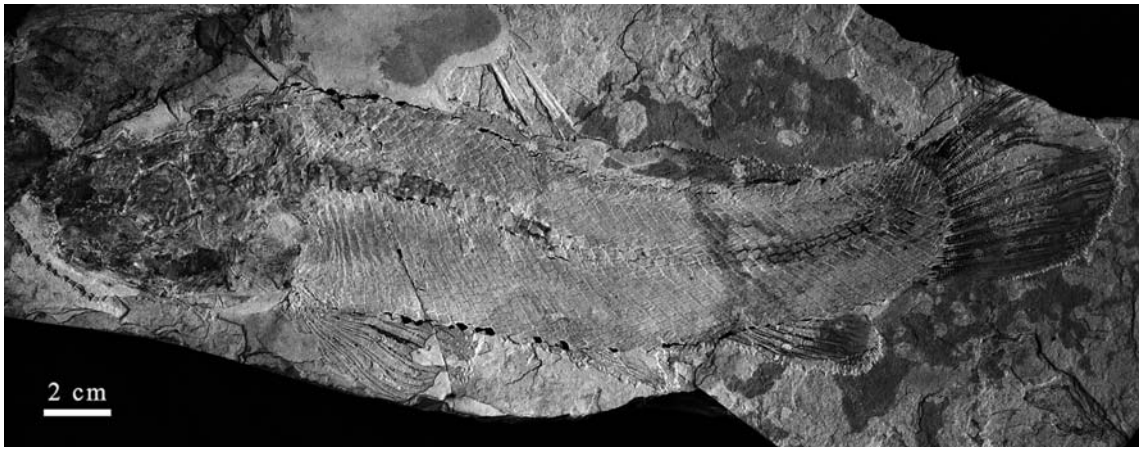

Fig. 3 *Sinamia liaoningensis* sp. nov., IVPP V 17973A

Table 1 Measurements and meristics of *Sinamia liaoningensis* sp. nov. (mm)

Specimen	V 14608	V 17973A	Specimen	V 14608	V 17973A
Total length	425	310	Caudal peduncle length	35	28
Standard length	365	261	Dorsal fin base	80	~ 50
Body depth	100	60	Anal fin base	30	30
Head length	107	77	Dorsal fin rays	18	—
Head depth	90	57	Anal fin rays	6	5
Prepectoral length	107	75	Pelvic fin rays	6	6
Prepelvic length	220	160	Pectoral fin rays	12	—
Predorsal length	187	~ 150	Caudal fin rays	16	16
Preanal length	290	200	Scale rows from the base of anal fin to the dorsal margin of the body	32	32
Caudal fin length	62	50			

Braincase The bones of the skull (Fig.4) roof is relatively smooth without coarse ornamentations as in *S. zdanskyi*. The rostral is V-shaped, which is shorter than that in *S. zdanskyi*. The ethmoid commissure runs along its anterior margin. The nasal is large and a nearly quadrate bone. The well-preserved supraorbital canal begins anteriorly in the posteroventral corner of the nasal, from where it first goes in an arch forwards and upwards to the anterodorsal part of the nasal, thence continuing backwards to the posterodorsal corner of the nasal, as in *S. zdanskyi*. The canal issues several tubuli and opens outwards with about eight pores. The antorbital is rather short as compared with that in *S. zdanskyi*. Two openings of sensory canal can be seen on the antorbital. Only one pore is shown on the lachrymal (ifo1). The frontal is large, slightly broader posteriorly than anteriorly. The lateral margin above the orbital opening is excavated. The anterior margin of the bone has a very shallow notch. The suture of the two frontals is curved. The sensory canal on the frontal is difficult

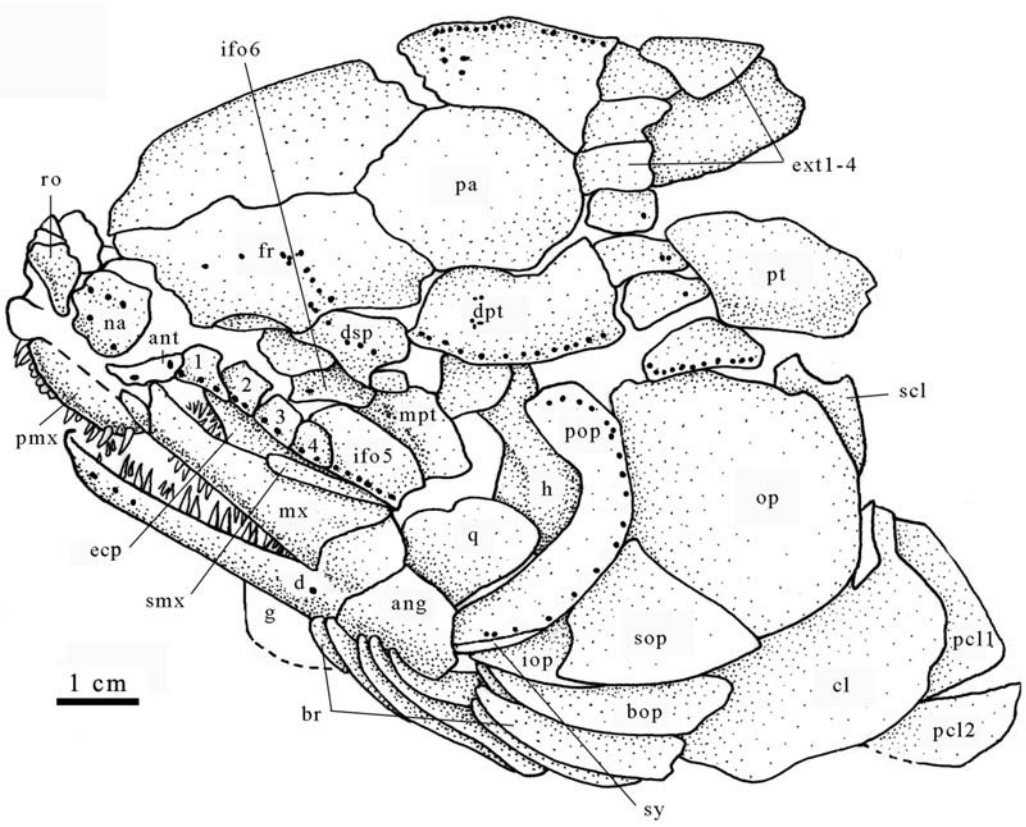

Fig. 4 The skull of *Sinamia liaoningensis* sp. nov., holotype IVPP V 14608

Abbreviations: ang. angular隅骨; ant. antorbital眶前骨; bop. branchiopercle鳃鳃盖骨; br. branchiostegal 鳃条骨; cl. cleithrum匙骨; d. dentary齿骨; dpt. dermopterotic膜质翼耳骨; dsp. dermosphenotic膜质蝶耳骨; ecp. ectopterygoid外翼骨; ext1-4. extrascapular 1-4额外肩胛骨1-4; fr. frontal额骨; g. gular喉板骨; h. hyomandibular舌颌骨; 1-4, ifo5-6. first to sixth infraorbitals眶下骨1-6; iop. interopercle间鳃盖骨; mpt. metapterygoid后翼骨; mx. maxilla上颌骨; na. nasal鼻骨; op. opercle鳃盖骨; pa. parietal顶骨; pcl1-2. postcleithrum 1-2后匙骨1-2; pmx. premaxilla 前上颌骨; pop. preopercle前鳃盖骨; pt. posttemporal 后颞骨; q. quadrate方骨; ro. rostral吻骨; scl. supracleithrum上匙骨; smx. supramaxilla辅上颌骨; sop. subopercle下鳃盖骨; sy. symplectic续骨

to trace but a series of pores can be seen, which are situated first along the middle part of the bone and then to the lateral margin. The parietal is a large median plate as in other sinamids. The bone is sutured posteriorly to two median extrascapulars, laterally to the dermopterotic and anteriorly to the frontals. The posterior margin of the bone is not as straight as that in *S. zdanskyi*, while its lateral margin is nearly straight. Anteriorly, the bone becomes pointed and fits into the two frontals. The dermopterotic is short and about equal to parietal in length. Its medial margin is somewhat concave, suturing with the slightly convex lateral margin of the parietal. Posteriorly the bone is quite straight and sutured with two extrascapulars. The dermopterotic is connected by a suture to the frontal and dermosphenotic anteriorly. Most pores are along the ventral margin of the dermopterotic, but five pores are at the anterior part of the bone, different from the case in *S. zdanskyi* where these anterior pores are missing. A bone lateral to the frontal and dermopterotic is recognized as the dermosphenotic. It is sutured dorsally to the frontal and posteriorly to the dermopterotic. Four pores can be seen along the middle part of the dermopterotic. There are four independent extrascapulars on each side of the median line, and all are rectangular and longer than broad except the most lateral one which is roughly triangular in shape and slightly larger than others. Eleven pores are present along the ventral margin of the most lateral extrascapular, but only one or two in other extrascapulars. The parasphenoid (V 12700.2) is only partially exposed. It is large and has a strong processus ascendens. The vomer is not preserved.

Circumorbital ring The circumorbital ring (V 14608, V 12700.4B) is well preserved except for the supraorbitals, which are not shown in the specimens studied. There are six infraorbitals, one more than in *S. zdanskyi*, including the lachrymal (ifo1), three subinfraorbitals (ifo2-4), and two postinfraorbitals (ifo5-6). The lachrymal is small with a posteroventral process. The sensory canal enters the lachrymal at its anteroventral corner. Three pores can be seen along the ventral margin of the bone. There are three subinfraorbitals, one more than in *S. zdanskyi*. These bones are nearly quadrilateral and similar in size. The fourth one is situated completely in a deep curve on the anterior margin of the ventral postinfraorbital. The posterior margin of the orbit is formed mostly by the two postinfraorbitals, which are somewhat smaller than the two corresponding bones in *S. zdanskyi*, leaving a wide gap between them and the preopercle. The anterior margin of the ventral postinfraorbital has a deep concavity at the anteroventral corner, which receives the last subinfraorbital. The posterior margin is somewhat concave without a long process as found in *S. zdanskyi*. The bone is short and not twice longer than the dorsal postinfraorbital as shown in the type species of the genus. The dorsal postinfraorbital is partly covered by the demosphenotic with only its lower part visible in the holotype. The impression of the bone in V 12700.4B is also partially shown with the dorsal margin unclear. As far as can be judged, this bone is smaller than the ventral one. The pores of the infraorbital sensory canal are situated along the ventral margin of the subinfraorbitals and the ventral postinfraorbital, but the number of the pores cannot be counted.

Jaw and suspensorium The premaxilla is incompletely preserved and therefore the

outline of the bone cannot be seen. Conical teeth are present on the oral margin of the bone, with the posterior ones larger than the anterior ones. The number of teeth is difficult to count because of the poor preservation. The maxilla is large and short. The head of the bone is stout and curved medially. The posterior end of the maxilla is deep and bears a broad notch (a synapomorphy of halecomorphs). The oral margin of the bone bears numerous teeth, which decrease in size posteriorly. The maxillary teeth are smaller than the posterior ones on the premaxilla and also smaller than those of *S. zdanskyi*. A definite count of maxillar teeth is not possible due to the preservation. Above the posterior part of the maxilla is a small elongated supramaxilla, similar in shape and position to the corresponding bone of *S. zdanskyi*. The length of the bone is about half that of the maxilla.

The lower jaw is well preserved on the holotype. The dentary is large and long, bearing a single row of large conical teeth. The posterior part of the bone increases in height to form the coronoid process. The coronoid process is formed by the dentary only. No supraangular is recognized in the available specimens. The angular is of the same shape as in *S. zdanskyi* but shorter. The sensory pores are along the middle part of the mandible but the number is uncertain.

A bone partially shown above the anterior part of the maxilla is identified as the ectopterygoid according to the teeth on it. The metapterygoid is visible on the holotype but its shape is unclear. The quadrate is large and triangular in shape. The hyomandibular is a flat bone with a fairly strong concave anterior margin just as in *S. zdanskyi*, but its opercular process is covered by the preopercle. Below the lower end of the preopercle is a bone that only preserves its ventral margin, and is identified as the sympletic here. The dermopalatine and entopterygoid are not exposed in the specimens.

Opercular series The opercular series bones are almost perfectly preserved. The preopercle is narrow and more arched than that in *S. zdanskyi*. The upper end of the bone is large, but the bone is narrowed downwards. The anteroventral margin of the bone is attached to the quadrate. The preopercular canal leaves about 18 pores along the dorsal, posterior and ventral margins of the bone. The distinct character of the sensory canal on this bone is the presence of two pores at the dorsal margin, contrary to the situation in *S. zdanskyi* where these pores are missing. The opercle is large with rounded dorsal and posterior edges and straight anterior and ventral edges. The subopercle, lying between the opercle and interopercle, is triangle in shape and much shorter than that in *S. zdanskyi* and *Amia.* The anterodorsal projection which fits into an anteroventral notch on the opercle is not as pronounced as that in *S. zdanskyi* and *Amia.* The posteroventral edges of subopercle and interopercle are articulated with the lateral surface of the last branchiostegal ray (the branchiopercle). The interopercle is a rather small triangular bone, similar to that in *S. zdanskyi*.

There are 9 elongated plate-like branchiostegal rays in the holotype, less than in *S. zdanskyi* (14). The most posterior one of these bones is enlarged and termed the branchiopercle following Grande and Bemis (1998). Anterior to the branchiostegals is the median gular that is

only partially exposed.

Pectoral girdle and paired fins The posttemporal lies posterior to the extrascapulars of the skull with its anterior part underlying the extrascapulars. The bone is large and four-sided. The dorsal margin, the longest one, is rounded while the other three somewhat concave. No scale covers the bone as it does in *Amia calva*. No pore of sensory canal can be seen on the bone. The supracleithrum is only partially visible with a concave dorsal margin. One pore is present at the dorsal margin of the bone. Two postcleithrums are found as in *S. huananensis*. The upper one is larger and deeper than the lower one. The cleithrum is rather large and broad, with the ventral limb longer than the dorsal one. At the junction between its dorsal and ventral limbs, there is a small ornamented area, the only ornamentation found in the skull. The pectoral fin is almost perfectly preserved. There are four elongated proximal radials which are articulated directly to cleithrum (Fig.2). The number of the pectoral fin rays is 12-14, all branched except the first two, which are unbranched and very strong. The proximal end of the first ray is remarkably enlarged and articulated to the ventral margin of the cleithrum. The pelvic fin is small with 6 rays, all branched distally. The pelvic bone is unknown.

Dorsal and anal fins and supports The dorsal fin is shorter than that in *S. zdanskyi* and has only 18 principal rays supported by 17 proximal radials. The middle and distal radials are not visible. The anal fin is situated more posteriorly than in *S. zdanskyi* and lies behind the posterior part of the dorsal fin. It contains 5 segmented fin rays in specimens V 14608, V 12700.4B, but 6 in V 17973.

Vertebral column The holotype and other complete specimens are covered with scales and therefore the number of the vertebrae cannot be counted. Some vertebral centra are partially shown on the holotype. In specimen V 17974, 18 centra are preserved and well ossified. The centra are amphicoelous, deeper than long, with several deep irregular grooves on the lateral side. Some neural spines and ribs can be seen in this specimen.

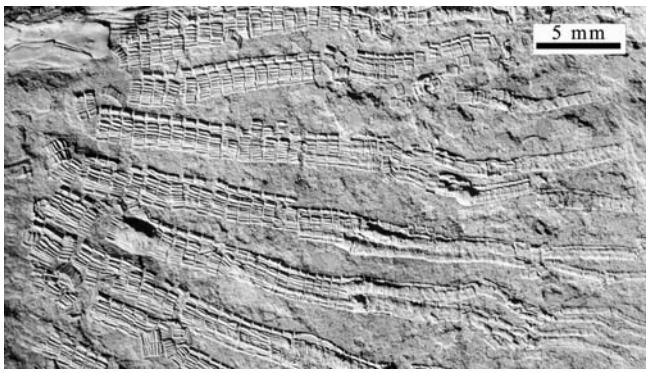

Fig. 5 The caudal fin of *Sinamia liaoningensis* sp. nov., IVPP V 12700.4B, showing the remains of thin fibrous actinotrichia

Caudal skeleton and caudal fin The caudal skeleton is covered by scales and cannot be seen. The caudal fin is rounded convexly in outline. There are 16 principal rays, of which the inner 14 are branched. Several short, non-segmented epaxial rays (6 in V 17973A) and hypaxial rays are present anterior to the principal rays. The anterior half of the caudal fin rays has remains of thin fibrous actinotrichia (Fig.5).

Scales The scales are rhombic and covered with ganoin on their exposed area. Most scales are lower than long, particularly the ventral ones. The scales near the dorsal margin of

the body are not as narrow as others and some are even rounded. Articular pegs and articular sockets are entirely absent. The posterior margins of all scales are smooth, different from in *S. zdanskyi* and other species of the genus where some of the trunk-scales are serrated. The number of scales along the vertebral column is about 51 and the number of scale rows from the beginning of the base of anal fin to the dorsal margin of the body is counted as 32.

The microscopic structure (Fig.6) of the scale is lepidosteid type (Schultze, 1993). The base lamellar bone layer is directly overlain by ganoin without an intercalated dentine layer. The canals of Williamson extend inward from the base to the ganoine layer and do not branch below the ganoin. The ganoine layer is relatively thin in the middle part and thick on the margin of the scale.

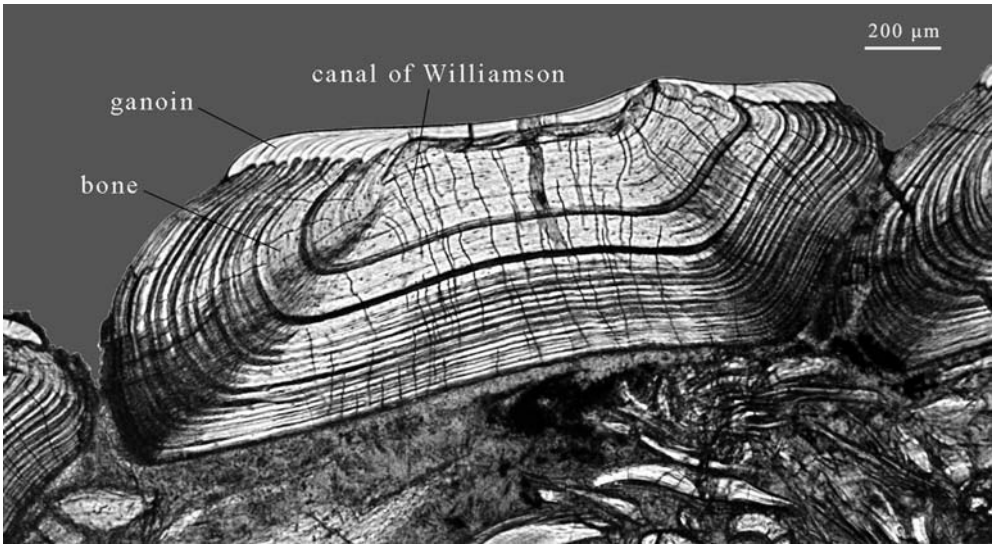

Fig. 6 Cross section of the scales of *Sinamia liaoningensis* sp. nov., IVPP V 18332.1
The photograph was taken with a Zeiss Laser Scanning Microscope (LSM 5 PASCAL)

5 Discussion

The new materials reveal the three synapomorphies of the Sinamiidae as proposed by Grande and Bemis (1998): presence of only a single median parietal, three pairs of extrascapular bones and short dermopterotics about equal to parietal in length. Therefore, the new fish belongs to the family Sinamiidae undoubtedly. Up to now, three genera of the family have been established, *Sinamia, Ikechaoamia* and *Siamamia*. The specimens studied in this paper are most similar to *Sinamia* according to the original description of Stensiö (1935) and the emended diagnosis made by Liu et al. (1963). Thus, they are referred to this genus. *Sinamia* closely resembles *Ikechaoamia* in its skull structure but with a longer dorsal fin, rhombic scales and relatively small postinfraorbitals. *Siamamia* is represented by only three partly articulated skulls and a collection of isolated ossifications, which makes it difficult to have a detailed comparison with other two genera of Sinamiidae. *Sinamia* from Liaoning was

first reported and referred to *S. zdanskyi* by Jin et al. (1995) but the specimens were poorly preserved. The new materials from Liaoning differ from the five nominal species of *Sinamia* in the form of the body, shape and/or number of rostral, nasal, infraorbitals, preorpercle, scale and some meristic characters (Table 2). The sensory canal of the new fish is also different in many aspects from the type species, but this character is unknown in other four species. It represents a new species: *Sinamia liaoningensis* sp. nov.

Table 2 Meristic and measurements data of *Sinamia* (mm)

	S. zd	*S. hua*	*S. ch*	*S. lu*	*S. po*	*S. li*
Total length	153–437	130	ca 125	ca 400	120–270	310–480
Body depth/total length	0.142	0.174	0.115	0.162	0.146	0.323
Subinfraorbitals	2	—	—	—	2	3
Pectoral fin rays	10–12	11	13	ca 12	ca 8	12–14
Pelvic fin rays	6	—	ca 7	9	ca 7	6
Dorsal fin rays	27	22	ca 33	28	25	18
Anal fin rays	6–9	ca 6	ca 9	11	6	5–6
Caudal fin rays	11–13	ca 12	13	13–14	11	16
Scales along the vertebral column	46–48	ca 41	ca 54	54–56	48	51
Scales serrated	yes	yes	yes	yes	yes	no

Note: *S. zd. S. zdanskyi* Stensiö, 1935; *S. hua. S. huananensis* Su, 1973; *S. ch. S. chinhuaensis* Wei, 1976; *S. lu. S. luozigouensis* Li, 1984; *S. po. S. poyangica* Su & Li, 1990; *S. li. S. liaoningensis* sp. nov.

Sinamia liaoningensis sp. nov. is a very large fish and has a much more podgy body form than the other species of the genus, with a ratio of body depth to total length up to 0.323 while the ratio of other species is only 0.115–0.174. Three subinfraorbitals are present in *S. liaoningensis*, one more than that in *S. zdanskyi* and *S. poyangica*. The infraorbital ring is unclear in other fishes of the genus. The preopercle is more arched than in all the other species of the genus. The dorsal fin rays count differently among the five known species of *Sinamia*, with a maximum of 33 in *S. chinhuaensis* and a minimum of 22 in *S. huananensis*. *S. liaoningensis* has only 18. The caudal fin rays of the new fish are more than in the other fishes of the genus. The presence of thin fibrous actinotrichia in the anterior half of the caudal fin rays of sinamiid fishes supports the sister group relationship of Sinamiidae and Amiidae as suggested by Grande and Bemis (1998) since many long thin fibrous actinotrichia form within fleshy fin folds in the early stages of fin-ray development of *Amia*. All the five known species of *Sinamia* bear scales with the posterior margin serrated on some parts of the body. Whereas, the posterior margin of all scales of *S. liaoningensis* is smooth. There are 32 scale rows between the origin of the anal fin and the dorsal margin of the body in *S. liaoningensis*, which is greater than in other *Sinamia* species (less than 25).

In conclusions, *S. liaoningensis* sp. nov. is a big fish and it differs from all other species of the genus in the shape of body, nasal, preopercle, the size and shape of infraorbitals, the number of subinfraorbitals (3), less dorsal fin rays (18), more scale rows (32) from the beginning of the base of the anal fin to the dorsal margin of the body, more caudal fin rays (16) and no serrated scales.

The pectoral fin of *S. liaoningensis* sp. nov. has four elongate proximal radials. This

feature is described for the first time in a sinamiid fish. The anterior half of the caudal fin rays of *S. liaoningensis* has remains of thin fibrous actinotrichia. *S. liaoningensis* has lepidosteoid scale in microstructure. The basal lamellar bone layer is directly overlain by ganoin and the dentine layer is lacking. The canals of Williamson do not branch below the ganoin.

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中国古脊椎动物学会第13次年会在内蒙古二连浩特市召开

由中国科学院古脊椎动物与古人类研究所和二连浩特市国土资源局联合主办的中国古生物学会古脊椎动物学分会第13次学术年会暨第四纪古人类-旧石器考古专业委员会第4次学术年会，于2012年8月25日至27日在内蒙古自治区二连浩特市召开。来自全国各科研院所、高校和文博系统等80多家单位的200多位代表参加了会议。这是中国古脊椎动物学会成立以来参会代表最多、规模最大的一次年会。

会议安排了大会和分会场学术报告50多个，报告人从不同角度介绍了近年来古脊椎动物学、古人类学、旧石器考古学、生物地层学、分子古生物学、古环境学、新技术新手段在古生物学研究中的应用以及化石资源的开发与保护等领域的最新研究成果和进展。近20名研究生参加了研究生报告专场，4位同学获得“研究生优秀报告奖”。年会期间还组织参会代表在我国乃至亚洲古近纪地层发育最好、化石最为丰富的二连盆地参观考察了乌兰勃尔和及呼和勃尔和剖面，重访中亚考察团和中苏联合考察队的科考之路，参观了二连浩特国家地质公园，感受“恐龙之乡”的独特魅力。会前出版了年会论文集。为纪念本次会议的召开，《古脊椎动物学报》在2012年第50卷第3期出版了由王元青研究员主编的内蒙古二连盆地新生代地层与哺乳动物研究专辑，集中展示了近年来二连盆地相关研究的进展。

会议期间，学会第七届理事会召开了第2次会议。与会理事认真总结了前一阶段的工作情况，讨论了今后的工作安排，重点就如何加强学会的科学传播力度展开讨论，提出了许多建议和思路。理事会会议经无记名投票，决定2014年第14次年会的举办地点为贵州省黔西县。

通过本次年会，我国相关领域的研究和科学传播工作者展示了近两年来的丰硕成果；通过各种方式的讨论和交流，又激发了新的灵感和研究方向，年轻学子的成长和进步也昭示着我国古脊椎动物学与古人类学事业蓬勃发展的美好未来和远景。

（学会秘书处）