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# A NEW LARGE BAURIAMORPH FROM THE CYNOGNATHUS-ZONE OF SOUTH AFRICA

By A. S. Brink


## Abstract

The specimen forming the subject of this paper is the anterior two-thirds of a very large *Bauria* skull. It is described as a new species, *Bauria robusta*. It is pointed out that the skull is perhaps as much as 20 per cent larger than the largest known specimen of *Bauria cynops*, which in turn is about 15 per cent larger than the average of all other known specimens of the genotype. Many of the measurements are derived from reconstructed figures and if these measurements should prove to be less, the new skull would undoubtedly prove to be proportionally different, in which case its recognition as a new species would be more substantial. The features on which the specimen can at present be recognised as a new species are size, the greater number of cheek teeth (11 as compared with 9 in *B. cynops*), the weaker canines and the absence of an interpterygoid vacuity.


## Introduction

In January 1955 Mr J. W. Kitching recovered from *Cynognathus*-zone beds on the farm Grootdam (Betseba) in the Burghersdorp district a skull of a particularly large *Bauria* specimen. It is unfortunately not well preserved. It would appear as if it had been exposed to weathering for some time before it became suitably embedded for fossilization. The bone surfaces are poor and so riddled with cracks that hardly a single suture is clearly displayed. In dorsal view everything posterior to the level of the middle of the orbits is missing, while in ventral view the pterygoids are preserved up to the basisphenoid processes. The right dentary is virtually complete, but the left has been deprived of more than its ventral half, and the damage extends across the region of the "chin".

The dentition is satisfactorily displayed for determining the general arrangement but, while the lower jaw is intimately in position, a detailed study of the crowns is not possible.

The region of the external nares is highly damaged. Otherwise the skull seems superficially to have suffered no compression or distortion in any direction.

### *Bauria robusta* sp. nov.
(Figure 48)

*Type*. Poorly preserved but otherwise satisfactory, apparently undistorted, anterior two-thirds of skull with damaged lower jaw, derived from middle *Cynognathus*-zone beds on the farm Grootdam (Betseba) in the Burghersdorp district, and catalogued under Field No. 1685 and Museum No. 369 in the collection of the Bernard Price Institute.

*Diagnosis.* Skull as a whole more robust and about 20 per cent larger than the largest specimen of *Bauria cynops;* eleven postcanine teeth; canines small; powerful cheek bulges with deep depressions below; no interpterygoid vacuity.

This specimen can virtually be diagnosed on size alone. Of the described specimens of *Bauria cynops*, the specimen in the American Museum of Natural History (No. 5622) is the largest (see table of measurements, Brink, 1963), and substantially larger than the others on record, but the present specimen is yet larger by a very conspicuous margin.

*Measurements.* In the following table the measurements of the present specimen are given, in millimeters, in the first column. In the second column the measurements for the specimen in the American Museum of Natural History are given, taken from the table of measurements referred to above (Brink, 1963). In the third column the average is given for the four other specimens also dealt with in the above table.

Measurements given in brackets in the first column are arrived at indirectly through restoring the skull after the proportions of *Bauria cynops* as figured by Brink (1963), and as reflected in the present figures.

| | *B. robusta* | *No.* 5622 | *Average B. cynops.* |
|---|---|---|---|
| Maximum length of skull | (168) | 140 | 121 |
| Maximum breadth of skull | (112) | 89 | 78 |
| From premaxillaries to occipital condyle | (164) | 132 | 116 |
| To back of interpterygoid boss | 95 | 84 | 70 |
| To posterior border of secondary palate | ?58 | 52 | 41 |
| To interparietal notch | (151) | 122 | 110 |
| To level of lateral tips of postorbitals | (117) | 91 | 83 |
| To level of anterior borders of orbits | 72 | 62 | 53 |
| Breadth of snout across canines | 40 | 31 | 28 |
| Interorbital width | 32 | 29 | 24 |
| Distance between lateral tips of postorbitals | (65) | 57 | 48 |
| Breadth across pterygoid processes | 62 | 50 | 47 |

## Description

From these measurements it can be seen that the American Museum specimen is intermediate in size between the new specimen and the average of the rest of the known *B. cynops* specimens.

Most of the above measurements for the new specimen are arrived at indirectly, but there are enough actual measurements, including quite a number not listed, to show that the new specimen is about 15-20 per cent larger than the

American Museum specimen, which in turn is about 10-15 per cent larger than the average. Yet, longitudinal measurements across the palate would appear to be very little greater than the corresponding measurements in the American Museum specimen. This is the only tangible evidence of a feature which is quite apparent to the eye; the fact that the snout appears to be stouter, higher and shorter than in *B. cynops*. The implication is that the posterior portion of the skull which is reconstructed in the figures, could also be shorter, broader and stouter, in which case many of the inferred measurements could be unreliable. The new specimen will then be not so conspicuously larger, but indeed more robust and out of proportion to *B. cynops*, a better specific diagnostic feature than size alone.

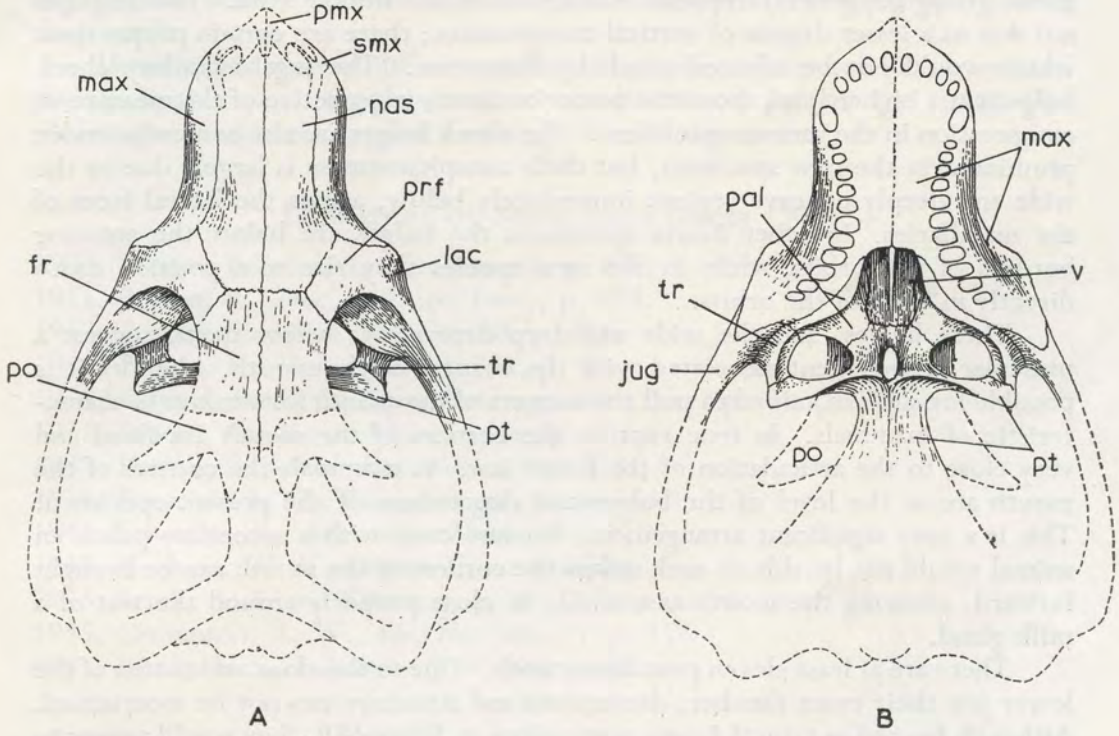



*Figure* 48
A—Dorsal and B—Ventral view of the skull of *Bauria robusta* sp. nov., posterior regions outlined according to *Bauria cynops* (Brink, 1963). Half natural size.
*Abbreviations:* fr—frontal; jug—jugal; lac—lachrymal; max—maxillary; nas—nasal; pal—palatine; pmx—premaxillary; po—postorbital; prf—prefrontal; pt—pterygoid; smx—septomaxillary; tr—transverse bone; v—vomer.

The whole region of the external nares is highly damaged, affecting mostly the anterior ends of the nasals, the septomaxillaries and the internarial bridge. The nares can be reconstructed, on what is preserved, directly in line with the typical *Bauria* condition, but there appears to be one significant difference. The

septomaxillaries do not reach down as near to the incisors as is the normal condition. The premaxillaries are exposed above the incisors for a height of eleven millimeters.

The incisors are damaged. In cross section they seem to be only slightly smaller than the canines, which is a normal *Bauria* feature, and on visualizing them as complete, or reconstructed, they would nearly match the canines in length.

Sutures over the dorsal surface can be followed with the greatest difficulty. The general impression gathered is that depicted in figure 48A, which is perfectly in line with the general *Bauria* arrangement.

The snout as a whole is conspicuously higher than in the other known specimens, giving the general impression of a shorter and stouter skull. The height is not due to a lesser degree of vertical compression; there are certain proportions which would not be affected much by distortion. The jugal-maxillary cheek bulge is at a higher level above the posterior teeth, irrespective of the measure of compression in the various specimens. The cheek bulges are also somewhat more prominent in the new specimen, but their conspicuousness is largely due to the wide and deeply concave regions immediately below, across the lateral faces of the maxillaries. In other *Bauria* specimens the bulges are below the anterior borders of the orbits, while in the new species they rise to a position more directly in front of the orbits.

These bulges, and the wide and deep depressions below them, suggest a muscular arrangement associated with the corners of the mouth, whereby it is possible for such an animal to pull the corners of the mouth forwards as is characteristic of mammals. In true reptiles the corners of the mouth are fixed and very close to the articulation of the lower jaw. In mammals the corners of the mouth are at the level of the bulges and depressions of the present specimen. This is a very significant arrangement, because even with a secondary palate an animal would not be able to suck unless the corners of the mouth can be brought forward, allowing the mouth as a whole to close properly around the teat of a milk gland.

There are at least eleven postcanine teeth. Due to the close association of the lower jaw their exact number, dimensions and structure can not be ascertained. Although figured as typical *Bauria* postcanines in figure 48B, they would appear to be slightly narrower.

The secondary palate could not be exposed and in the process of preparation the posterior margin has been damaged. Its position is nevertheless clear. The region behind the internal nares is shorter and broader by comparison with other *B. cynops* specimens. There is the characteristic pterygoid median boss from which the palatines radiate anterolaterally to support the maxillaries, but from a comparison between the accompanying figure 48B and figure 7 (Brink, 1963) for *Bauria cynops*, a distinct difference is apparent, both in structure and proportions.

Further comparison between these two figures will show a difference

between the transverse bones. These bones are, however, not clearly displayed in the present specimen.

The pterygoids close firmly behind the median boss, leaving no trace of an interpterygoid fossa. The median boss itself is also not as large and outstanding as in *Bauria cynops*.

The lower jaw has the typical *Bauria* bulged structure and peculiar twist, but although damaged anteroventrally, the dentaries do seem to form a more prominent and more anteriorly situated chin.

The skull would appear to be slightly distorted, not in overall proportions, but where the palate and lower jaw seem to have been pressed forward, relative to the dorsal portion. This distortion may account for the chin being more angular and farther forward and the palate as a whole being proportionally shortened.

However, in spite of differences that can thus be accounted for in terms of distortion, there are enough structural peculiarities to warrant the recognition of this specimen as the type of a new species, *Bauria robusta*.

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