

## Supplemental material

### Appendix S2.

#### *List of characters*

1. Osteoderms attached to skull roof bones: absent (0), or present (1).
2. Lateral margin of frontal more-or-less convex (0) or straight (only in large specimens) or more or less concave (1).
3. Frontal ornamented shield reaches lateral margin of frontal (0), or frontal has a smooth orbital margin (1), or long smooth orbital margin present, but ornamented surface reaches the lateral margin of bone anteriorly to it (2).
4. Posterolateral process of the frontal extremely laterally expanded (0), or well expanded, more than half of mediolateral length of the frontal in the mid-length (1), or less (2) (in anguine lizards, the posterolateral process measured from the lateral end of the lateral frontal sulcus. Although in *Xenosaurus* and *Shinisaurus* there is no lateral frontal sulcus and thus the exact length of the posterolateral process is not possible to measure, we coded this character state as 0).
5. Parietal foramen located very anteriorly on parietal, close to the frontal articulation: absent (0), present (1).
6. Length (measured in median plane) of smooth area (area levis) relative to length of occipital ornamented shield; smooth area: longer (0), of about the same length (1), shorter (2).

7. Anterior end of interparietal sulcus lies medial to (0) or in (1) anterolateral corner of ornamented surface.
8. Anterolateral process of parietal table: short (indistinctly separated from the parietal table) (0), long (laterally expanded, more or less distinctly separated from the rest of parietal table) (1)
9. Postfoveal crest: absent (0), short (shorter than one half of juxtafoveal crest length) (1), long (longer than one half of length of juxtafoveal crest) (2).
10. Muscular surface: absent (0), present narrow (about one third or less of width between parietal cranial crest and pineal foramen) (1), present wide (about one half of width between parietal cranial crest and pineal foramen) (2).
11. Ventrolateral surface of supratemporal process running laterally to ventrolateral ridge and gradually passing to muscular surface anteriorly: absent (0), present (1), short ventrolateral surface present (it flanks only the anterolateral margin of the anterior end of the ventrolateral ridge) (2).
12. Posterior margin of parietal table: parietal arch present (posterior ends of postfoveal crests lie anterior to posterior margin of parietal table) or if shallow parietal notch present it crosses or reaches anteriorly the posterior section of postfoveal crests (0), distinct parietal notch present in posterior portion of parietal table (it crosses juxtaotic crests) (1).
13. Anterior end of ventrolateral ridge of supratemporal process joins parietal cranial crest: at or slightly posterior (0) or anterior (1) to level of posteromedial margin of parietal fossa floor.
14. Shape of supratemporal process: straight (0), more-or-less widely expanded with the presence of angle between base and the rest of the supratemporal process (1).

15. Posterior section of parietal cranial crest very low (0) or high (1) at its junction with anterior end of posterolateral ridge of supratemporal process.
16. The length of dentary relative to posterior portion of mandible, behind dentary: dentary is shorter (0), or longer (1) than posterior region.
17. Dentary; in lateral view, posterior tip of surangular process of dentary terminates at or anterior to (0) or posterior to (1) mid-length of dorsal process of coronoid.
18. Dentary; in lateral view, coronoid process of dentary overlies one half or more than one half (0) or less than one half (1) of length of anterodorsal margin of anterolateral process of coronoid.
19. Dentary; surangular process of dentary terminates anterior (0) or at the same level or posterior to level of coronoid process of dentary (1).
20. Dentary; splenial spine absent (0) or present (1).
21. Dentary; angular process of dentary terminates anterior (0) or posterior (1) to level of coronoid process of dentary.
22. Dentary; angular process of dentary extends anterior (0) or posterior (1) to alveolar surface, and/or level of posterior tooth.
23. Dentary; surangular spine absent (0) or present (1).
24. Dentary; intramandibular septum is a vertical (0) or horizontal or slightly dorsolaterally-ventromedially inclined wall (1).
25. Tooth number; 9-11 (0); 12-15 (1); more than 15 (2)
26. Dentition: slender, pointed teeth distinctly recurved posteriorly (0); pointed teeth but not markedly recurved posteriorly (1); amblyodont dentition in posterior teeth (2); or bicuspid (3); blunt, mediolaterally compressed and vertically striated teeth (4).

27. Coronoid; in lateral view, anterolateral process of coronoid short (shorter than height of dorsal process of coronoid) (0) or long (longer than height of dorsal process of coronoid) (1).
28. Coronoid; mid-length of dorsal process of coronoid lies anterior (0) or posterior (1) to level of mid-length of laterally exposed portion of coronoid.
29. Surangular; in lateral view, surangular extends (0) or not (1) the anterior tip of the anterolateral process of coronoid.
30. Splenial; anterior mylohyoid foramen lies posteroventrally to anterior inferior alveolar foramen (0), ventrally to and at level of posterior margin of anterior inferior alveolar foramen (1) or anteroventrally to anterior inferior alveolar foramen (2).
31. Surangular; anterior surangular foramen lies posterior to dentary (0) or dentary enters anterior surangular foramen (1).
32. Angular; posterior end of angular reaches anterior (0) or posterior (1) to mid-length of distance: mid-length of dorsal process of coronoid - posterior margin of retroarticular process.
33. Angular; posterior mylohyoid foramen; lies posterior to the level of coronoid apex (0); or anterior (1).
34. Articular; retroarticular process of square (0), quadrangular (1) or subtriangular shape (2).
35. Splenial; in region immediately posterior to anterior inferior alveolar foramen mediolaterally broad and dorsally extending into a process (0) or thin and without process (1).
36. Ornamentation of frontal and parietal bones: consisting of anastomosing ridges, grooves and pits (0) or tubercles (1).
37. Legs: (0) present; (1) reduced to small, but functional elements; (2) absent;

38. The parietal cranial crests diverge anteriorly to form a V: (0) absent; (1) present;
39. The palatal dentition: (0) absent; (1) present on pterygoid only; (2) present on both pterygoid and palatine;
40. The postfrontal-postorbital fusion: (0) absent; (1) present.