CAPTORHINIDS: PHYLOGENETIC CHARACTERS

CAPTORHINIDS: PHYLOGENETIC CHARACTERS

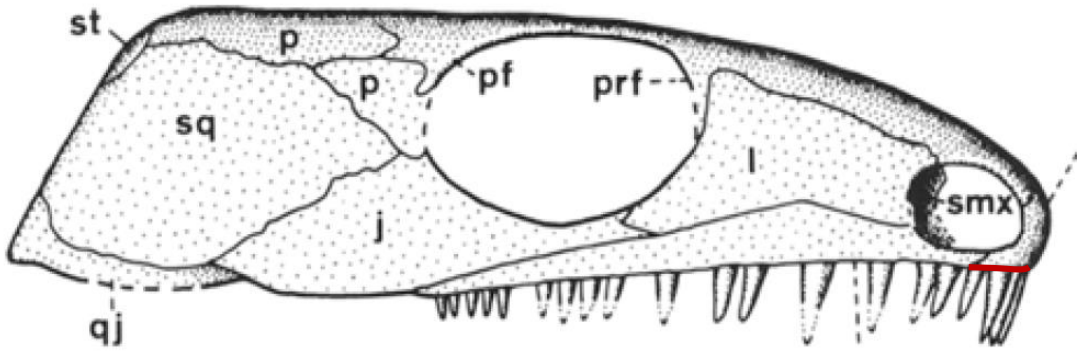
SKULL ROOF

(1) Premaxilla ventral margin aligned: anteroposteriorly in lateral view (0) anteroventrally in lateral view (1). In Modesto 2018.

(1) Premaxilla – ventral margin aligned:

Anteroposteriorly in lateral view (0)

Anteroventrally in lateral view (1)



Thuringothyris mahlendorffae. Holotype MNG 7729. In Boy & Martins 1991.

Captorhinus kierani. Holotype OMNH 73281a. In deBraga, Bevitt & Reisz 2019.

Status 1(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*

Status 1(1)

- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 1(?)

- *Saurorictus australis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

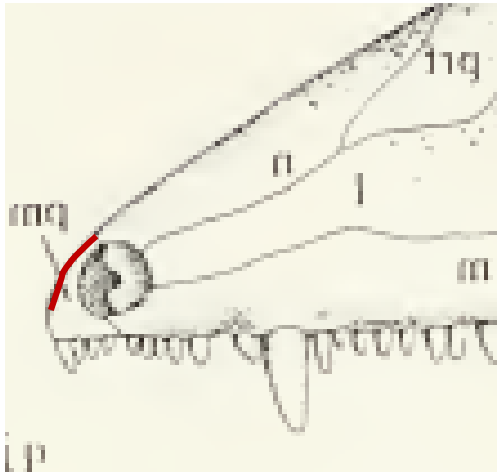
(1) Premaxilla ventral margin aligned: anteroposteriorly in lateral view (0) anteroventrally in lateral view (1). In Modesto 2018.

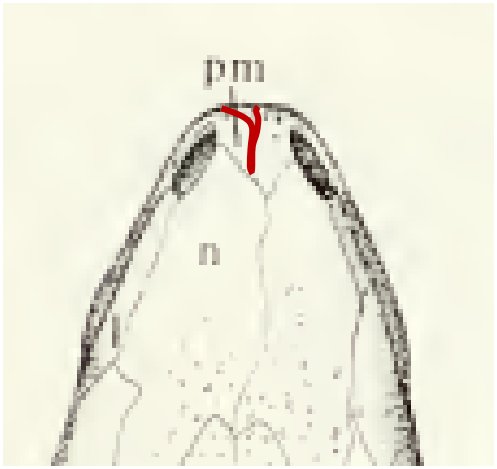
(2) Premaxilla – alary process :

Absent (0)

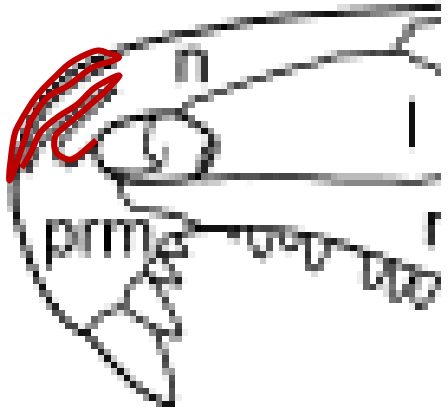
Present on posterodorsal process (1)

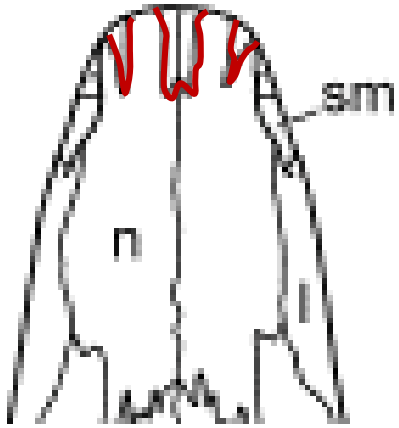
(2) Premaxilla: alary process absent (0); alary process present on posterodorsal process (1). In Modesto 2018.





Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.





Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.

Status 2(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*

Status 2(1)

- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 2(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

(2) Premaxilla: alary process absent (0); alary process present on posterodorsal process (1). In Modesto 2018.

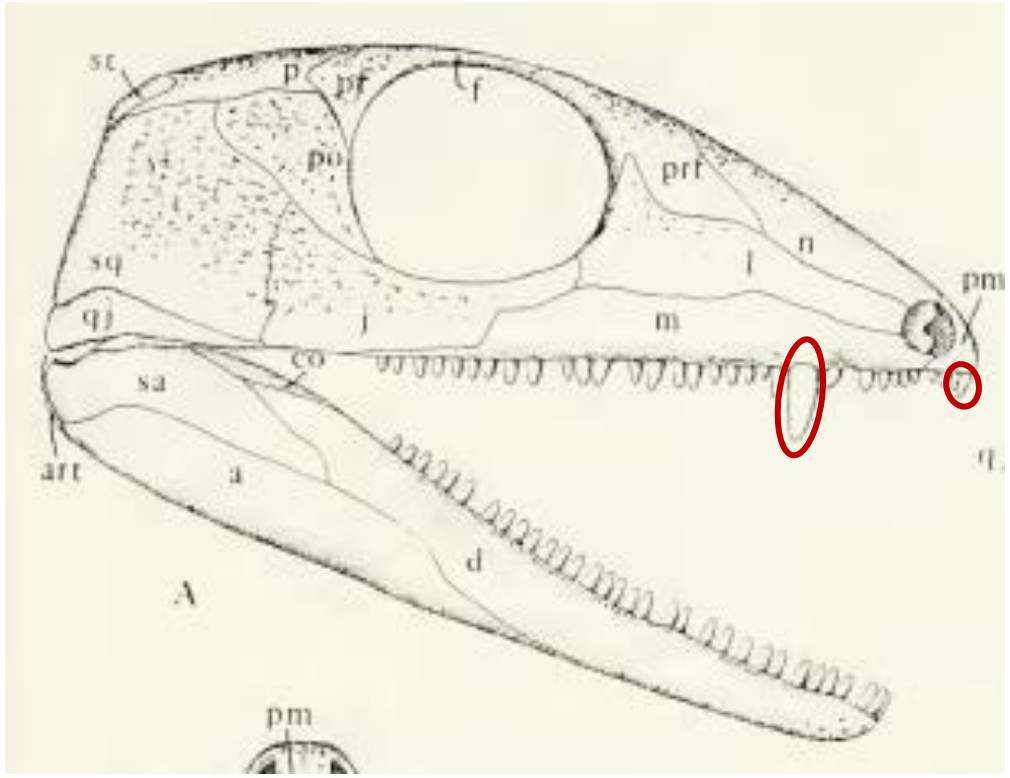
(3) Premaxillary dentition: first tooth relatively small relative to maxillary caniniform (0); subequal to maxillary caniniform (1). In Modesto 2018.

(3) Premaxillary dentition:

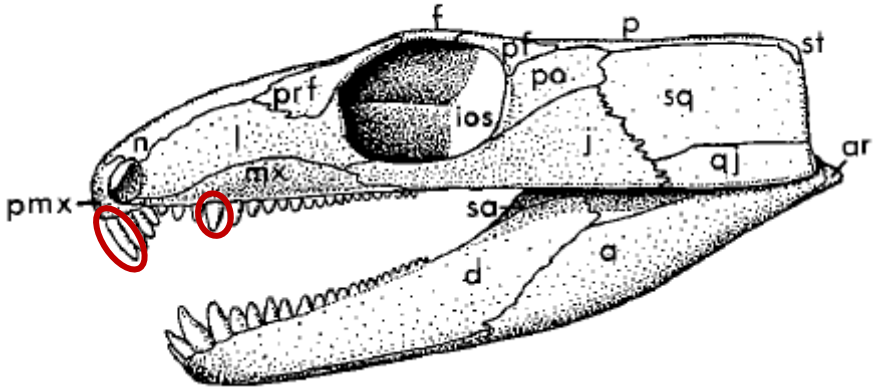
First tooth relatively small to maxillary caniniform (0)

Subequal to maxillary caniniform (1)

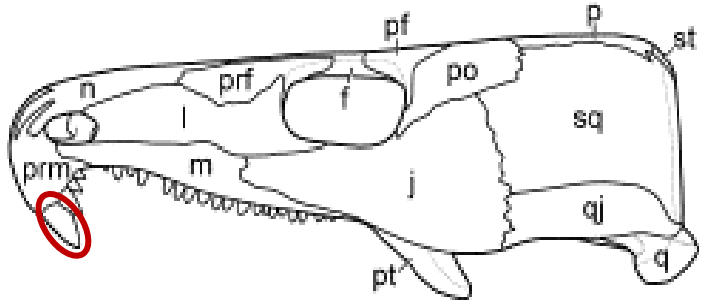
NOTE: in taxa lacking caniniforms, state 1 applies when the first premaxillary tooth is the largest marginal tooth present (marginal teeth = non-palatine teeth)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.

Status 3(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Rhiodenticulatus heatoni*
- *Opisthodontosaurus carrolli*

Status 3(1)

- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 3(?)

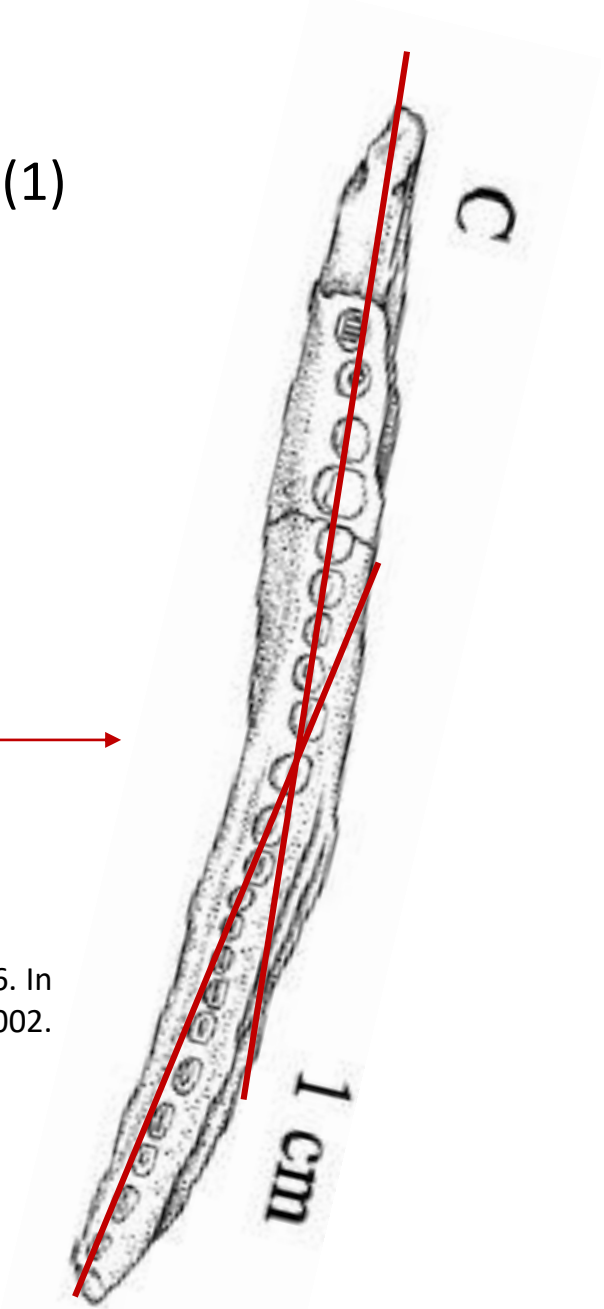
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

(3) Premaxillary dentition: first tooth relatively small relative to maxillary caniniform (0); subequal to maxillary caniniform (1). In taxa lacking maxillary caniniforms, state 1 applies when the first premaxillary tooth is the largest marginal tooth present. In Modesto 2018.

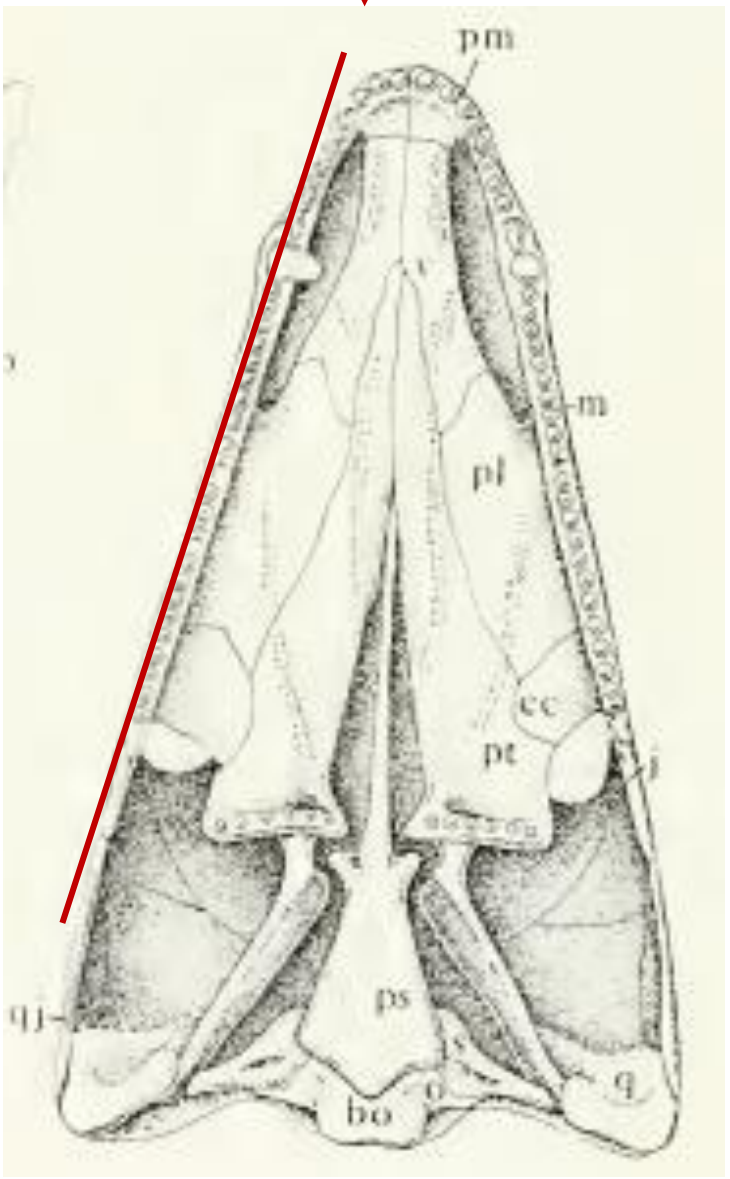
(4) Maxilla:

Relatively straight (0)

Posterior end flexed laterally (1)



Captorhinus magnus. OMNH 55386. In Kissel, Dilkes & Reisz 2002.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.

(4) Maxilla: relatively straight (0); posterior end flexed laterally (1). In Modesto 2018.

Status 4(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*

Status 4(1)

- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 4(?)

- *Saurorictus australis*
- *Captorhinikos valensis*

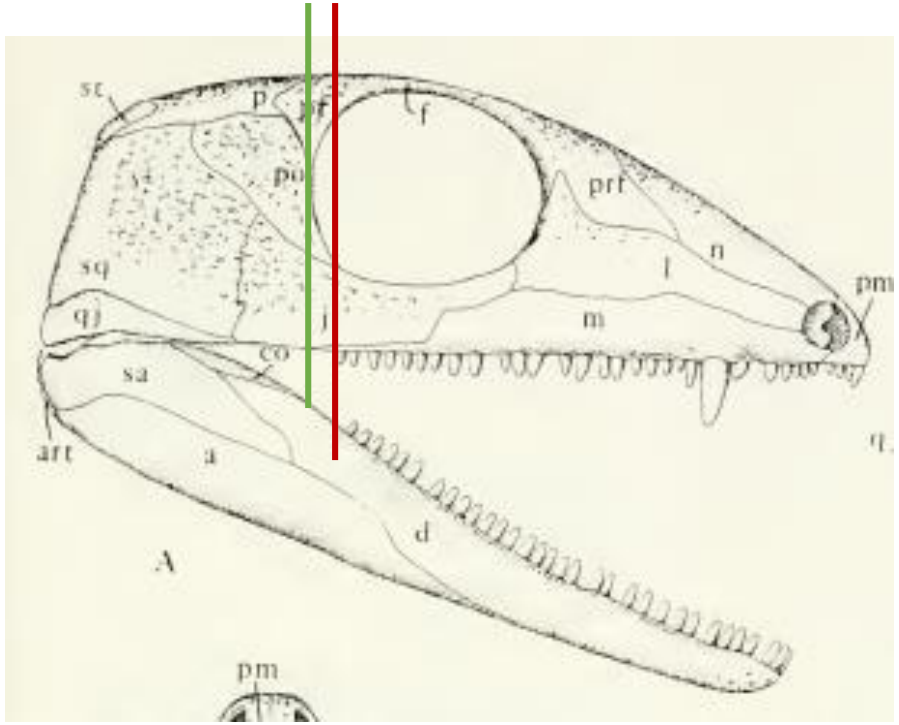
(4) Maxilla: relatively straight (0); posterior end flexed laterally (1). In Modesto 2018.

(5) Maxilla – posterior-most tooth positioned:

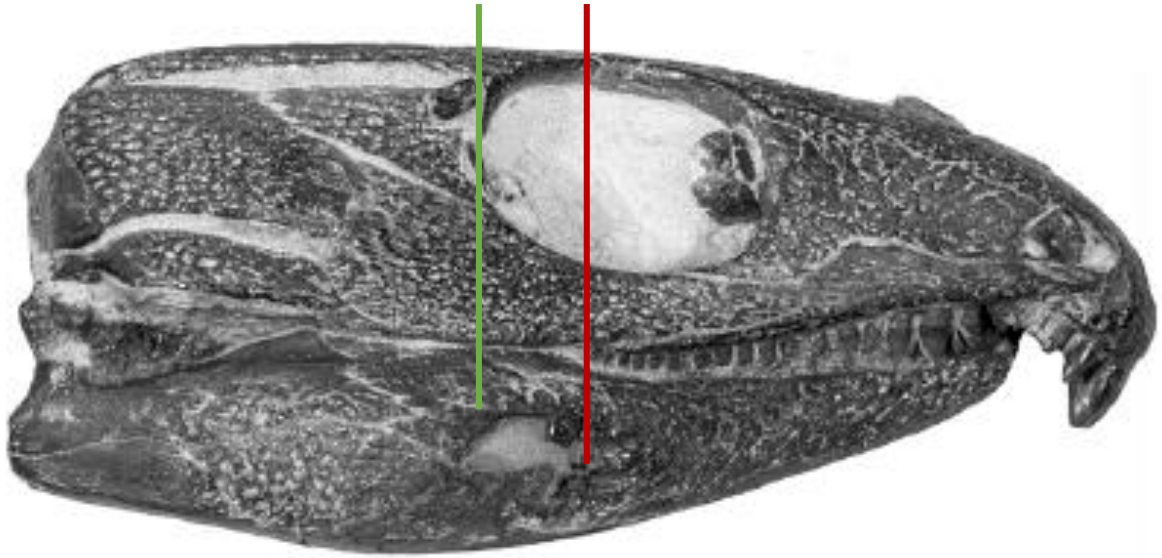
At level of posterior margin of orbit (0)

More anteriorly (1)

(5) Maxilla: posterior-most tooth positioned at level of posterior margin of orbit (0) or positioned more anteriorly (1). In Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus kierani. Holotype OMNH 73281a. In deBraga, Bevitt & Reisz 2019.

Status 5(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Reiszorhinus olsoni*

Status 5(1)

- *Euconcordia cunninghami*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 5(?)

- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

(5) Maxilla: posterior-most tooth positioned at level of posterior margin of orbit (0) or positioned more anteriorly (1). In Modesto 2018.

(6) Maxillary dentition – tooth stations nº:

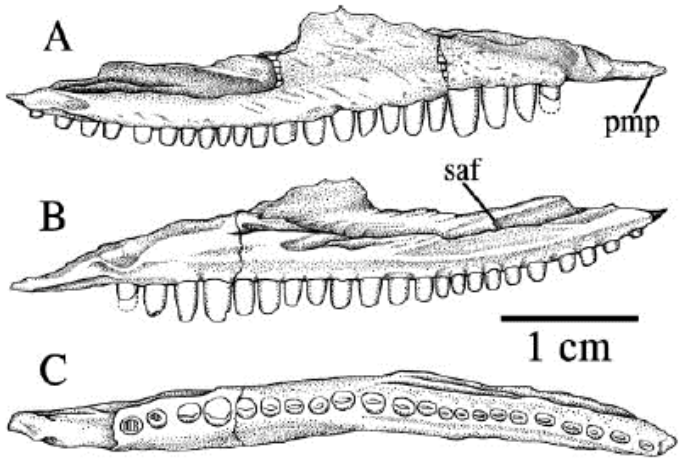
30 or more (0)

18-26 (1)

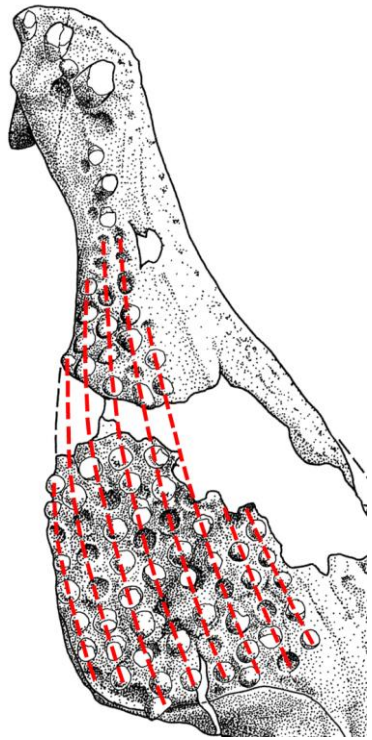
14-17 (2)

13 or less (3)

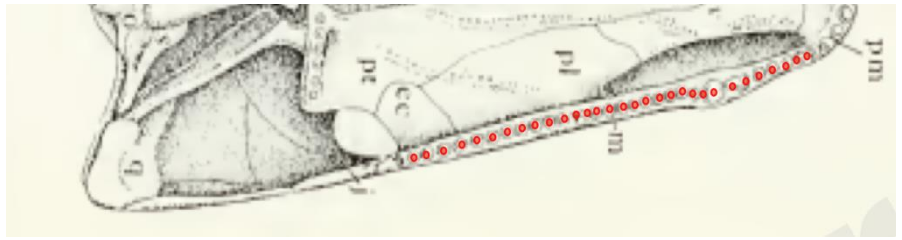
NOTE: For multiple-rowed taxa, only those teeth with unobstructed profiles when viewed laterally are considered.



Captorhinus magnus. OMNH 55386. In Kissel, Dilkes & Reisz 2002.

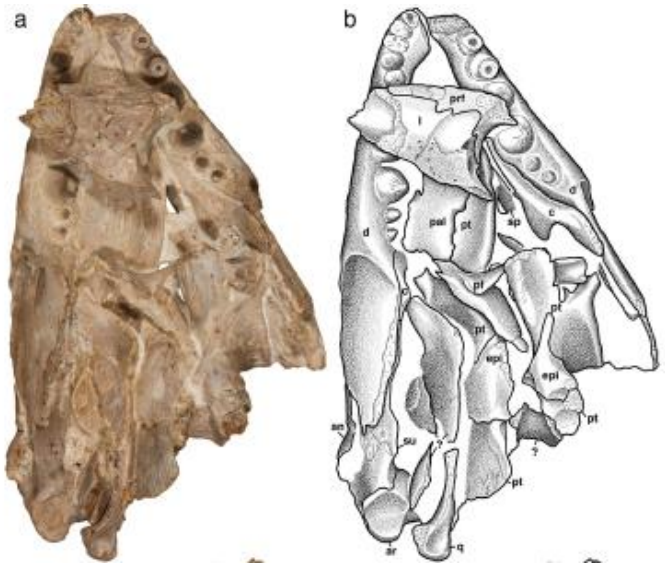


Moradisaurus grandis. Image from Modesto 2018. Personal communication.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.

(6) Maxillary dentition: tooth stations number 30 teeth or more (0); teeth number 18–26 (1); teeth number 14–17 (2); teeth number 13 or less (3). For multiple-rowed taxa, only those teeth with unobstructed profiles when viewed laterally are considered. In Modesto 2018.



Opisthodontosaurus carrolli. Holotype OMNH 77469. In Reisz et al 2015.

Status 6(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*

Status 6(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 6(2)

- *Saurorictus australis*
- *Moradisaurus grandis*
- *Labidosauriscus richardi*

Status 6(3)

- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Opisthodontosaurus carrolli*

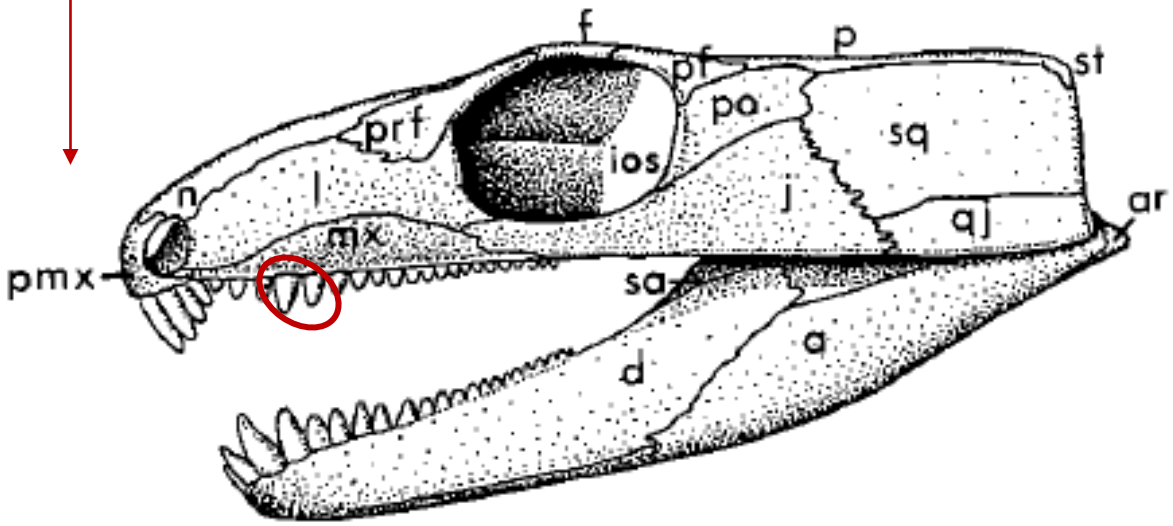
(6) Maxillary dentition: tooth stations number 30 teeth or more (0); teeth number 18–26 (1); teeth number 14–17 (2); teeth number 13 or less (3). For multiple-rowed taxa, only those teeth with unobstructed profiles when viewed laterally are considered. In Modesto 2018.

(8) Maxillary caniniform teeth:

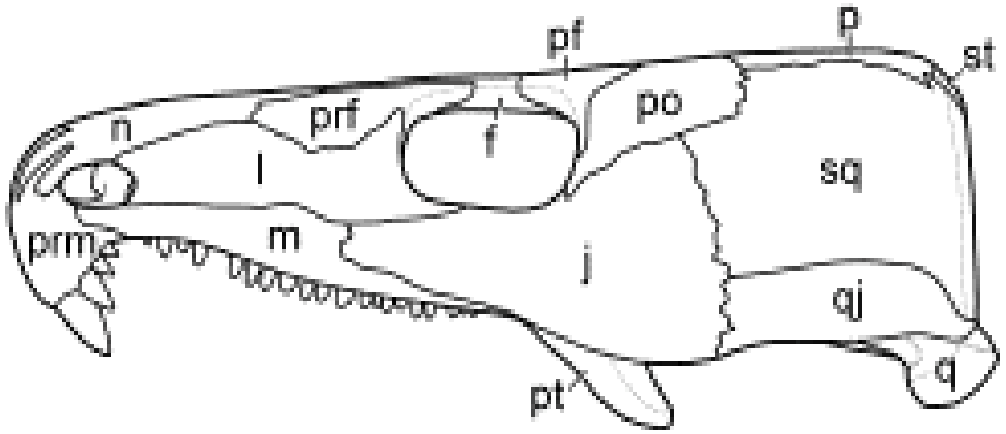
(8) Maxillary caniniform teeth: present (0); absent (1). In Modesto 2018.

Present (0)

Absent (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.

Status 8(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 8(1)

- *Thuringothyris mahlendorffae*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*

Status 8(?)

(8) Maxillary caniniform teeth: present (0); absent (1). In Modesto 2018.

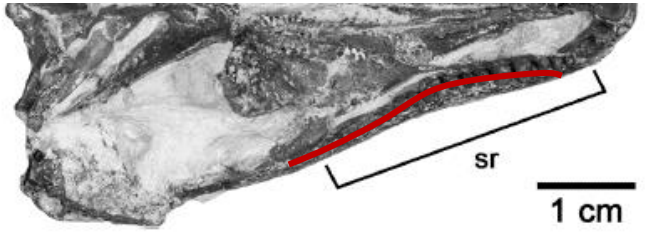
(9) Number of tooth rows in the upper jaw:

One (0)

Two to four (1)

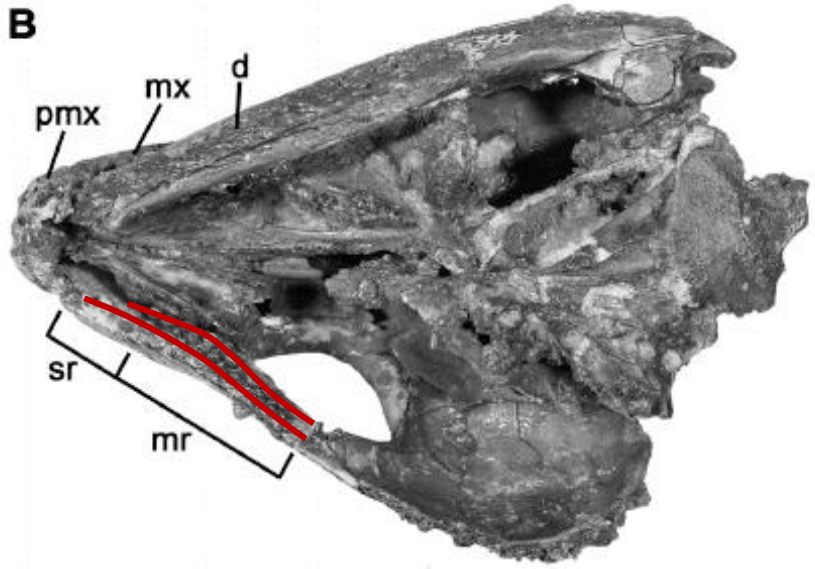
Five (2)

Six or more (3)

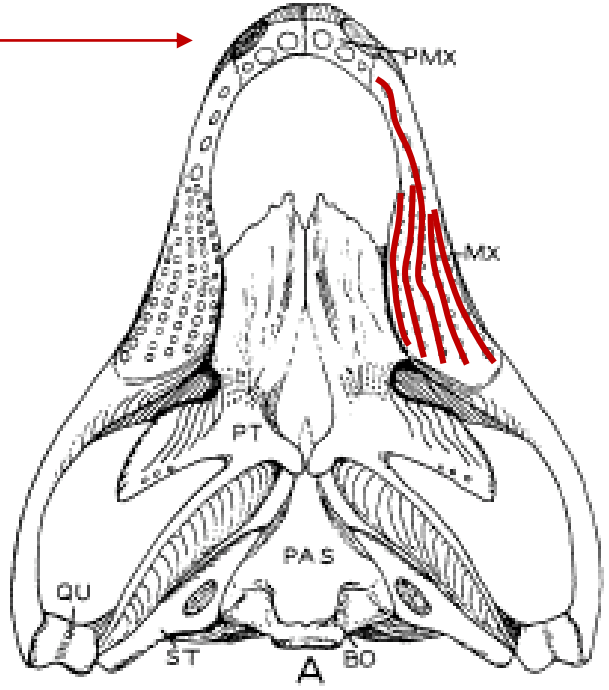


Captorhinus kierani. Holotype OMNH 73281a. In deBraga, Bevitt & Reisz 2019.

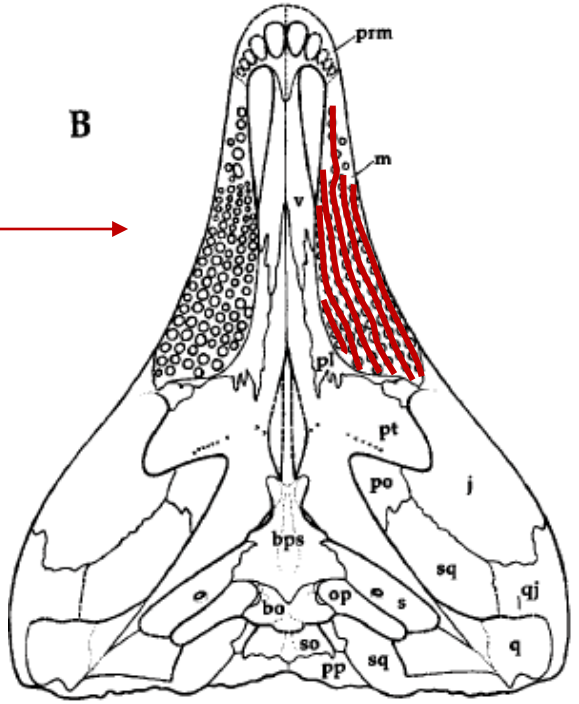
(9) Number of tooth rows in the upper jaw: one (0); two to four (1); five (2); six or more (3). In Modesto 2018.



Captorhinus aguti. OMNH 523292. In LeBlanc & Reisz 2015.



Captorhinikos chozaensis. Reconstruction. In Olson 1962.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 9(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 9(1)

- *Captorhinus aguti*

Status 9(2)

- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*

Status 9(3)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*

(9) Number of tooth rows in the upper jaw: one (0); two to four (1); five (2); six or more (3). In Modesto 2018.

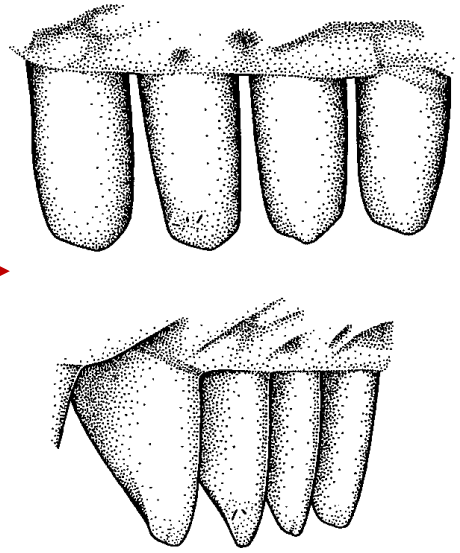
(10) Marginal dentition – cheek teeth:

Recurved (0)

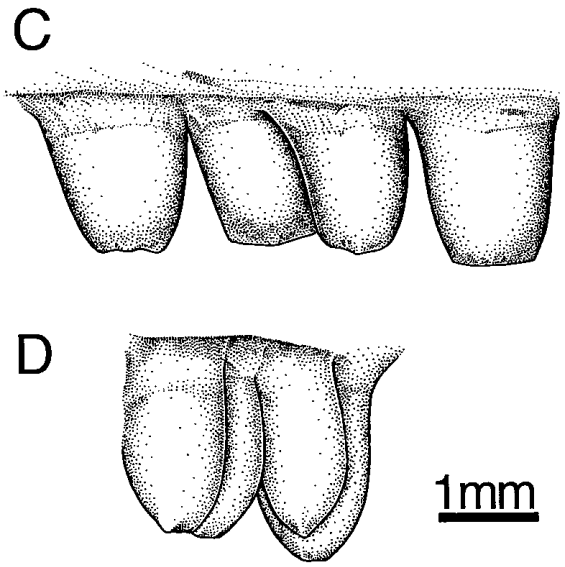
Chisel-shaped (1)

Bulbous and ogival (2)

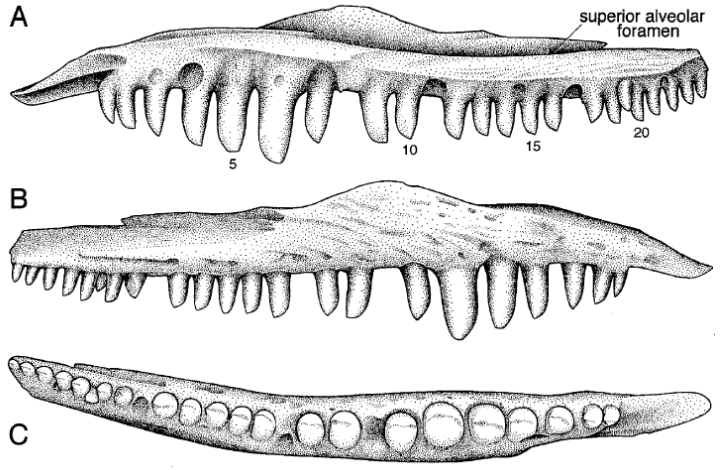
Bulbous at base and conical above (3)



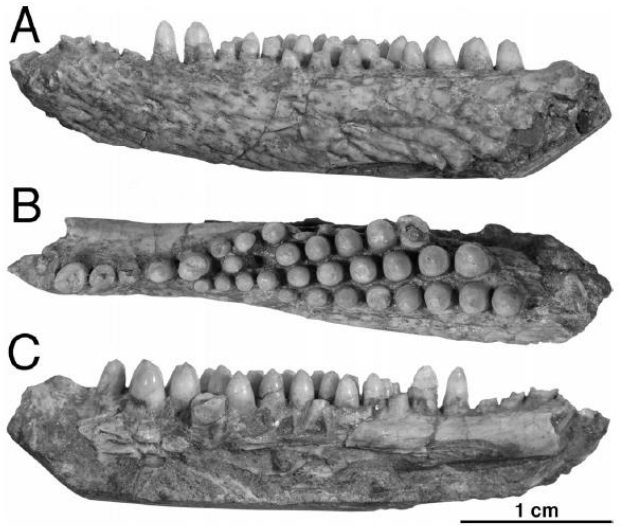
Captorhinus laticeps. OMNH 15101. In Modesto 1998.



Captorhinus aguti. OMNH 15138. In Modesto 1998.



Captorhinidae incertae sedis. OMNH 52366. In Modesto 1996.



Captorhinikos valensis. Holotype FMNH UR 101. In Modesto, Lamb and Reisz 2014.

(10) Marginal dentition: 'cheek' teeth recurved (0); chisel-shaped (1); bulbous and ogival (2); bulbous at base and conical above (3). In Modesto 2018.

Status 10(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Reiszorhinus olsoni*

Status 10(1)

- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 10(2)

- *Captorhinus aguti*

Status 10(3)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

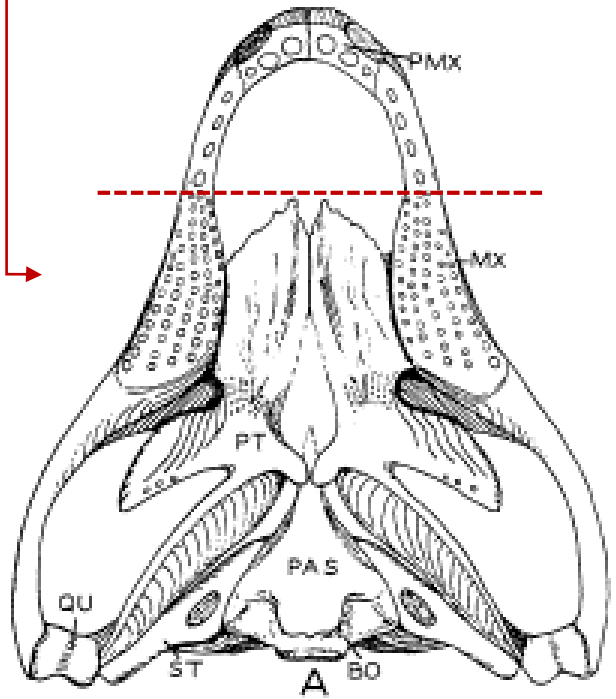
(10) Marginal dentition: ‘cheek’ teeth recurved (0); chisel-shaped (1); bulbous and ogival (2); bulbous at base and conical above (3). In Modesto 2018.

(11) Maxilla – double row of teeth:

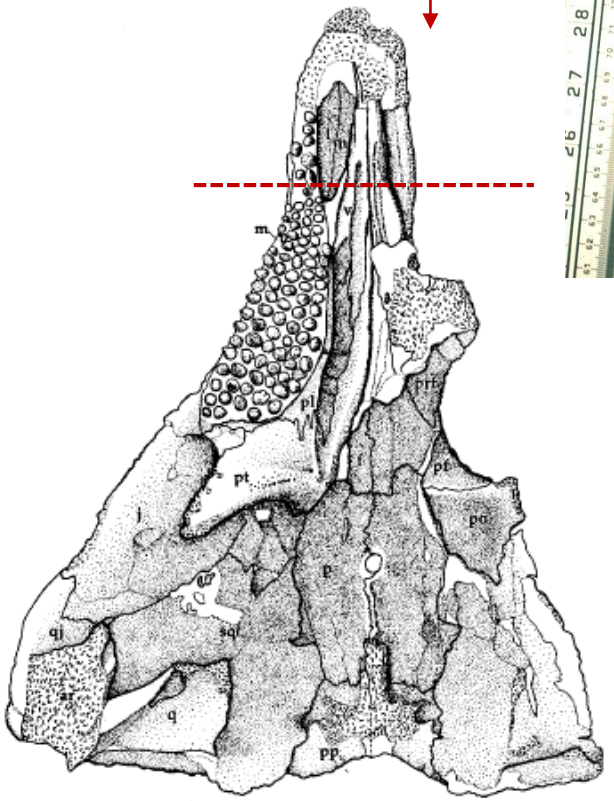
Extend far anteriorly on tooth row absent (0)

Extend far anteriorly on tooth row present (1)

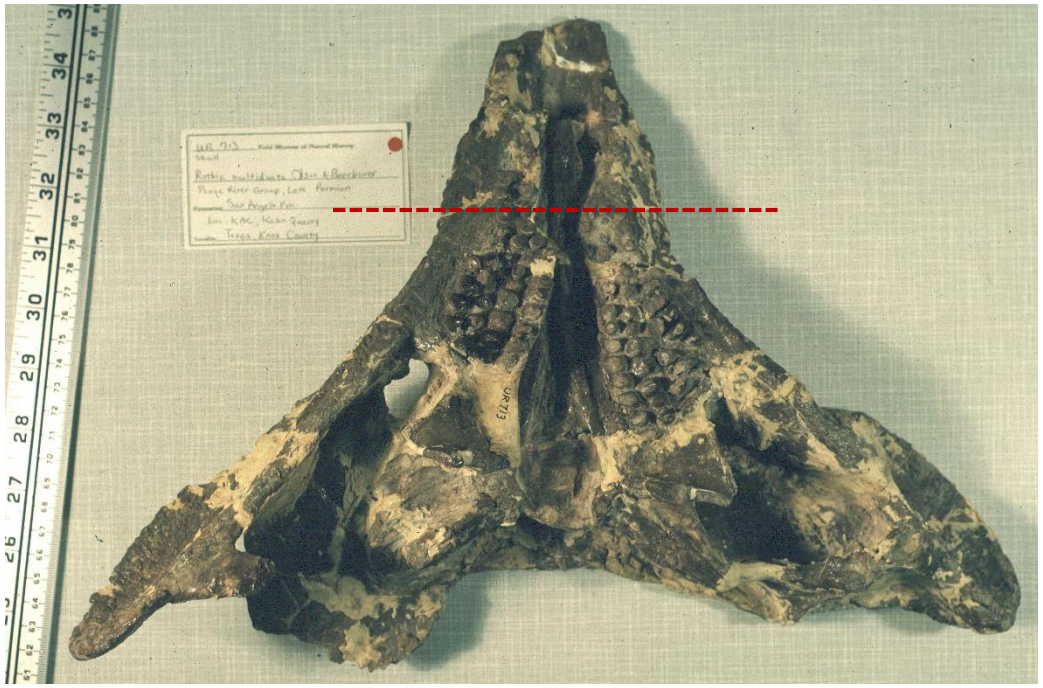
NOTE: only applies to specimen with several teeth rows; one single teeth row is always 0.



Captorhinikos chozaensis. Reconstruction. In Olson 1962.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.



Rothianiscus multidontus. Image from Modesto 2018. Personal communication.

(11) Maxilla: double row of teeth extend far anteriorly on tooth row absent (0); double row of teeth extend far anteriorly on tooth row present (1). In Modesto 2018.

Status 11(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Moradisaurus grandis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 11(1)

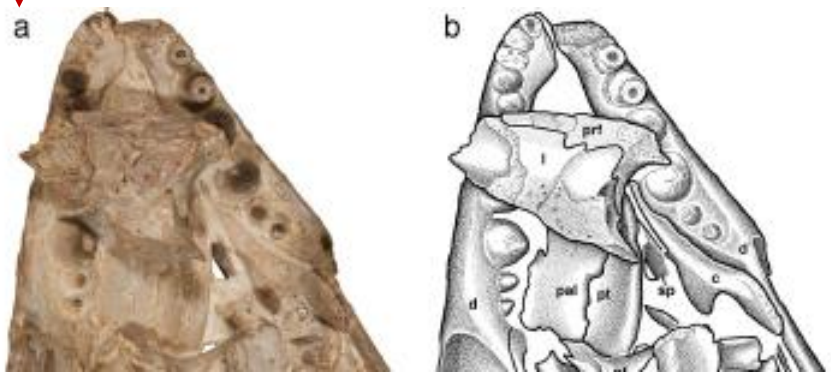
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*

Status 11(?)

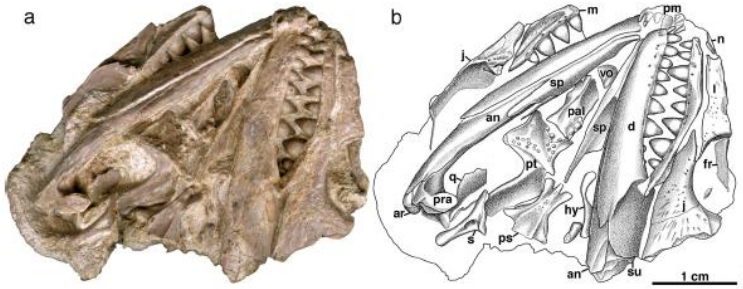
(11) Maxilla: double row of teeth extend far anteriorly on tooth row absent (0); double row of teeth extend far anteriorly on tooth row present (1). In Modesto 2018.

(12) Dental tooth wear:

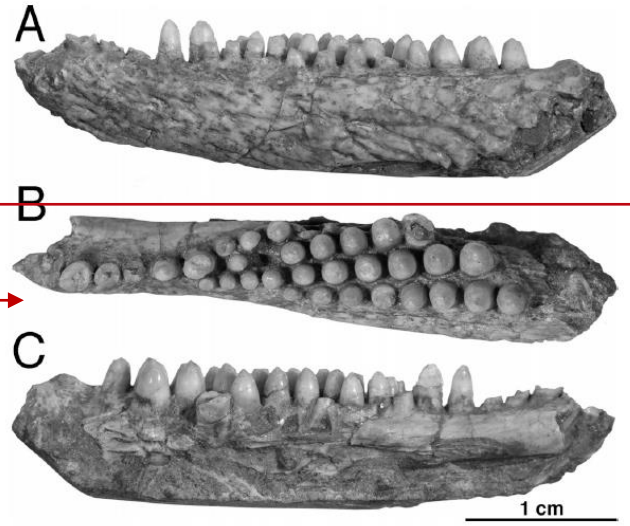
- Absent (0)
- Present, modest (1)
- Present, saddle-shaped (2)



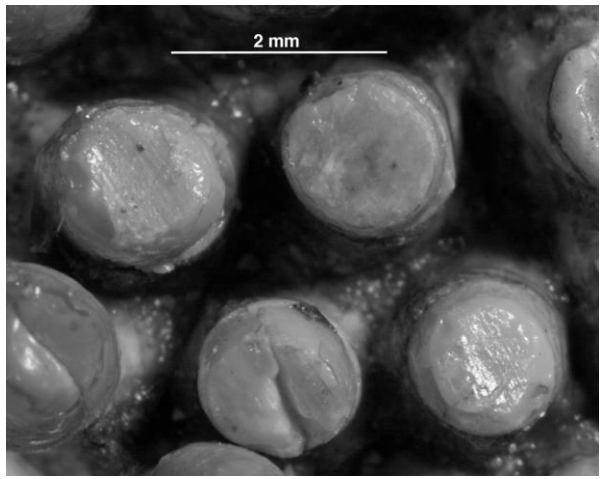
Opisthodontosaurus carrolli. UWBM 89171. In Reisz et al 2015.



Opisthodontosaurus carrolli. Holotype; OMNH 77469. In Reisz et al 2015.



Captorhinikos valensis. Holotype MNH UR 101. In Modesto, Lamb and Reisz 2014.



Captorhinikos valensis. FMNH UR 2496. In Modesto, Lamb and Reisz 2014.

Moradisaurus grandis. Images from Modesto 2018. Personal communication.

(12) Dental tooth wear: absent (0); present, modest (1); present, saddle shaped (2). In Modesto 2018.

Status 12(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Gansurhinus qingtoushanensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 12(1)

- *Captorhinus aguti*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*
- *Captorhinus kierani*

Status 12(2)

- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Captorhinikos valensis*

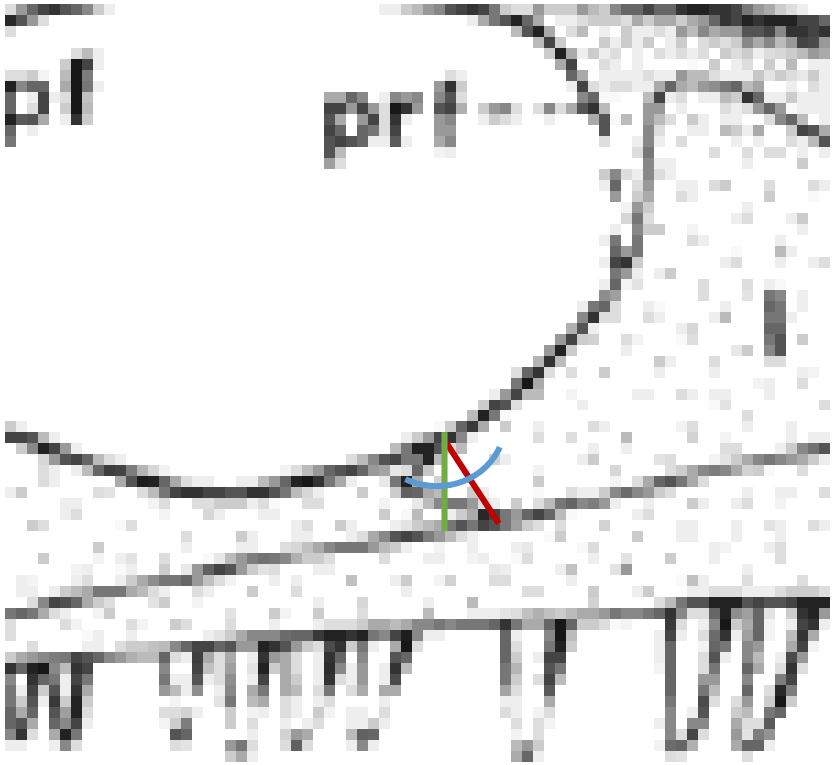
Status 12(?)

(12) Dental tooth wear: absent (0); present, modest (1); present, saddle shaped (2). In Modesto 2018.

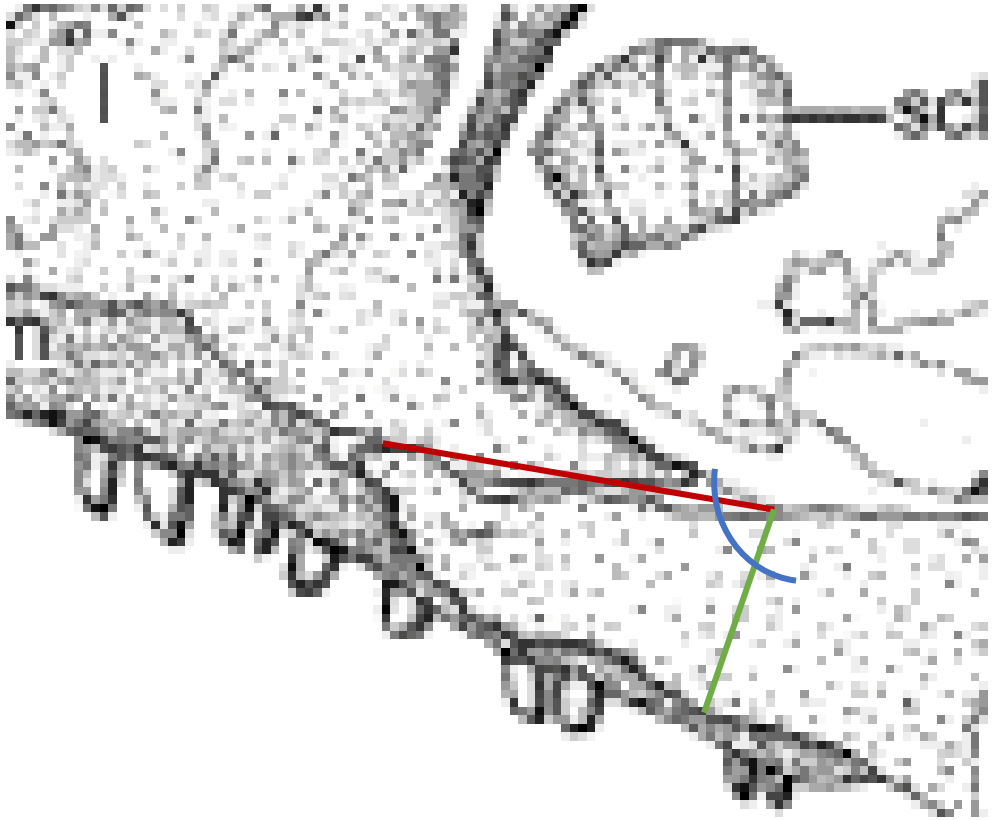
(13 a) Lacrimal – suture with jugal:

Angle between L-J suture and perpendicular distance to mandible < 65º (0)

Angle between suture and perpendicular distance to jugal suture with mandible > 65º (1)



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martens 1991.



Reiszorhinus olsoni. Reconstruction; holotype; FMNH UC183. In Sumida, Dodick et al 2010.

Status 13a (0)

- *Thuringothyris mahlendorffae*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus chozaensis*

Status 13a (1)

- *Euconcordia cunninghami*
- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

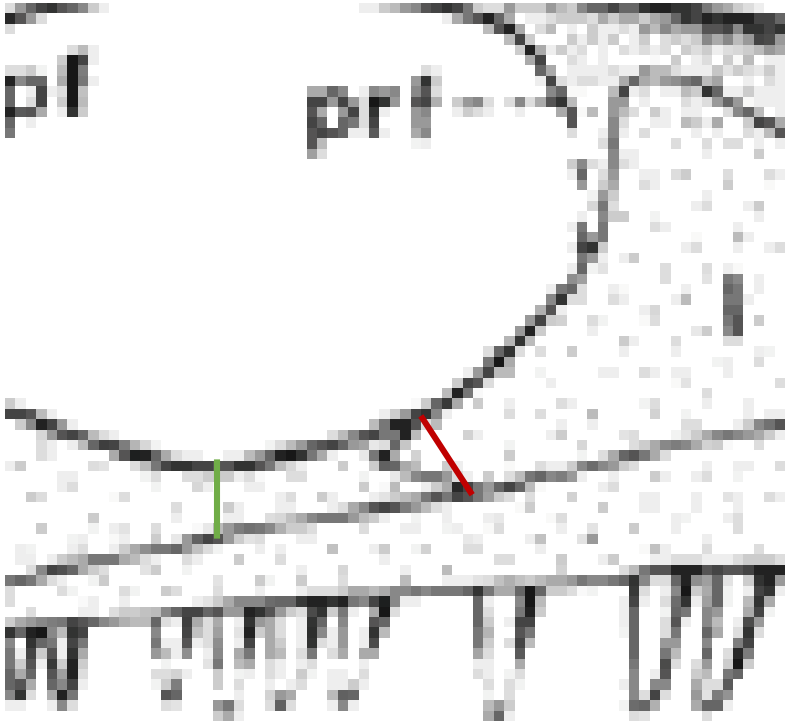
Status 13a (?)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

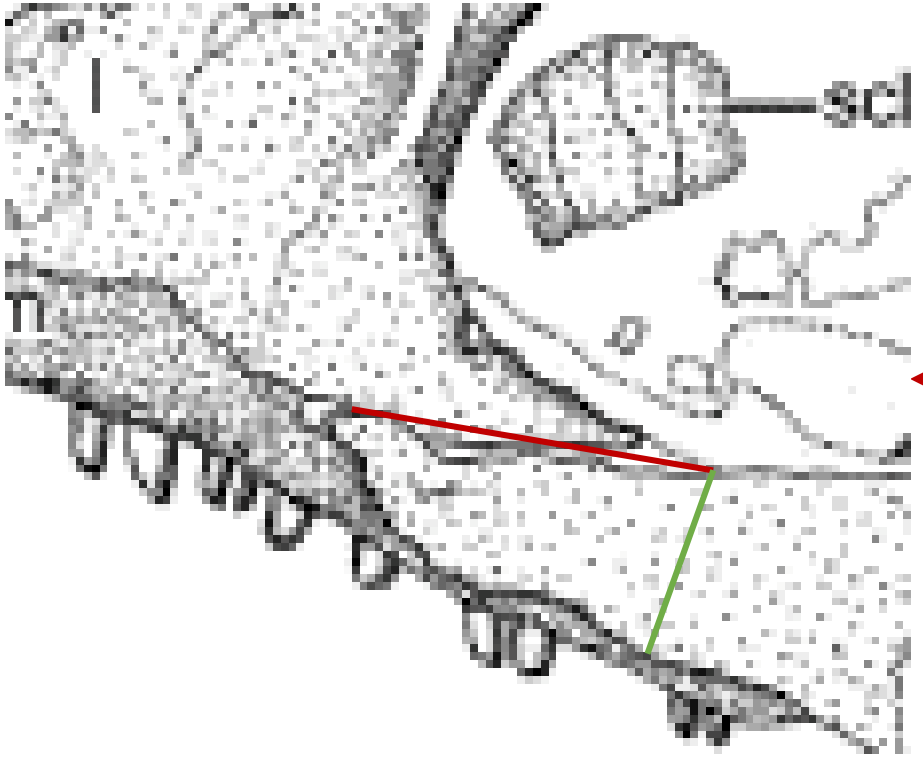
(13 b) Lacrimal – suture with jugal:

Shorter than perpendicular distance to jugal's suture with mandible (0)

Longer than perpendicular distance to jugal's suture with mandible (1)



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martens 1991.



Reiszorhinus olsoni. Reconstruction; holotype; FMNH UC183. In Sumida, Dodick et al 2010.

Status 13b (0)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*

Status 13b (1)

- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Captorhinus aguti*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

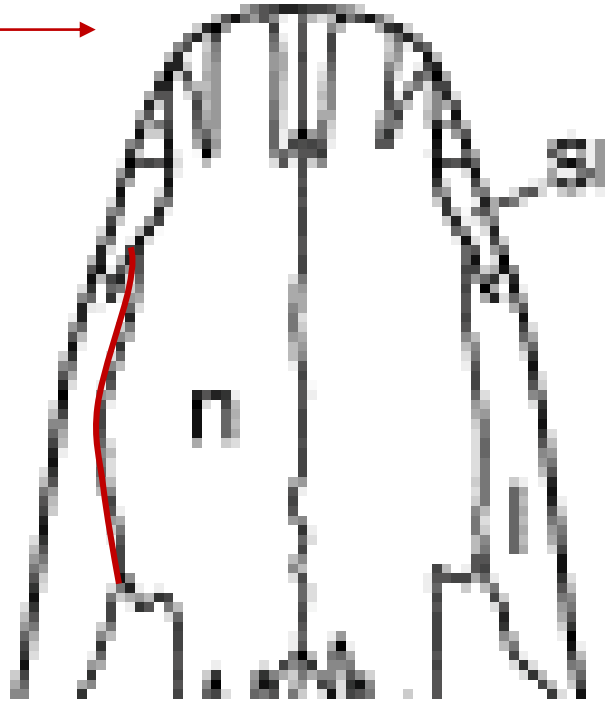
Status 13b (?)

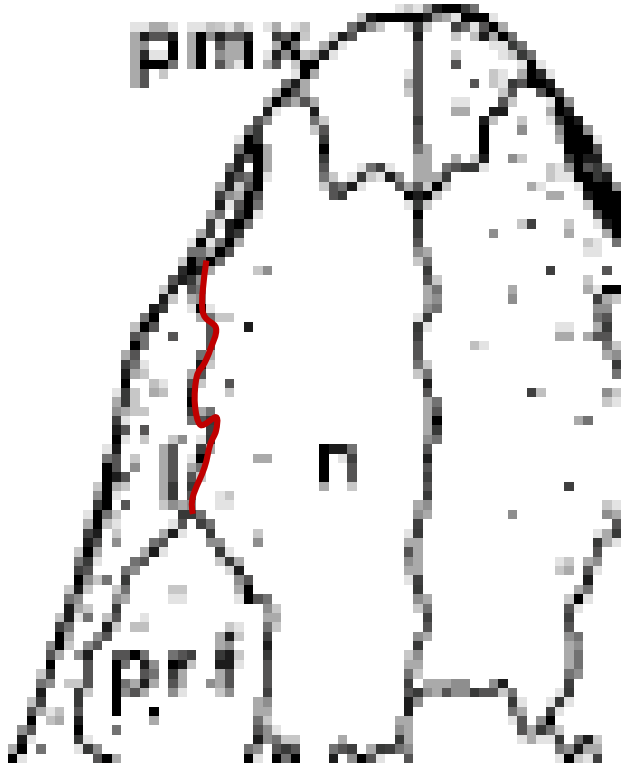
- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

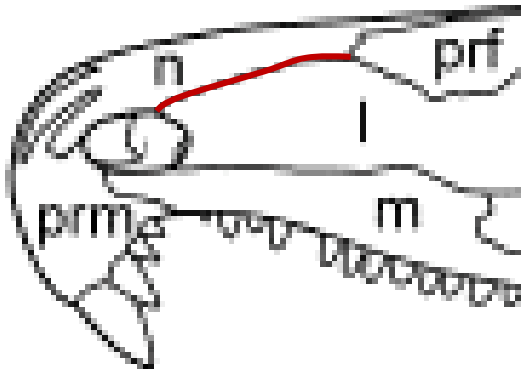
(14) Nasolacrimal suture:

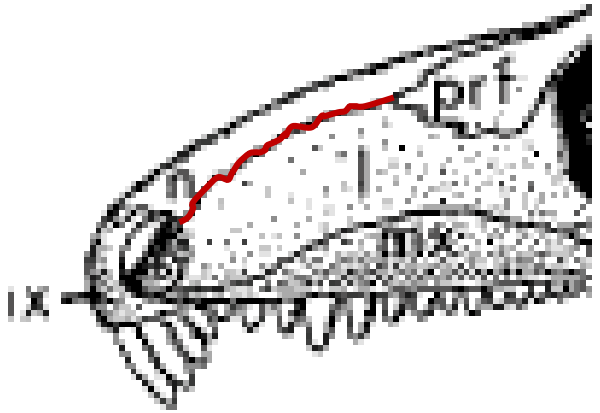
Straight (0)

Interdigitating (1)









(14) Nasolacrimal suture: straight (0); interdigitating (1). In Modesto 2018.

Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.

Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 14(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Saurorictus australis*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*

Status 14(1)

- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 14(?)

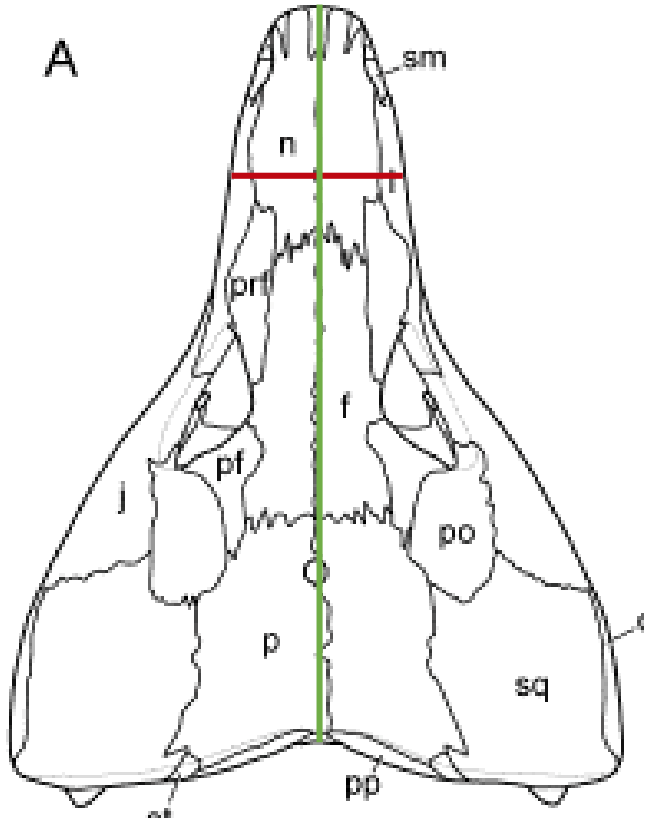
- *Romeria texana*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

(14) Nasolacrimal suture: straight (0); interdigitating (1). In Modesto 2018.

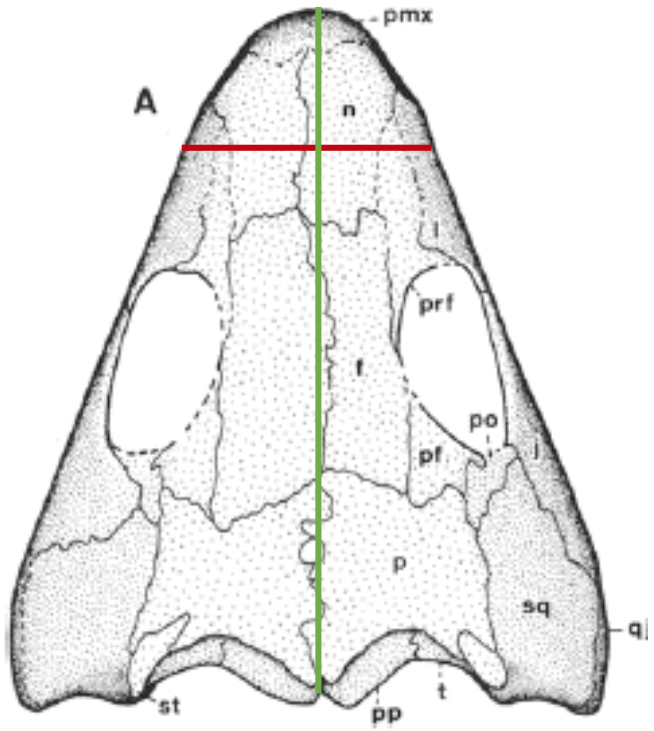
(15 a) Snout:

Ratio between cranium width at nostril-orbital midpoint and total cranium length < 0,36 (0)

Ratio between cranium width at nostril-orbital midpoint and total cranium length > 0,36 (1)



Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martins 1991.

Status 15a (0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 15a (1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinikos chozaensis*

Status 15a (?)

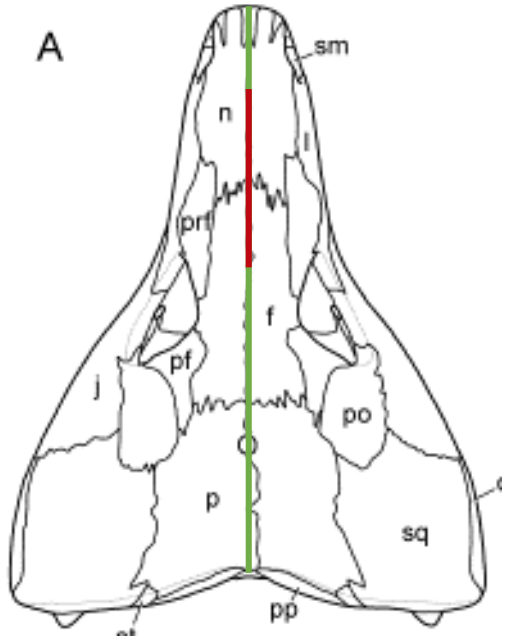
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

(15 b) Snout:

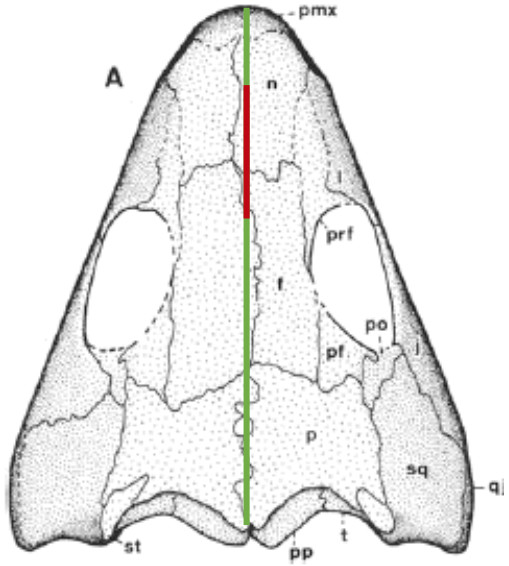
Ratio between anterior cranium length at nostril-orbital midpoint and total cranium length > 0,28 (0)

Ratio between anterior cranium length at nostril-orbital midpoint and total cranium length between 0,21 and 0,28 (1)

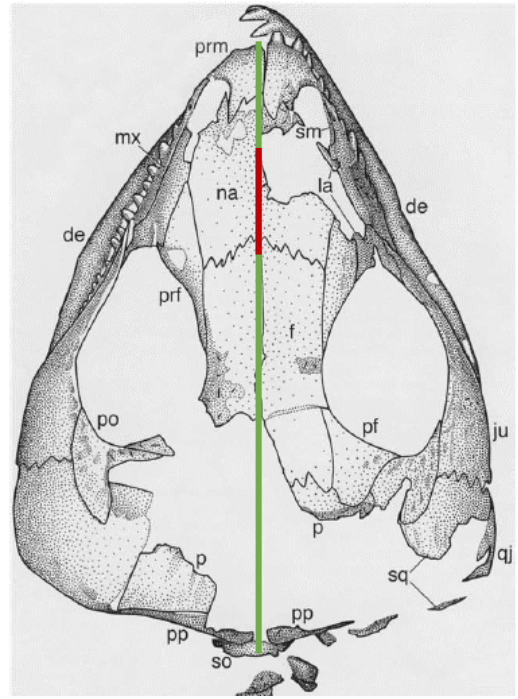
Ratio between anterior cranium length at nostril-orbital midpoint and total cranium length < 0,21 (2)



Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martins 1991.



Saurorictus australis. Illustration SAM-PK 8666. In Modesto & Smith 2001.

Status 15b(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria texana*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

Status 15b(1)

- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 15b(2)

- *Euconcordia cunningham*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*

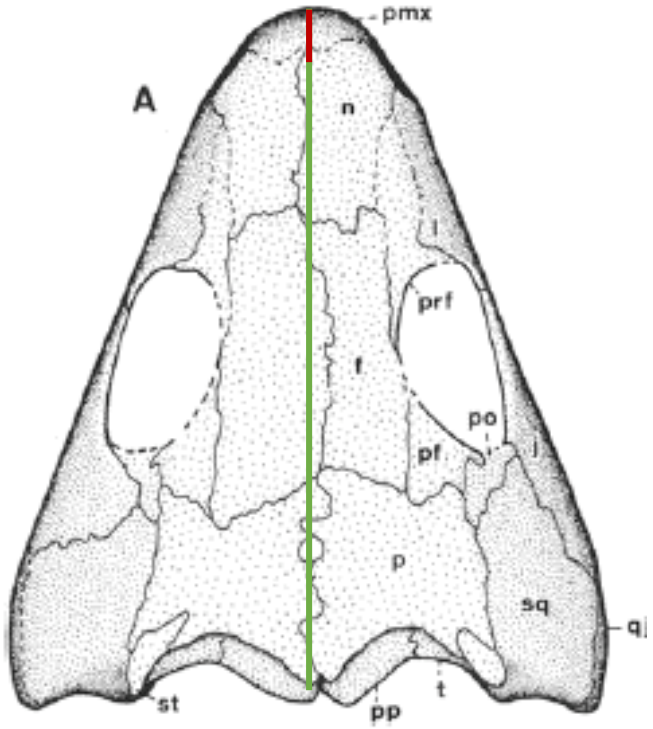
Status 15b(?)

- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

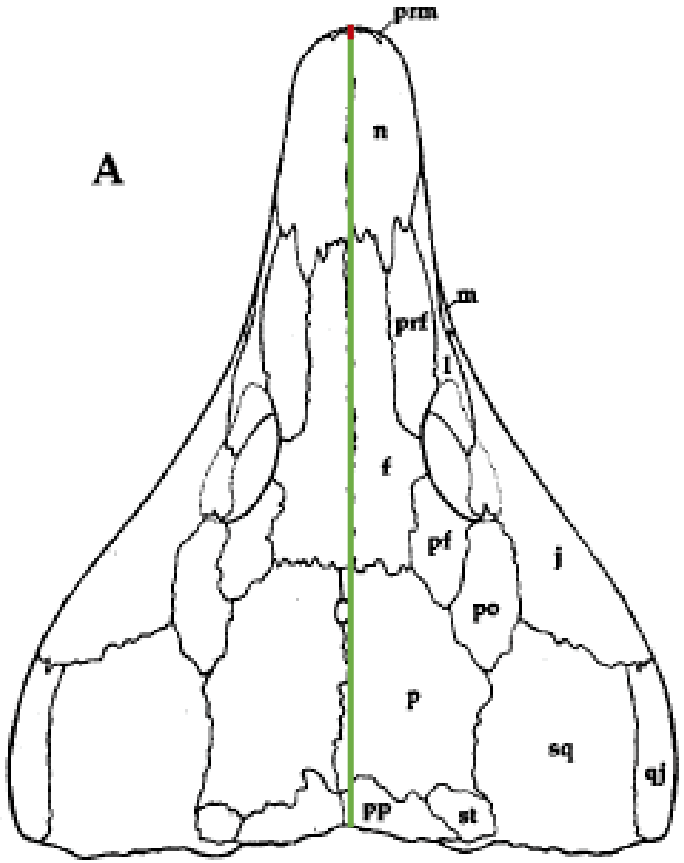
(15 c) Snout:

Ratio between premaxilla length in dorsal view and total cranium length
> 0,05 (0)

Ratio between premaxilla length in dorsal view and total cranium length
< 0,05 (1)



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martins 1991.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 15c (0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 15c (1)

- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*

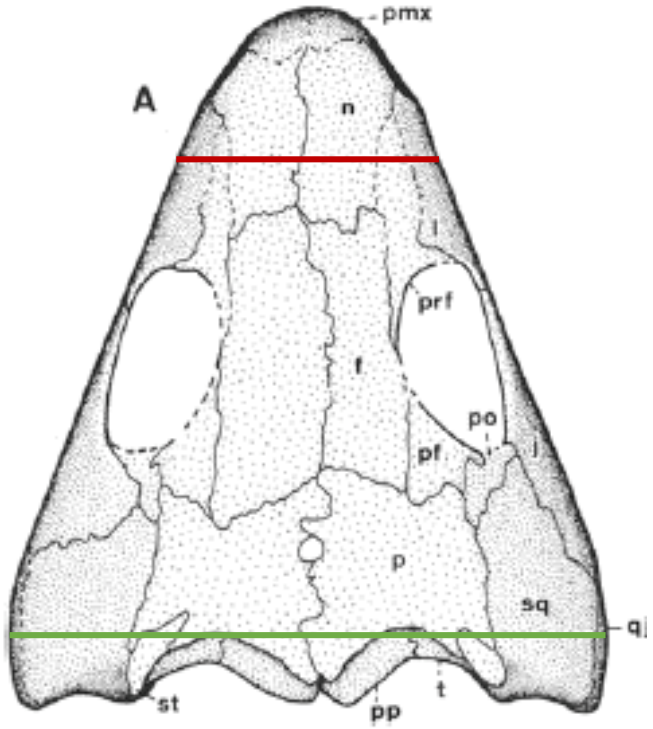
Status 15c (?)

- *Euconcordia cunninghami*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

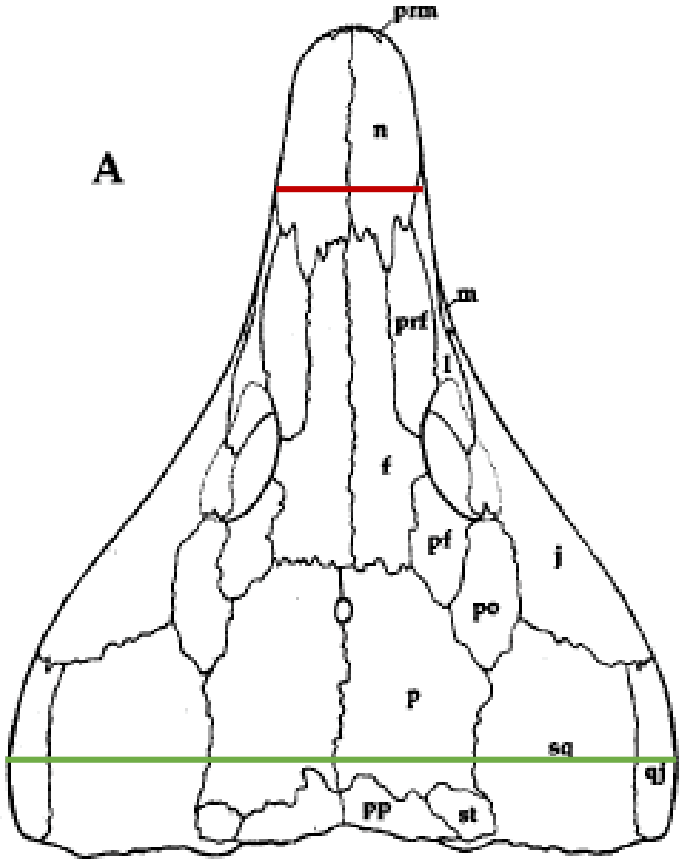
(15 d) Snout:

Broad; ratio between cranium width at nostril-orbital midpoint and broadest cranium width > 0,34 (0)

Narrow; ratio between cranium width at nostril-orbital midpoint and broadest cranium width < 0,34 (1)



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martins 1991.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 15d (0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinikos chozaensis*
- *Captorhinus kierani*

Status 15d (1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*

Status 15d (?)

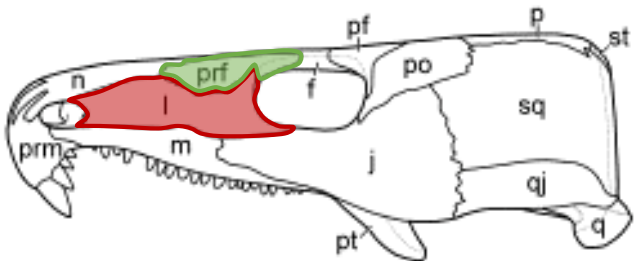
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

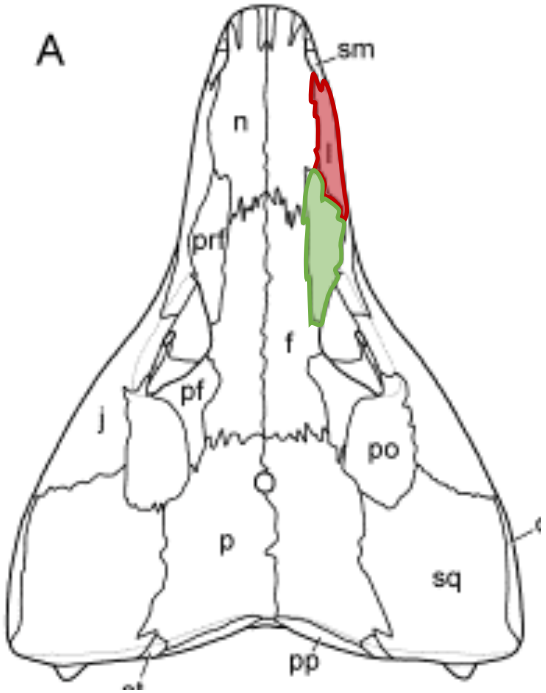
(16) Antiorbital/cheek region:

(16) Antorbital/cheek region: mainly formed by lacrimal and prefrontal (0); mostly formed by lacrimal due to dorsal expansion of the bone (1). In Modesto 2018.

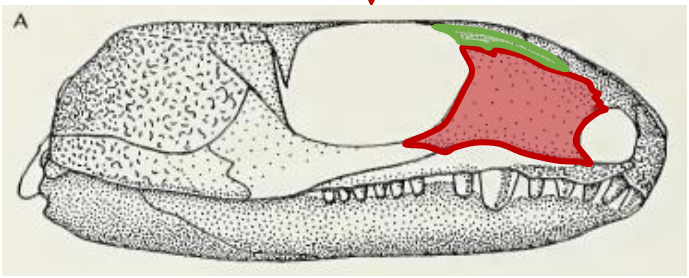
Mainly formed by lacrimal and prefrontal (0)

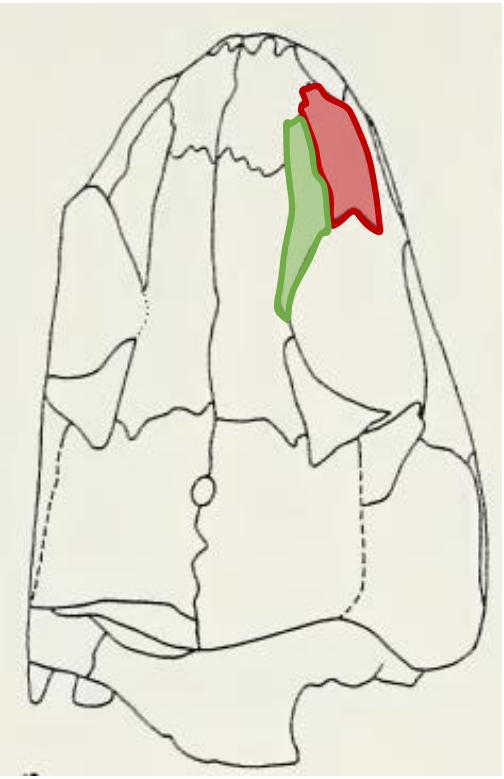
Mainly formed by lacrimal due to dorsal expansion of the bone (1)





Labidosaurus hamatus. Reconstruction CM 73371. In Modesto, Scott et al 2007.





Rhiodenticulatus heatoni. Reconstruction UCMP 40209. In Bergman & Reisz 1986.

Status 16(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 16(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Rhiodenticulatus heatoni*
- *Moradisaurus grandis*

Status 16(?)

- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

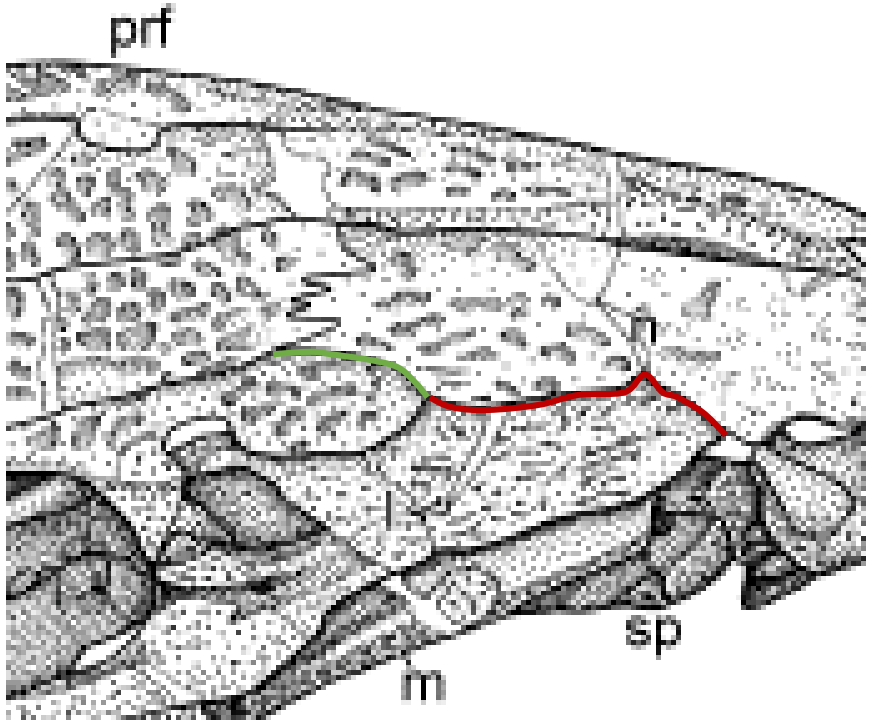
(16) Antorbital/cheek region: mainly formed by lacrimal and prefrontal (0); mostly formed by lacrimal due to dorsal expansion of the bone (1). In Castanhinha & Modesto 2018.

(17) Prefrontal – prefrontal-nasal suture:

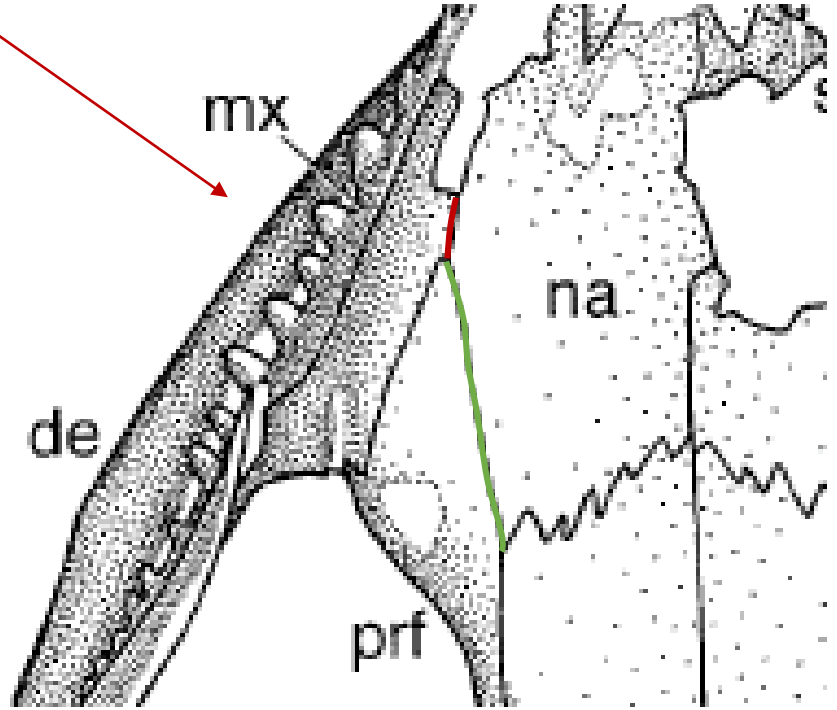
Shorter than lacrimal-nasal suture (0)

Longer than lacrimal-nasal suture (1)

(17) Prefrontal: prefrontal-nasal suture shorter than lacrimal-nasal suture (0); prefrontal-nasal suture longer than lacrimal-nasal suture (1). In Modesto 2018.



Labidosaurus hamatus. CM 73371. In Modesto, Scott et al 2007.



Saurorictus australis. Holotype SAM PK-8666. In Modesto & Smith 2001.

Status 17(0)

- *Protorothyris archeri*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 17(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*

Status 17(?)

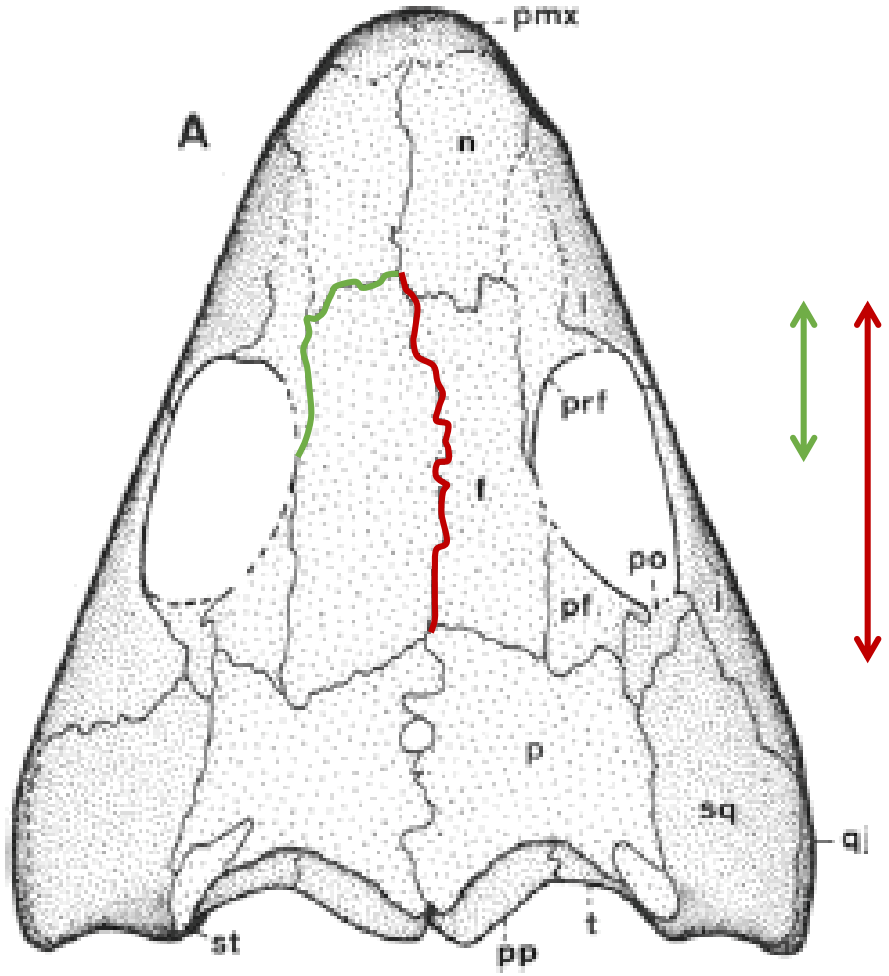
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

(17) Prefrontal: prefrontal-nasal suture shorter than lacrimal-nasal suture (0); prefrontal-nasal suture longer than lacrimal-nasal suture (1). In Castanhinha & Modesto 2018.

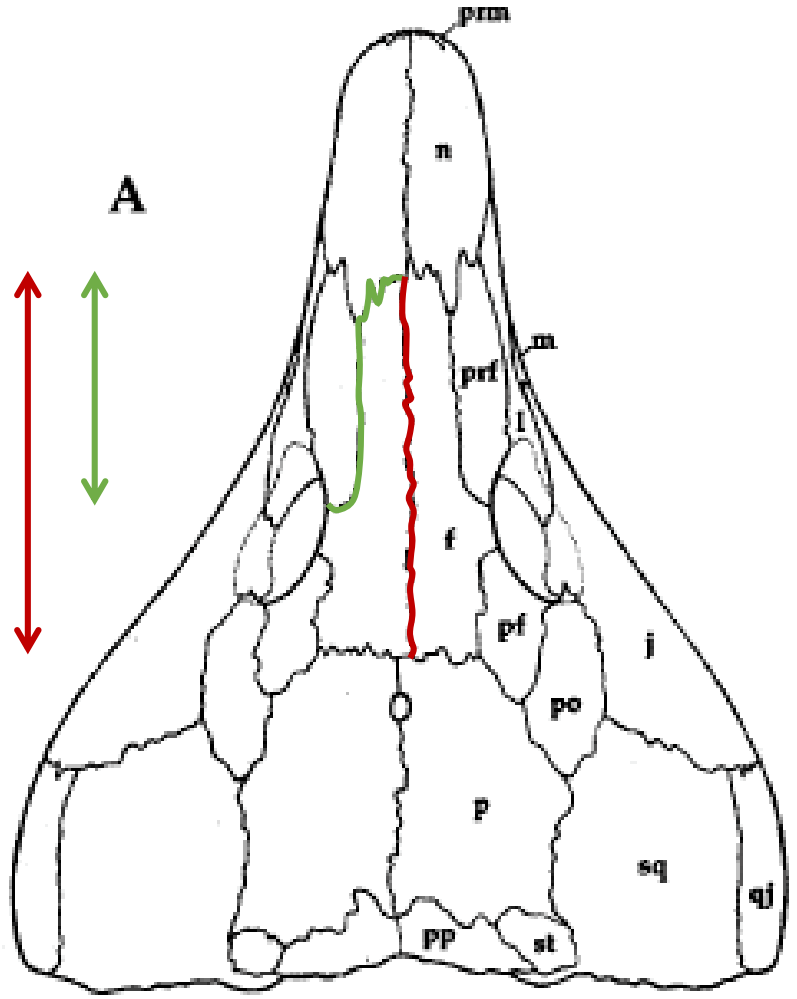
(18 a) Frontal – anterior process:

Short, less than 0,59 of the frontal sagittal length (0)

Long, 0,59 or more of the frontal sagittal length (1)



Thuringothyris mahlendorffae. Reconstruction. In Boy & Martins 1991.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 18a(0)

- *Paleothyris acadiana*
- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 18a(1)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Labidosaurikos meachami*

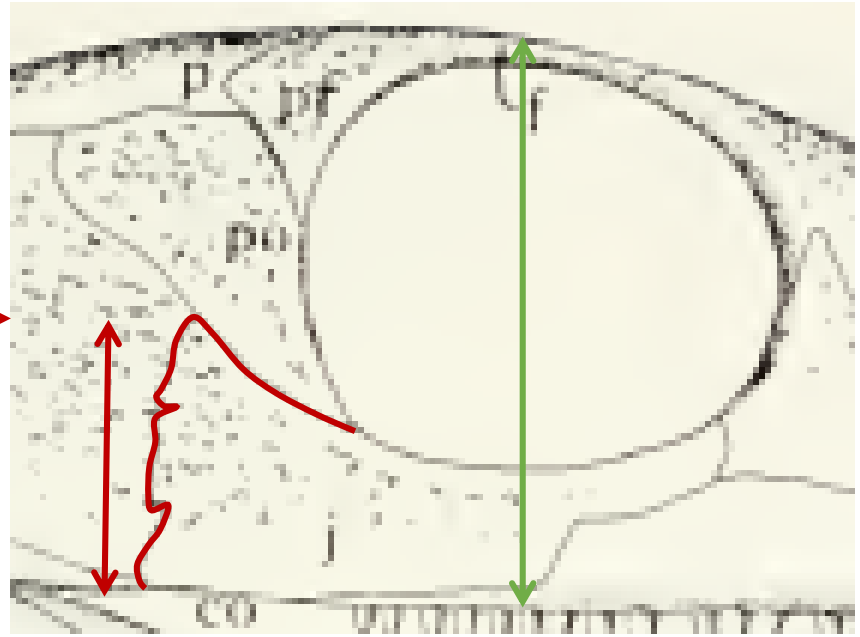
Status 18a(?)

- *Romeria texana*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

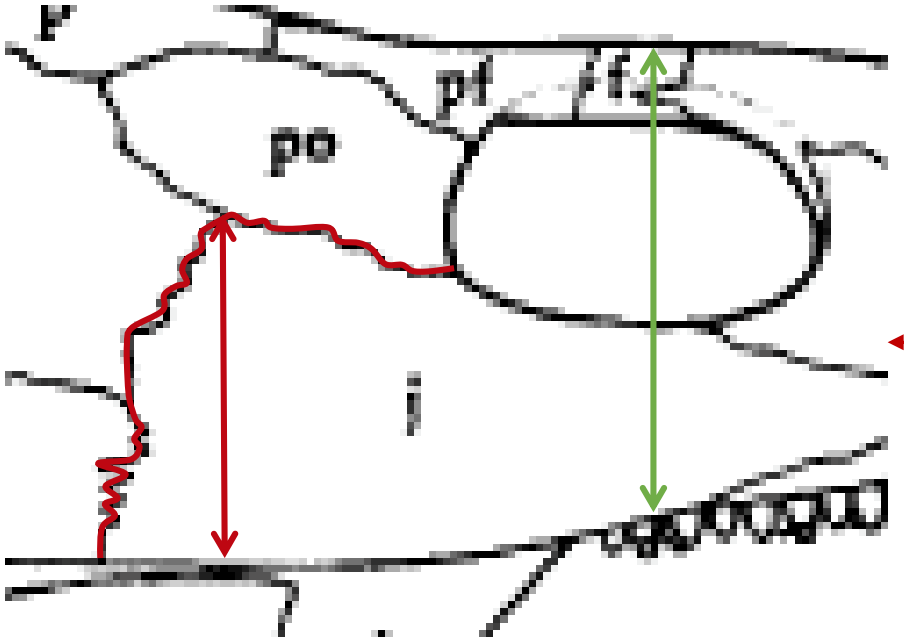
(19a) Jugal – subtemporal process height:

Dorsoventrally low, equal to or less than 0,52 of skull height through orbital midpoint (0)

Dorsoventrally deep, at least 0,52 of skull height through orbital midpoint (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 19a(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Opisthodontosaurus carrolli*

Status 19a(1)

- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

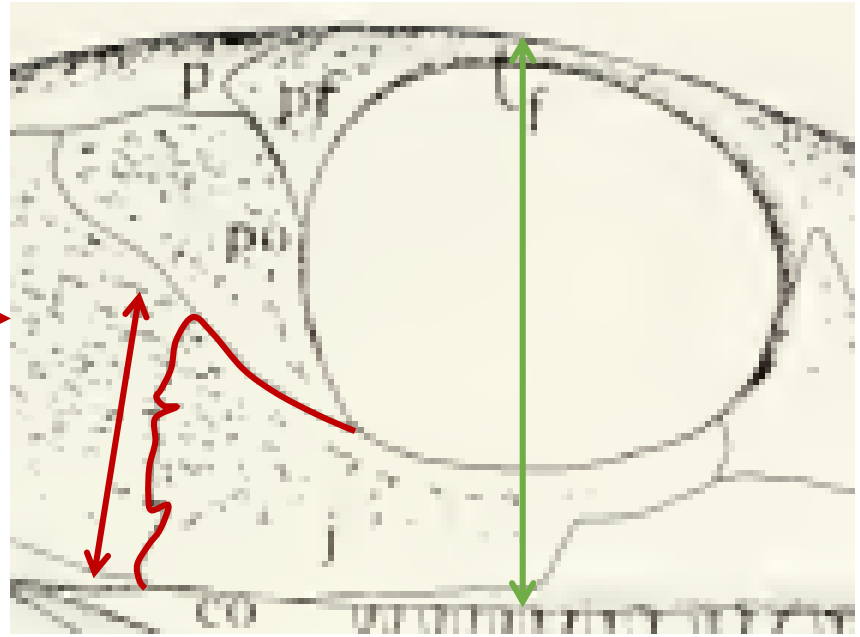
Status 19a(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus rochardi*

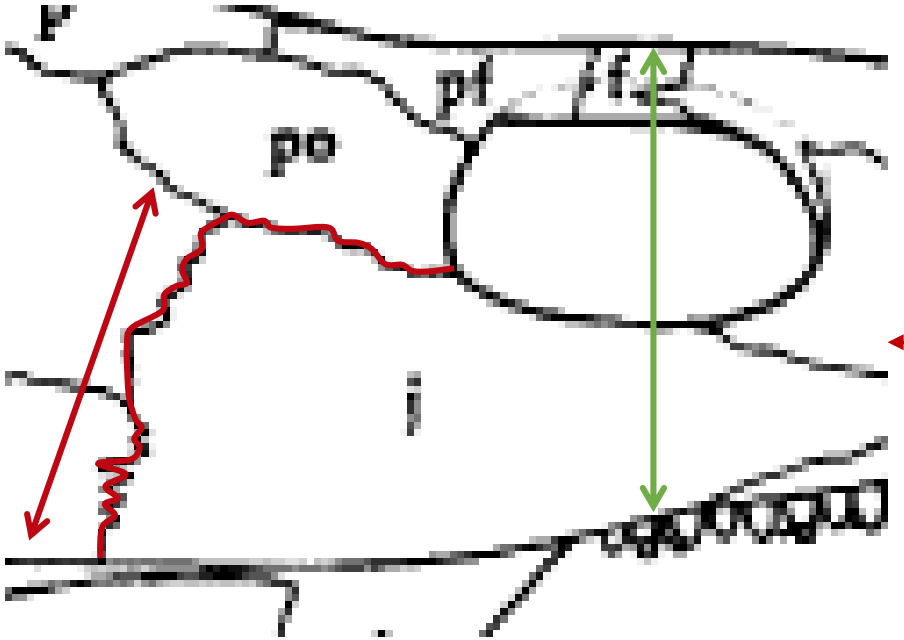
(19b) Jugal – subtemporal process length:

Dorsoventrally low, equal to or less than 0,52 of skull height through orbital midpoint (0)

Dorsoventrally deep, at least 0,52 of skull height through orbital midpoint (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 19b(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*

Status 19b(1)

- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

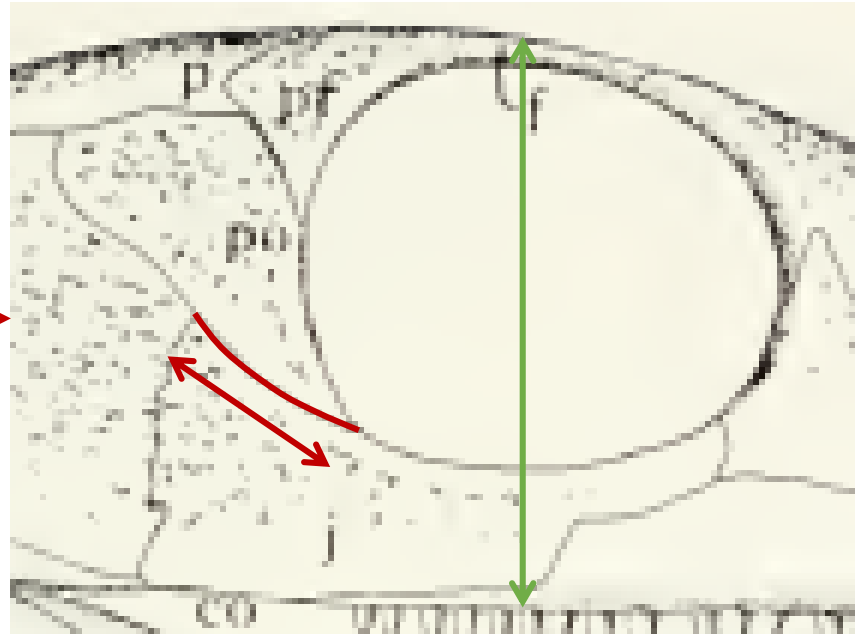
Status 19b(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus rochardi*

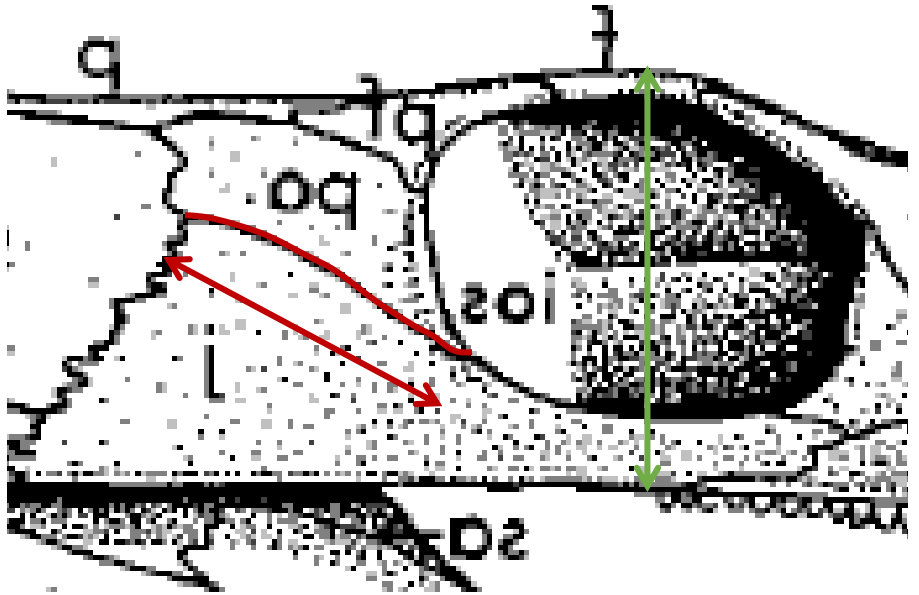
(19c) Jugal-Postorbital suture length:

Short, equal to or less than 0,68 of skull height through orbital midpoint (0)

Long, at least 0,68 of skull height through orbital midpoint (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 19c(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*

Status 19c(1)

- *Captorhinus laticeps*
- *Captorhinus kierani*

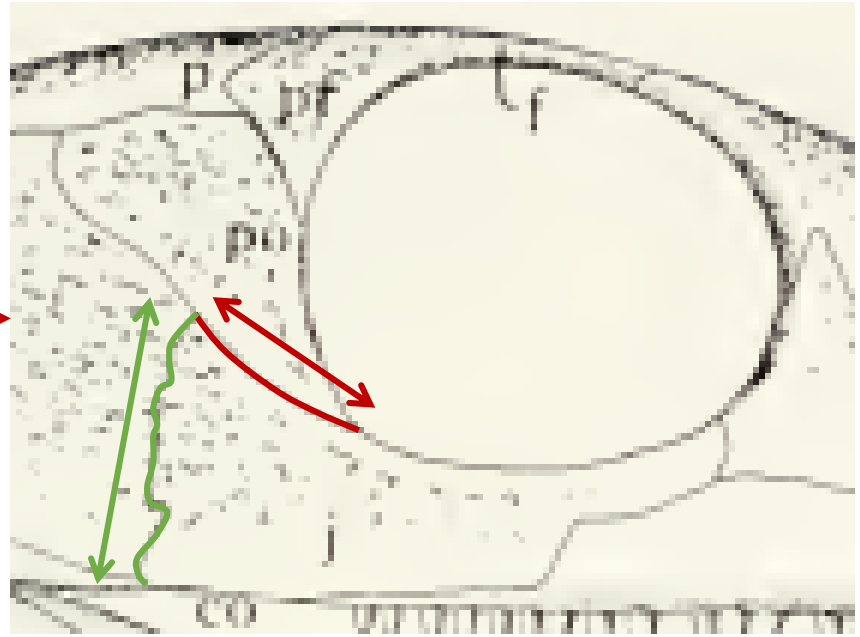
Status 19c(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus rochardi*

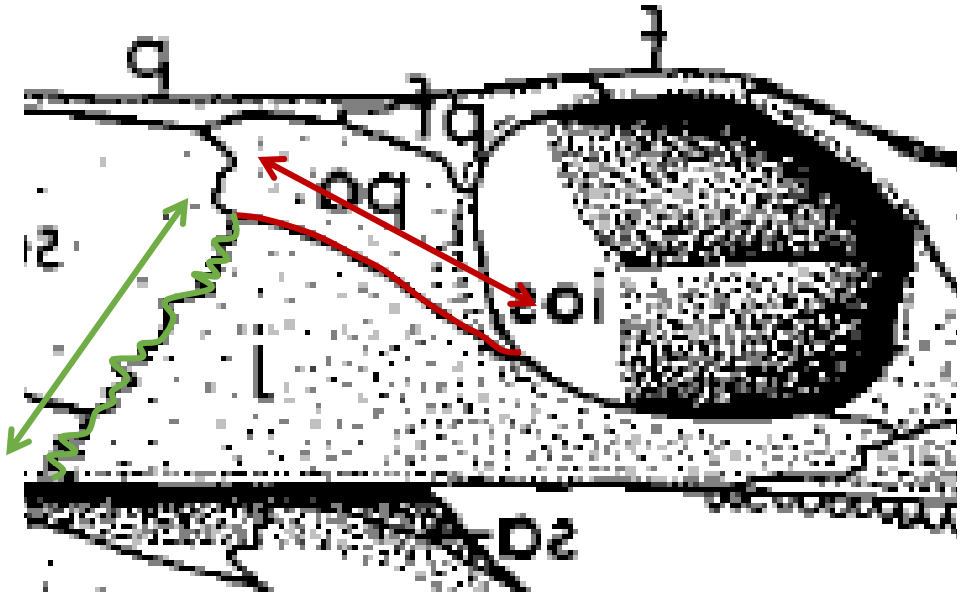
(19d) Jugal-Postorbital suture length:

Short, less than 0,84 of jugal's subtemporal process length (0)

Long, equal or more than 0,84 of jugal's subtemporal process length (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 19d(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*

Status 19d(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus kierani*

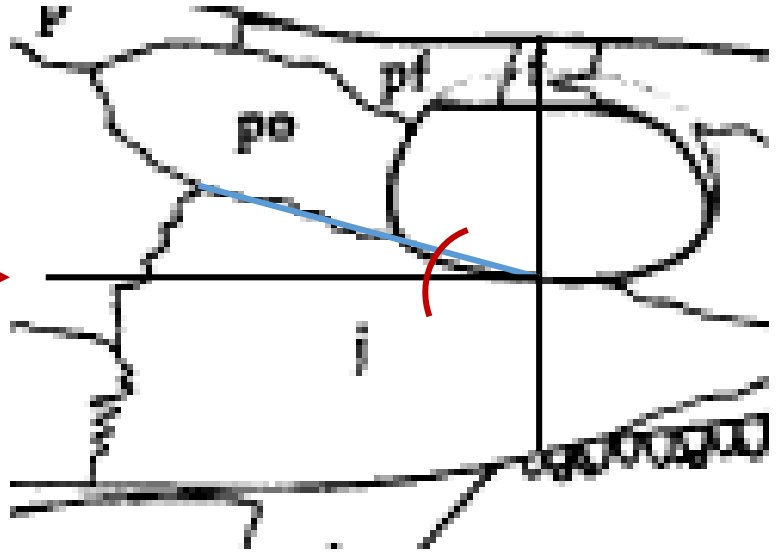
Status 19d(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus rochardi*

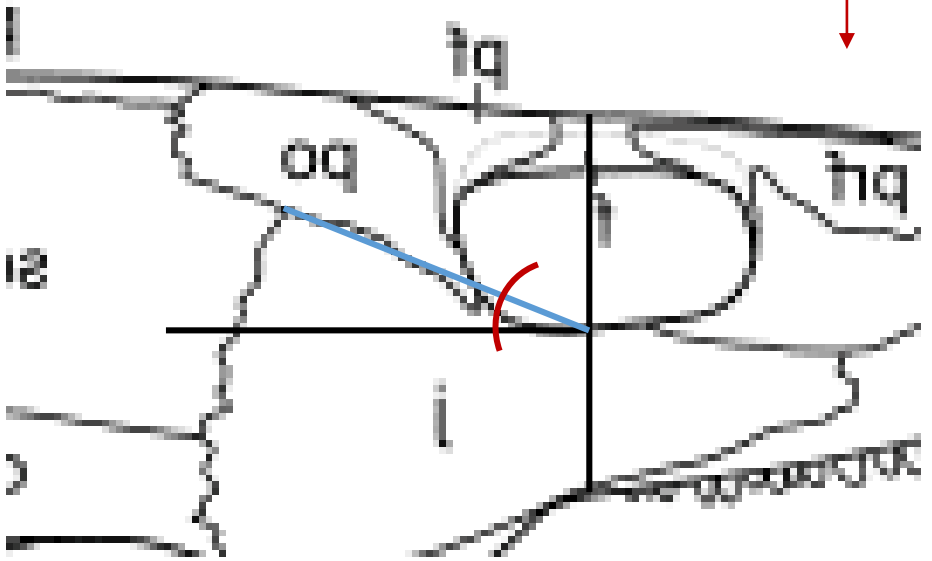
(19e) Jugal-Postorbital suture:

Angle with lower limit of orbit midpoint smaller than 30º (0)

Angle with lower limit of orbit midpoint equal or bigger than 30º (1)



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.



Labidosaurus hamatus. Reconstruction. In Modesto et al. 2007.

Status 19e(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

Status 19e(1)

- *Romeria prima*
- *Romeria texana*
- *Labidosaurus hamatus*

Status 19e(?)

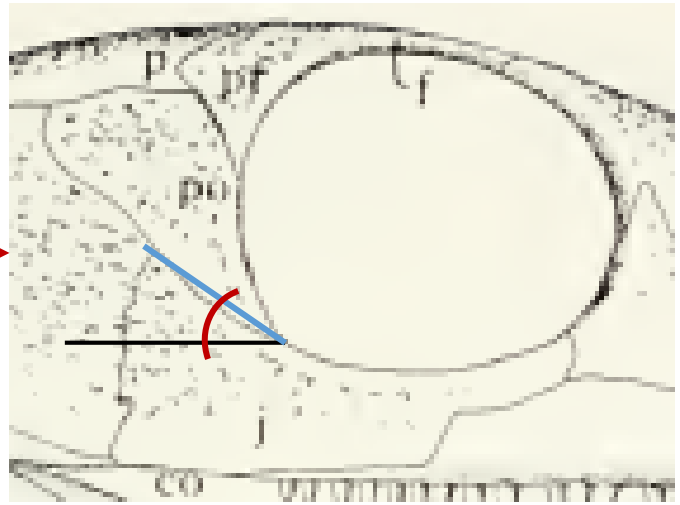
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus rochardi*

(19f) Jugal-Postorbital suture:

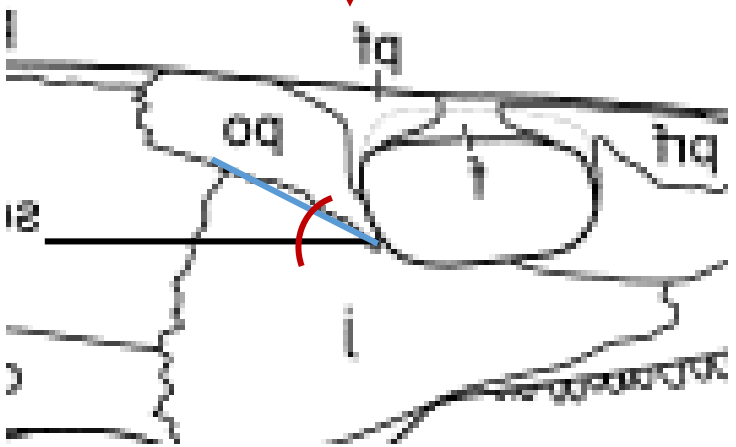
Angle with dorsal plan bigger than 33º (0)

Angle with dorsal plan between 19º and 33º (1)

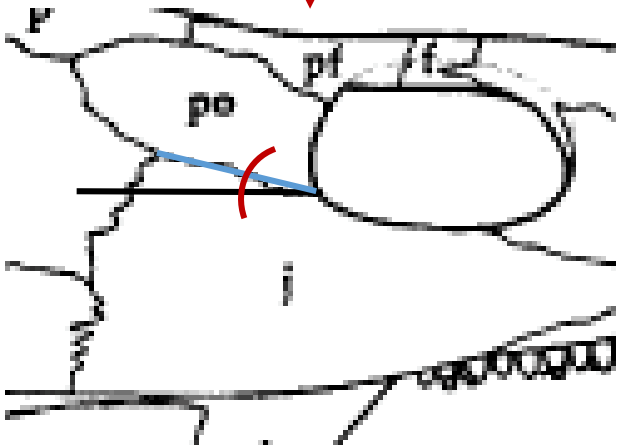
Angle with dorsal plan smaller than 19º (2)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurus hamatus. Reconstruction. In Modesto et al. 2007.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 19f(0)

- *Protorothyris archeri*
- *Romeria prima*
- *Romeria texana*

Status 19f(1)

- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 19f(2)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Saurorictus australis*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*

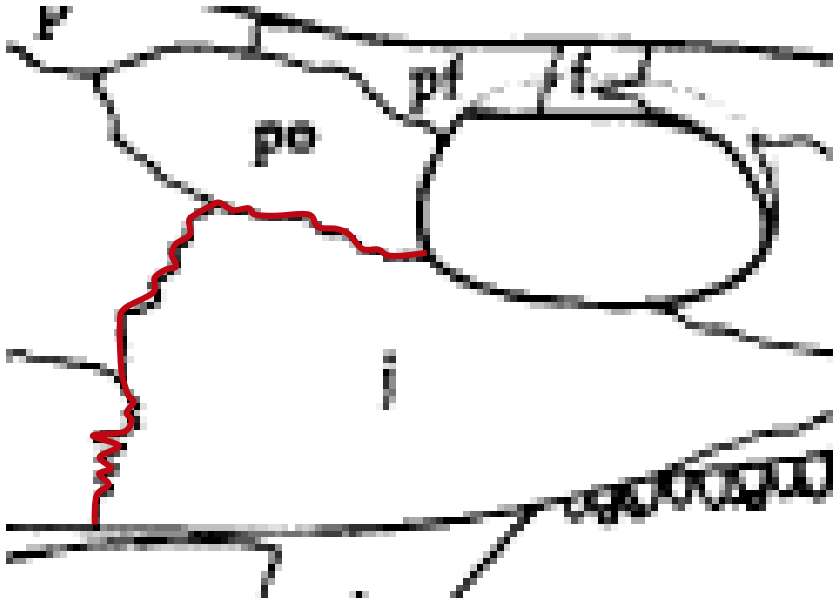
Status 19f(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

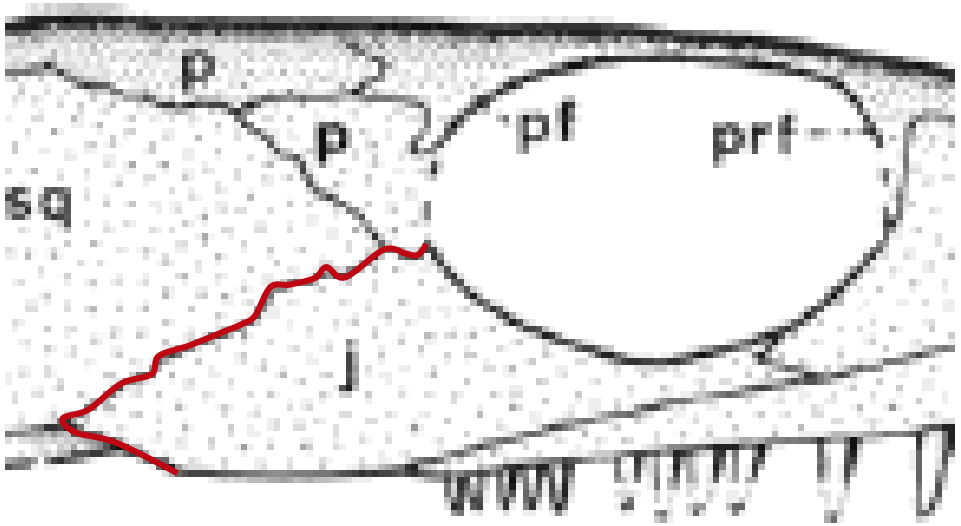
(19g) Jugal – subtemporal process shape:

Fanning out (0)

Descending (1)



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.



Thuringothyris mahlendorffae. Holotype; Museum of Nature in Gotha, Germany, Nr. 7729-1 to 3. In Boy & Martins 1991.

Status 19g(0)

- *Protorothyris archeri*
- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinus kierani*

Status 19g(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 19g(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus rochardi*

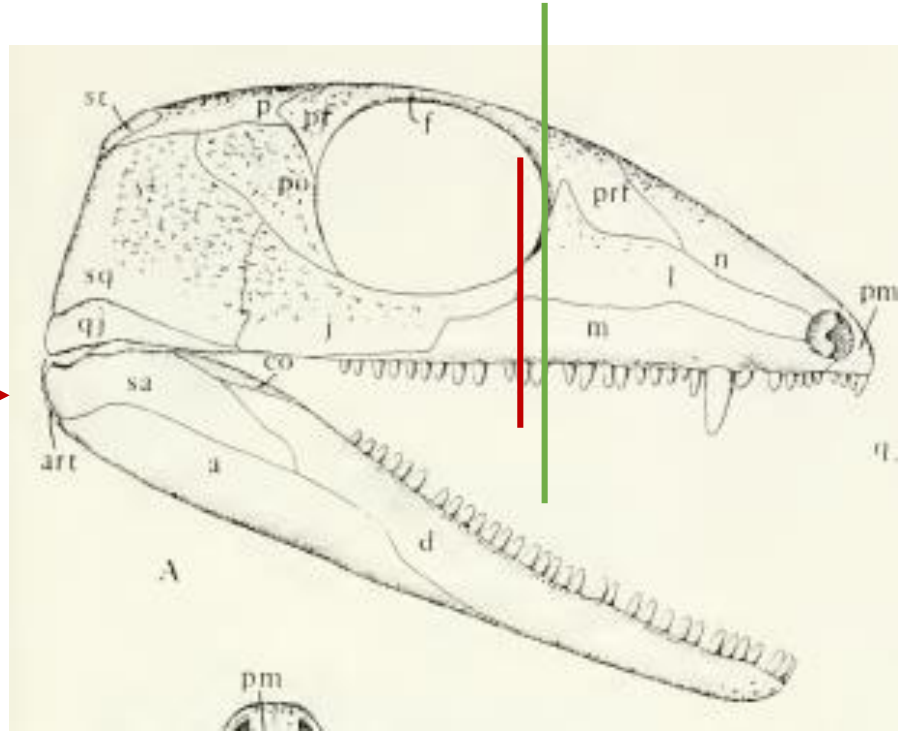
(20) Jugal – anterior extent:

Ends posterior to anterior orbital margin (0)

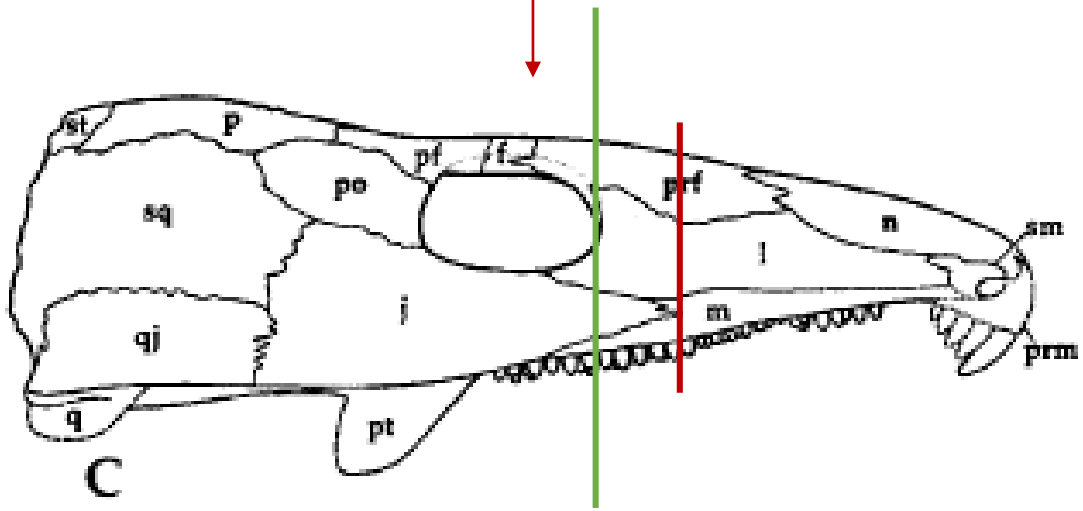
Reaches beyond anterior orbital margin (1)

NOTE: not independent from character 13.

(20) Jugal: anterior extent ends posterior to anterior orbital margin (0); anterior extent reaches beyond anterior orbital margin (1). In Castanhinha & Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurikos meachami. Reconstruction; Holotype; OMNH 04331. In Dodick & Modesto 1995.

Status 20(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Captorhinus laticeps*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

Status 20(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 20(?)

- *Moradisaurus grandis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

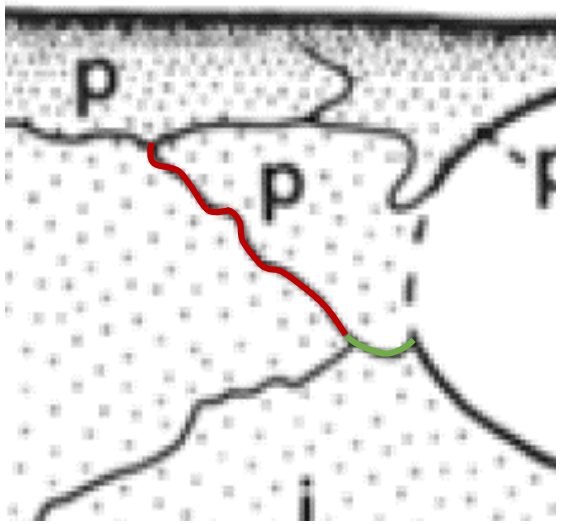
(20) Jugal: anterior extent ends posterior to anterior orbital margin (0); anterior extent reaches beyond anterior orbital margin (1). In Castanhinha & Modesto 2018.

(21) Postorbital-jugal suture:

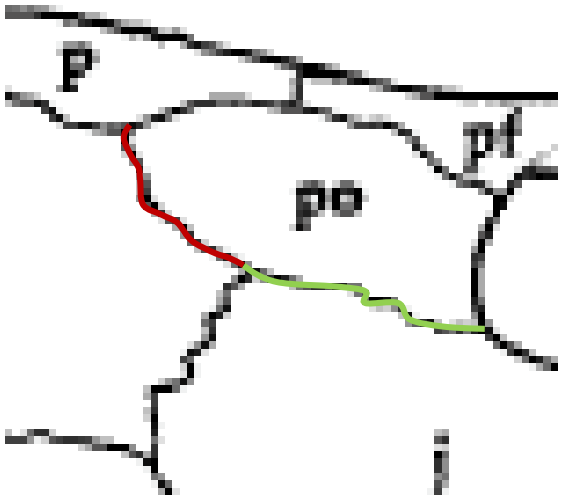
(21NEW) Postorbital-Jugal suture shorter than the Squamosal-Postorbital suture (0); Postorbital-Jugal suture equal or longer (1). In Castanhinha & Modesto 2018.

Shorter than the squamosal-postorbital suture (0)

Equal or longer than the squamosal-postorbital suture (1)



Thuringothyris mahlendorffae. Holotype; Museum of Nature in Gotha, Germany, Nr. 7729-1 to 3. In Boy & Martins 1991.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 21(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Saurorictus australis*

Status 21(1)

- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

Status 21(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

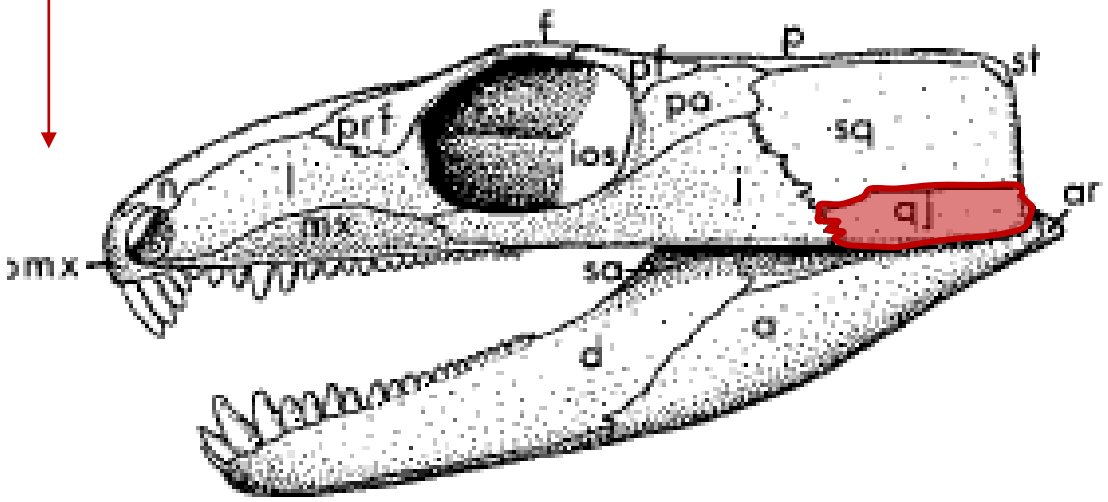
(21NEW) Postorbital-Jugal suture shorter than the Squamosal-Postorbital suture (0); Postorbital-Jugal suture equal or longer (1). In Castanhinha & Modesto 2018.

(22) Quadratojugal:

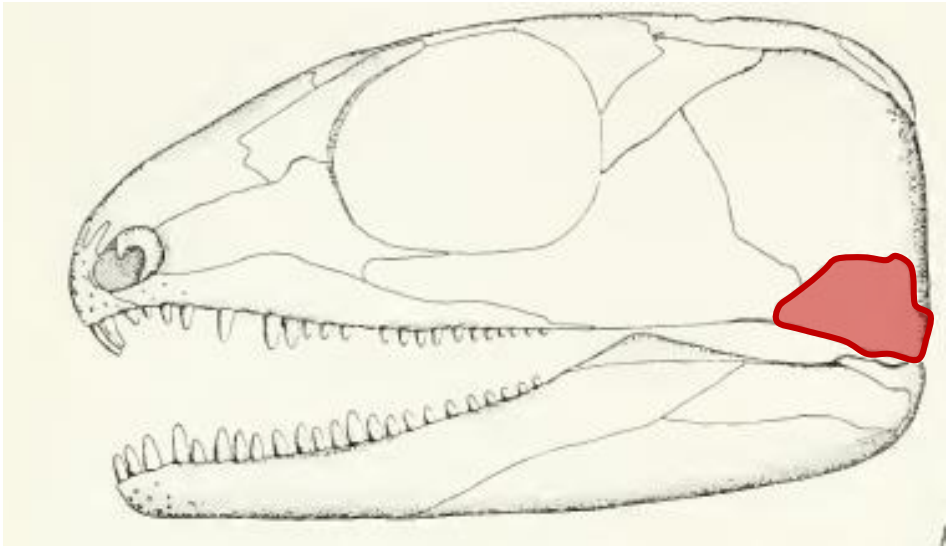
(22NEW) Quadratojugal: anteroposteriorly elongate (0); short, not extending anteriorly beyond midpoint of postorbital region (1). In Castanhinha & Modesto 2018.

Anteroposteriorly elongate (0)

Short, not extending anteriorly beyond midpoint of postorbital region (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Romeria prima. Reconstruction; MCZ 1963. In Clark & Carroll 1972.

Status 22(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 22(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Opisthodontosaurus carrolli*

Status 22(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

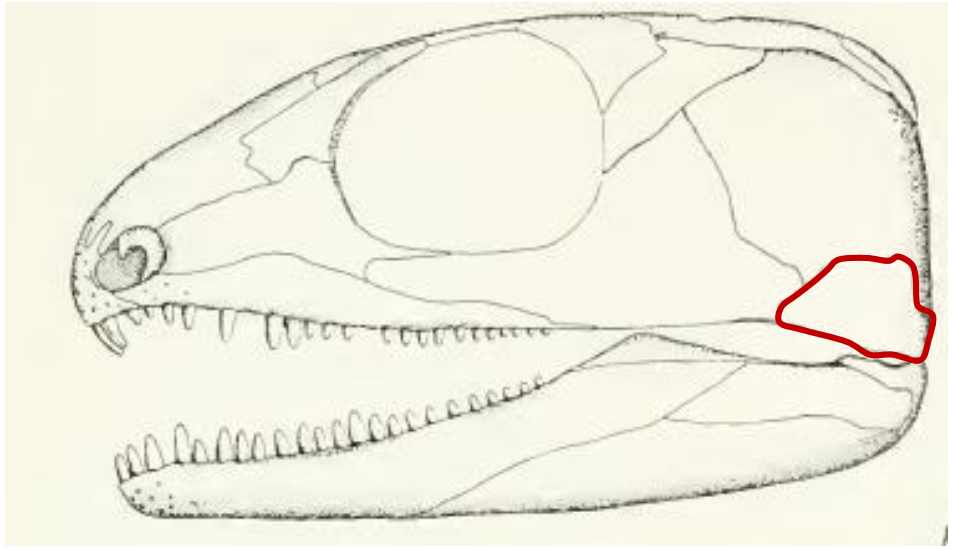
(22NEW) Quadratojugal: anteroposteriorly elongate (0); short, not extending anteriorly beyond midpoint of postorbital region (1). In Castanhinha & Modesto 2018.

(23) Quadratojugal - anteriorly:

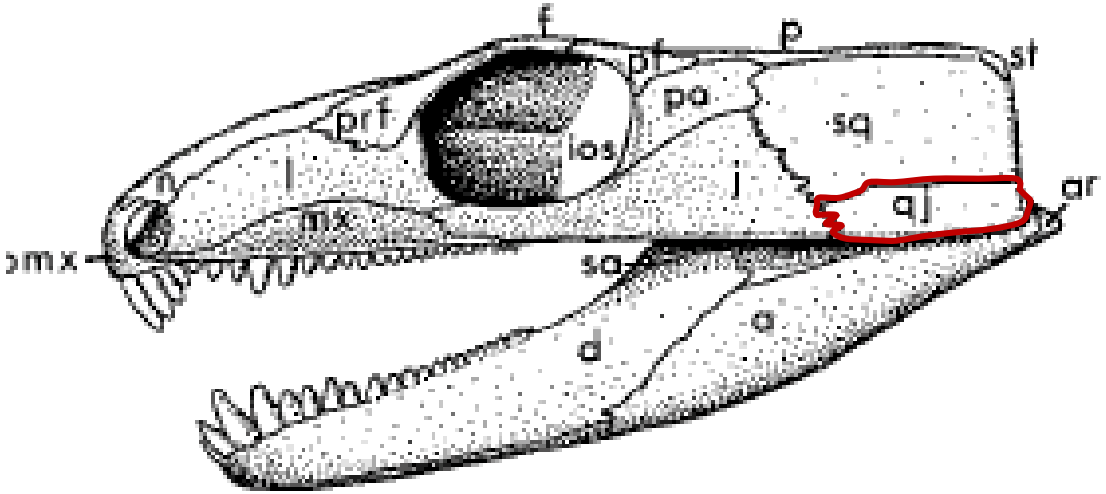
(23) Quadratojugal: acuminate anteriorly (0); square-tipped anteriorly (1). In Castanhinha & Modesto 2018.

Acuminate (0)

Square-tipped (1)



Romeria prima. Reconstruction; MCZ 1963. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 23(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 23(1)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinus kierani*

Status 23(?)

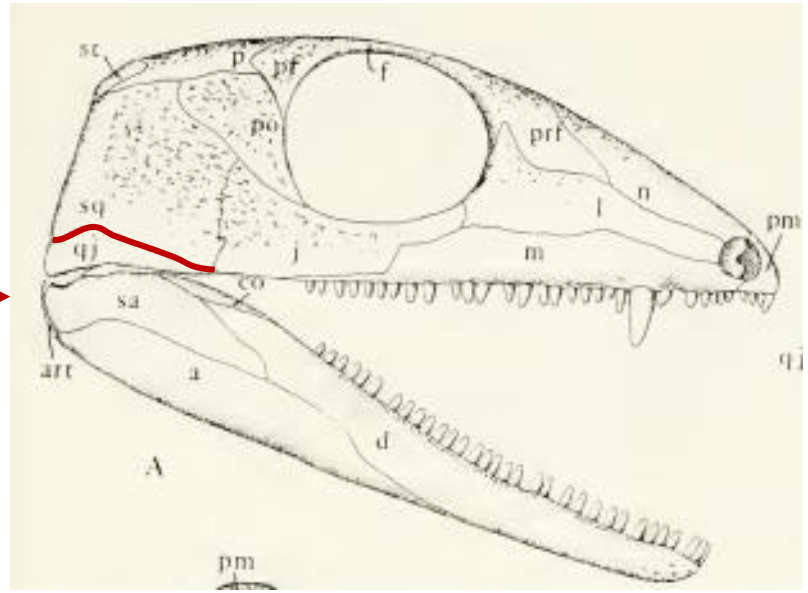
- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

(23) Quadratojugal: acuminate anteriorly (0); square-tipped anteriorly (1). In Castanhinha & Modesto 2018.

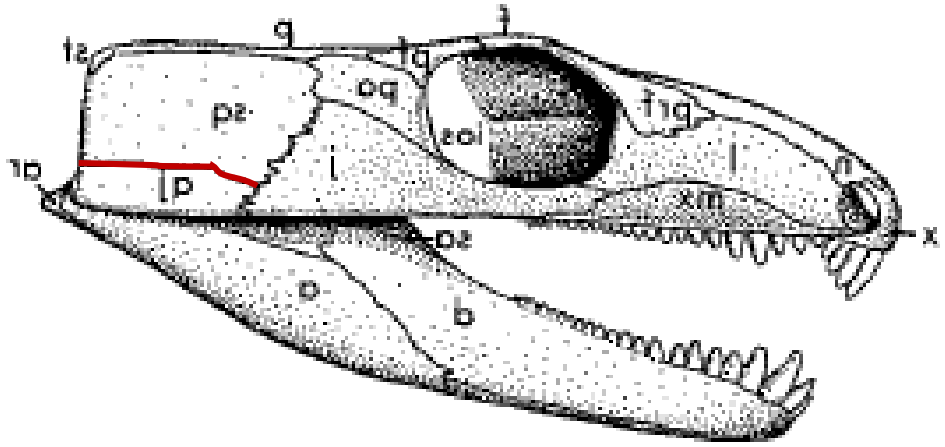
(24) Quadratojugal:

- Expanded dorsally (0)
- Posteriorly straight or decreasing in height (1)

(24) Quadratojugal: expanded dorsally (0); posteriorly straight or decreasing in height (1). In Castanhinha & Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 24(0)

- *Protorothyris archeri*
- *Romeria prima*
- *Romeria texana*

Status 24(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 24(?)

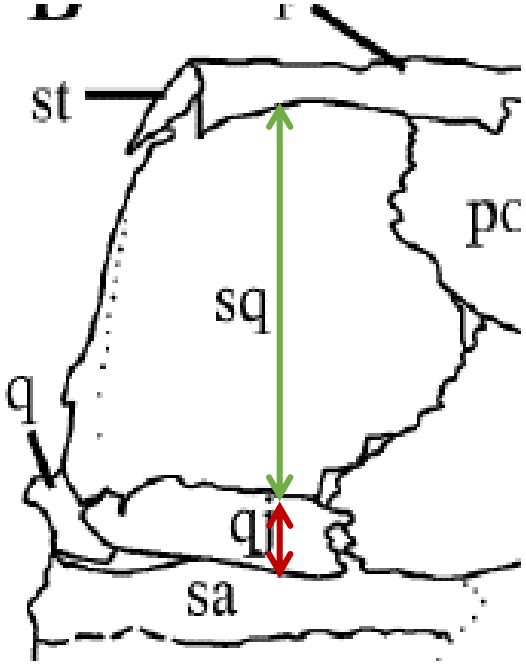
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

(24) Quadratojugal: expanded dorsally (0); posteriorly straight or decreasing in height (1). In Castanhinha & Modesto 2018.

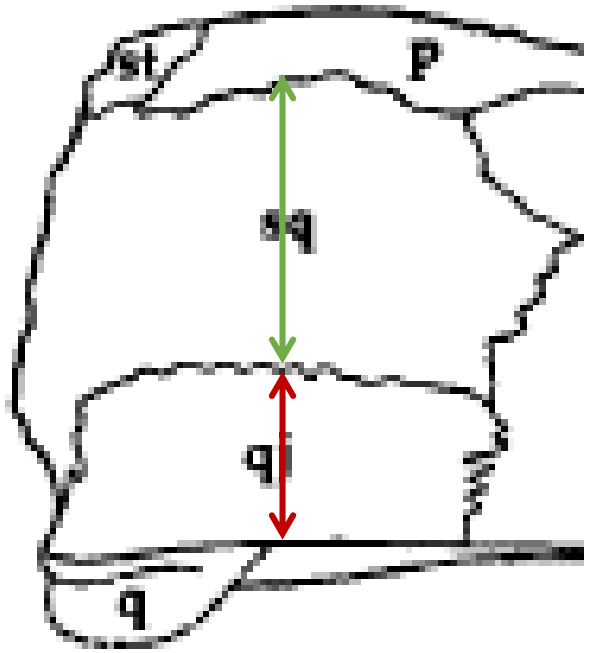
(25a) Quadratojugal – maximum height vs squamosal height:

Approximately equal to or less than 0,36 (0)

More than 0,36 (1)



Captorhinus magnus. OMNH 56821. In Kissel, Dilkes & Reisz 2002.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 25a(0)

- *Protorothyris archeri*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus magnus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 25a(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

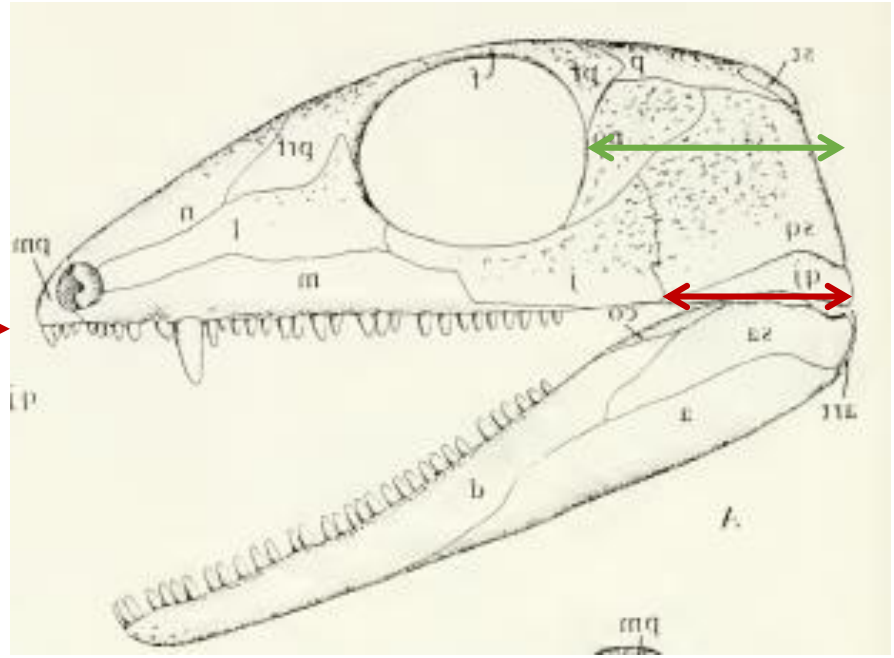
Status 25a(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

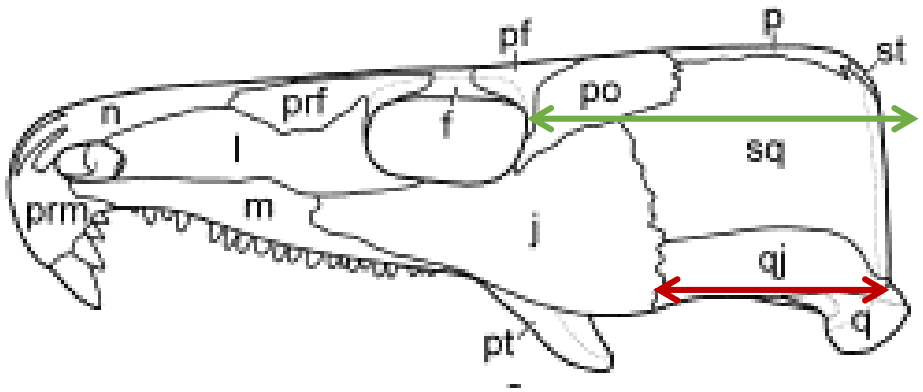
(25b) Quadratojugal – maximum length vs cranium length (posterior to orbit):

More than 0,66 (0)

Equal to or less than 0,66 (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Status 25b(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*

Status 25b(1)

- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

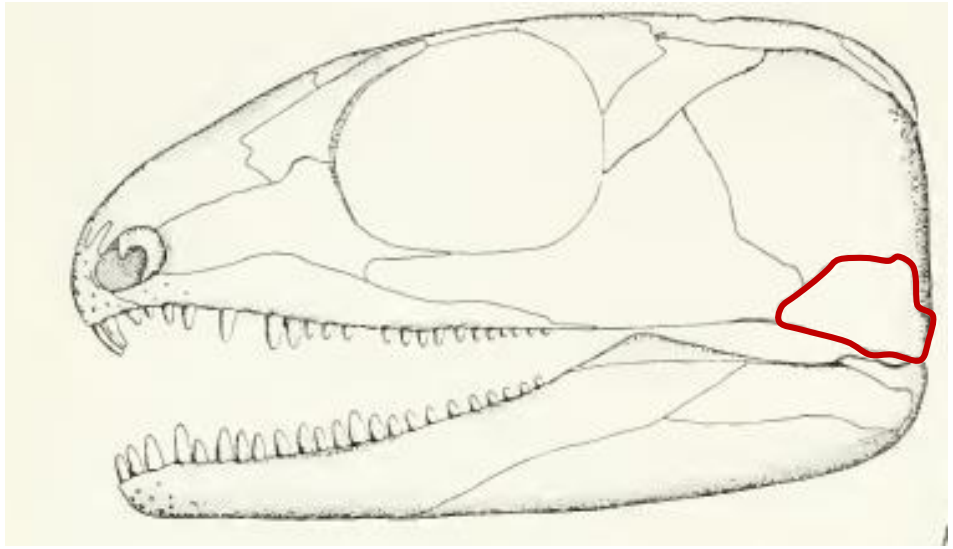
Status 25b(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

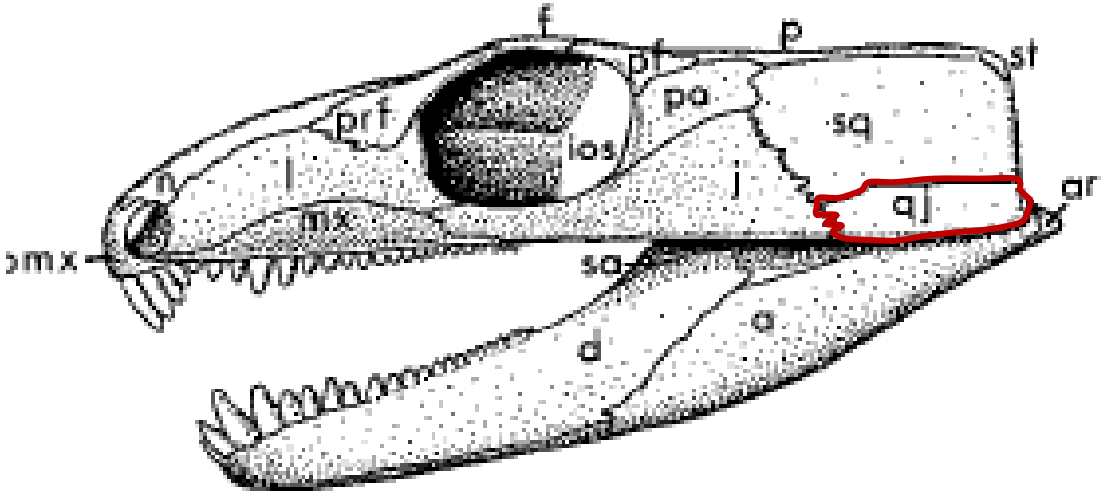
(25c) Quadratojugal – anterior process shape:

Acuminate (0)

Square (1)



Romeria prima. Reconstruction; MCZ 1963. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 25c(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*

Status 25c(1)

- *Thuringothyris mahlendorffae*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

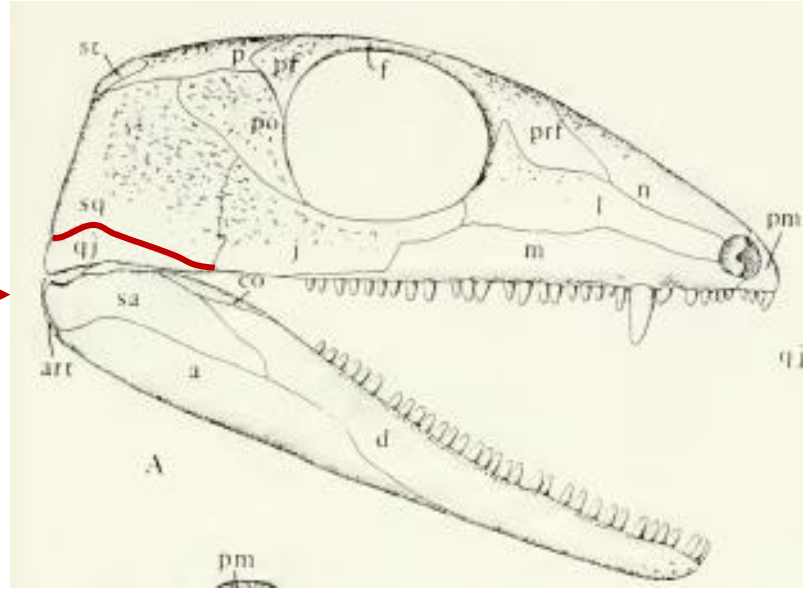
Status 25c(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

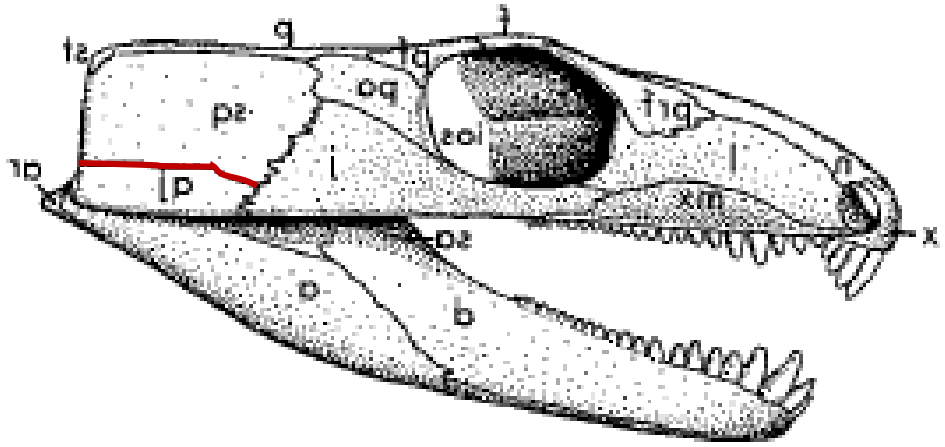
(25d) Quadratojugal – longitudinal shape:

Elevated (0)

Not elevated/straight (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 25d(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus aguti*
- *Reiszorhinus olsoni*

Status 25d(1)

- *Thuringothyris mahlendorffae*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

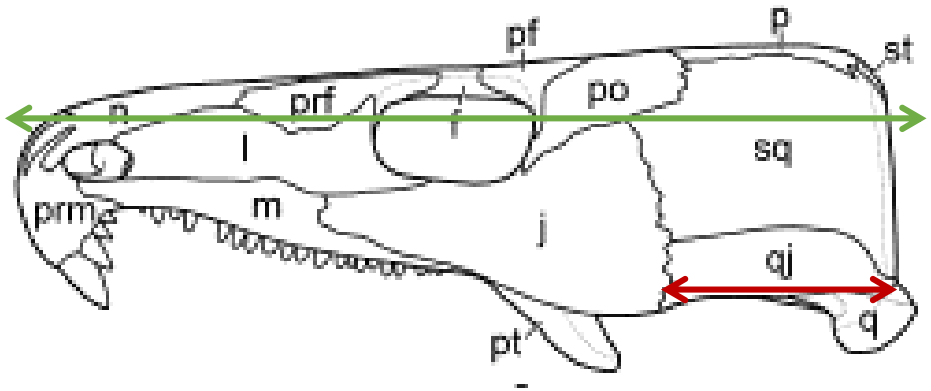
Status 25d(?)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

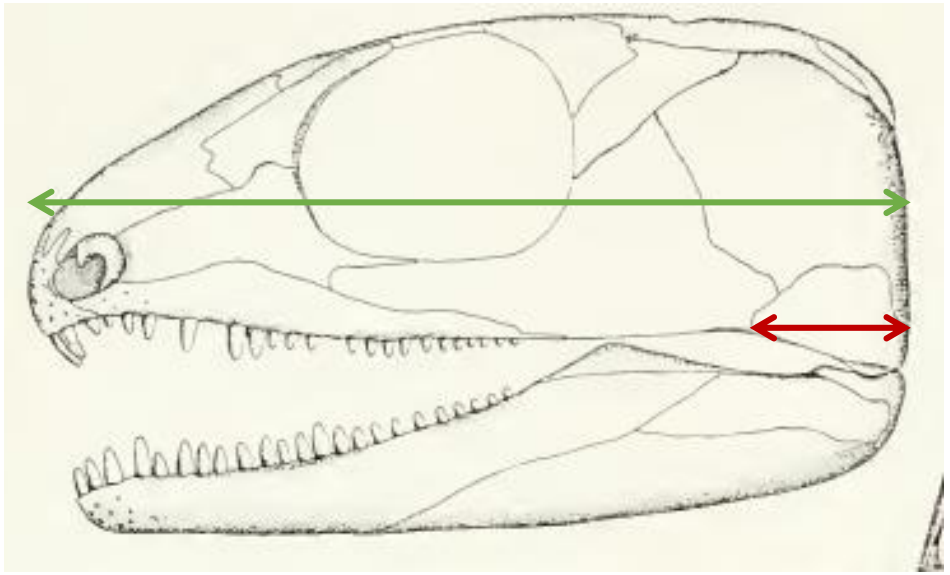
(25e) Quadratojugal – maximum length vs total cranium length:

More than 0,2 (0)

Equal to or less than 0,2 (1)



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.



Romeria prima. Reconstruction. In Clark & Carroll 1972.

Status 25e(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 25e(1)

- *Romeria prima*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus aguti*

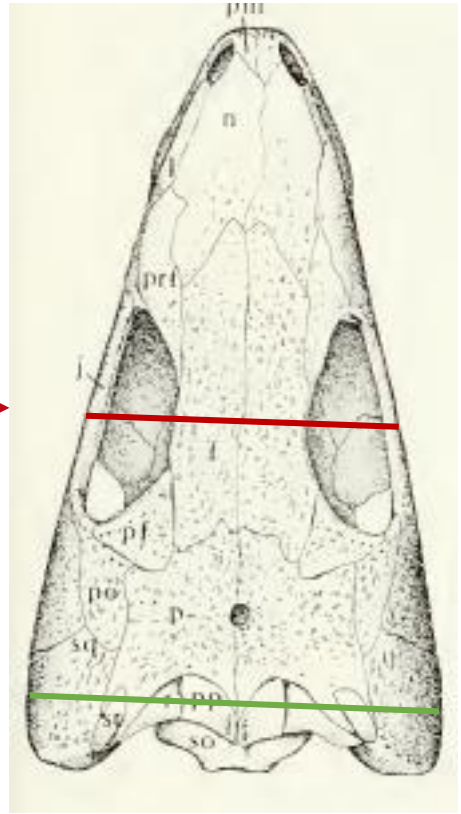
Status 25e(?)

- *Euconcordia cunninghami*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

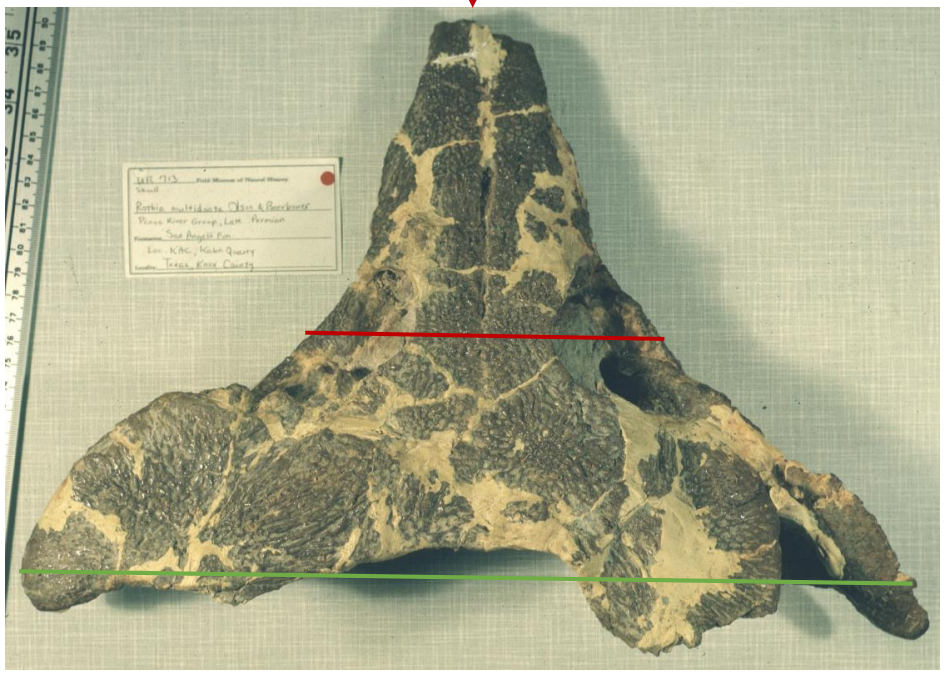
(26a) Postorbital cheek:

Not expanded laterally: ratio between width of cranium at midorbital point and largest cranium width > 0,58 (0)

Expanded laterally: ratio between width of cranium at midorbital point and largest cranium width < 0,58 (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Rothianiscus multidontus. Image from Modesto 2018. Personal communication.

Status 26a(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*
- *Captorhinus kierani*

Status 26a(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*

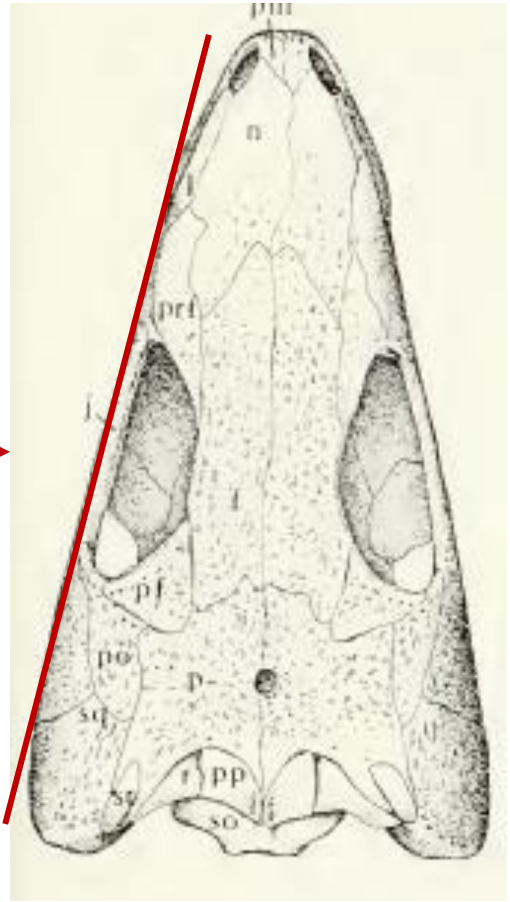
Status 26a(?)

- *Captorhinus magnus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

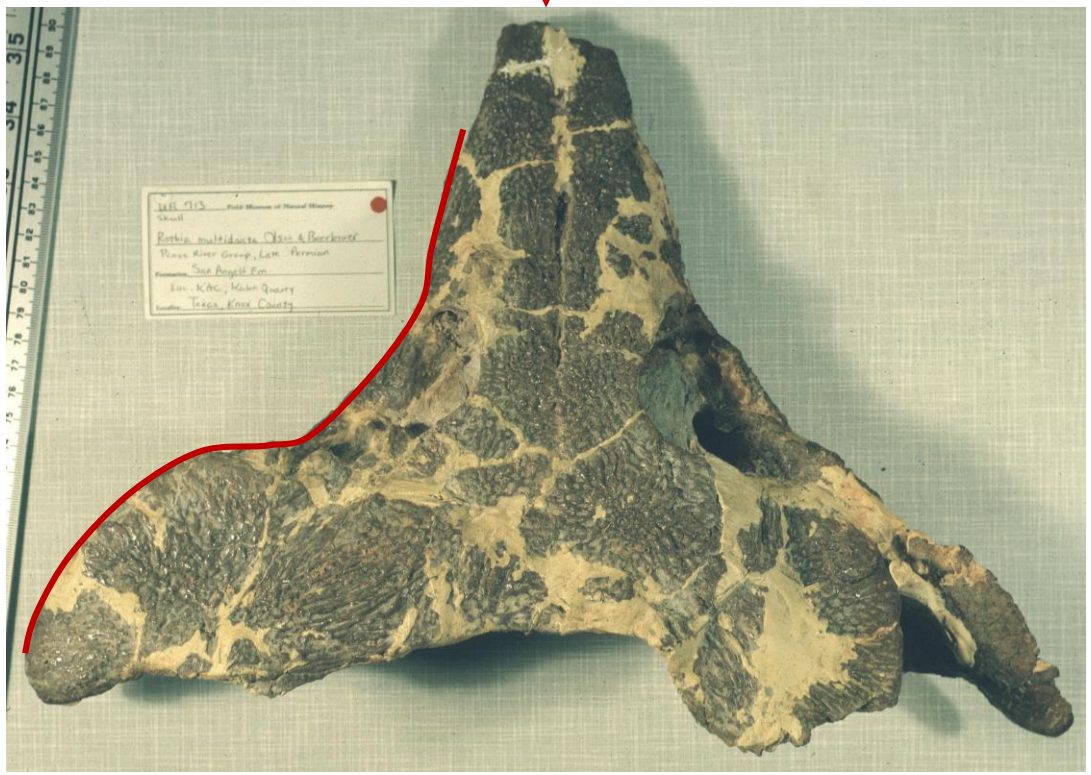
(26b) Postorbital cheek:

Relatively straight (0)

With sigmoidal shape (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Rothianiscus multidontus. Image from Modesto 2018. Personal communication.

Status 26b(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Reiszorhinus olsoni*

Status 26b(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

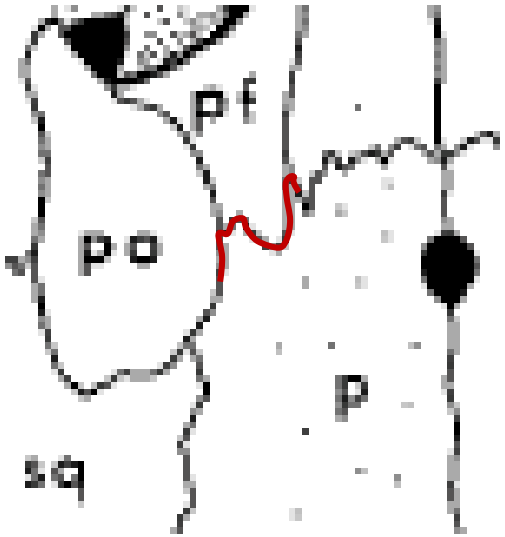
Status 26b(?)

- *Euconcordia cunninghami*
- *Captorhinus magnus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

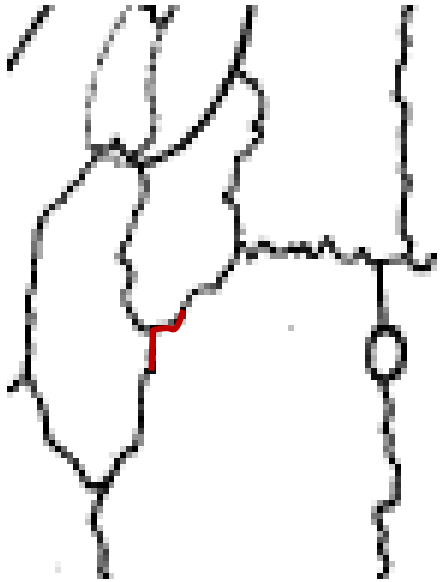
(27) Parietal:

- Distinct anterolateral process present that partially separates postfrontal and postorbital (0)
- Does not strongly project between postfrontal and postorbital (1)

(27) Parietal: distinct anterolateral process present that partially separates postfrontal and postorbital (0); does not strongly project between postfrontal and postorbital (1). In Castanhinha & Modesto 2018.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 27(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

Status 27(1)

- *Paleothyris acadiana*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Labidosaurikos meachami*

Status 27(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*

(27) Parietal: distinct anterolateral process present that partially separates postfrontal and postorbital (0); does not strongly project between postfrontal and postorbital (1). In Castanhinha & Modesto 2018.

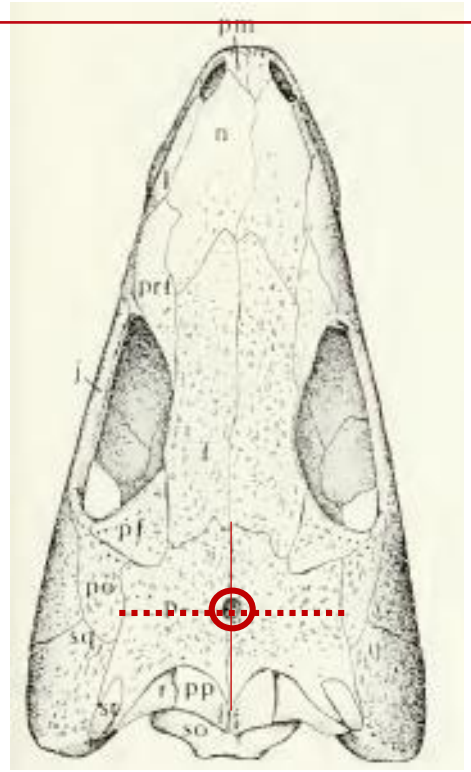
(28) Pineal foramen:

(28) Pineal foramen: positioned at midpoint of interparietal suture (0); anterior to midpoint of interparietal suture (1); posterior to midpoint of interparietal suture (2). In Castanhinha & Modesto 2018.

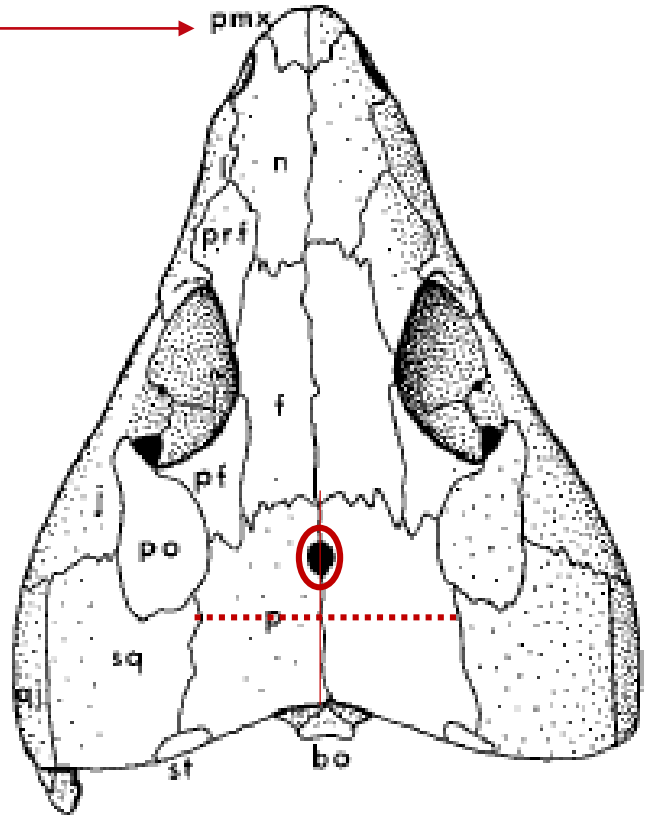
Positioned at midpoint of interparietal suture (0)

Positioned anteriorly to midpoint of interparietal suture (1)

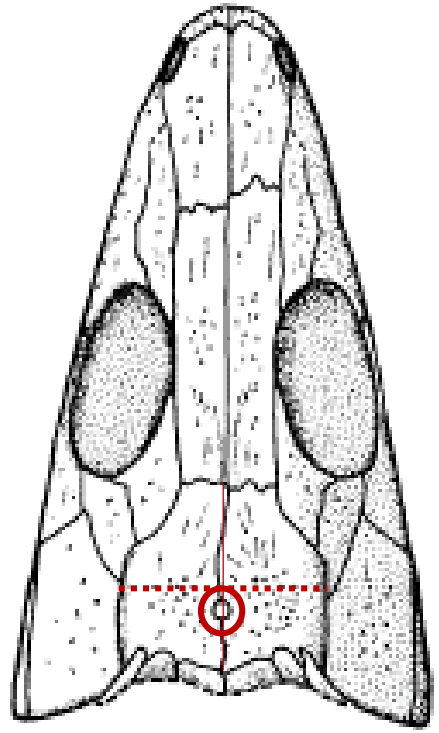
Positioned posteriorly to midpoint of interparietal suture (2)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Paleothyris acadiana. Reconstruction; MCZ 3483. In Carroll 1969.

Status 28(0)

- *Protorothyris archeri*
- *Romeria prima*

Status 28(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 28(2)

- *Paleothyris acadiana*

Status 28(?)

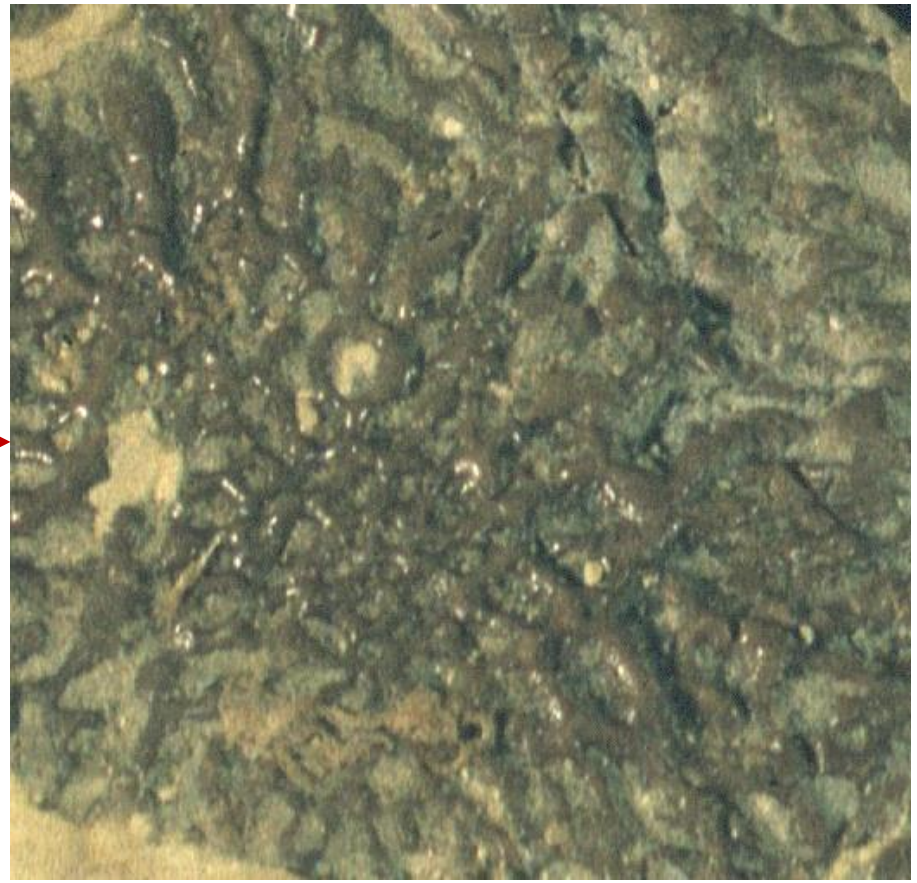
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

(28) Pineal foramen: positioned at midpoint of interparietal suture (0); anterior to midpoint of interparietal suture (1); posterior to midpoint of interparietal suture (2). In Castanhinha & Modesto 2018.

(29a) Sculptural ridges on each bone:

Differ in width (0)

Width is constant (1)



Rothianiscus multidontus. Pers. Comm. Modesto 2018.

Protocaptorhinus pricei. Reconstruction. Olson 1964.

Status 29a(0)

- *Thuringothyris mahlendorffae*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 29a(1)

- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 29a(?)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

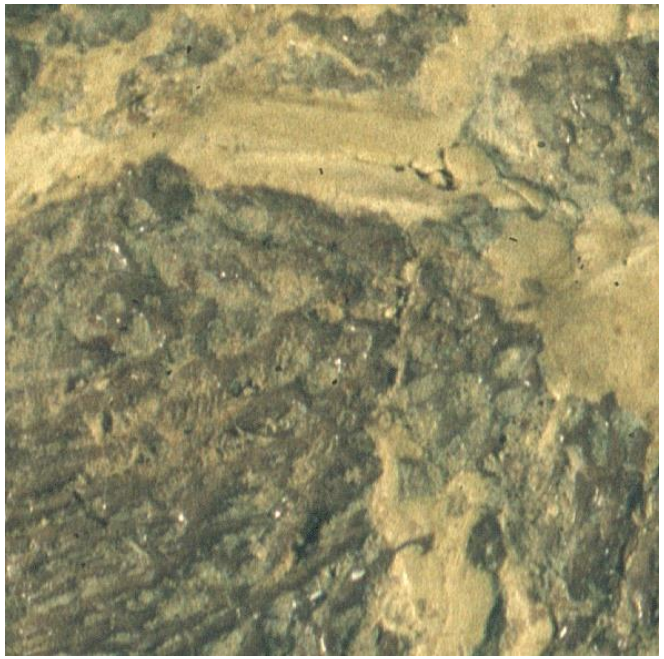
(29b) Sculptural ridges edges:

Mostly rounded (0)

Some rounded, some edged/narrow (1)

Mostly edged/narrow (2)

Protocaptorhinus pricei. Reconstruction. Olson 1964.



Rothianiscus multidontus. Pers. Comm. Modesto 2018.

Opisthodontosaurus carrolli. OMNH 77470. In Reisz et al. 2015.

Status 29b(0)

- *Protorothyris archeri*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Captorhinikos valensis*
- *Captorhinus kierani*

Status 29b(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 29b(2)

- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

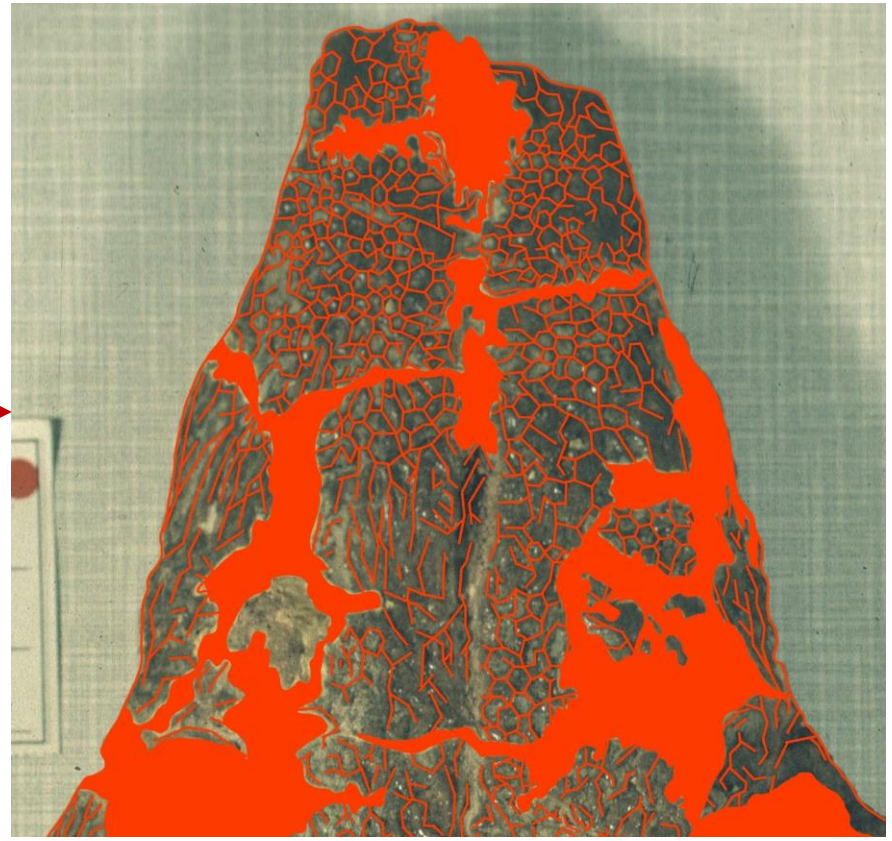
Status 29b(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

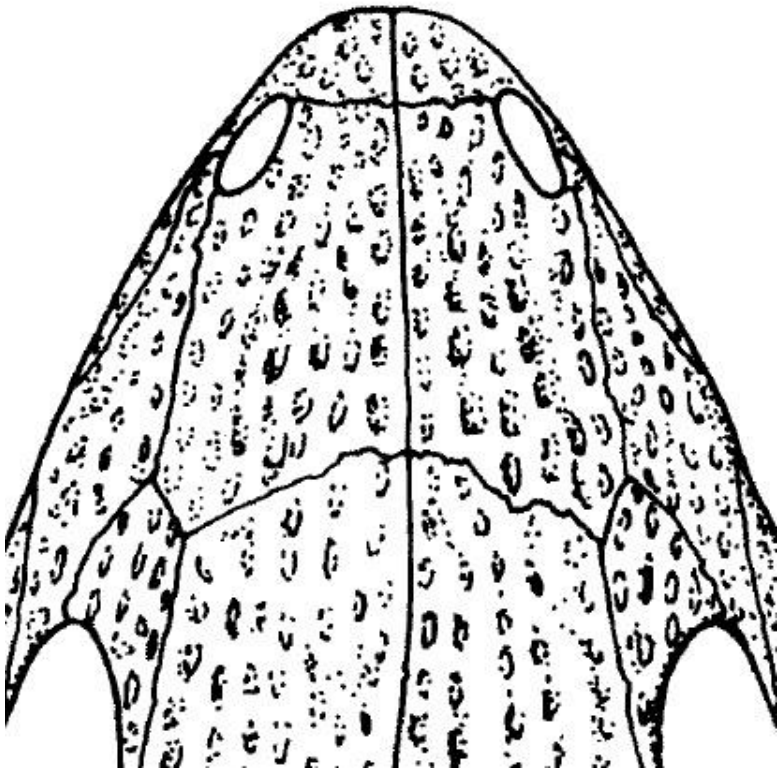
(29c) Sculptural ridges:

Undulated (0)

Straight (1)



Rothianiscus multidontus. Pers. Comm. Modesto 2018.



Protocaptorhinus pricei. Reconstruction. Olson 1964.

Status 29c(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Euconcodia cunninghami*
- *Saurorictus australis*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 29c(1)

- *Paleothyris acadiana*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

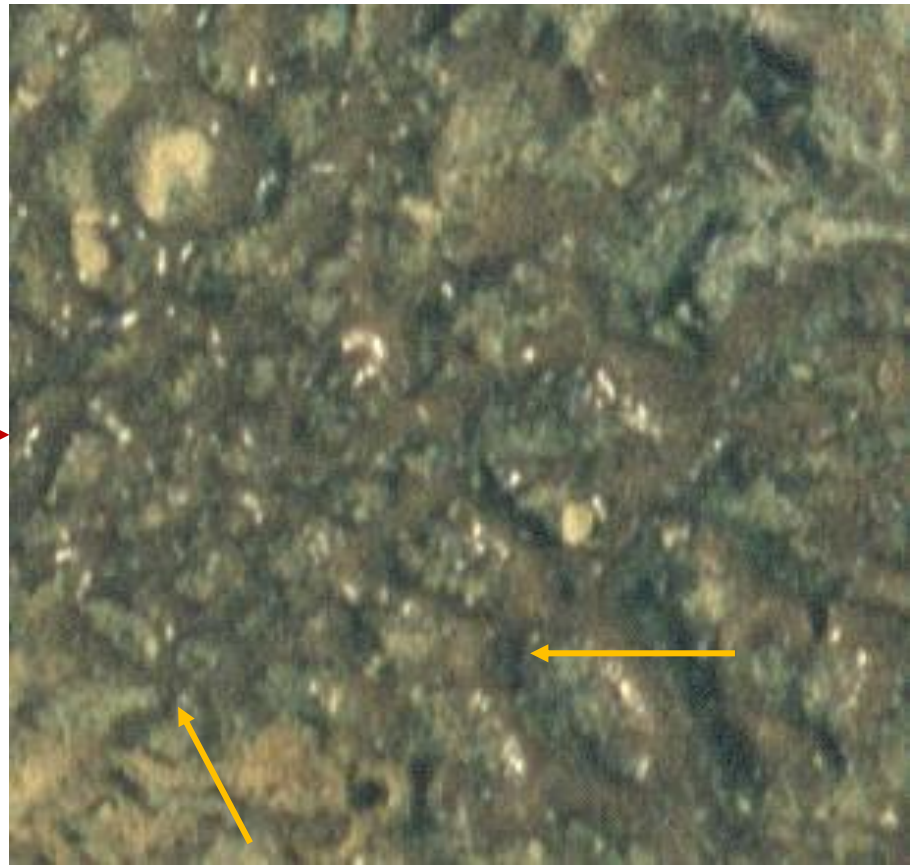
Status 29c(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

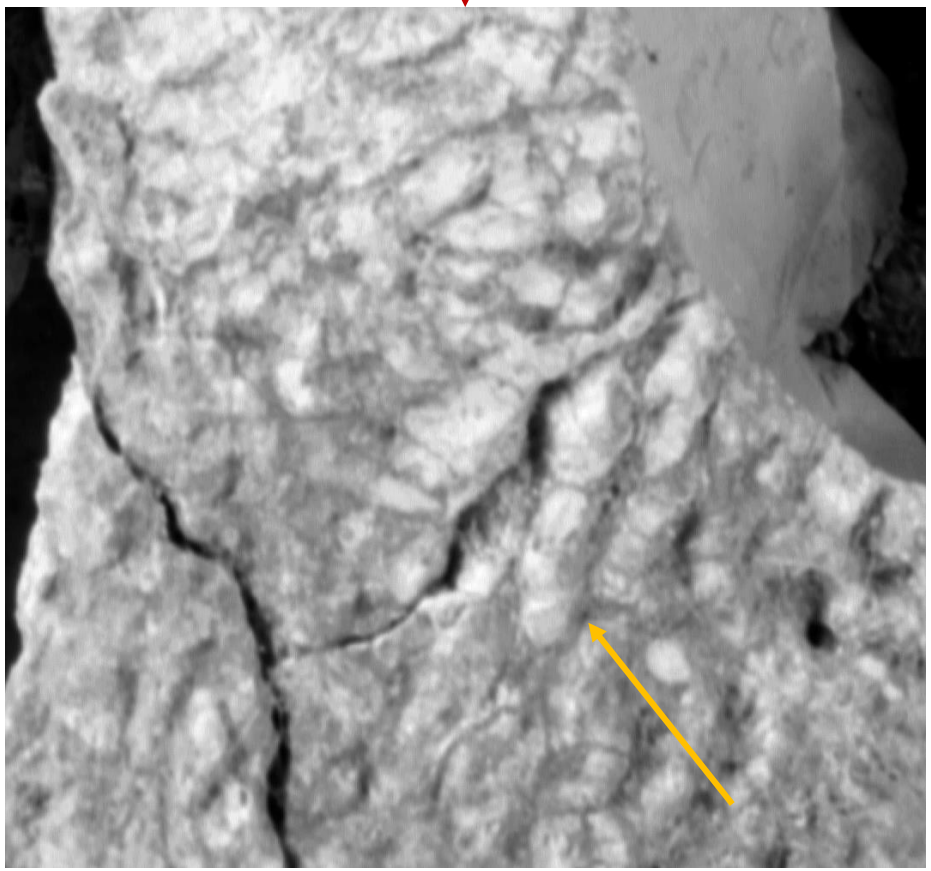
(29d) Nodal points:

Some with same width as ridges around it with others distinctively broader than the ridges around it (0)

Same width as ridges around it (1)



Rothianiscus multidontus. Pers. Comm. Modesto 2018.



Moradisaurus grandis. Reconstruction. Olson 1964.

Status 29d(0)

- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Rothianiscus multidontus*

Status 29d(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinus kierani*

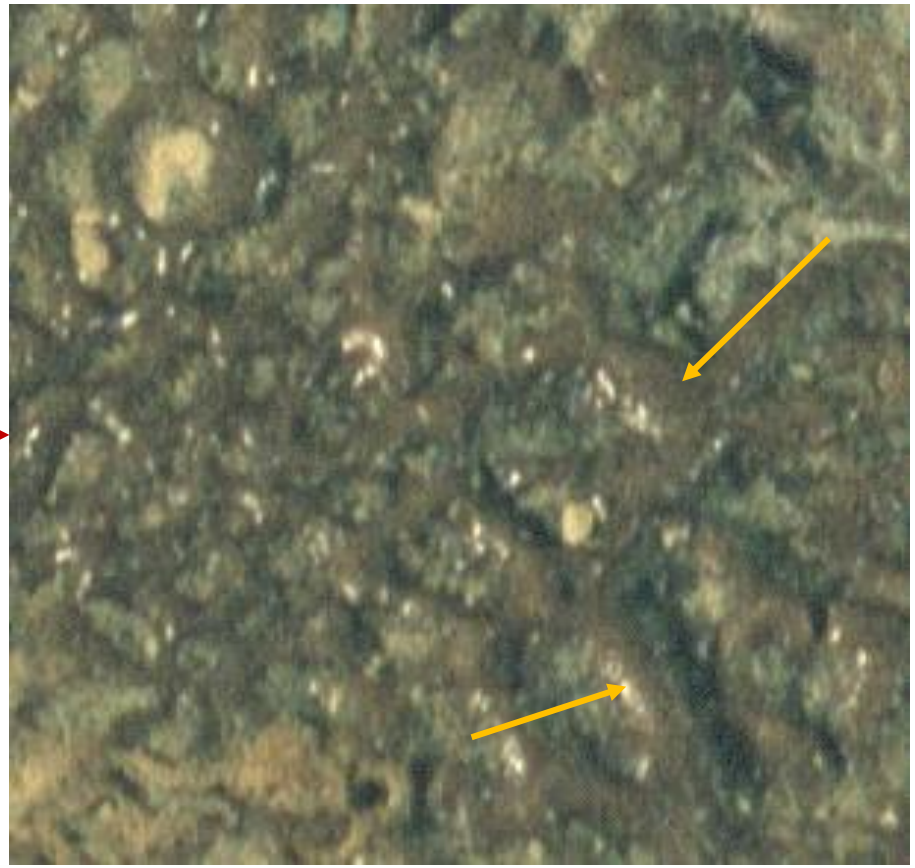
Status 29d(?)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

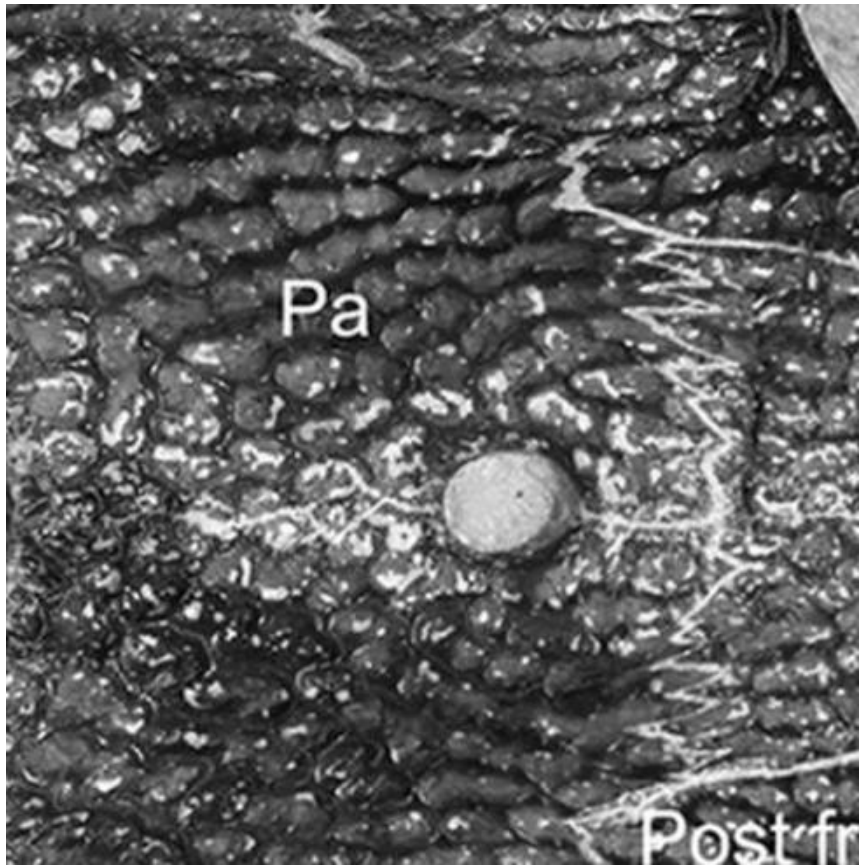
(29e) Nodal points:

Form tubercules (0)

Do not form tubercules (1)



Rothianiscus multidontus. Pers. Comm. Modesto 2018.



Captorhinus kierani. OMNH 73281a. In deBraga et al. 2019.

Status 29e(0)

- *Euconcordia cunninghami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 29e(1)

- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Captorhinus kierani*

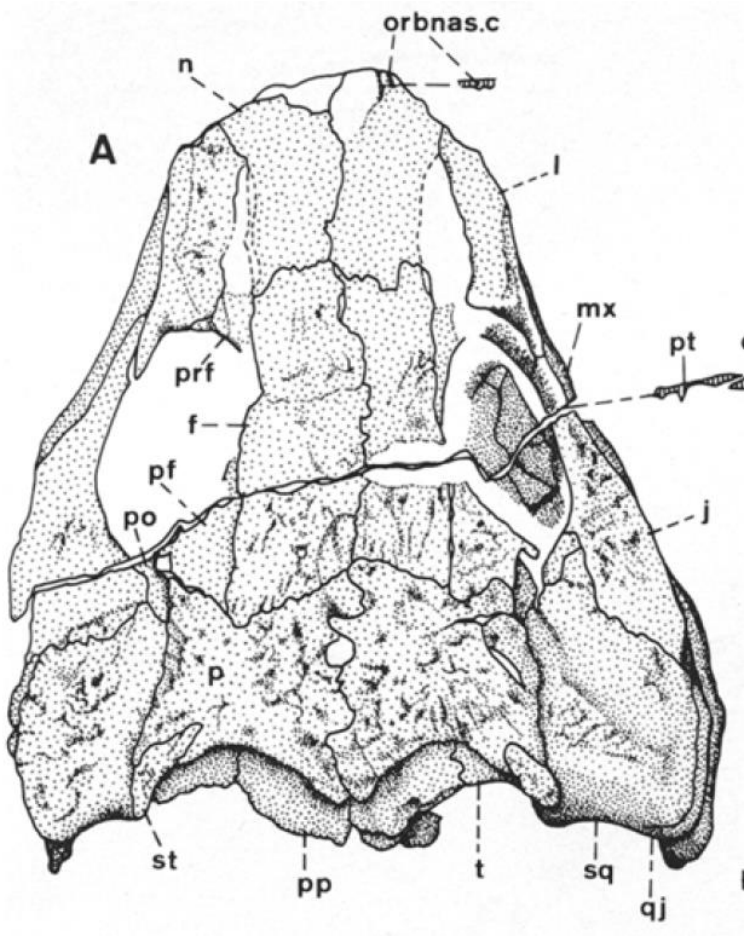
Status 29e(?)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus magnus*
- *Labidosaurikos meachami*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

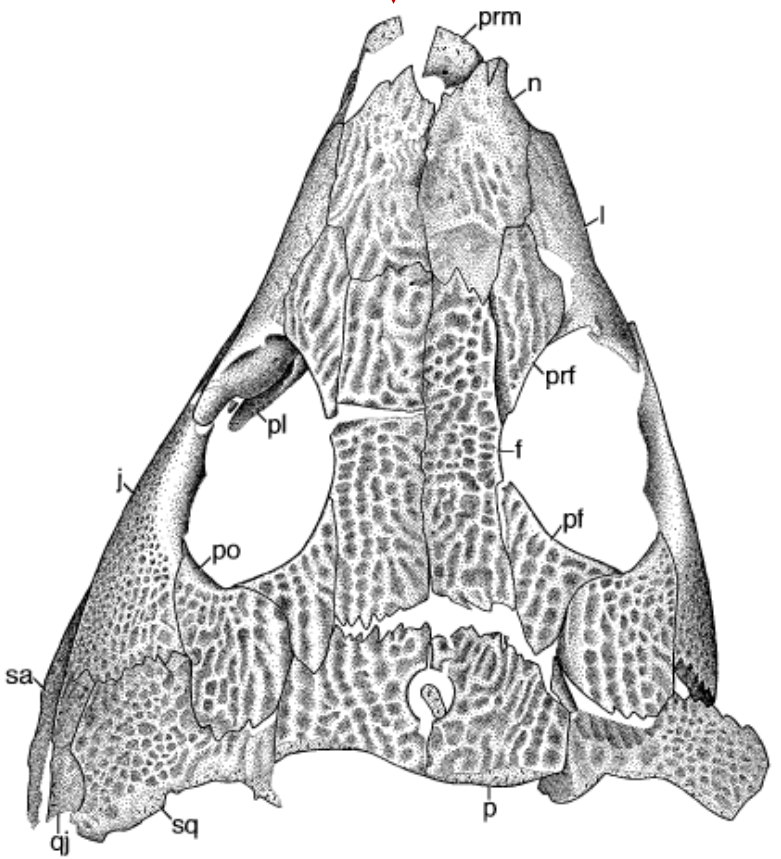
(29f) Sculpture:

Regions without sculpture or with subdue sculpture present (0)

Sculpture present on all cranial bones (1)



Thuringothyris mahlendorffae. MNG 7729. In Boy & Martens 1991.



Captorhinus aguti. ROM 44627. In deBraga et al. 2019.

Status 29f(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus magnus*
- *Rothianiscus multidonta*

Status 29f(1)

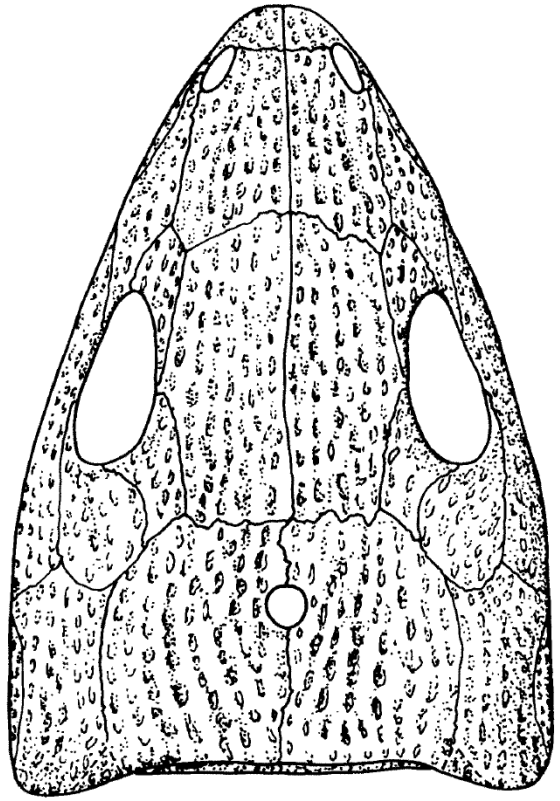
- *Protocaptorhinus pricei*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinus kierani*

Status 29f(?)

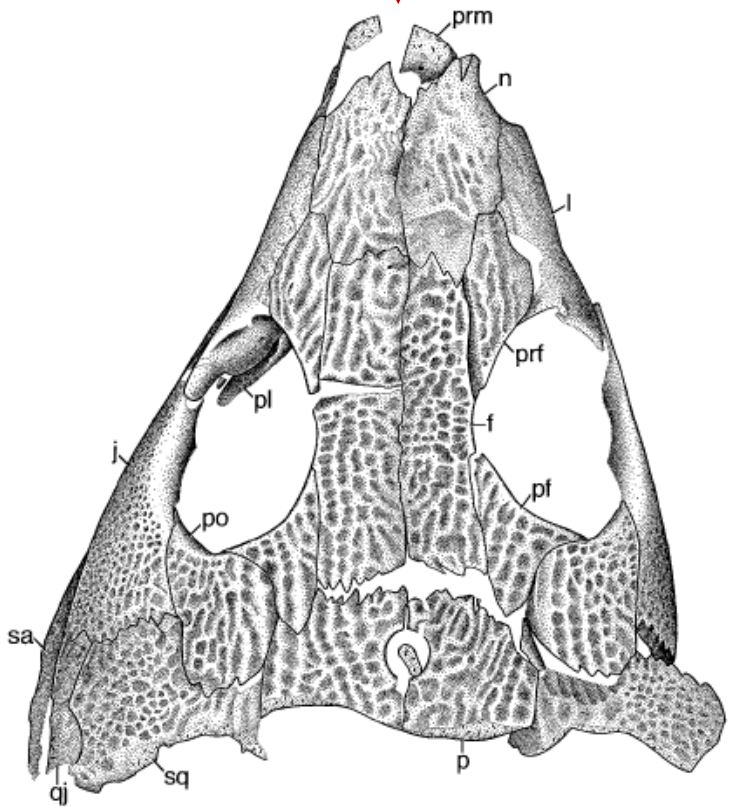
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

(29g) Sculpture:

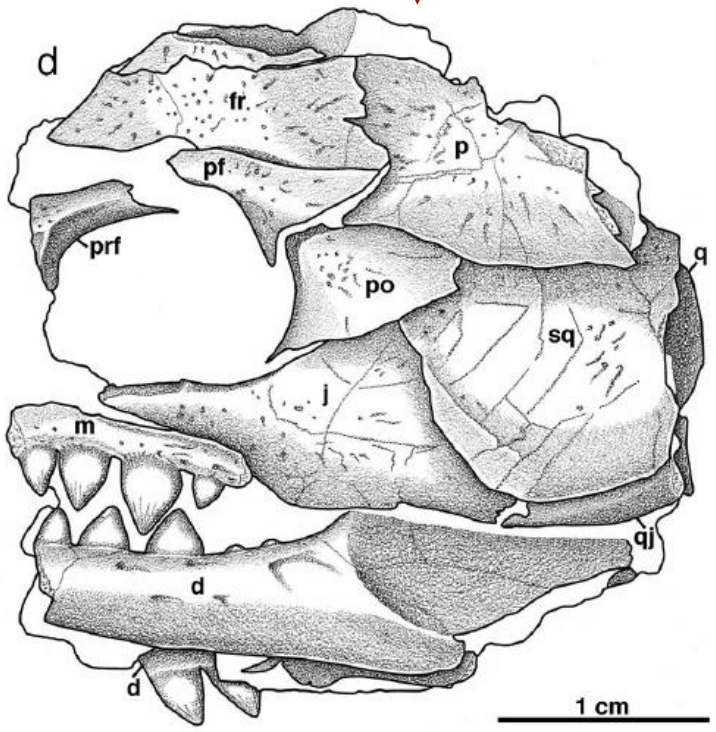
- Mostly cells (0)
- Cells and radial ridges (1)
- Mostly radial ridges (2)



Protocaptorhinus pricei. Reconstruction. Olson 1964.



Captorhinus aguti. ROM 44627. In deBraga et al. 2019.



Opisthodontosaurus carrolli. OMNH 77470. In Reisz et al. 2015.

Status 29g(0)

- *Protorothyris archeri*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*

Status 29g(1)

- *Paleothyris acadiana*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 29g(2)

- *Thuringothyris mahlendorffae*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

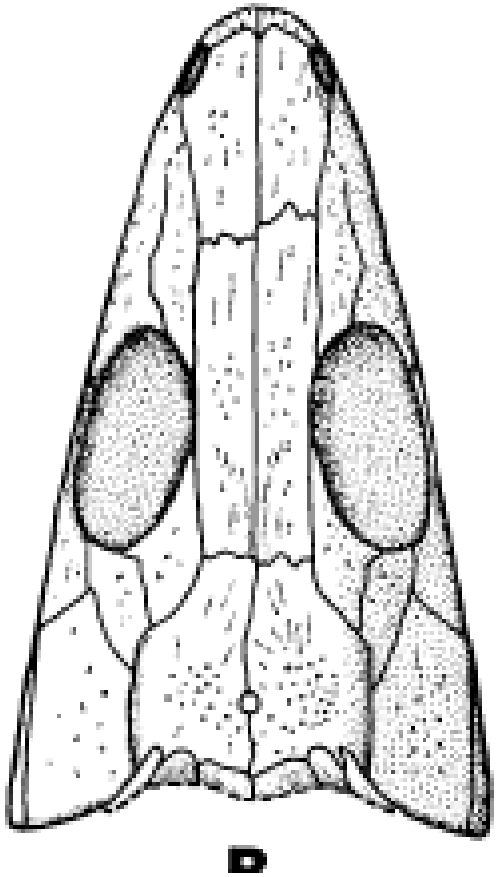
Status 29g(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*

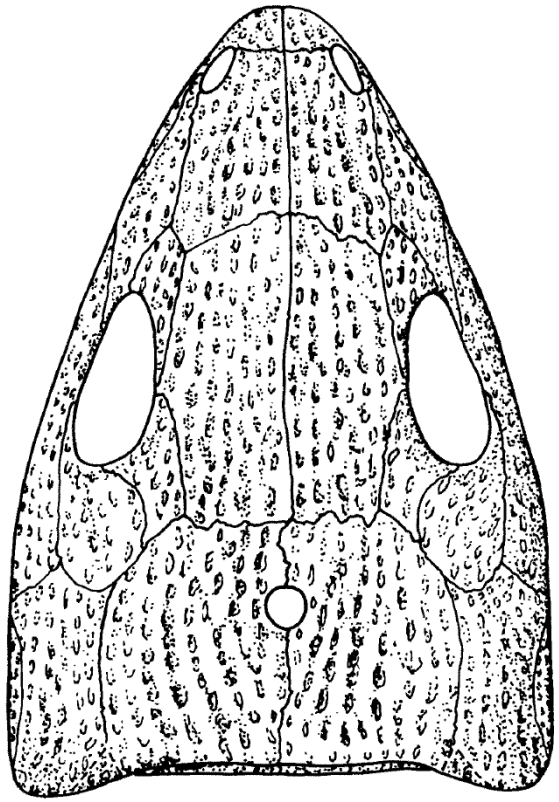
(29h) Sculpture on each bone:

More than one type (0)

Only one type (1)



Paleothyris acadiana. Reconstruction. In Carroll 1969.



Protocaptorhinus pricei. Reconstruction. Olson 1964.

Status 29h(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 29h(1)

- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Moradisaurus grandis*
- *Captorhinus kierani*

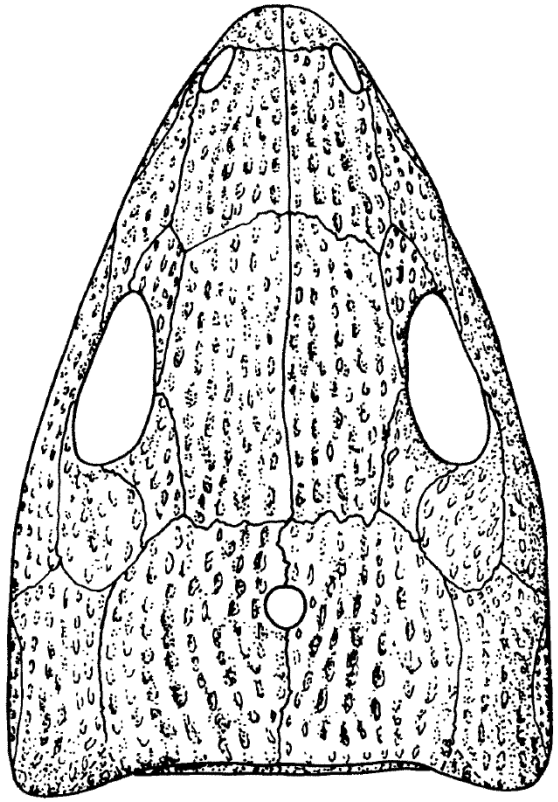
Status 29h(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus magnus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

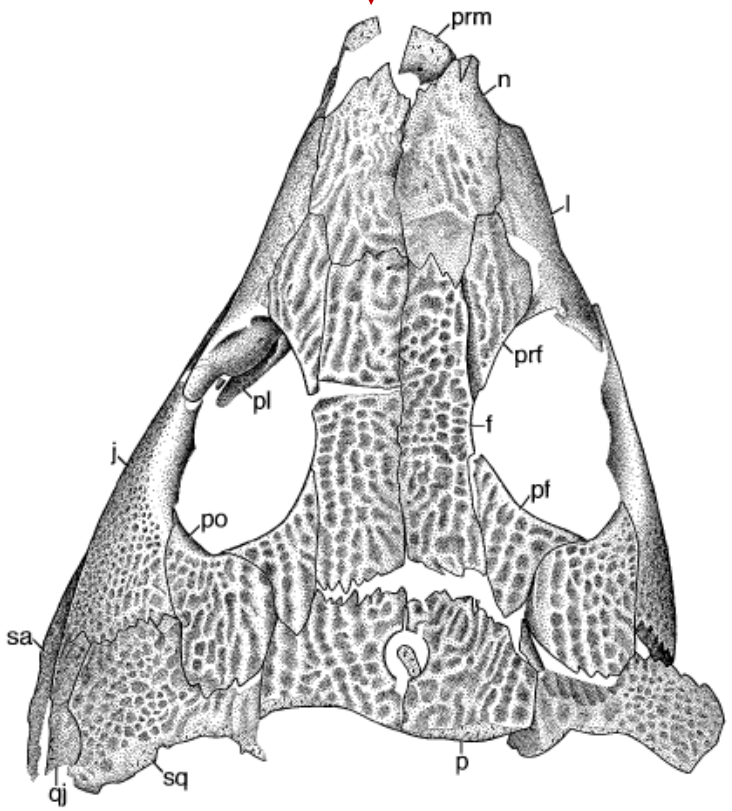
(29i) Cell shape:

Mostly oval (0)

Mostly polygonal (1)



Protocaptorhinus pricei. Reconstruction. Olson 1964.



Captorhinus aguti. ROM 44627. In deBraga et al. 2019.

Status 29i(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 29i(1)

- *Thuringothyris mahlendorffae*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

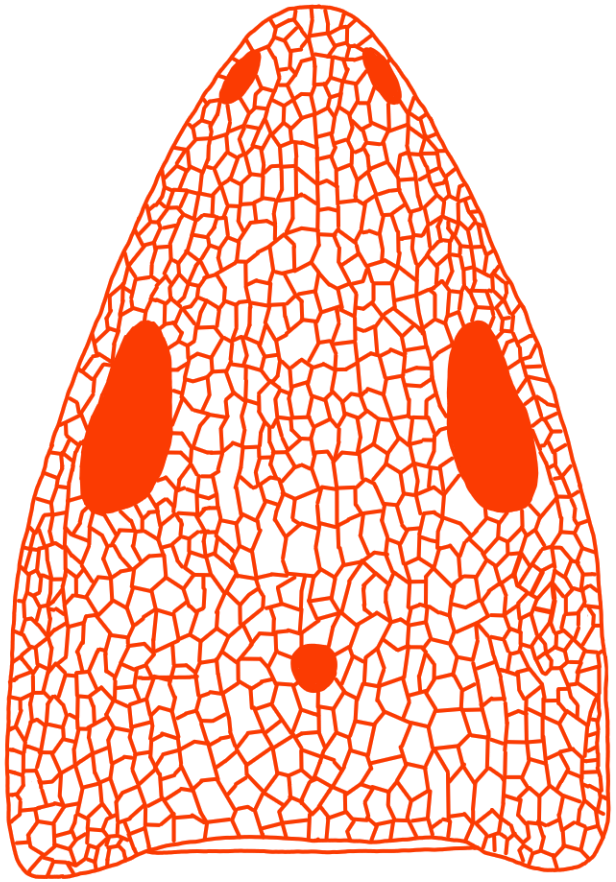
Status 29i(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*

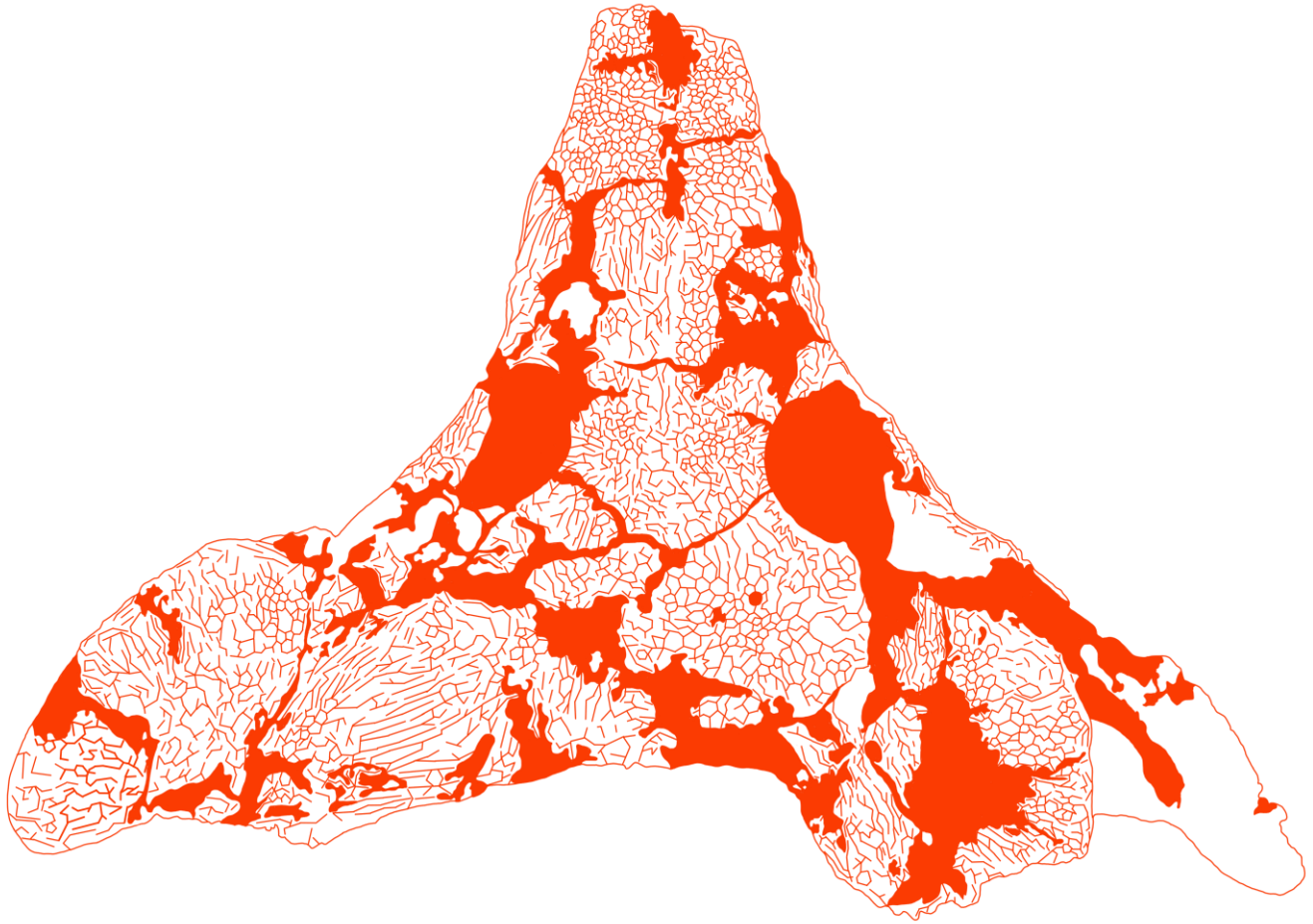
(29j) Cell shape:

Small (0)

Large (1)



Protocaptorhinus pricei. Reconstruction. Olson 1964.



Rothianiscus multidontus. Pers. Comm. Modesto 2018.

Status 29j(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 29j(1)

- *Thuringothyris mahlendorffae*
- *Protocaptorhinus pricei*
- *Captorhinikos valensis*

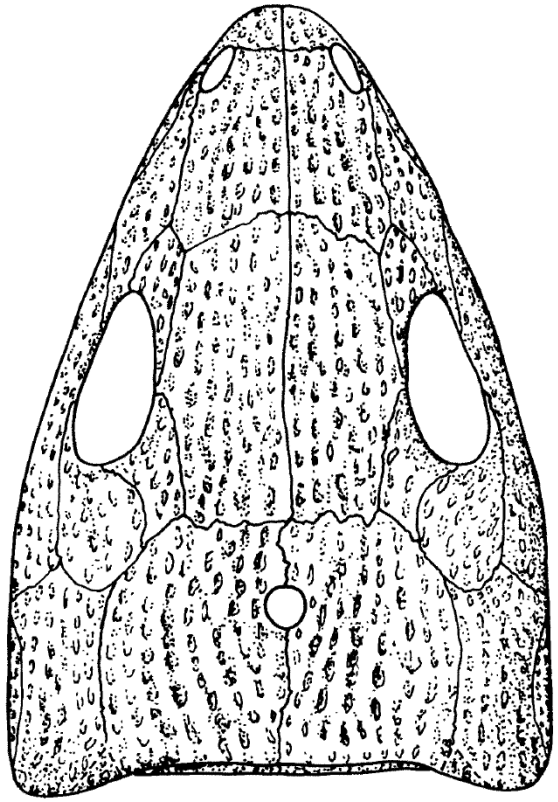
Status 29j(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*

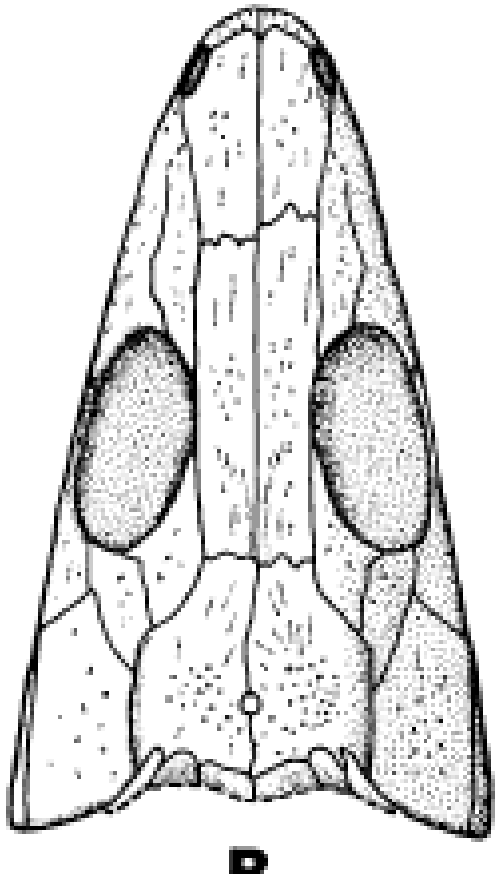
(29j) Cell density:

Dense (0)

Sparse (1)



Protocaptorhinus pricei. Reconstruction. Olson 1964.



Paleothyris acadiana. Reconstruction. In Carroll 1969.

Status 29k(0)

- *Protorothyris archeri*
- *Euconcordia cunninghami*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 29k(1)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Saurorictus australis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

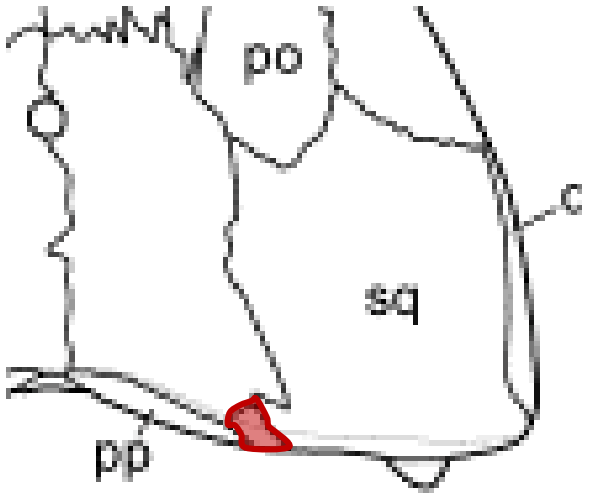
Status 29k(?)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*

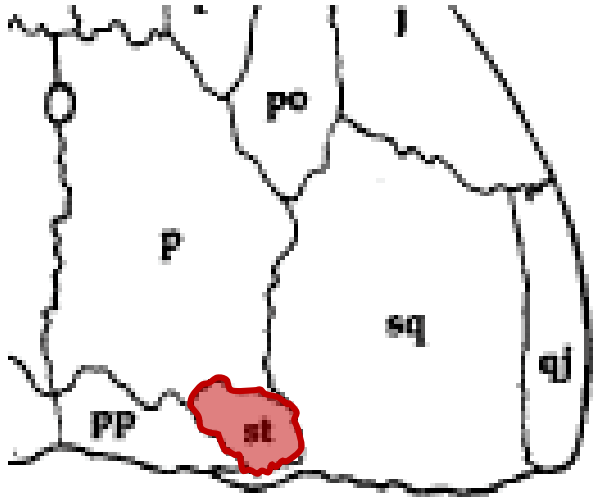
(31) Supratemporal:

- Small, slender element (0)
- Large, contributing to skull table (1)

(31) Supratemporal: small, slender element (0); large, contributing to skull table (1). In Castanhinha & Modesto 2018.



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.



Labidosaurikos meachami. Reconstruction; Holotype; OMNH 04331. In Dodick & Modesto 1995.

Status 31(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*

Status 31(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinus kierani*

Status 31(?)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

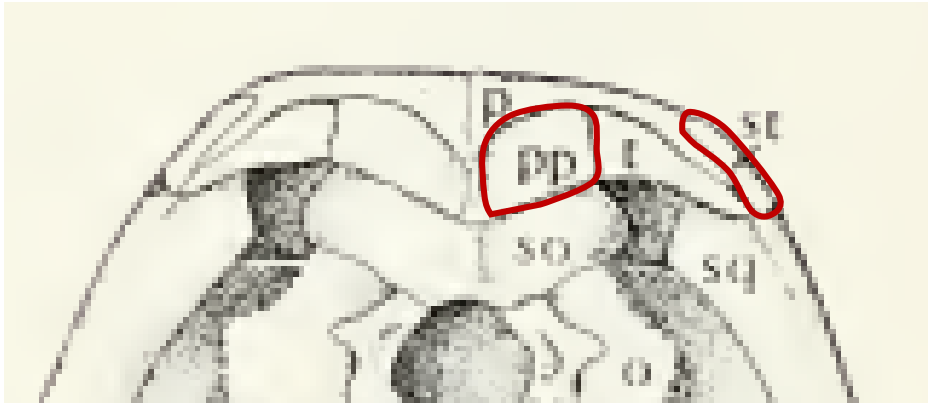
(31) Supratemporal: small, slender element (0); large, contributing to skull table (1). In Castanhinha & Modesto 2018.

(32) Supratemporal-postparietal contact:

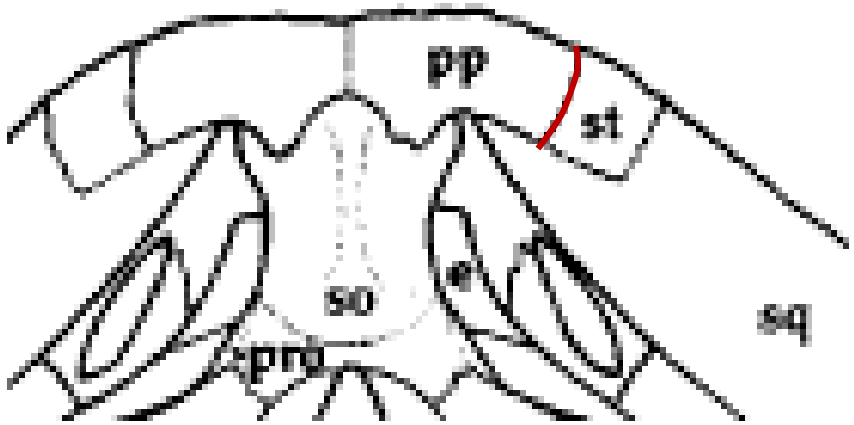
Tenuous or absent (0)

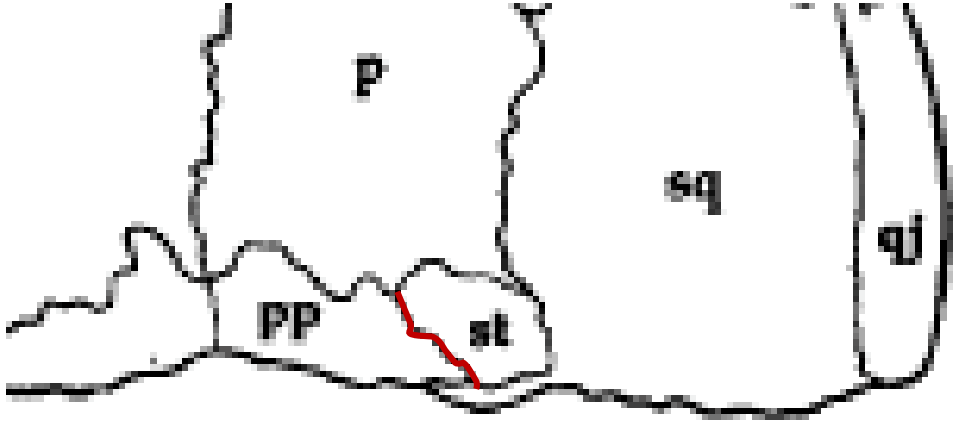
Well-developed (1)

(32) Supratemporal-postparietal contact: tenuous or absent (0); well developed (1). In Castanhinha & Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.





Labidosaurikos meachami. Reconstruction; Holotype; OMNH 04331. In Dodick & Modesto 1995.

Status 32(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 32(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*

Status 32(?)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

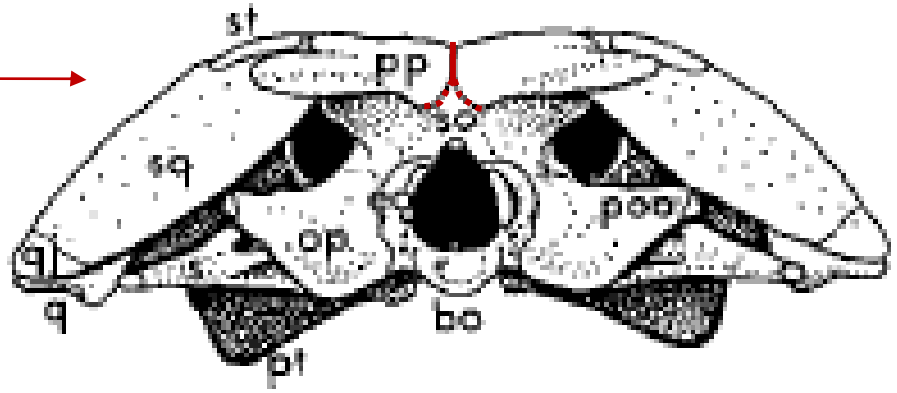
(32) Supratemporal-postparietal contact: tenuous or absent (0); well developed (1). In Castanhinha & Modesto 2018.

(33) Postparietal – contacts mate:

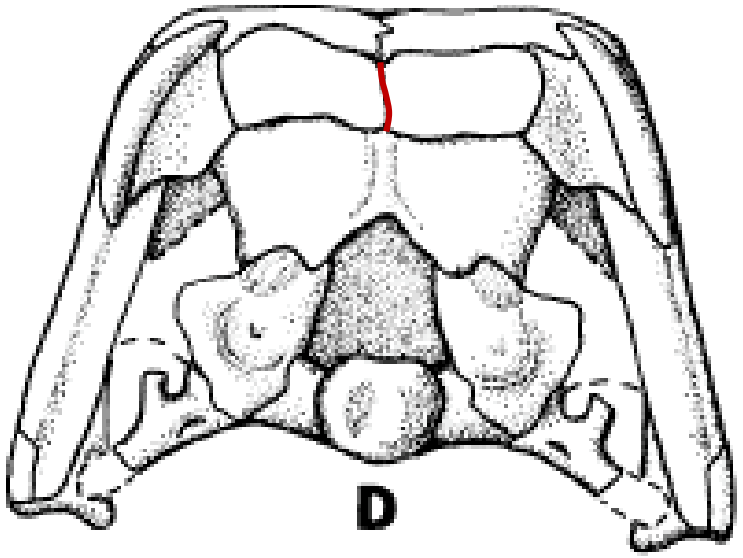
(33) Postparietal: contacts mate dorsally only, postparietals separated slightly ventrally by supraoccipital (0); contacts mate fully along height (1). In Castanhinha & Modesto 2018.

Dorsally only, postparietals separated slightly ventrally by supraoccipital (0)

Fully along height (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Paleothyris acadiana. Reconstruction; MCZ 3484. In Carroll 1969.

Status 33(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinus kierani*

Status 33(1)

- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Reiszorhinus olsoni*

Status 33(?)

- *Saurorictus australis*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

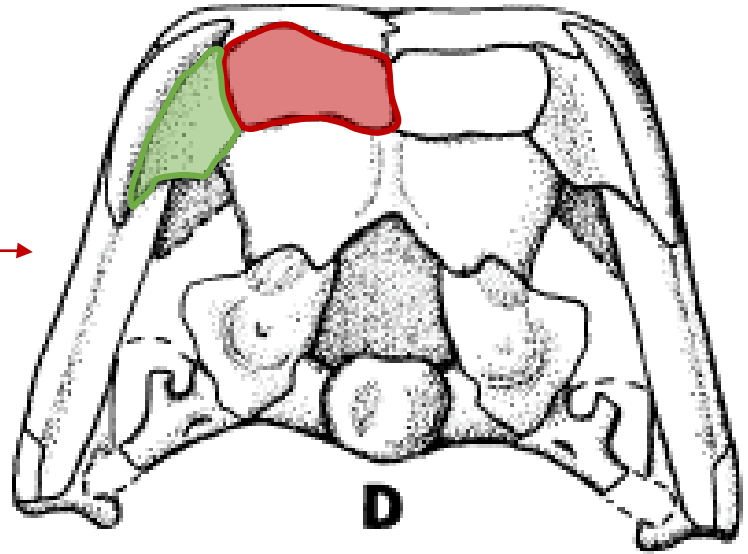
(33) Postparietal: contacts mate dorsally only, postparietals separated slightly ventrally by supraoccipital (0); contacts mate fully along height (1). In Castanhinha & Modesto 2018.

(34) Postparietal:

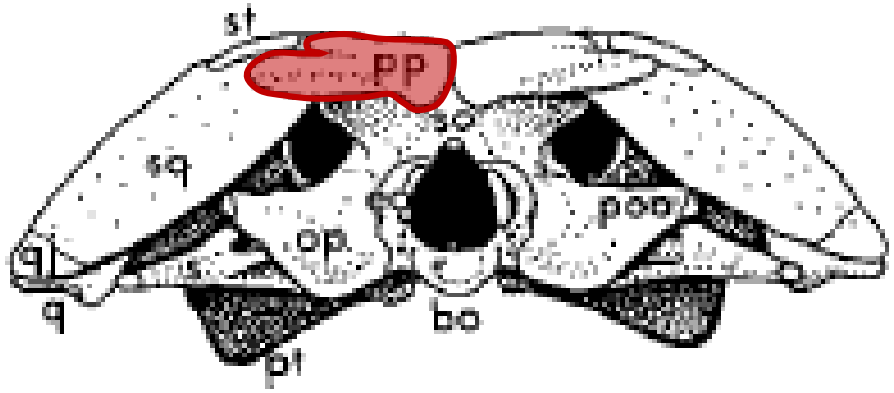
Transversely short with tabular present (0)

Transversely elongate with tabular absent (1)

(34) Postparietal: transversely short with tabular present (0); transversely elongate with tabular absent (1). In Castanhinha & Modesto 2018.



Paleothyris acadiana. Reconstruction; MCZ 3484. In Carroll 1969.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 34(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*

Status 34(1)

- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 34(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

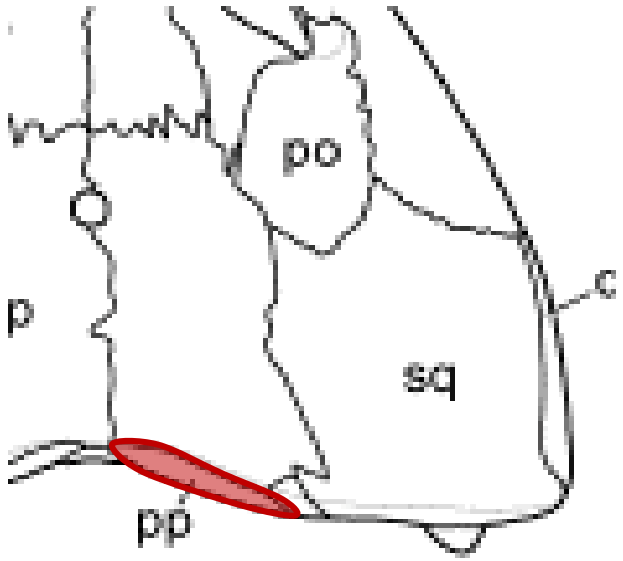
(34) Postparietal: transversely short with tabular present (0); transversely elongate with tabular absent (1). In Castanhinha & Modesto 2018.

(35) Postparietal – contribution to skull table:

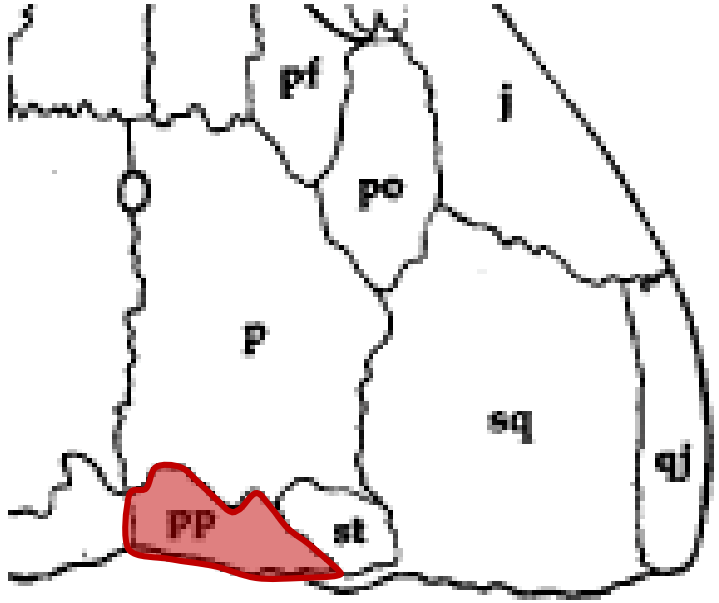
Absent or forms only narrow edge (0)

Large, forming sculptured posterior portion of skull table (1)

(35) Postparietal: contribution to skull table absent or forms only narrow edge (0); contribution to skull table large, forming sculptured posterior portion of skull table (1). In Castanhinha & Modesto 2018.



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 35(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 35(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*

Status 35(?)

- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

(35) Postparietal: contribution to skull table absent or forms only narrow edge (0); contribution to skull table large, forming sculptured posterior portion of skull table (1). In Castanhinha & Modesto 2018.

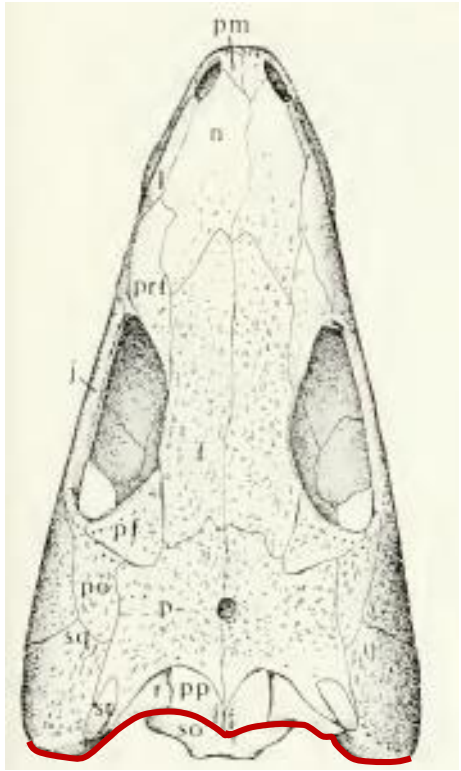
(36) Skull table occipital margin:

Embayed bilaterally (0)

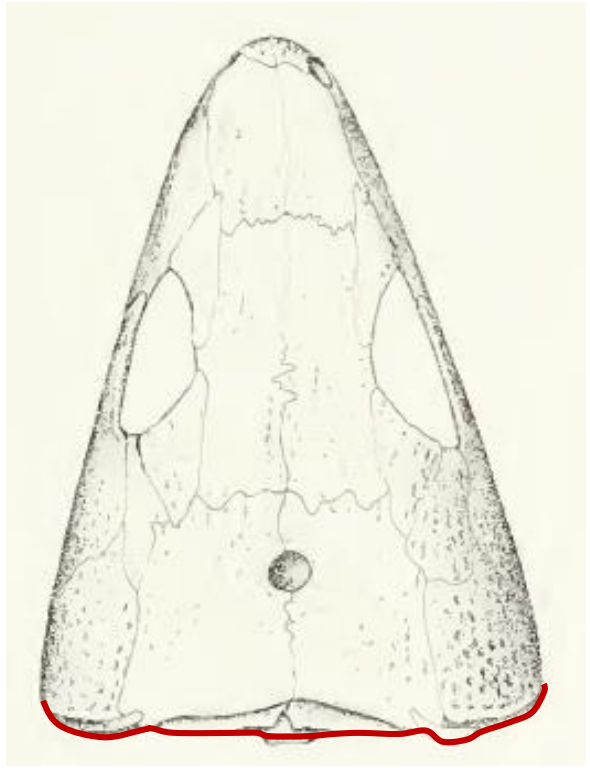
Straight (1)

With single median embayment (2)

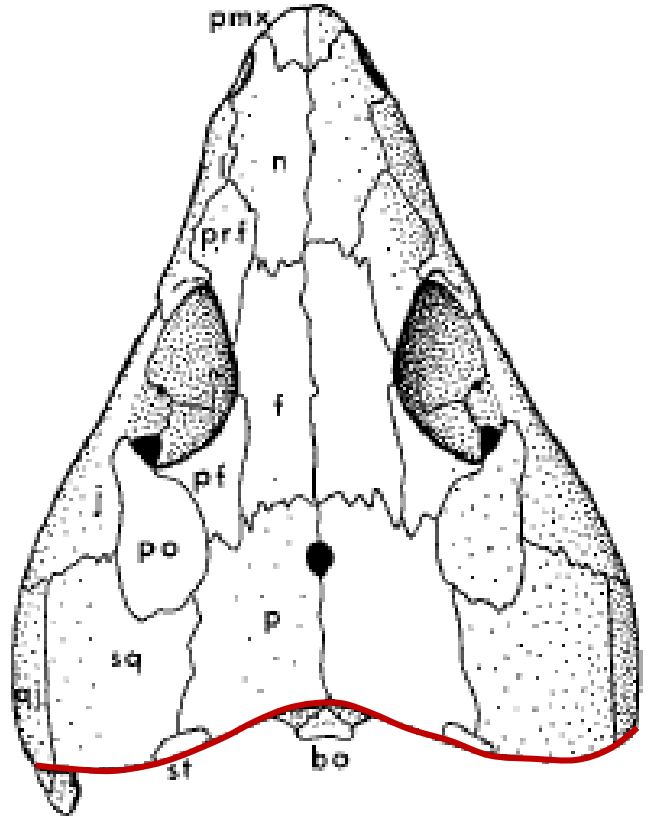
(36) Skull table occipital margin: embayed bilaterally (0); straight (1); with single median embayment (2). In Castanhinha & Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Protocaptorhinus pricei. Reconstruction; MCZ 1478. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 36(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Romeria prima*

Status 36(1)

- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Reiszorhinus olsoni*

Status 36(2)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 36(?)

- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

(36) Skull table occipital margin: embayed bilaterally (0); straight (1); with single median embayment (2). In Castanhinha & Modesto 2018.

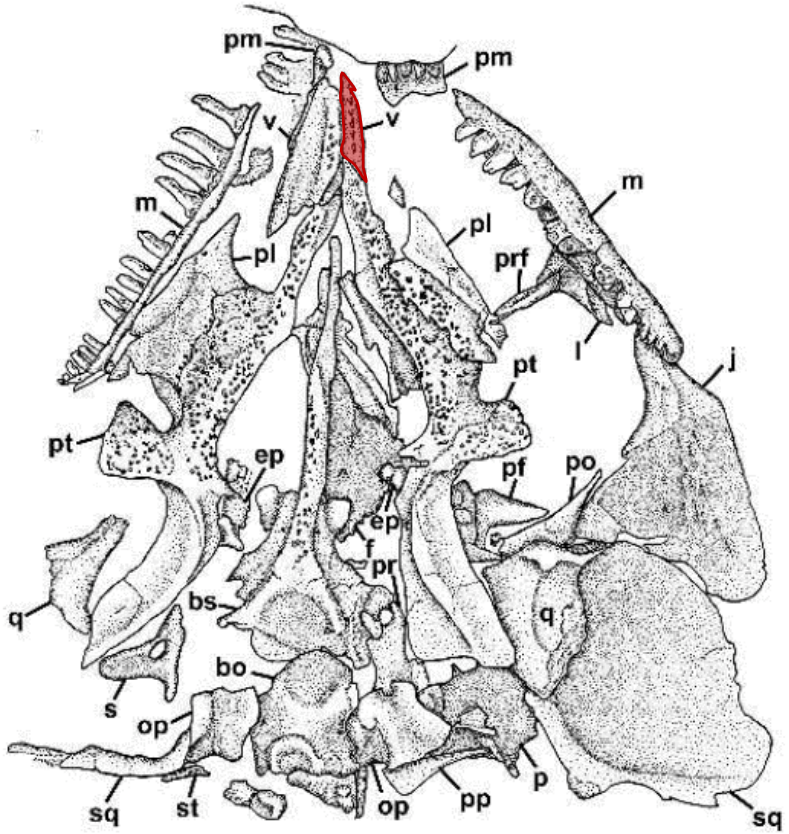
CAPTORHINIDS: PHYLOGENETIC CHARACTERS

PALATE

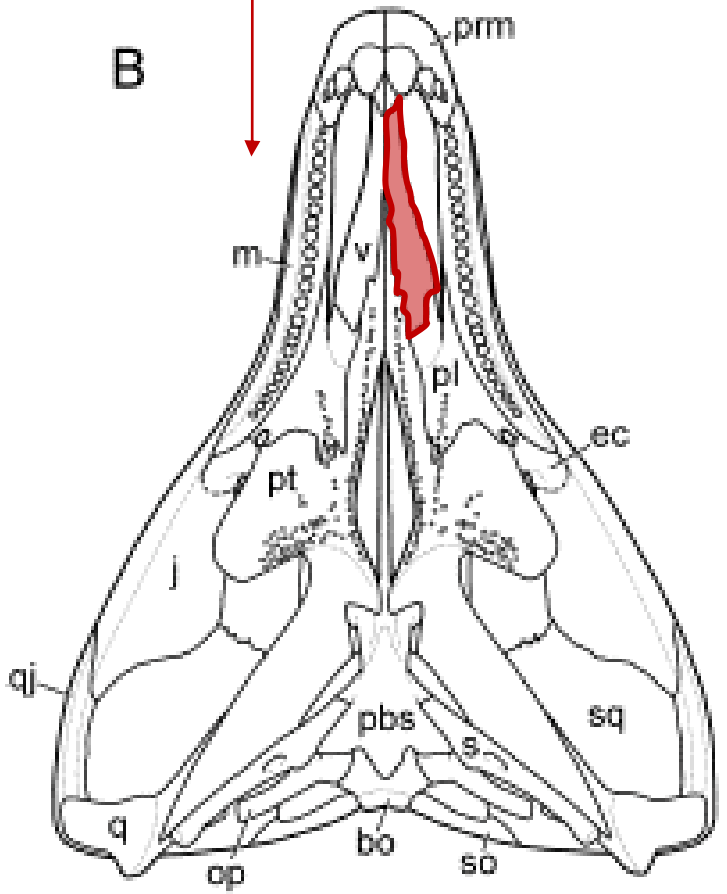
(37) Vomer:

- Denticulated (0)
- Edentulous (1)

(37) Vomer: denticulated (0); edentulous (1). In Castanhinha & Modesto 2018.



Euconcordia cunninghami. KUVP 96/95. In Müller & Reisz 2005.



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.

Status 37(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Opisthodontosaurus carrolli*

Status 37(1)

- *Romeria prima*
- *Romeria texana*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 37(?)

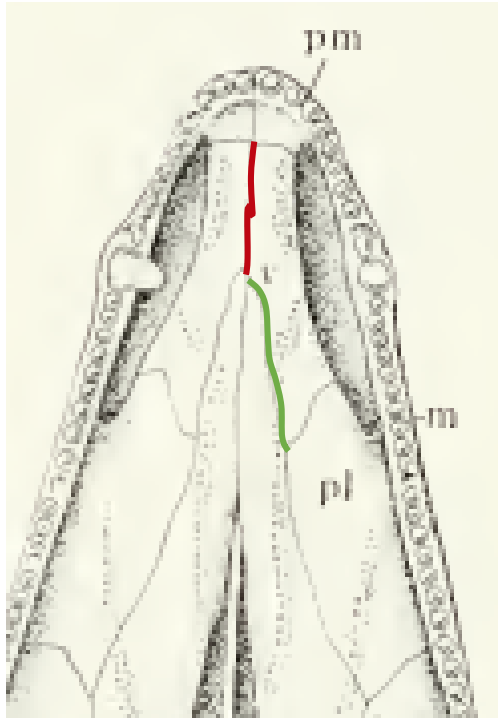
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

(37) Vomer: denticulated (0); edentulous (1). In Castanhinha & Modesto 2018.

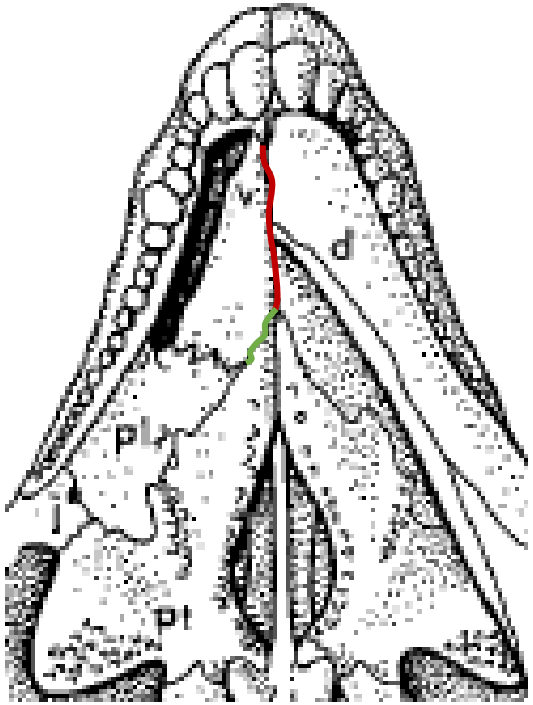
(38a) Vomer-pterygoid contact:

Extensive, at least 0,66 times median border of vomer (0)

Short, no more than 0,66 times median border of vomer (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 38a(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*

Status 38a(1)

- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Captorhinus laticeps*

Status 38a(?)

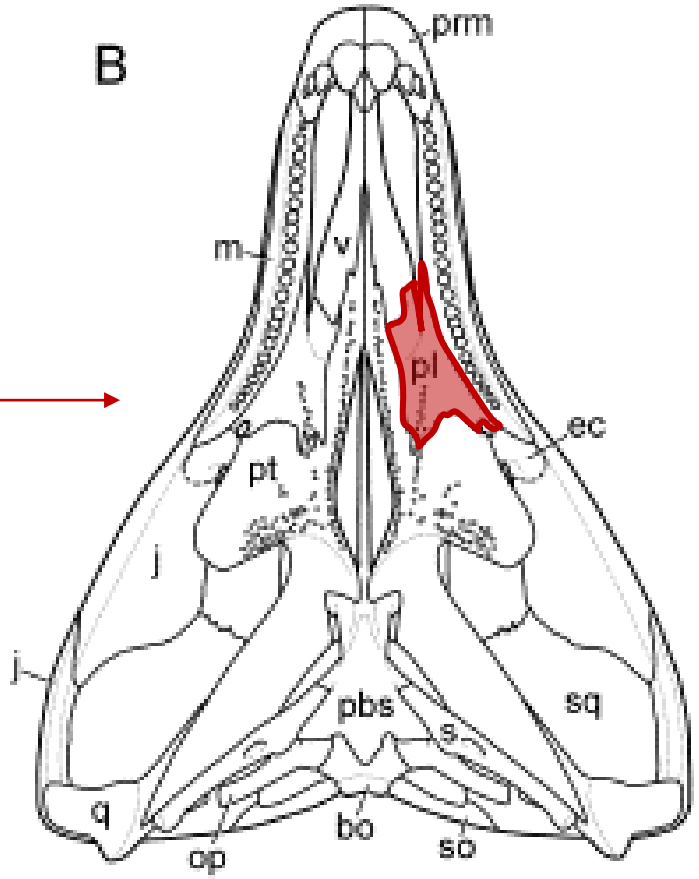
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

(39) Palatine:

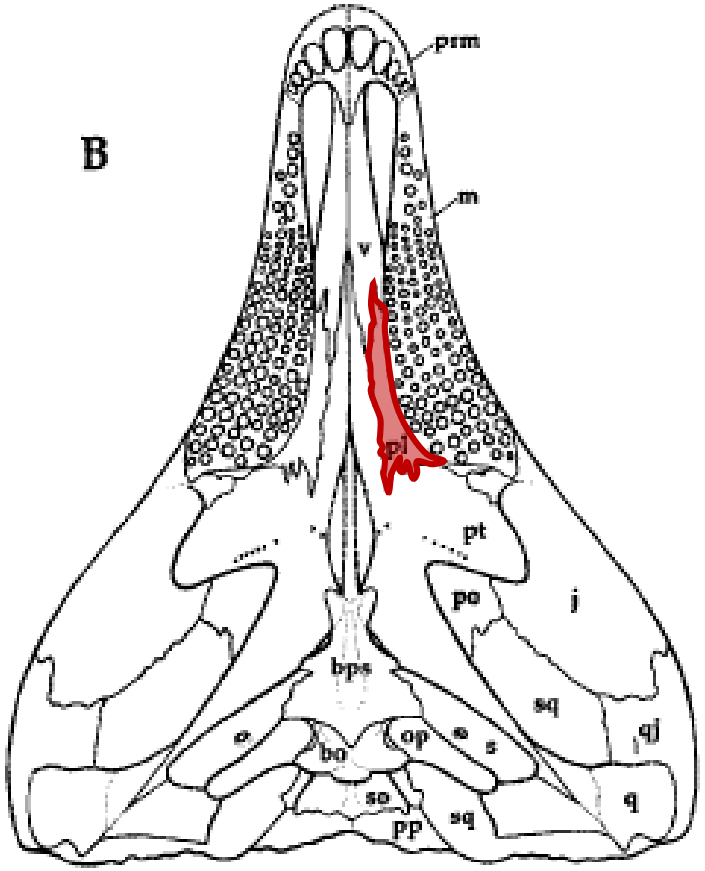
(39) Palatine: denticulated (0); edentulous (1). In Castanhinha & Modesto 2018.

Denticulated (0)

Edentulous (1)



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 39(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 39(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 39(?)

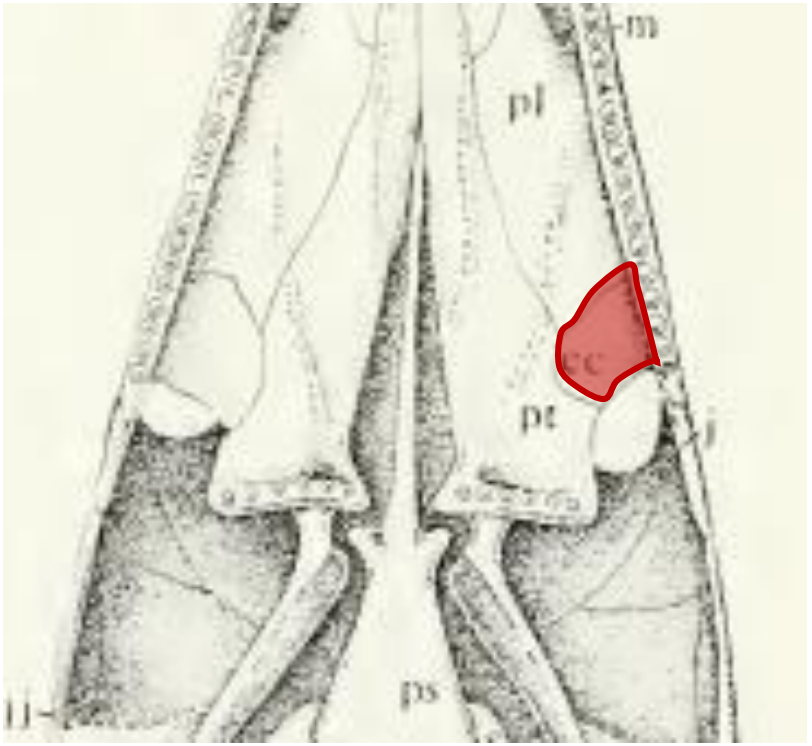
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(39) Palatine: denticulated (0); edentulous (1). In Castanhinha & Modesto 2018.

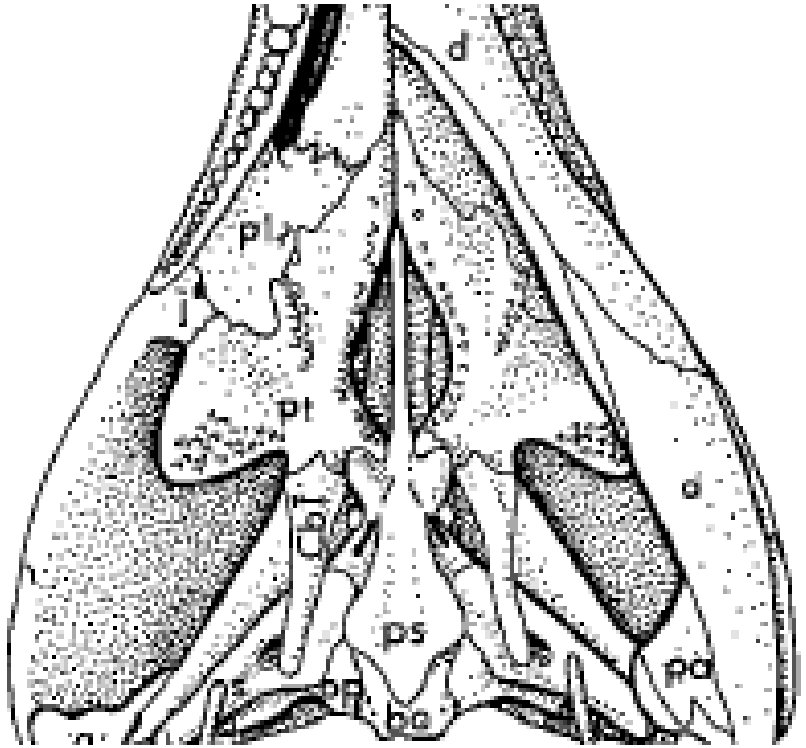
(40 a) Jugal/Ectopterygoid:

Ectopterygoid present (0)

Ectopterygoid absent (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 40a (0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*

Status 40a (1)

- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 40a (?)

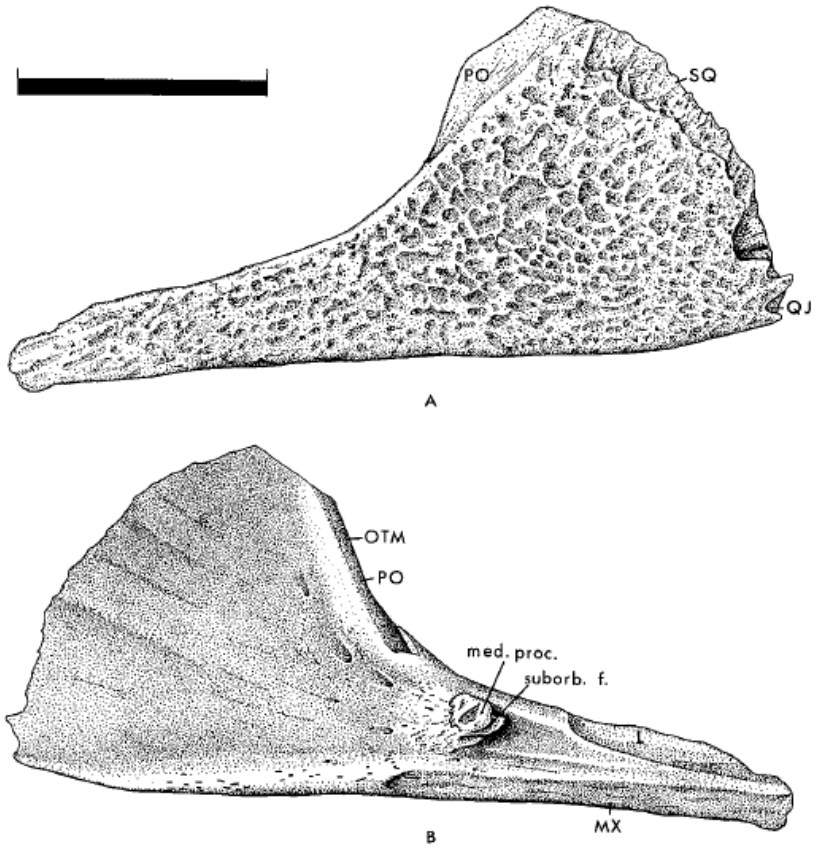
- *Romeria prima*
- *Romeria texana*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(40 b) Jugal:

Inexistant alary process (0)

Alary process no higher than the midpoint of the suborbital process of the jugal and distinct from the orbital margin (1)

Alary process positioned dorsally on the medial surface of the jugal, flush with orbital margin (2)



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 40b (0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*

Status 40b (1)

- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*

Status 40b (2)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 40b (?)

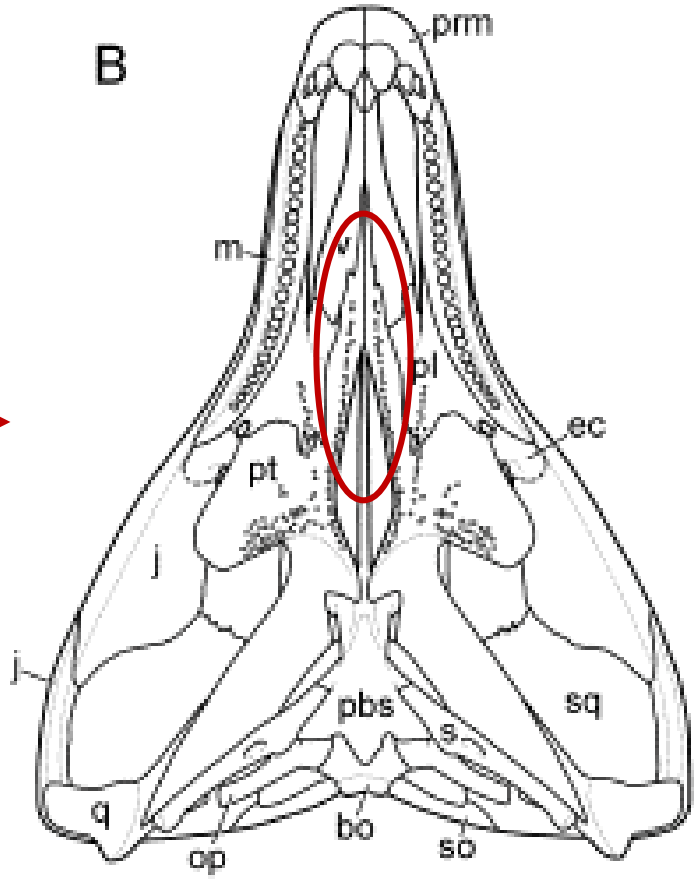
- *Romeria prima*
- *Romeria texana*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(41) Dentition on palatal ramus of pterygoid:

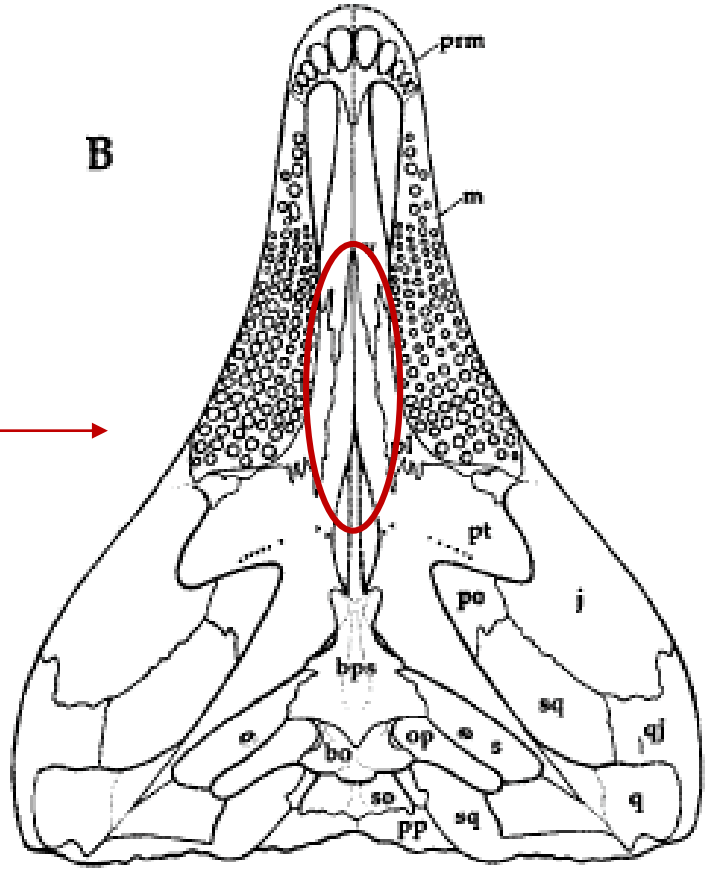
(41) Dentition on palatal ramus of pterygoid: present (0); greatly reduced or absent (1). In Castanhinha & Modesto 2018.

Present (0)

Greatly reduced or absent (1)



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 41(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 41(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*

Status 41(?)

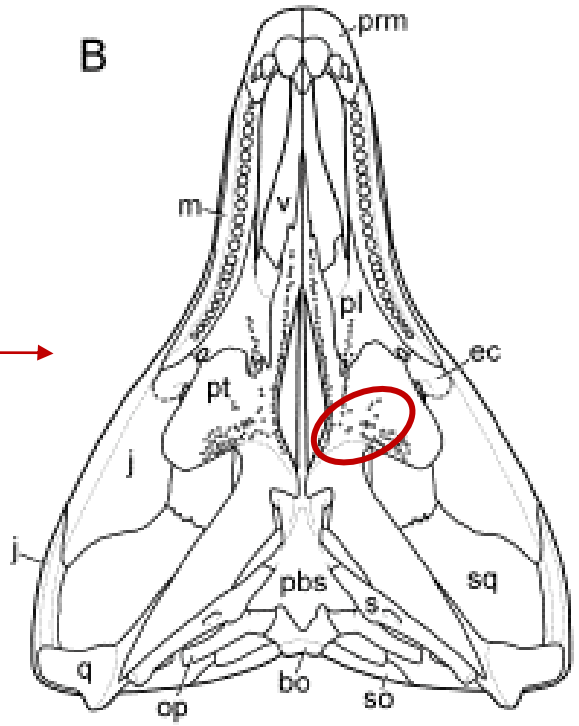
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Reiszorhinus olsoni*

(41) Dentition on palatal ramus of pterygoid: present (0); greatly reduced or absent (1). In Castanhinha & Modesto 2018.

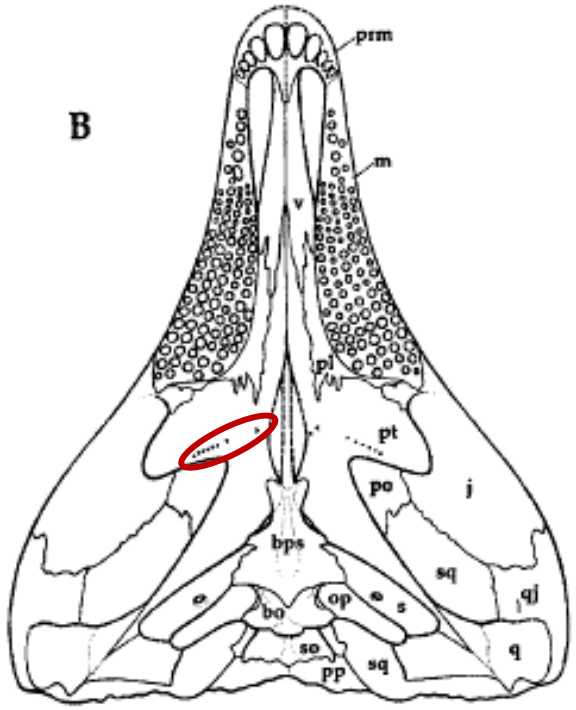
(42) Pterygoid – transverse flange dentition:

(42) Pterygoid: transverse flange dentition consists of shagreen (i.e. cluster) of denticles (0); transverse flange dentition consists of at least one row of functional teeth (1); transverse flange dentition absent (2). In Castanhinha & Modesto 2018.

- Consists of shagreen (i.e. cluster) of denticles (0)
- Consists of at least one row of functional teeth (1)
- Absent (2)



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.



Labidosaurikos meachami. Reconstruction; Holotype; OMNH 04331. In Dodick & Modesto 1995.

Rothianiscus multidontus. Image from Modesto 2018. Personal communication.

Status 42(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 42(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinus kierani*

Status 42(2)

- *Rothianiscus multidontus*

Status 42(?)

- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Reiszorhinus olsoni*

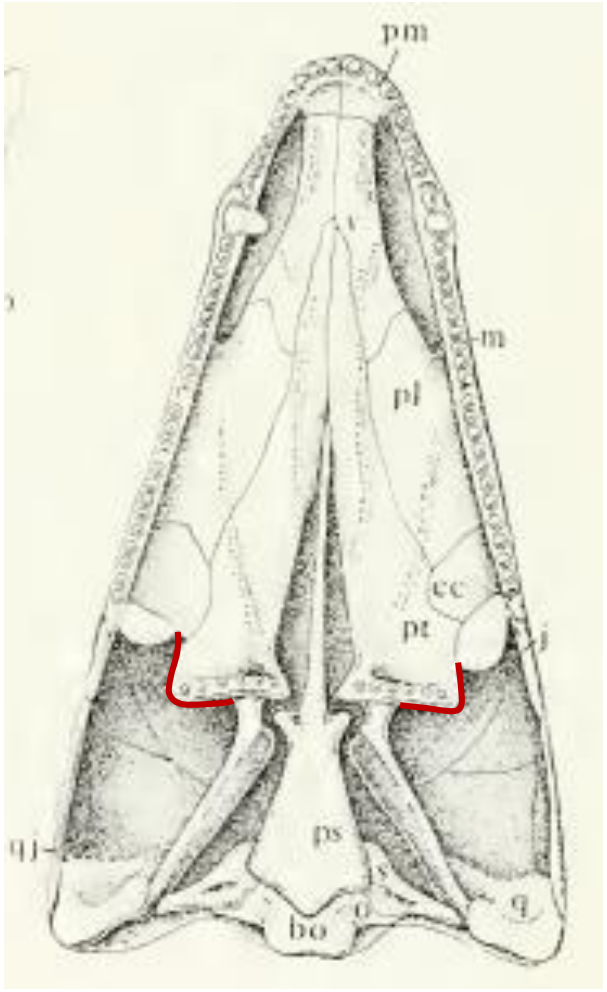
(42) Pterygoid: transverse flange dentition consists of shagreen (i.e. cluster) of denticles (0); transverse flange dentition consists of at least one row of functional teeth (1); transverse flange dentition absent (2). In Castanhinha & Modesto 2018.

(43) Pterygoid – transverse flange:

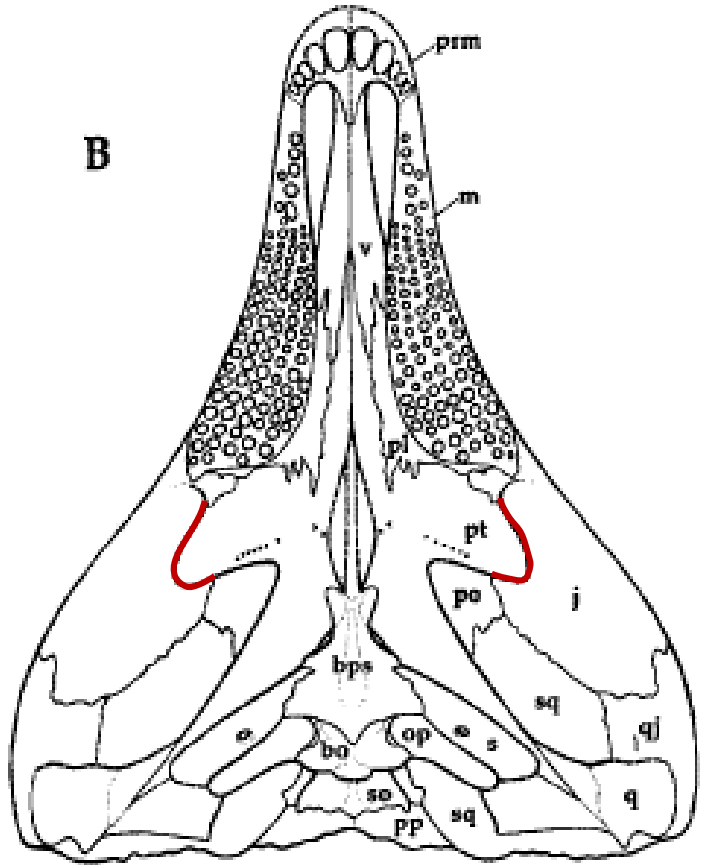
(43) Pterygoid: transverse flange broad-based and distinctly angular in ventral view (0); transverse flange narrow and tongue-like in ventral view (1). In Castanhinha & Modesto 2018.

Broad-based and distinctly angular in ventral view (0)

Narrow and tongue-like in ventral view (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurikos meachami. Reconstruction. In Dodick & Modesto 1995.

Status 43(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*

Status 43(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 43(?)

- *Romeria prima*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Reiszorhinus olsoni*

(43) Pterygoid: transverse flange broad-based and distinctly angular in ventral view (0); transverse flange narrow and tongue-like in ventral view (1). In Castanhinha & Modesto 2018.

CAPTORHINIDS: PHYLOGENETIC CHARACTERS

BRAIN CASE

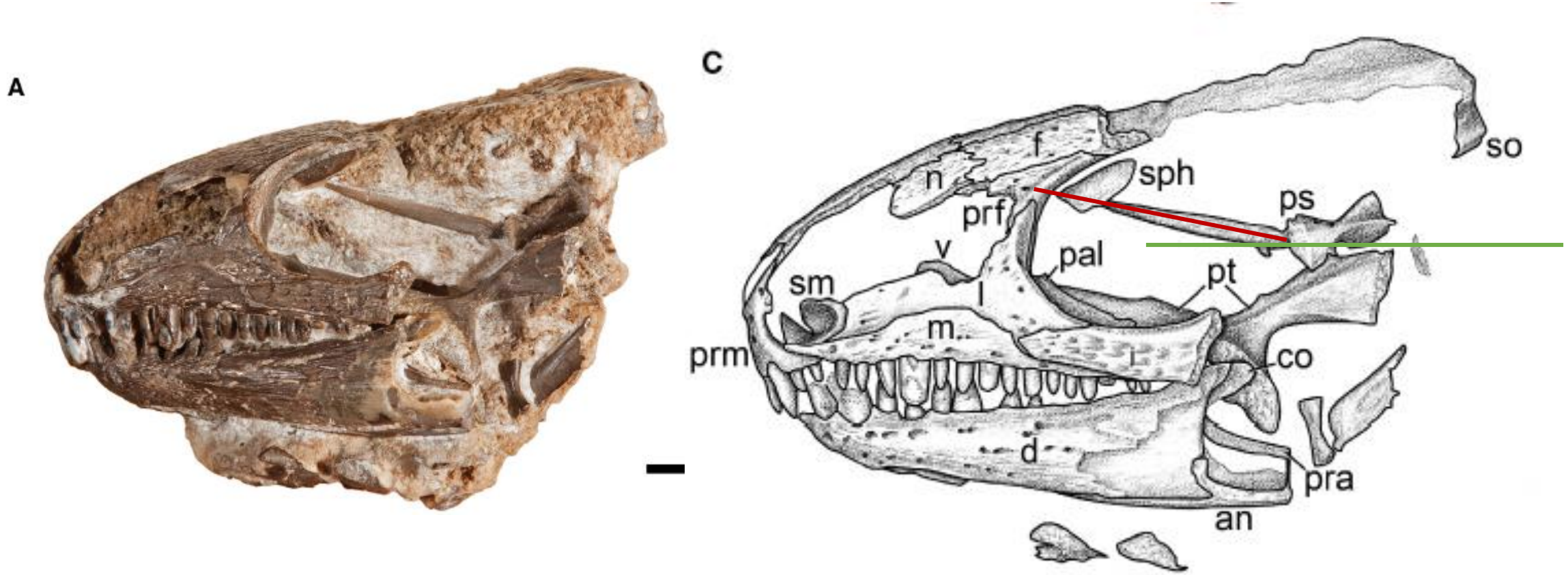
(45) Parasphenoid – cultriform process:

Extends anteriorly (0)

Extends slightly dorsally at roughly 15º to the basal plane (1)

Extends anterodorsally at more than 45º to the basal plane (2)

(45) Parasphenoid: cultriform process extends anteriorly (0); cultriform process extends slightly dorsally at roughly 15º to the basal plane (1); cultriform process extends anterodorsally at more than 45º to the basal plane (2). In Castanhinha & Modesto 2018.



Labidosauriscus richardi. Reconstruction; Holotype; OMNH 77609. In Modesto, Scott & Reisz 2018.

Status 45(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Opisthodontosaurus carrolli*

Status 45(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosauriscus richardi*

Status 45(2)

- *Labidosaurikos meachami*
- *Labidosaurus hamatus*
- *Moradisaurus grandis*

Status 45(?)

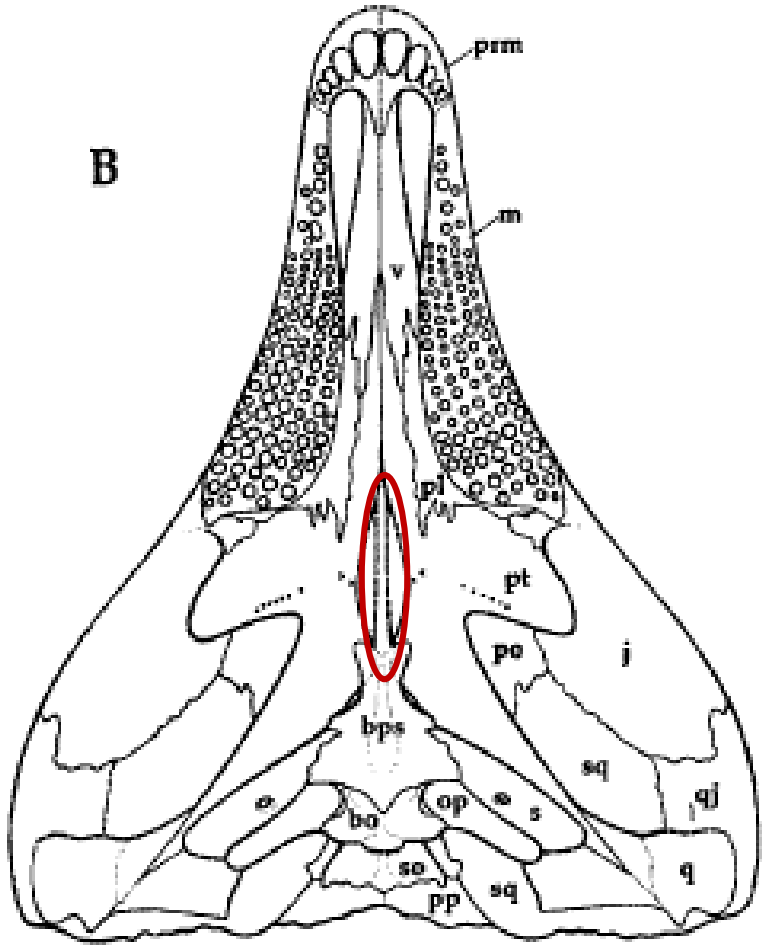
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

(45) Parasphenoid: cultriform process extends anteriorly (0); cultriform process extends slightly dorsally at roughly 15º to the basal plane (1); cultriform process extends anterodorsally at more than 45º to the basal plane (2). In Castanhinha & Modesto 2018.

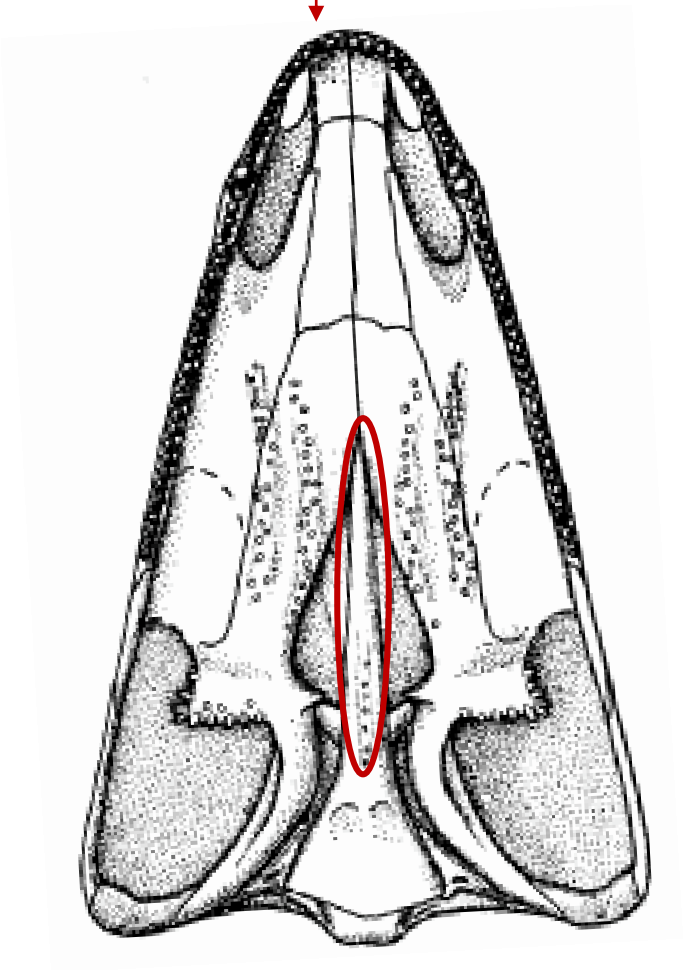
(46) Parasphenoid: edentulous (0); denticulated (1). In Castanhinha & Modesto 2018.

(46) Parasphenoid:

- Edentulous (0)
- Denticulated (1)



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.



Paleothyris acadiana. Reconstruction; MCZ 3481. In Carroll 1969.

Status 46(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*

Status 46(1)

- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Captorhinus aguti*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 46(?)

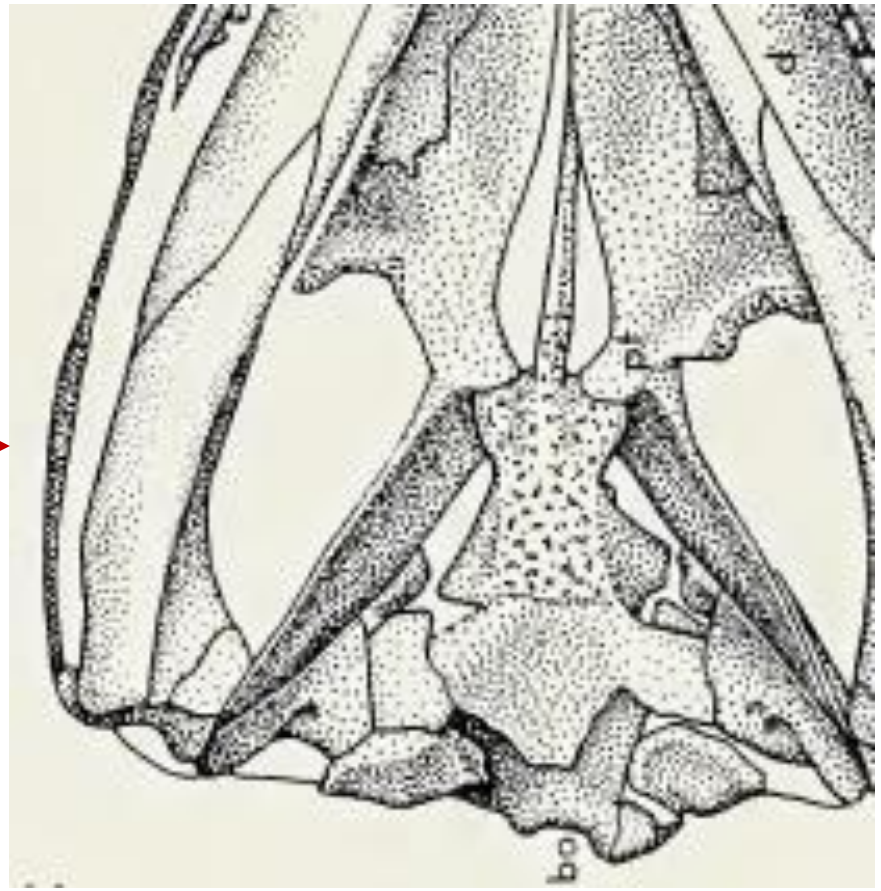
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(46) Parasphenoid: edentulous (0); denticulated (1). In Castanhinha & Modesto 2018.

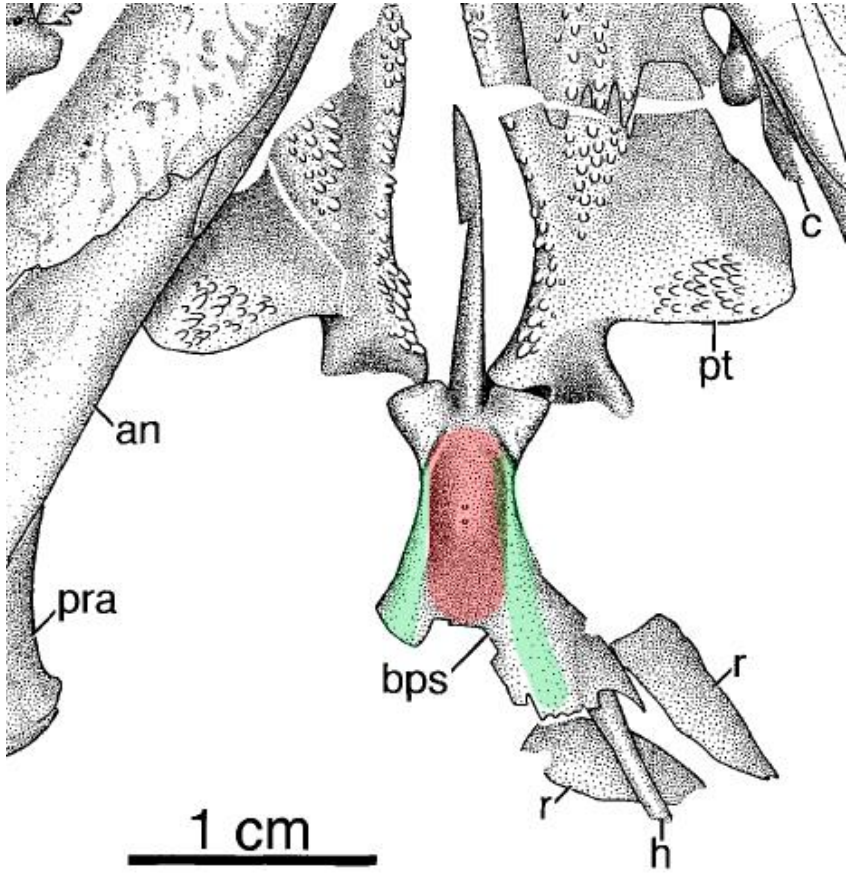
(47) Parasphenoid – deep ventral groove formed by cristae ventrolateralis:

Absent (0)

Present (1)



Rhiodenticulatus heatoni. Reconstruction; Holotype UCMP 35757. In Bergman & Reisz 1986.



Captorhinus aguti. Reconstruction; ROM 44627. In Modesto 1998.

(47) Parasphenoid: deep ventral groove formed by cristae ventrolateralis absent (0); deep ventral groove formed by cristae ventrolateralis present (1). In Castanhinha & Modesto 2018.

Status 47(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*

Status 47(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 47(?)

- *Saurorictus australis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

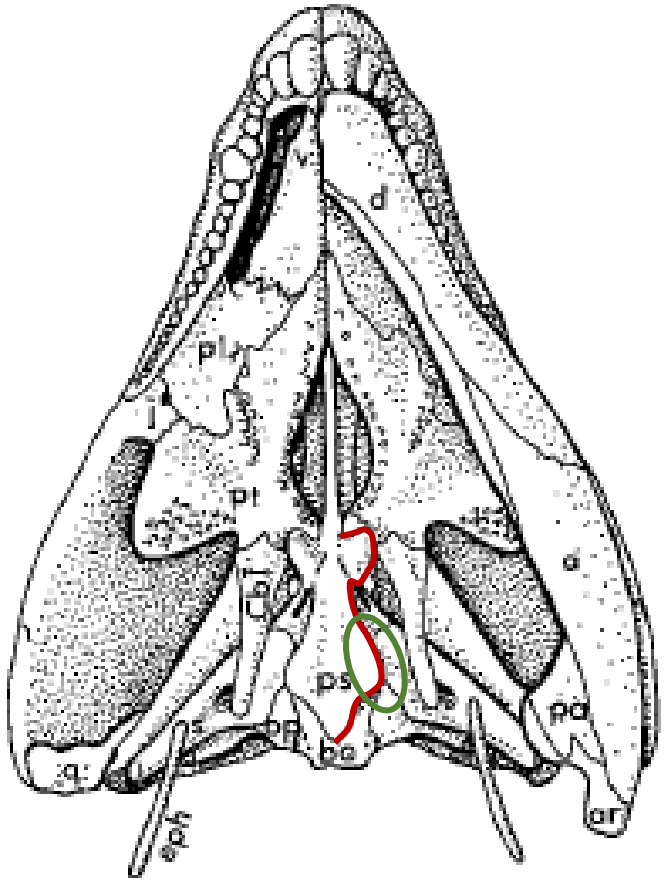
(47) Parasphenoid: deep ventral groove formed by cristae ventrolateralis absent (0); deep ventral groove formed by cristae ventrolateralis present (1). In Castanhinha & Modesto 2018.

(48) Parasphenoid – posterolateral wing:

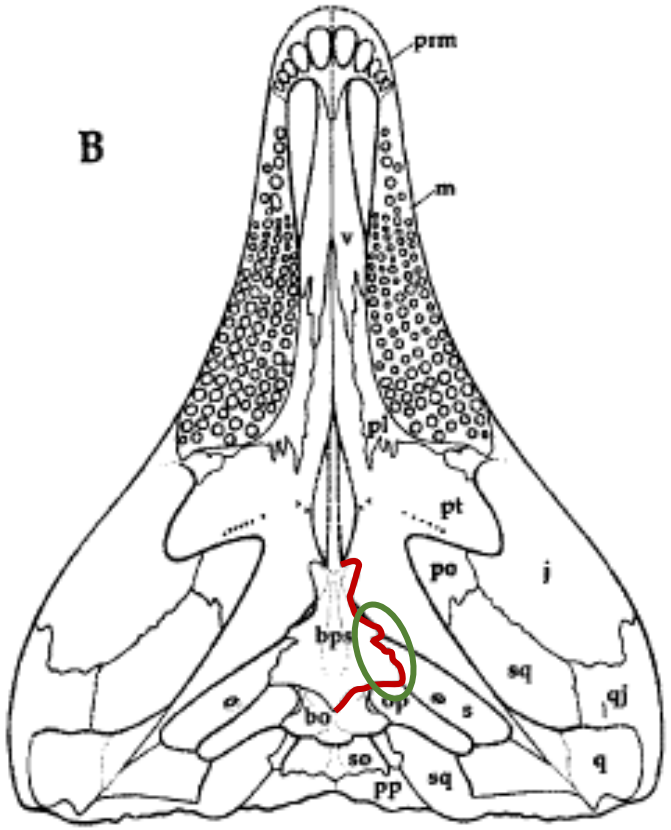
Narrow, meets narrow head of stapes (0)

Broad, meets large head of stapes in an elongate, nearly parasagittal suture (1)

(48) Parasphenoid: posterolateral wing narrow, meets narrow head of stapes (0); wing broad, meets large head of stapes, in an elongate, nearly parasagittal suture (1). In Castanhinha & Modesto 2018.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 48(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 48(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinus kierani*

Status 48(?)

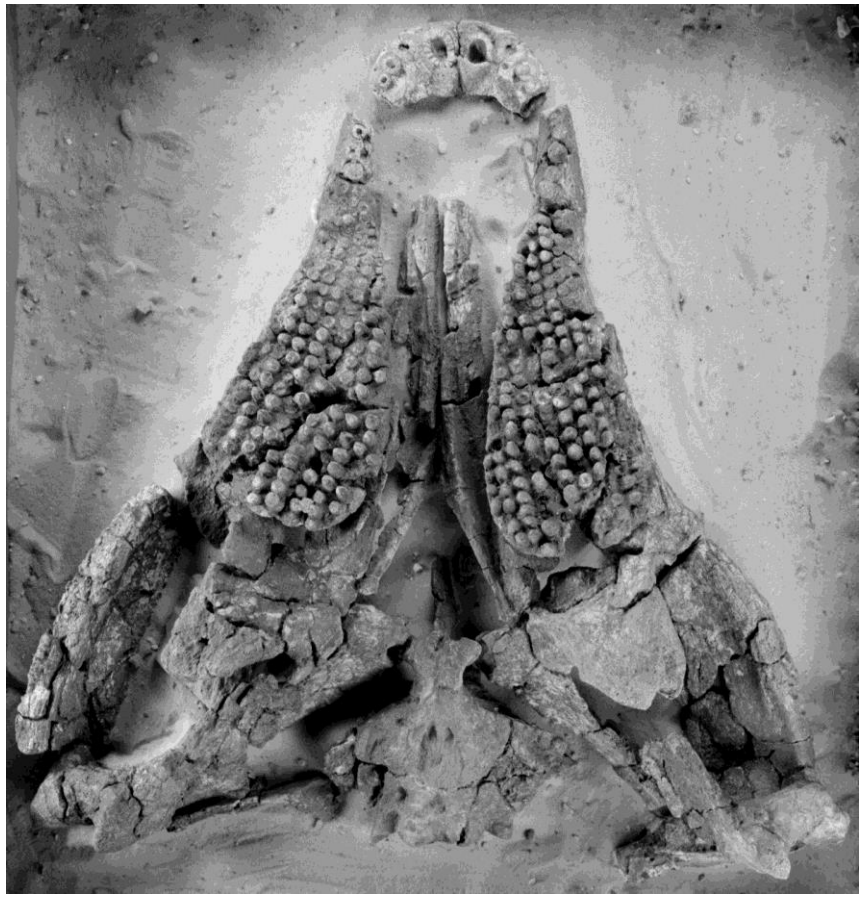
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*

(48) Parasphenoid: posterolateral wing narrow, meets narrow head of stapes (0); wing broad, meets large head of stapes, in an elongate, nearly parasagittal suture (1). In Castanhinha & Modesto 2018.

(49) Opisthotic – paroccipital process:

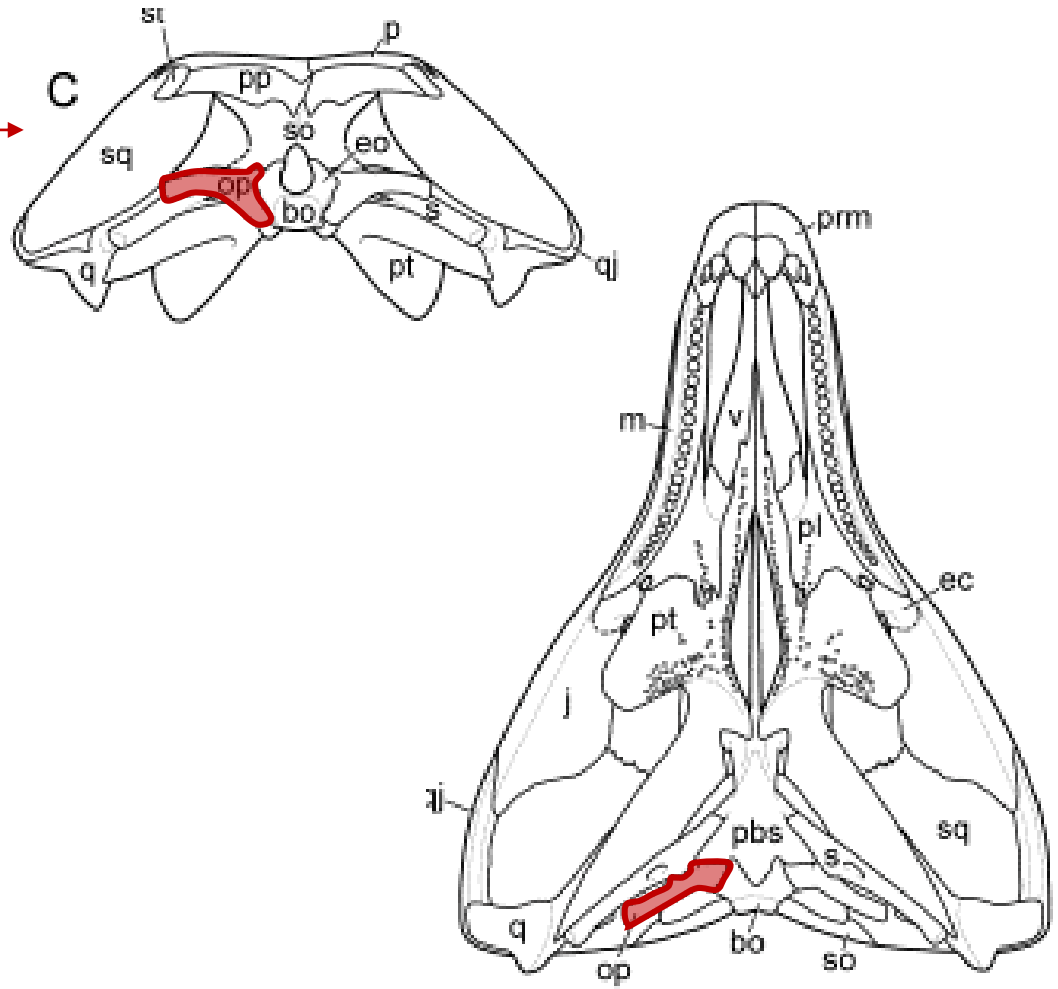
Short, extending only slightly beyond body of opisthotic (0)

Long, extending near to medial edge of squamosal (1)



Moradisaurus grandis. Image from Sean Modesto 2018. Personal communication.

(49) Opisthotic: paroccipital process long, extending near to medial edge of squamosal (0); process short, extending only slightly beyond body of opisthotic (1). In Castanhinha & Modesto 2018.



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.

Status 49(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinus kierani*

Status 49(1)

- *Moradisaurus grandis*

Status 49(?)

- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

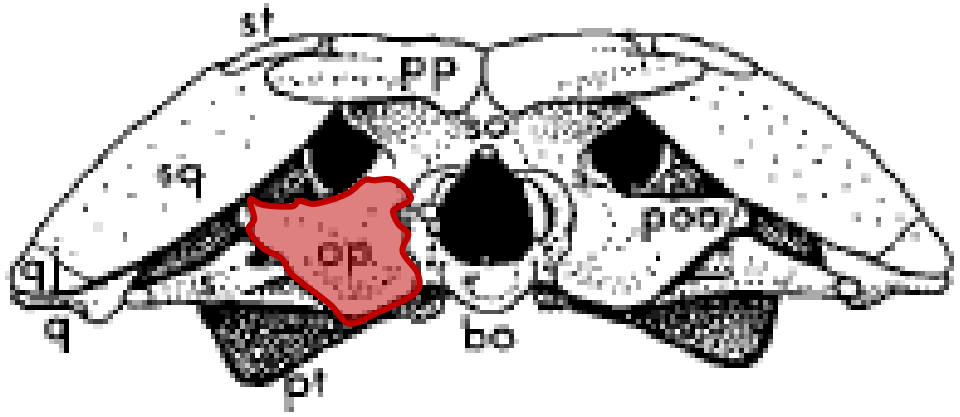
(49) Opisthotic: paroccipital process long, extending near to medial edge of squamosal (0); process short, extending only slightly beyond body of opisthotic (1). In Castanhinha & Modesto 2018.

(50) Paroccipital process: broad (0); narrow (1). In Castanhinha & Modesto 2018.

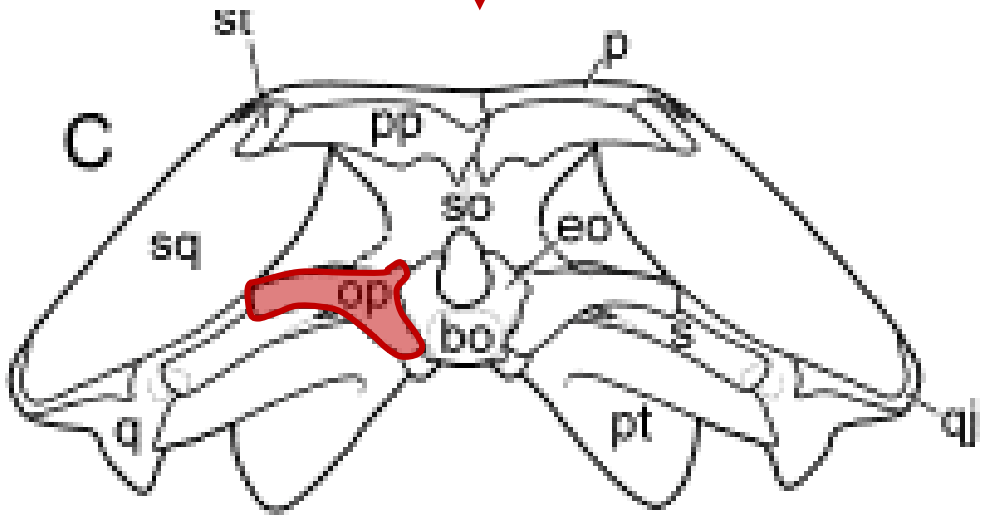
(50) Paroccipital process:

Broad (0)

Narrow (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction; CM 73371. In Modesto, Scott et al 2007.

Status 50(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Captorhinus kierani*

Status 50(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*

Status 50(?)

- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

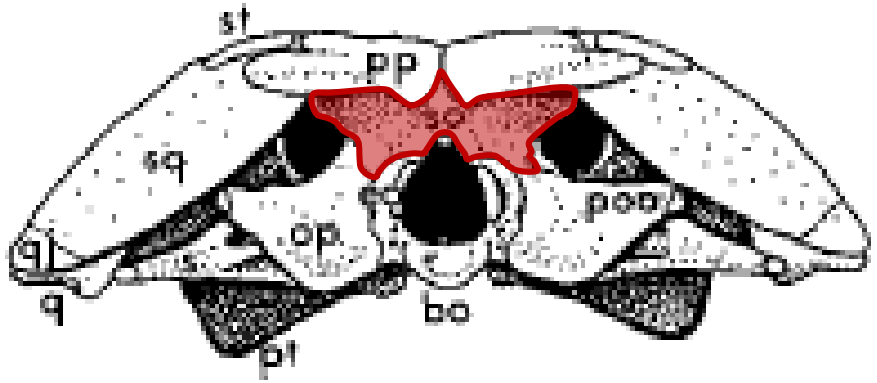
(50) Paroccipital process: broad (0); narrow (1). In Castanhinha & Modesto 2018.

(52) Supraoccipital:

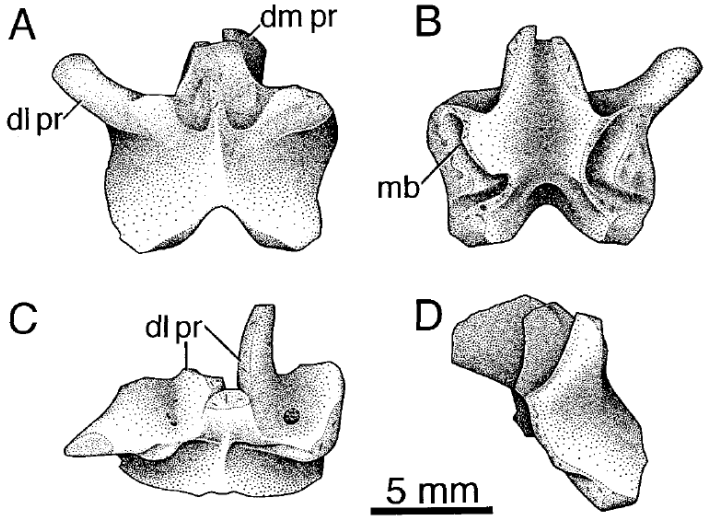
(52) Supraoccipital: slopes anterodorsally (0); aligned vertically or slopes posterodorsally (1). In Castanhinha & Modesto 2018.

Slopes anterodorsally (0)

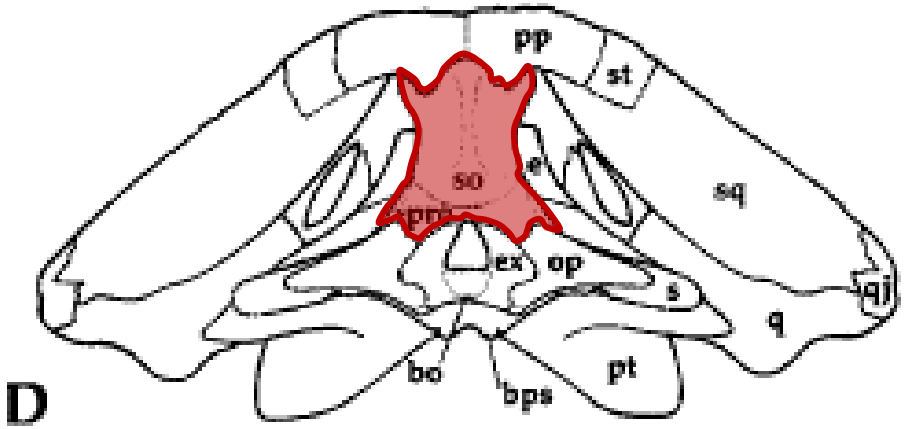
Aligned vertically or slopes posterodorsally (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Captorhinus aguti. Reconstruction; ROM 30099. In Modesto 1998.



Labidosaurikos meachami. Reconstruction; Holotype OMNH 04331. In Dodick & Modesto 1995.

Status 52(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 52(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*

Status 52(?)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

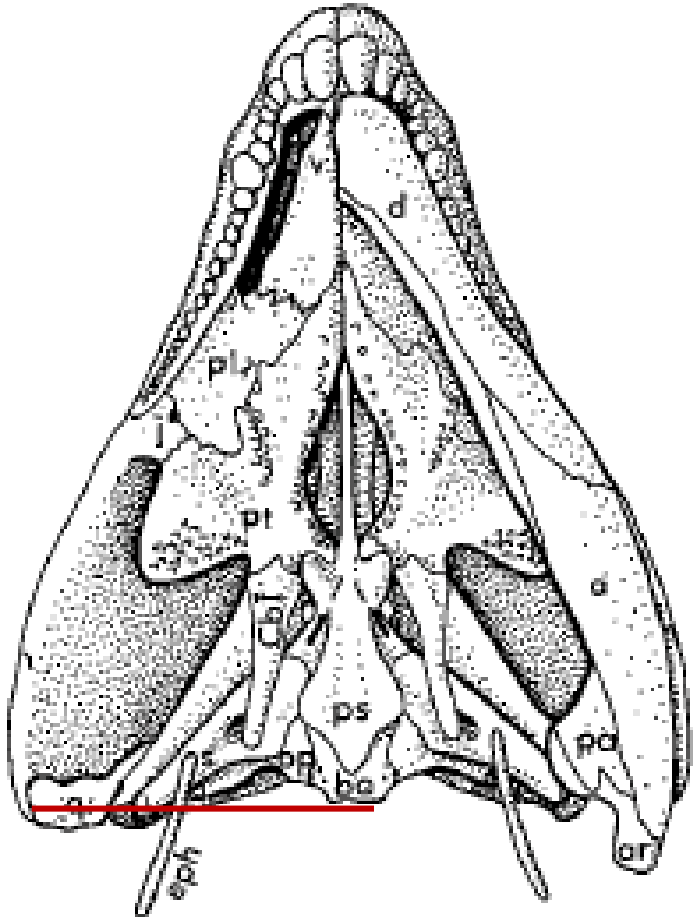
(52) Supraoccipital: slopes anterodorsally (0); aligned vertically or slopes posterodorsally (1). In Castanhinha & Modesto 2018.

(54) Occipital condyle:

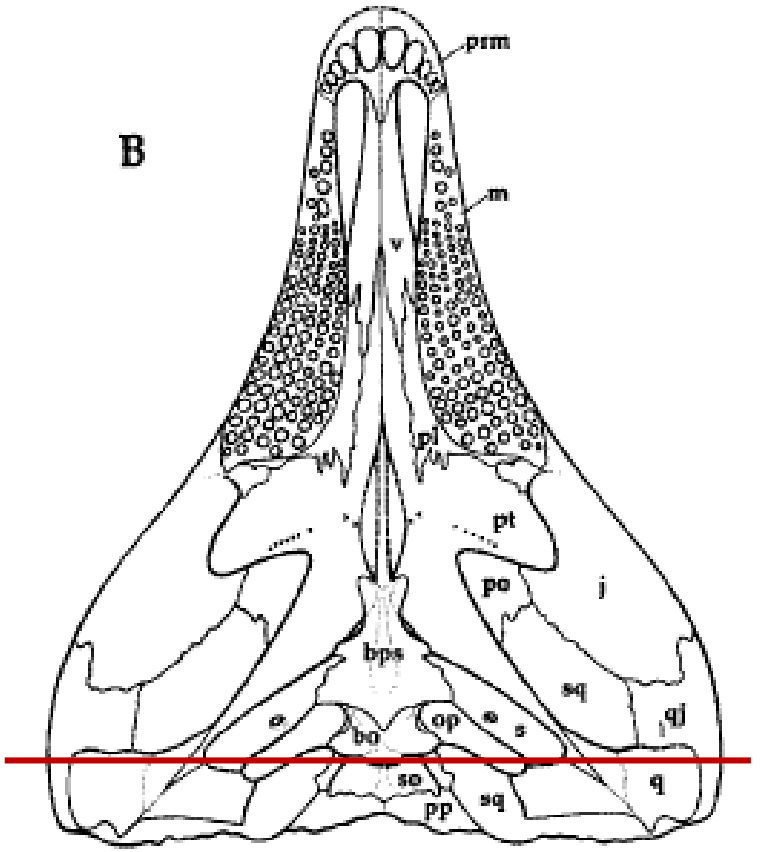
At level of quadrate condyles (0)

Immediately anterior to quadrate condyles (1)

(54) Occipital condyle: at level of quadrate condyles (0); immediately anterior to condyles (1). In Castanhinha & Modesto 2018.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurikos meachami. Reconstruction; Holotype; OMNH 04331. In Dodick & Modesto 1995.

Status 54(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

Status 54(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Captorhinikos chozaensis*

Status 54(?)

- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

(54) Occipital condyle: at level of quadrate condyles (0); immediately anterior to condyles (1). In Castanhinha & Modesto 2018.

CAPTORHINIDS: PHYLOGENETIC CHARACTERS

MANDIBLE

(56) Dentary – anterior dentary teeth:

(56) Dentary: Anterior dentary teeth: teeth uniformly small (0), multiple enlarged teeth present anteriorly (1) (i.e. caniniform region sensu Modesto); single enlarged tooth present anteriorly (2). In Castanhinha & Modesto 2018.

- Teeth uniformely small (0)
- Multiple enlarged teeth present anteriorly (1)
- Single enlarged tooth present anteriorly (2)

Paleothyris acadiana. Reconstruction; MCZ 3483. In Carroll 1969.

Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Labidosaurikos meachami. Reconstruction. In Dodick & Modesto 1995.

Status 56(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Opisthodontosaurus carrolli*

Status 56(1)

- *Romeria prima*
- *Romeria texana*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 56(2)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*

Status 56(?)

- *Thuringothyris mahlendorffae*
- *Protocaptorhinus pricei*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*

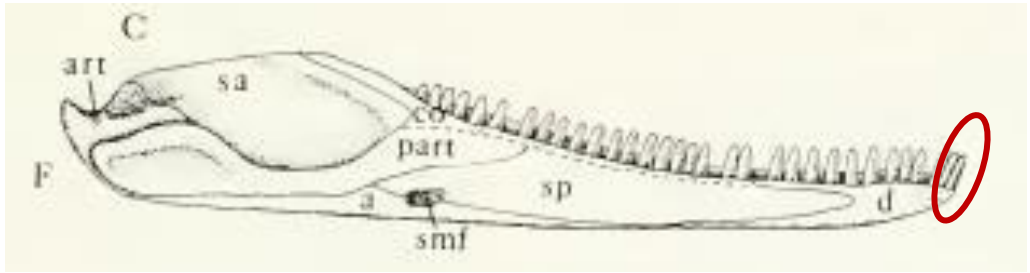
(56) Dentary: Anterior dentary teeth: teeth uniformly small (0), multiple enlarged teeth present anteriorly (1) (i.e. caniniform region sensu Modesto); single enlarged tooth present anteriorly (2). In Castanhinha & Modesto 2018.

(57) Dentary – first tooth:

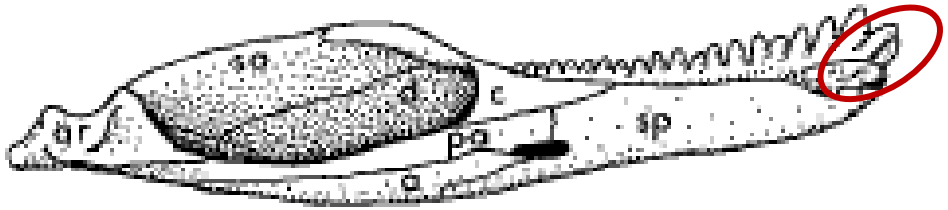
(57) Dentary: first tooth oriented mainly vertically (0); first tooth leans strongly anteriorly (1). In Castanhinha & Modesto 2018.

Oriented mainly vertically (0)

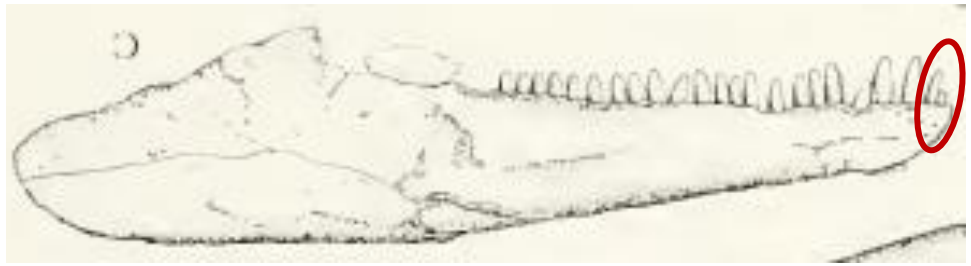
Leans strongly anteriorly (1)



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Romeria primq. Reconstruction; MCZ 1963. In Clark & Carroll 1972.

Status 57(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Labidosauriscus richardi*

Status 57(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Moradisaurus grandis*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

Status 57(?)

- *Thuringothyris mahlendorffae*
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

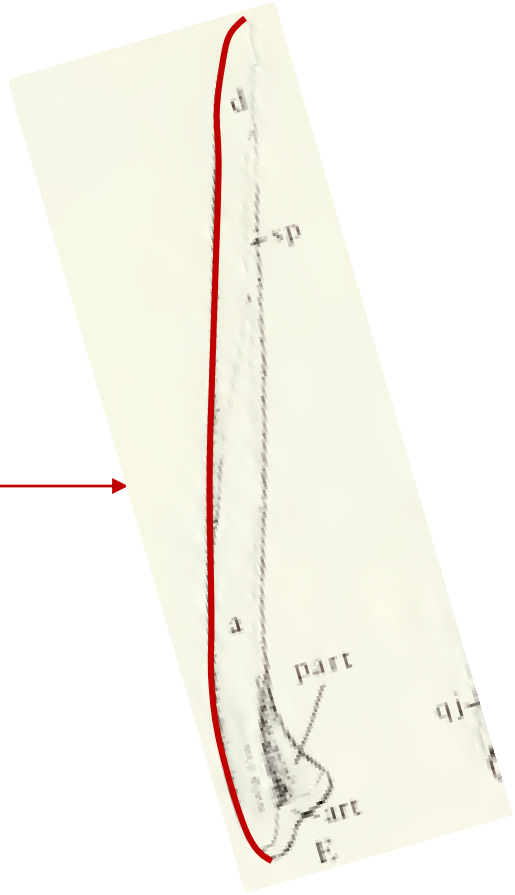
(57) Dentary: first tooth oriented mainly vertically (0); first tooth leans strongly anteriorly (1). In Castanhinha & Modesto 2018.

(58) Mandibular ramus – ventral view:

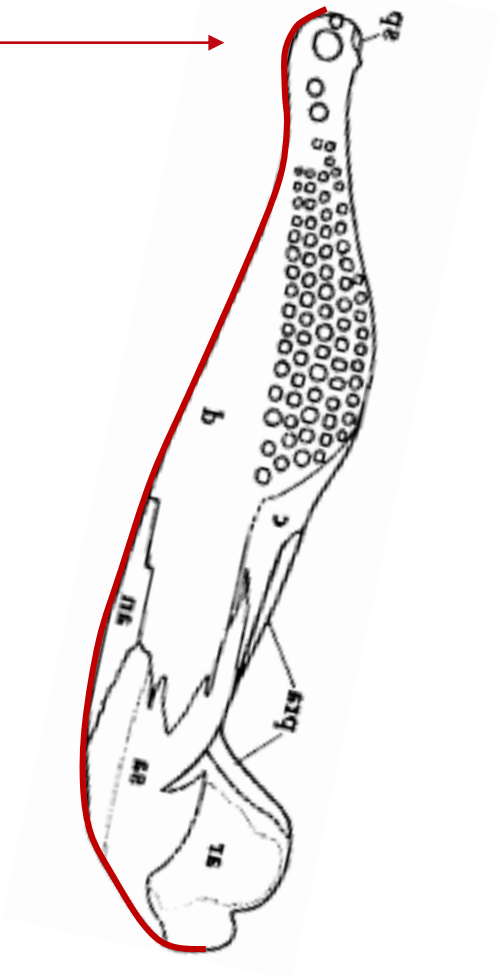
Relatively straight (0)

Sigmoidal (1)

(58) Mandibular ramus: relatively straight in ventral view (0); sigmoidal in ventral view (1). In Castanhinha & Modesto 2018.



Protorothyris archeri. Reconstruction. In Clark & Carroll 1972.



Labidosaurikos meachami. Reconstruction. In Dodick & Modesto 1995.

Status 58(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 58(1)

- *Labidosaurus hamatus*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*

Status 58(?)

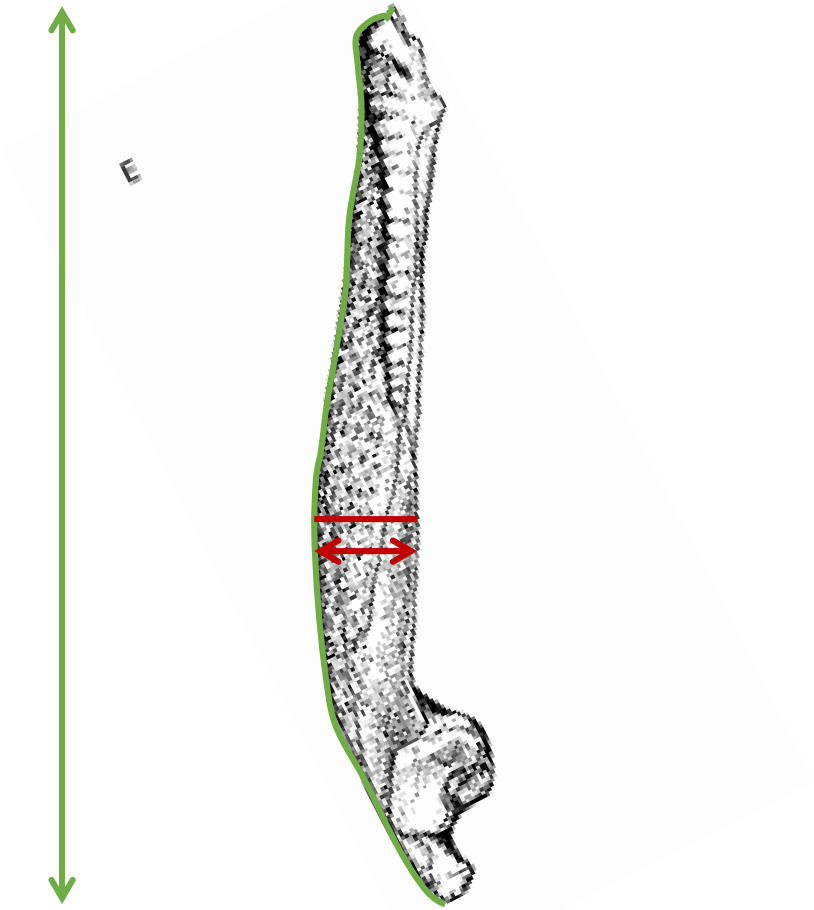
- *Labidosaurikos meachami*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

(58) Mandibular ramus: relatively straight in ventral view (0); sigmoidal in ventral view (1). In Castanhinha & Modesto 2018.

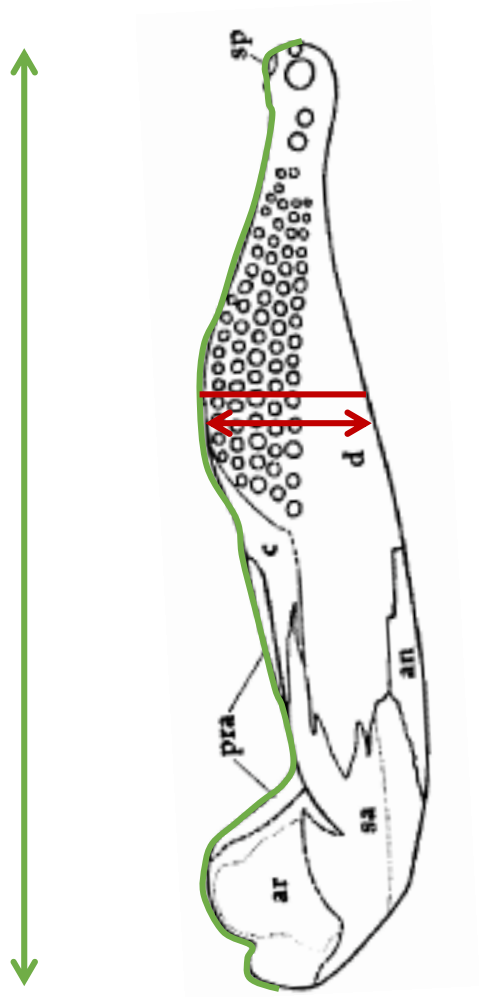
(59a) Mandibular ramus:

Narrow, 0,13 or less of total jaw length (0)

Broad, more than 0,13 of total jaw length (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurikos meachami. Reconstruction. In Dodick & Modesto 1995.

Status 59a(0)

- *Protorothyris archeri*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 59a(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*

Status 59a(?)

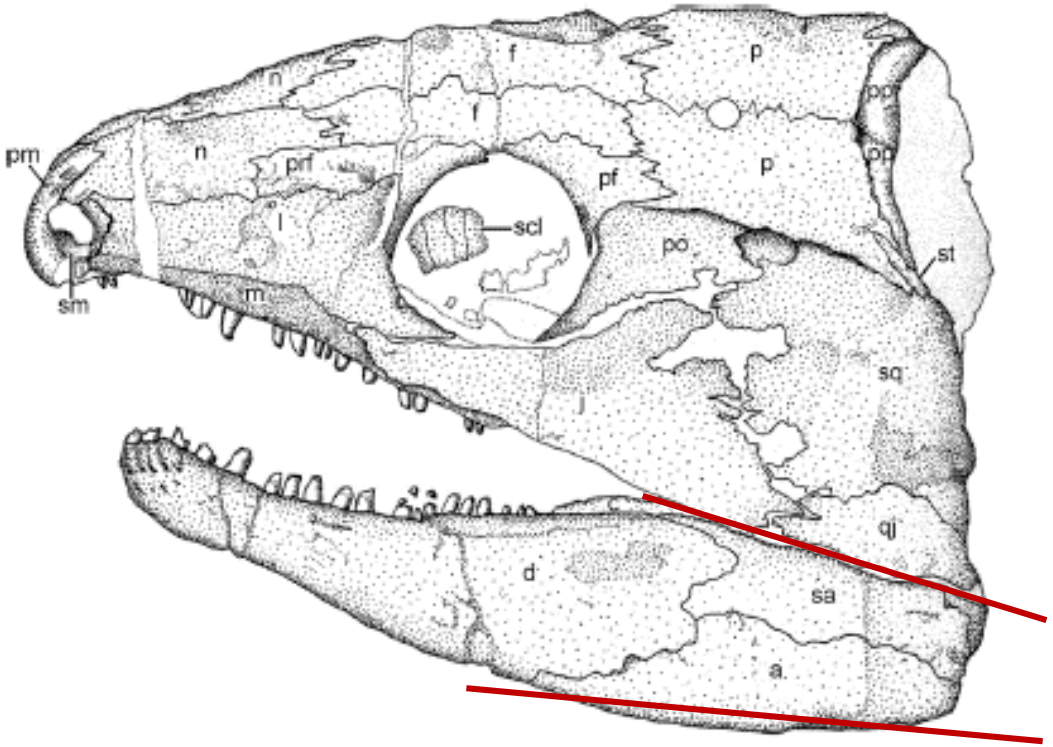
- *Paleothyris acadiana*
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(60) Mandibular ramus – posterior end in lateral view:

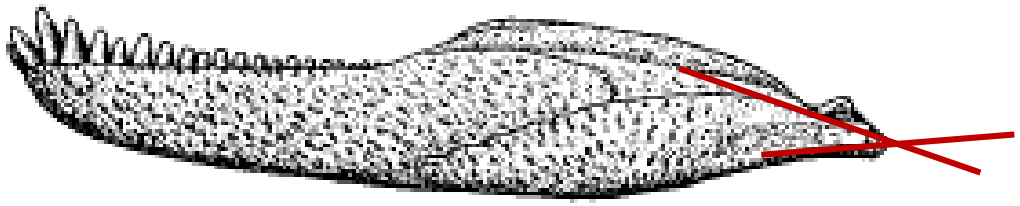
(60) Mandibular ramus: posterior end rectilinear in lateral view (0) or acuminate in lateral view (1). In Castanhinha & Modesto 2018.

Rectilinear (0)

Acuminate (1)



Reiszorhinus olsoni. Holotype FMNH UC183. In Sumida, Dodick et al 2010.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 60(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 60(1)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

Status 60(?)

- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*

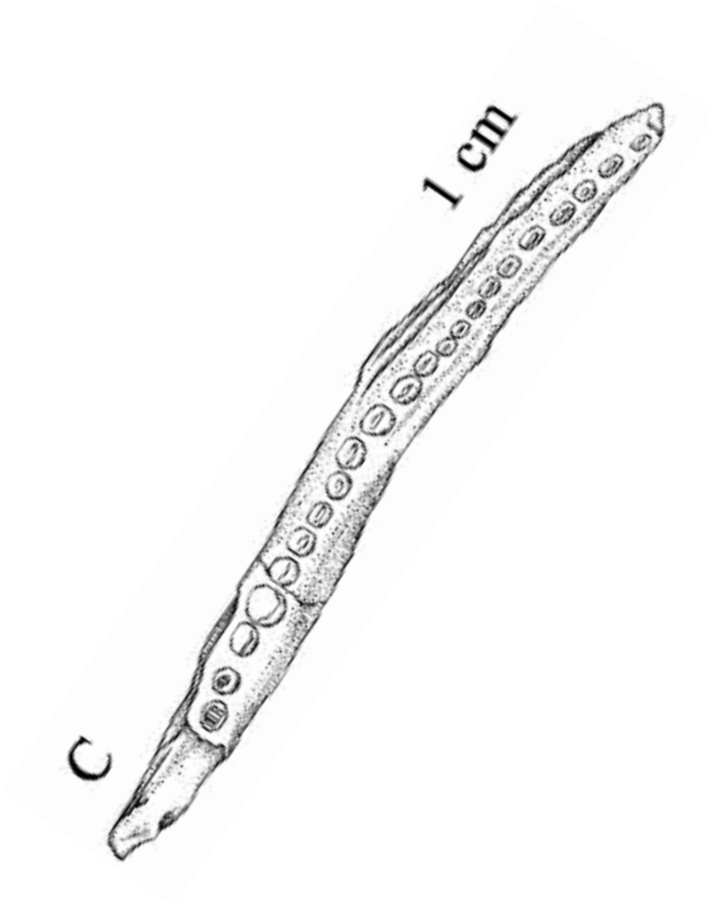
(60) Mandibular ramus: posterior end rectilinear in lateral view (0) or acuminate in lateral view (1). In Castanhinha & Modesto 2018.

(61) Mandibular ramus – lateral shelf:

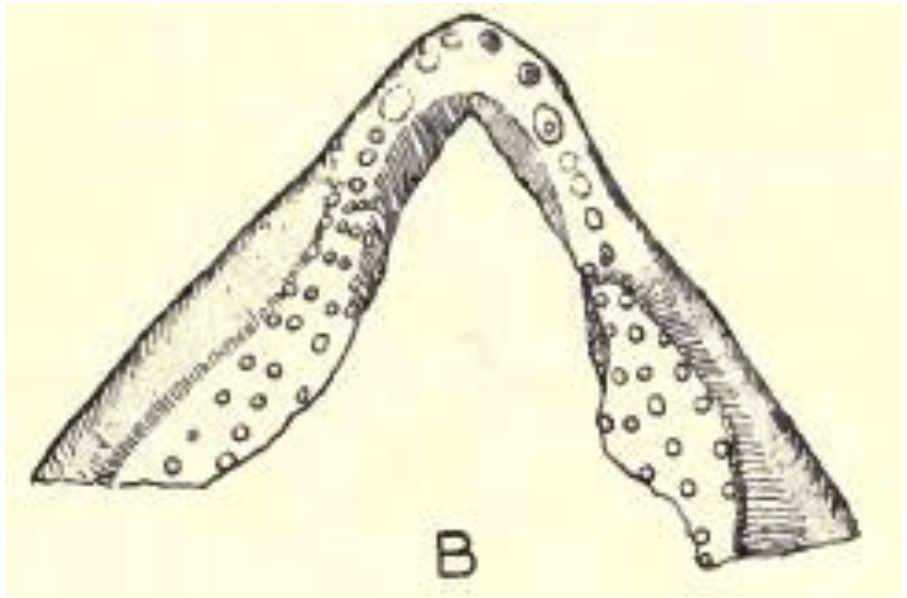
(61) Mandibular ramus: lateral shelf absent (0); lateral shelf present below coronoid process (1). In Castanhinha & Modesto 2018.

Absent (0)

Present below coronoid process (1)



Captorhinus magnus. OMNH 55386. In Kissel, Dilkes & Reisz 2002.



Captorhinikos chozaensis. CNHM UR 97. In Olson 1954.

Status 61(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Captorhinus kierani*

Status 61(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 61(?)

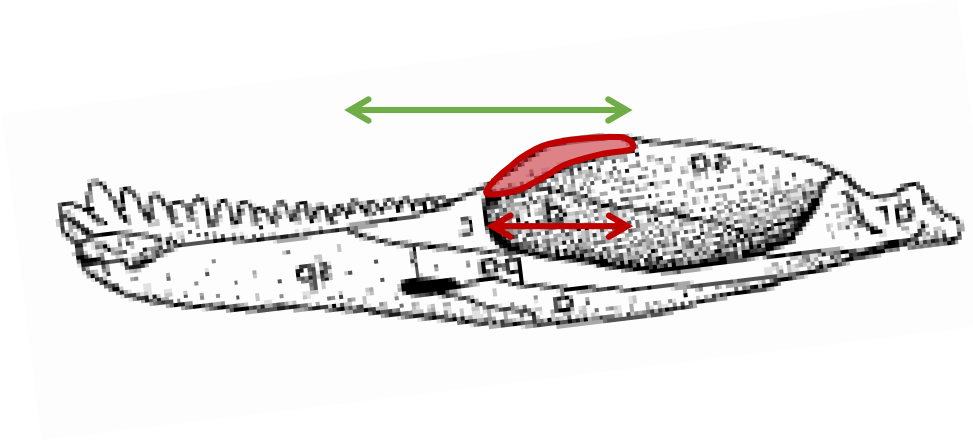
- *Saurorictus australis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*

(61) Mandibular ramus: lateral shelf absent (0); lateral shelf present below coronoid process (1). In Castanhinha & Modesto 2018.

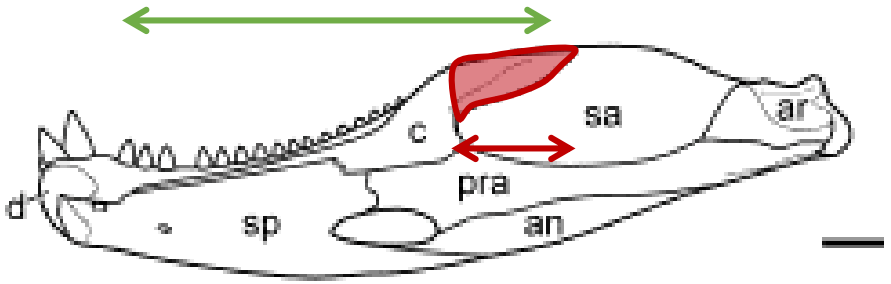
(62a) Coronoid – posterior process:

Equal to or longer than 0,42 of total coronoid length (0)

Shorter than 0,42 of total coronoid length (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Status 62a(0)

- *Protorothyris archeri*
- *Captorhinus laticeps*
- *Labidosaurikos meachami*

Status 62a(1)

- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

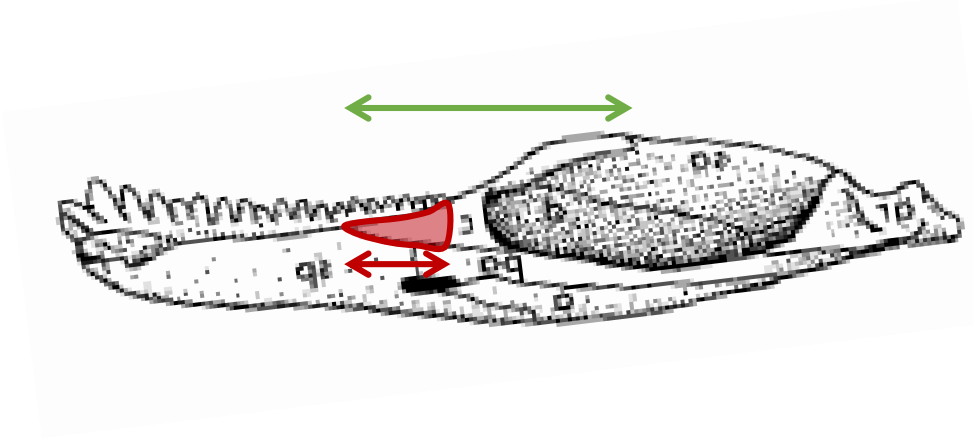
Status 62a(?)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

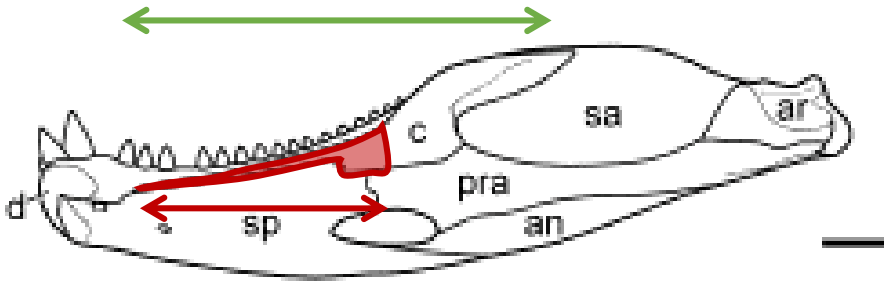
(62b) Coronoid – anterior process:

Equal to or longer than 0,32 of total coronoid length (0)

Shorter than 0,32 of total coronoid length (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Status 62b(0)

- *Protorothyris archeri*
- *Captorhinus laticeps*

Status 62b(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

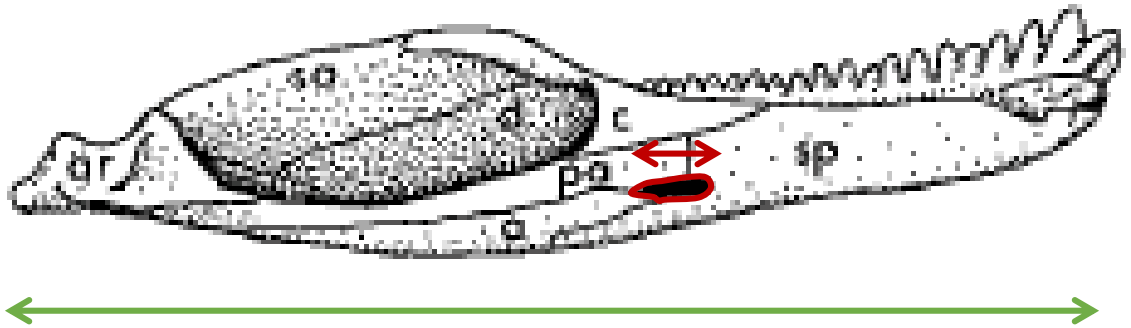
Status 62b(?)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

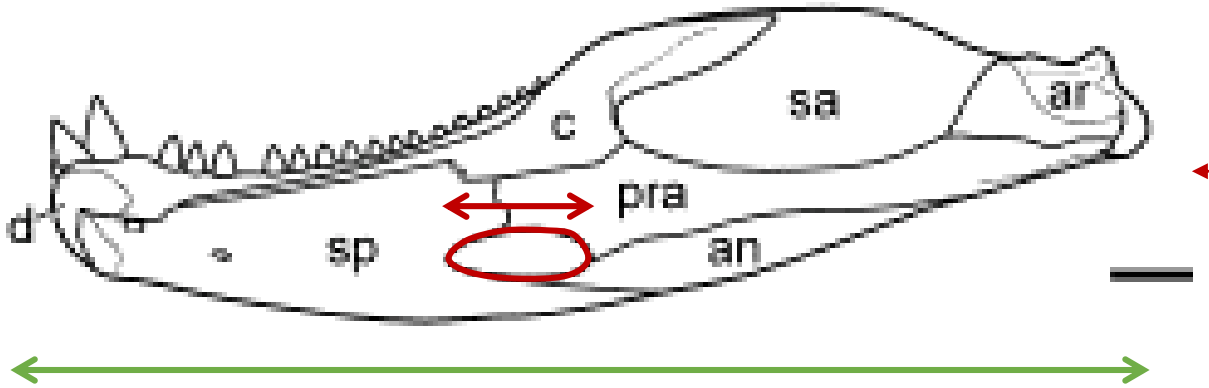
(63a) Meckelian foramen:

Small, anteroposterior length roughly or less 0,08 of total jaw length (0)

Large, anteroposterior length greater than or equal to 0,08 of total jaw length (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Status 63(0)

- *Protorothyris archeri*
- *Captorhinus laticeps*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

Status 63(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Reiszorhinus olsoni*
- *Captorhinus kierani*

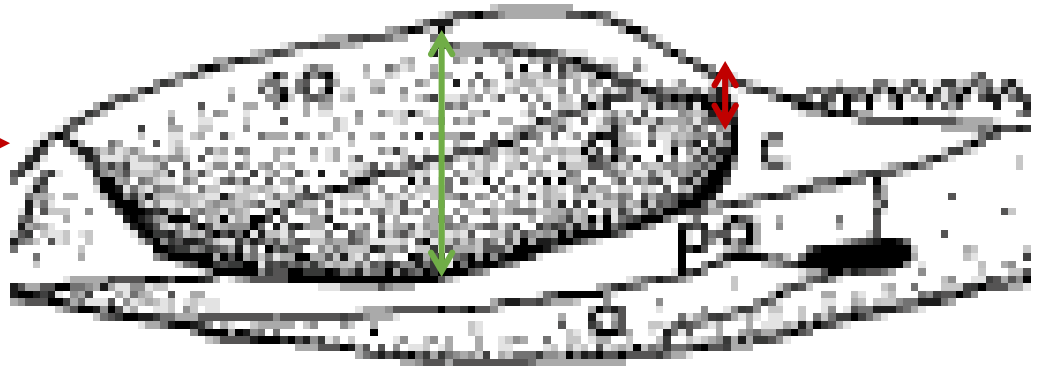
Status 63(?)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*

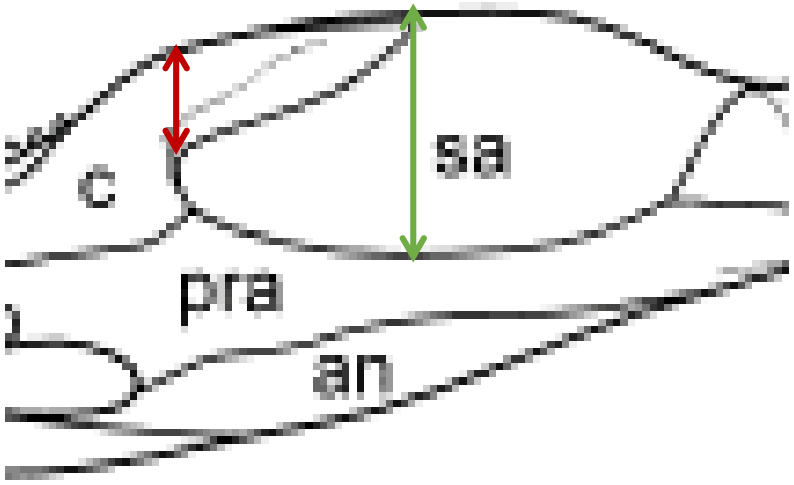
(64a) Coronoid – posterodorsal process:

Slender, < 0,25 of lateral wall of adductor fossa (0)

Deep, > 0,25 of lateral wall of adductor fossa (1)



Captorhinus laticeps. Reconstruction. In Heaton 1979.



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.

Status 64(0)

- *Protorothyris archeri*
- *Captorhinus laticeps*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 64(1)

- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

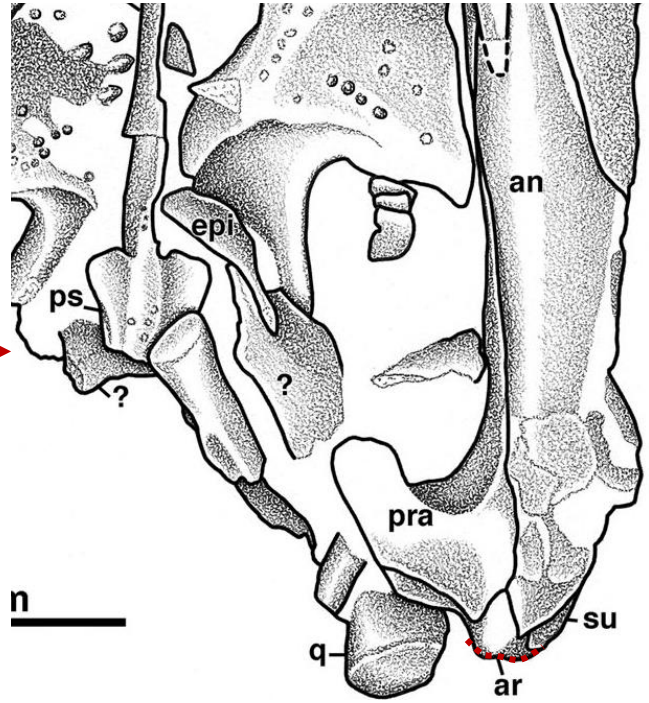
Status 64(?)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*

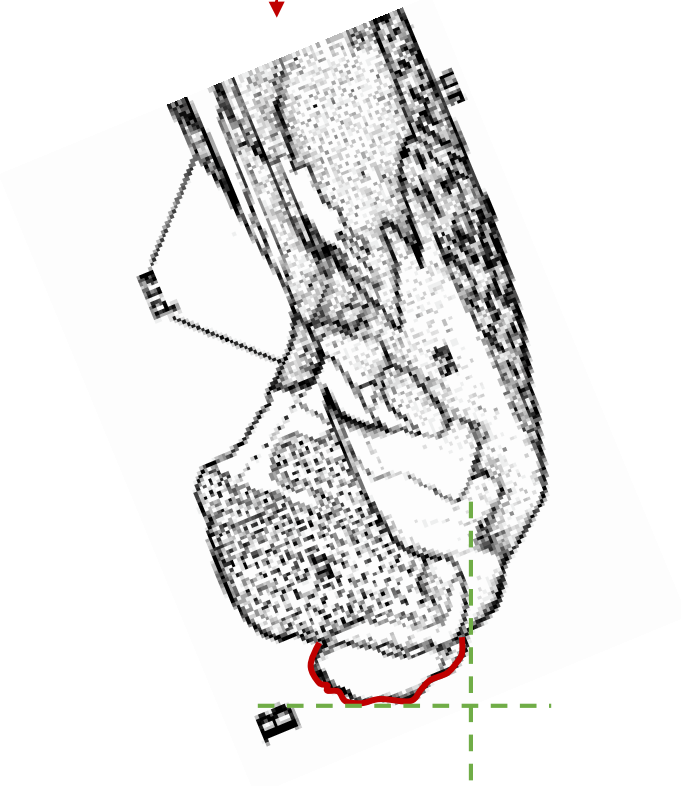
(65) Retroarticular process:

- Absent (0)
- Present and broader transversely than long (1)
- Present and longer anteroposteriorly than broad (2)

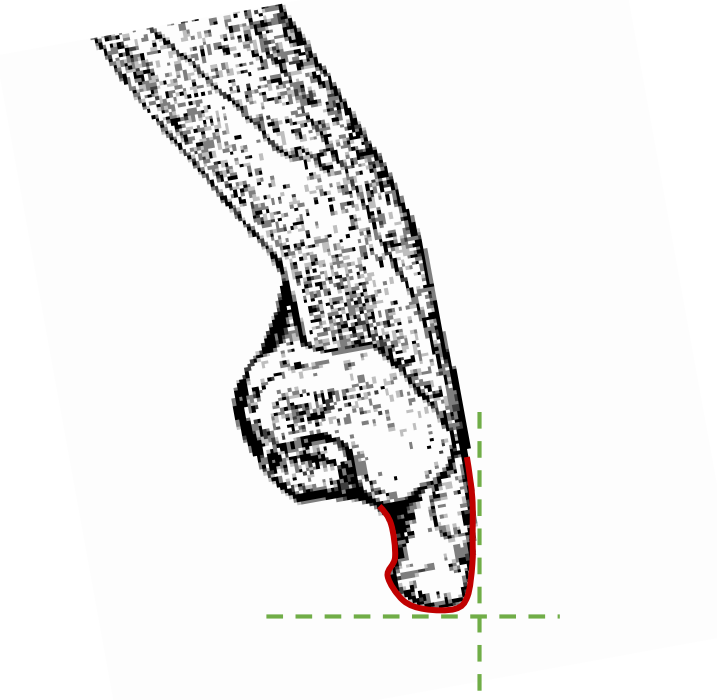
(65) Retroarticular process: absent (0); present and broader transversely than long (1); present and longer anteroposteriorly than broad (2). In Castanhinha & Modesto 2018.



Opisthodontosaurus carrolli. UWBM 89171. In Reisz, LeBlanc et al 2015.



Labidosaurikos meachami. Reconstruction; OMNH 04331. In Dodick & Modesto 1995.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 65(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 65(1)

- *Protocaptorhinus pricei*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*
- *Captorhinus kierani*

Status 65(2)

- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*

Status 65(?)

- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Labidosauriscus richardi*

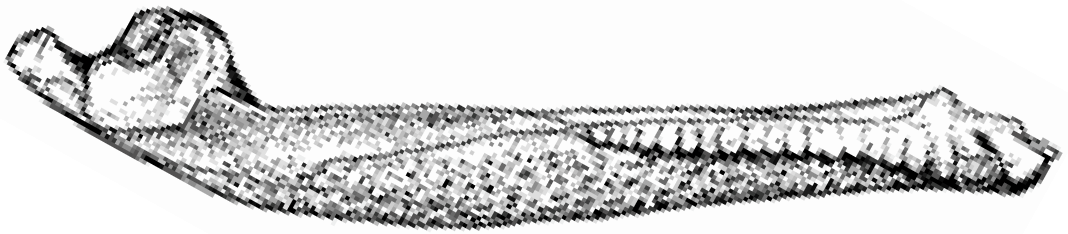
(65) Retroarticular process: absent (0); present and broader transversely than long (1); present and longer anteroposteriorly than broad (2). In Castanhinha & Modesto 2018.

CAPTORHINIDS: PHYLOGENETIC CHARACTERS

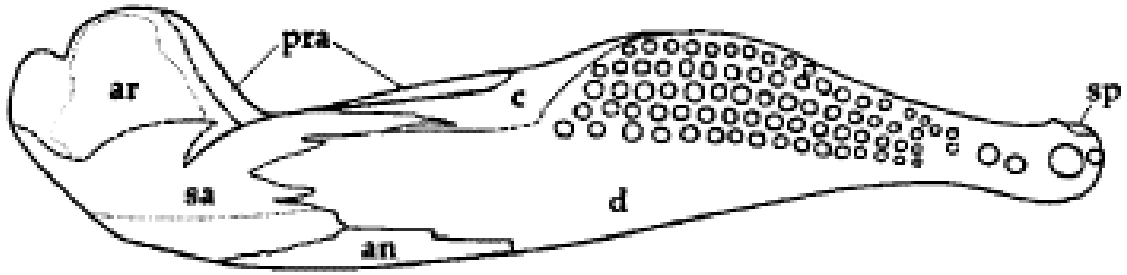
NEW CHARACTERS

(76) Dentary – lingual shelf:

- Absent (0)
- Present (1)



Labidosaurus hamatus. CM76876. In Modesto, Scott et al. 2007.



Labidosaurikos meachami. Reconstruction; OMNH 4331. In Dodick & Modesto 1995.

Status 76(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

Status 76(1)

- *Labidosaurikos meachami*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Captorhinikos chozaensis*

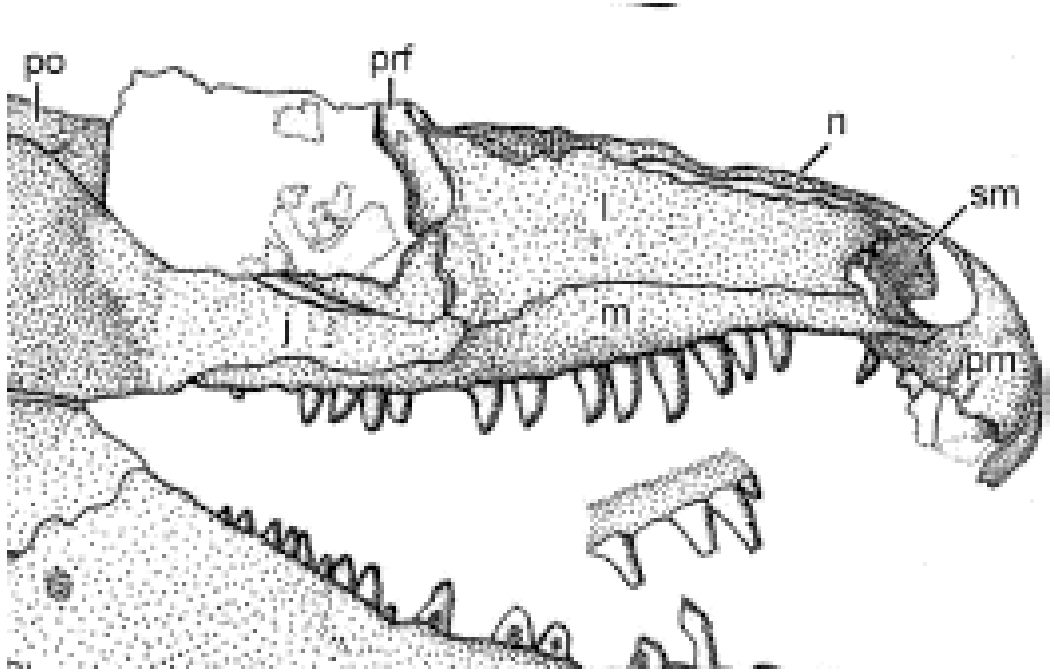
Status 76(?)

- *Euconcordia cunninghami*
- *Saurorictus australis*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Labidosauriscus richardi*
- *Captorhinus kierani*

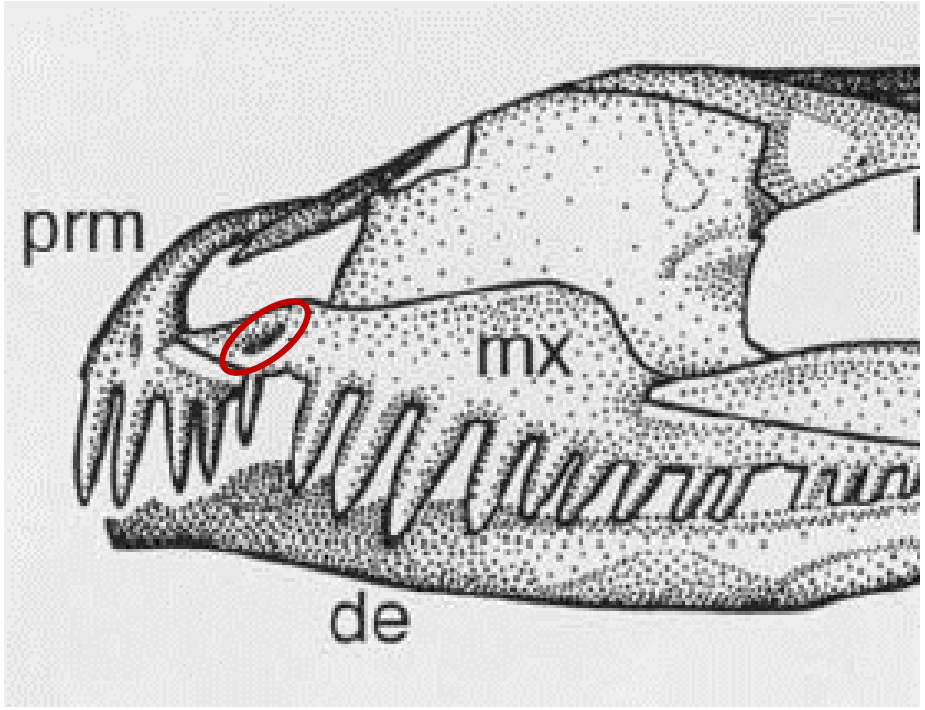
(77) Anterior maxillary foramen:

Absent (0)

Present (1)



Reiszorhinus olsoni. Holotype FMNH UC183. In Sumida, Dodick et al 2010.



Saurorictus australis. Holotype; SAM PK-8666. In Modesto & Smith 2001.

Status 77(0)

- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria prima*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*
- *Reiszorhinus olsoni*

Status 77(1)

- *Saurorictus australis*
- *Labidosauriscus richardi*

Status 77(?)

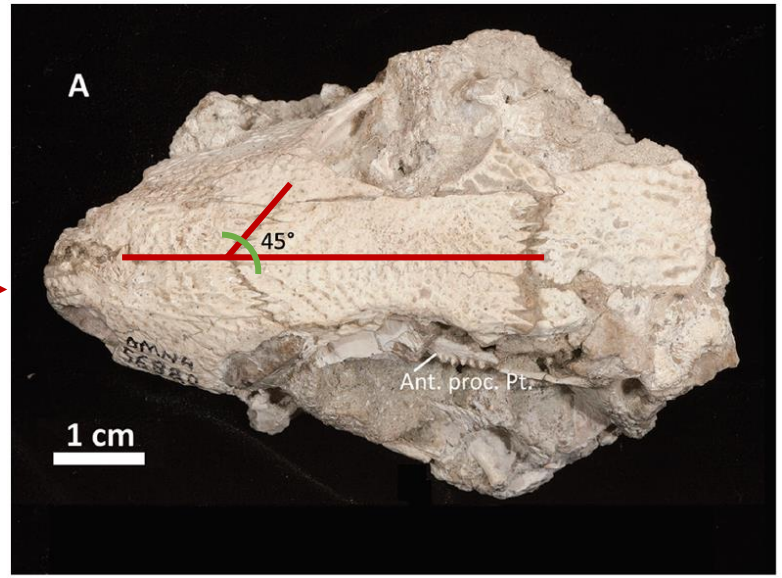
- *Protorothyris archeri*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Opisthodontosaurus carrolli*
- *Captorhinus kierani*

(78) Nasal-frontal:

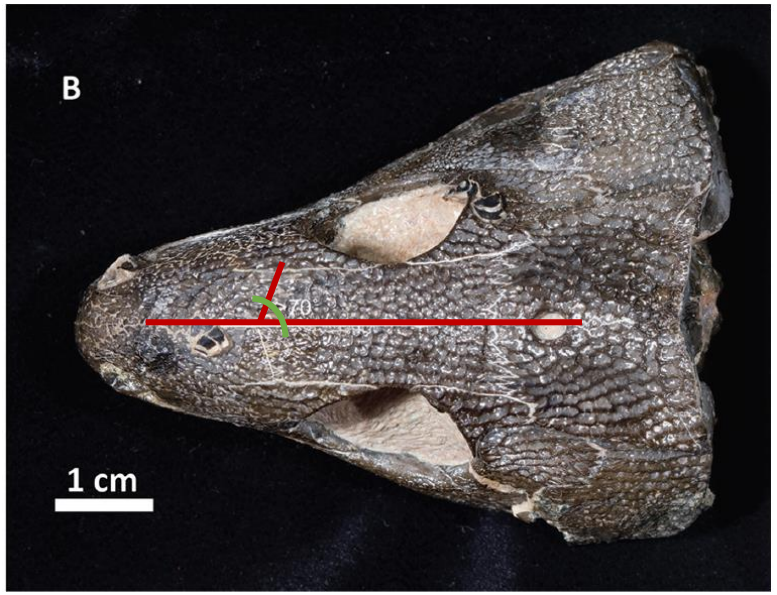
Angle of suture between nasal and frontals < 60º (0)

Angle of suture between nasal and frontals between 60º and 90º (1)

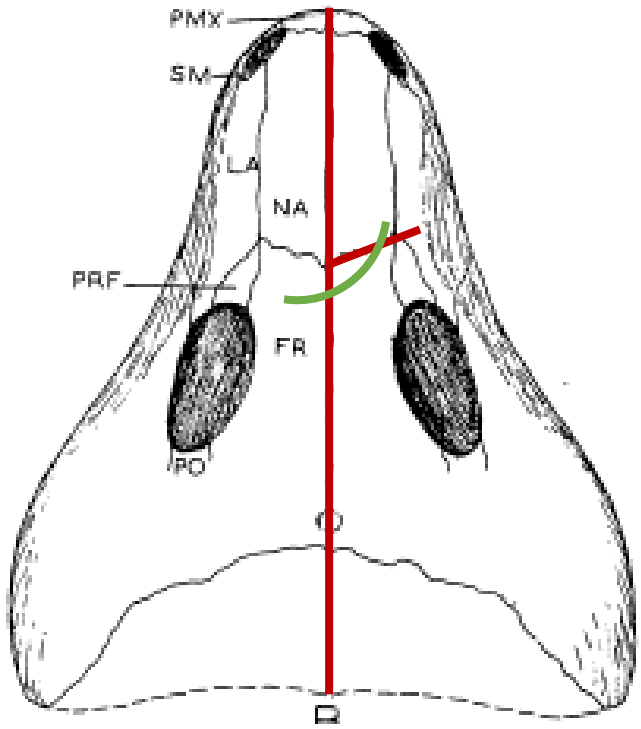
Angle of suture between nasal and frontals > 90º (2)



Captorhinus magnus. OMNH 56820. In deBraga, Bevitt & Reisz 2019.



Captorhinus kierani. Holotype OMNH 73281a. In deBraga, Bevitt & Reisz 2019.



Captorhinus chozaensis. Reconstruction. In Olson 1962.

Status 78(0)

- *Protorothyris archeri*
- *Captorhinus magnus*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*

Status 78(1)

- *Thuringothyris mahlendorffae*
- *Euconcordia cunninghami*
- *Romeria texana*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus laticeps*
- *Captorhinus aguti*
- *Captorhinus kierani*
- *Labidosauriscus richardi*

Status 78(2)

- *Paleothyris acadiana*
- *Romeria prima*
- *Captorhinikos chozaensis*

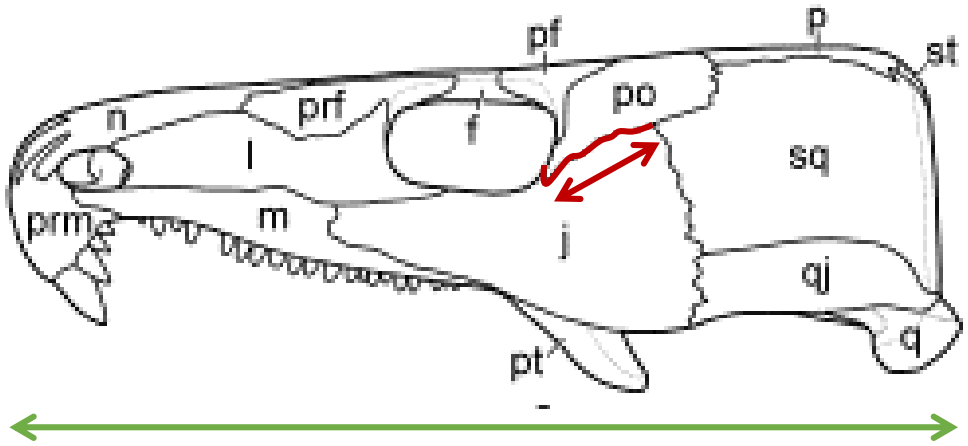
Status 78(?)

- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*

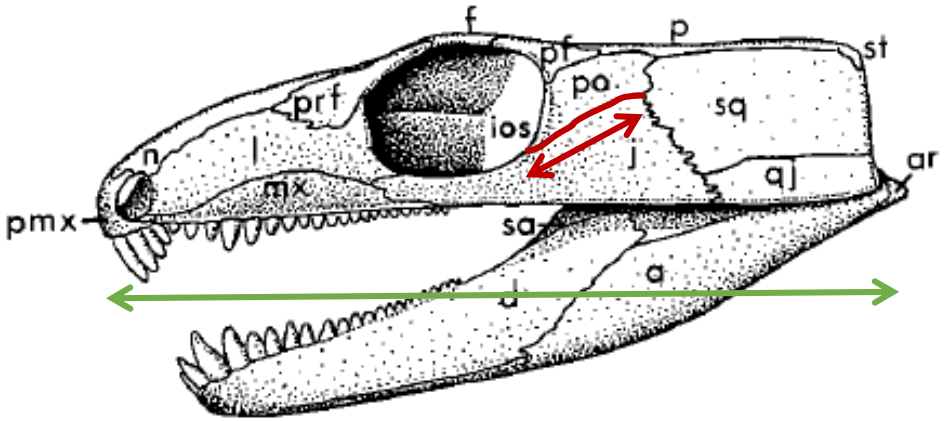
(79a) Postorbital-Jugal suture:

Ratio with cranium length < 0,15 (0)

Ratio with cranium length > 0,15 (1)



Labidosaurus hamatus. Reconstruction. In Modesto, Scott et al 2007.



Captorhinus laticeps. Reconstruction. In Heaton 1979.

Status 79a(0)

- *Protorothyris archeri*
- *Paleothyris acadiana*
- *Thuringothyris mahlendorffae*
- *Romeria prima*
- *Protocaptorhinus pricei*
- *Rhiodenticulatus heatoni*
- *Saurorictus australis*
- *Captorhinus aguti*
- *Labidosaurus hamatus*
- *Labidosaurikos meachami*

Status 79a(1)

- *Romeria texana*
- *Captorhinus laticeps*
- *Captorhinus kierani*

Status 79a(?)

- *Euconcordia cunninghami*
- *Captorhinus magnus*
- *Moradisaurus grandis*
- *Rothianiscus multidontus*
- *Gansurhinus qingtoushanensis*
- *Captorhinikos valensis*
- *Captorhinikos chozaensis*
- *Reiszorhinus olsoni*
- *Opisthodontosaurus carrolli*
- *Labidosauriscus richardi*