
Geological Magazine, A new species of *Platysiagum* from Luoping Biota (Anisian, Middle Triassic, Yunnan, South China) reveals the relationship between Platysiagidae and Neopterygii, W. WEN, S. X. HU, Q. Y. ZHANG, M. J. BENTON, J. KRIWET, Z. Q. CHEN, C. Y. ZHOU, T. XIE & J. Y. HUANG, **Supplementary Material,**

Character list.

1. **Post-temporal fossa:**
 0. absent
 1. present
2. **Sub-temporal fossa:**
 0. absent
 1. present
3. **Dilatator fossa:**
 0. absent
 1. present
4. **Parasphenoid:**
 0. short, terminates at otic fissure
 1. medium, extends across otic fissure but not contact basioccipital
 2. long, extends to basioccipital
5. **Basipterygoid process:**
 0. present
 1. absent
6. **Frontal:**
 0. elongated
 1. laterally expanded
7. **Supraorbital sensory canal ending at anterior half of frontal:**
 0. absent
 1. present
8. **Number of extrascapulars:**
 0. more than one pair
 1. one pair
9. **Posttemporal:**
 0. contacting extrascapular posteriorly
 1. contacting extrascapular posteromedially and separating this bone from contact with its counterpart
 2. lost
10. **Supratemporal-intertemporal/dermopterotic area:**

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0. supratemporal larger than intertemporal
 1. intertemporal large, sutures with nasal
 2. bones fused or replaced by 'dermopterotic'
- 11. Dermosphenotic/nasal contact:**
0. present
 1. absent
- 12. Shape of dermosphenotic:**
0. elongate
 1. keystone-shaped
- 13. Dermosphenotic attachment to skull roof in adult-sized individuals:**
0. loosely attached on the skull roof or hinged to the side of skull roof
 1. firmly sutured into skull roof, forming part of it
- 14. Distinct premaxilla:**
0. absent
 1. present as a pair of elements
 2. fused as a median element
- 15. Distinct nasal process of premaxilla:**
0. absent
 1. present
- 16. Number of infraorbitals between antorbital and dermosphenotic:**
0. two or three
 1. four or more
- 17. Supraorbital:**
0. absent
 1. single
 2. two or more
- 18. Suborbital:**
0. present
 1. absent
- 19. Dermohyal:**
0. present
 1. absent
- 20. Maxilla free from preopercle:**
0. absent
 1. present

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- 21. Supramaxilla:**
0. absent
1. present
- 22. Mobile maxilla in cheek:**
0. absent
1. present
- 23. Coronoid process:**
0. absent
1. present
- 24. Suspensorium angle:**
0. acute, 30-50?, hyoid facet directed posteroventrally
1. moderately acute, 60-80?
2. nearly vertical, 80-90?, hyoid facet horizontal
- 25. Hyomandibular with canal for hyoid branch of nerve VII:**
0. absent
1. present
- 26. Quadratojugal:**
0. plate-like, overlying quadrate
1. much reduced or lost
- 27. Symplectic:**
0. absent
1. present, contacting quadrate
2. present, separated from quadrate by quadratojugal
- 28. Symplectic/articular contact:**
0. absent
1. present
- 29. Elongated posteroventral process of quadrate:**
0. absent
1. present
- 30. Uncinate processes on epibranchials:**
0. absent
1. present
- 31. Interopercle:**
0. absent
1. present

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- 32. Pectoral fins enlarged as wings:**
0. absent
1. present
- 33. Pelvic fins enlarged as auxiliary wings:**
0. absent
1. present
- 34. Median fins (except caudal fin):**
0. rays more numerous than radials
1. rays and radials nearly equal in number
- 35. Dorsal and anal fin rays:**
0. segmented throughout the length
1. segmented distally
- 36. Caudal fin rays::**
0. terminate at caudal extremity of body axis
1. extend beyond termination of body axis
- 37. Dense lepidotrichial segments of pectoral fin rays between innermost principle pectoral fin ray and body:**
0. absent
1. present
- 38. Peg-and-socket articulation on flank scales:**
0. present
1. absent
- 39. Clavicle:**
0. present as a broad plate
1. much reduced or lost
- 40. Number of lachrymal bone(s):**
0. single
1. two or more
- 41. Sphenotic with small dermal component:**
0. absent
1. present
- 42. Postrostral bone(s):**
0. absent
1. present
- 43. Tube-like canal bearing anterior arm of antorbital:**

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- 0. absent
 - 1. present
- 44. Antorbital:**
- 0. small and low
 - 1. enlarged and deep
 - 2. lost
- 45. Premaxilla immovably attached to braincase by means of a long nasal process tightly sutured to frontals:**
- 0. absent
 - 1. present
- 46. Foramen for olfactory nerve on premaxilla:**
- 0. absent
 - 1. present
- 47. Pterotic:**
- 0. present
 - 1. absent
- 48. Opisthotic:**
- 0. present
 - 1. absent
- 49. Supraoccipital:**
- 0. absent
 - 1. present
- 50. A gap between hypurals 2 and 3:**
- 0. absent
 - 1. present
- 51. Rostral(s):**
- 0. cap-like, partially or wholly separating nasals
 - 1. much reduced or lost by fusion with other elements
- 52. Internal carotid foramen on parasphenoid:**
- 0. absent
 - 1. present
- 53. Efferent pseudobranchial foramen on parasphenoid:**
- 0. absent
 - 1. present
- 54. Intercalar:**

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- 0. present
 - 1. absent
- 55. Posterior margin of maxilla:**
- 0. straight or slightly convex
 - 1. concave with a posterior maxillary notch
- 56. Quadratomandibular articulation:**
- 0. behind or below posterior border of orbit
 - 1. anterior to posterior border of orbit
- 57. Number of hypobranchials:**
- 0. three
 - 1. four
- 58. Median gular:**
- 0. present
 - 1. absent
- 59. Lateral gulars:**
- 0. present
 - 1. absent
- 60. Size of median gular relative to lateral gular:**
- 0. median gular smaller than lateral gular
 - 1. median gular larger than lateral gular
- 61. Antorbital process on maxilla:**
- 0. absent
 - 1. present
- 62. Uronerual:**
- 0. absent
 - 1. present
- 63. Opercle:**
- 0. larger than subopercle
 - 1. roughly equal to or smaller than subopercle
- 64. Maxillary process on preopercle:**
- 0. present
 - 1. absent
- 65. Teeth on maxilla:**
- 0. present
 - 1. absent

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- 66. Solid vertebral centra of adult-sized individuals:**
0. absent
1. present
- 67. Rudimentary fin rays near dorsal margin of caudal fin in adults:**
0. absent
1. present
- 68. Scales in anterior flank region:**
0. present
1. absent
- 69. Shape of scales:**
0. rhomboid
1. amioid-type, subrectangular to elongate oval
2. circular
- 70. Posteriorly inclined scales in pectoral region:**
0. absent
1. present
- 71. Dorsal ridge of spine-like scales:**
0. absent
1. present
- 72. Caudal fin:**
0. forked, lower lobe slightly shorter than or equal to upper lobe
1. forked, lower lobe longer than upper lobe
2. unforked
- 73. Fringing fulcra:**
0. present
1. absent

Supplementary Material, Data matrix for phylogenetic analysis

<i>Pteronisculus stensioi</i>	0	0	0	0	0	0	0	0	0	0	0	0	?	
	0	0	0	0	0	0	0	0	1	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	?	0	0	0	0	?	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0											
<i>Acipenser brevirostrum</i>	1	0	0	1	1	0	0	0	2	1	0	0	0	
	0	0	1	1	1	?	?	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	1	0	0	0	1	
	0	2	0	?	0	0	0	?	0	0	1	?	0	
	0	0	0	0	0	0	?	?	?	0	0	0	0	
	0	0	1											
<i>Australosomus kochi</i>	1	1	1	0	1	0	0	1	0	2	?	?	?	?
	?	0	0	0	0	0	0	0	1	0	0	0	0	
	0	1	0	0	0	0	0	1	0	0	0	0	0	
	0	0	0	0	0	?	0	0	0	0	?	0	0	
	0	0	0	0	0	0	0	0	0	1	0	0	0	
	0	0	1											
<i>Platysiagum minus</i>	?	?	?	?	?	0	0	1	0	2	0	0	0	?
	?	?	0	1	0	0	0	0	0	2	?	?	?	?
	?	?	0	0	0	?	0	1	0	0	0	0	0	0
	0	0	0	0	?	?	0	?	0	?	?	?	0	0
	?	0	0	1	0	?	1	0	0	0	0	0	0	0
	0	0	0											
<i>Platysiagum sinensis</i>	?	?	?	?	?	0	0	1	0	2	1	1	0	1
	0	1	0	1	0	0	0	0	0	2	?	?	?	?
	?	?	0	0	0	0	0	1	0	0	0	0	0	0
	0	1	0	?	?	?	0	?	0	?	?	?	0	0
	?	0	0	1	0	?	1	0	0	0	0	0	0	0
	0	0	0											
<i>Helmolepis gracilis</i>	?	?	?	?	?	0	0	1	0	2	1	1	0	?
	?	0	0	1	0	0	0	0	0	2	?	?	?	?
	?	?	0	0	0	?	0	1	0	0	?	0	0	0
	0	?	?	?	?	?	?	?	0	?	?	?	0	?
	?	0	1	?	0	?	1	0	0	0	0	0	0	0
	0	0	?											
<i>Altisolepis sinensis</i>	?	?	?	?	?	0	0	1	0	2	1	1	0	0
	0	0	2	0	1	0	0	0	0	2	?	?	?	?

	?	?	0	0	0	?	1	0	0	?	1	0	?	0
	0	1	?	?	?	?	0	?	0	?	?	?	0	?
	?	1	1	?	0	?	0	0	0	?	0	0	0	0
	0	0	1											
<i>Caelatichthys nitens</i>	?	?	?	?	?	0	0	1	0	2	1	1	0	1
	0	1	0	0	0	0	0	0	0	1	?	?	?	?
	?	?	0	0	0	0	0	0	0	0	1	0	0	0
	0	0	0	?	?	?	?	?	0	?	?	?	0	0
	?	0	1	?	0	?	0	0	0	0	0	0	0	0
	0	0	0											
<i>Polzbergia brochatus</i>	?	?	?	?	?	0	0	1	2	2	1	1	0	1
	?	0	2	?	0	0	0	0	1	2	?	?	?	?
	?	?	0	0	0	0	0	1	0	0	0	0	0	0
	0	?	0	0	?	?	0	?	?	?	?	?	0	1
	?	?	?	?	0	?	1	0	0	0	1	0	0	0
	0	0	0											
<i>Cleithrolepidina minor</i>	?	?	?	?	?	0	0	1	2	2	1	1	0	?
	0	0	2	0	0	0	0	0	0	2	?	?	?	?
	?	?	0	0	0	0	0	1	0	0	?	0	0	0
	0	0	0	0	?	?	0	?	0	?	?	?	0	0
	?	0	?	?	0	?	1	0	1	0	1	0	0	1
	0	0	0											
<i>Cleithrolepis granulate</i>	?	?	?	?	?	0	0	0	2	2	1	1	0	1
	0	0	2	0	0	0	0	0	0	2	?	?	?	?
	?	?	0	0	0	0	0	1	0	0	?	0	0	0
	0	0	0	0	?	?	0	?	0	?	?	?	0	0
	?	0	?	?	0	?	1	0	1	0	1	0	0	1
	0	0	0											
<i>Teffichthys madagascariensis</i>	1	1	1	1	0	0	0	1	0	2	1	1	0	1
	0	0	2	0	0	0	0	0	0	2	1	1	?	?
	0	1	0	0	0	1	1	1	0	0	?	0	0	0
	0	0	0	0	0	?	0	?	0	0	0	?	0	0
	0	0	0	1	0	0	1	0	0	0	1	0	0	0
	0	0	0											
<i>Plesiofuro mingshuica</i>	?	?	?	?	?	0	0	1	0	2	1	1	0	1
	0	0	2	0	0	0	0	0	0	2	?	1	?	?
	?	?	0	0	0	1	1	1	0	0	?	0	0	0
	0	0	0	0	?	?	0	?	0	?	?	?	0	0
	?	0	0	1	0	?	1	0	0	0	1	0	0	0

0 0 0

Pseudobeaconia elegans

? ? ? ? ? 0 0 0 0 2 1 1 0 1
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Peltoperleidus macrodontus

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Peltopleurus rugosus

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Peripeltopleurus hypsisomus

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Thoracopterus niederristi

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Potanichthys xingyiensis

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