

in *A. k. adolfi-friderici*, except that the white of the chin and throat is more conspicuous.

Skull. Much as in *A. k. adolfi-friderici*, but smaller. Horns thinner at base and distinctly more curved in their basal portion.

Dimensions of type skull. Basal length 255; upper length 287; palatal length 149; palatal width inside m_2 39.5; postorbital width 114; zygomatic width 102.5; mastoid width 93; nasals, length 109, greatest breadth 23.9; breadth of rostrum across premaxillæ 39.5; length of upper tooth-row (alv.) 72.4; horns, length along curve 510, greatest diameter at base 54.8.

Adenota kob ubangiensis, subsp. nov.

Type locality. Duma, near Libenge, Ubangi River.

Type. ♂. Senckenberg Museum, Frankfurt-a.-M. Journal no. 215. Original number 18. Collected September 25th, 1910, by Dr. H. Schubotz (no skull).

Nearly allied to *Adenota k. bahr-keetæ*, but still darker, and with a distinct suffusion of black.

Colour of "mantle" much like the "ru ochre" of the 'Rép. de Couleurs,' but somewhat more brownish, and distinctly but finely speckled with black, especially posteriorly. No speckling on legs, neck, shoulders, and face. "Intermediate" zone near "cinnamon" no. 1, thighs only slightly darker. Black markings and distribution of white as in *A. k. bahr-keetæ*.

Only the skull of a young specimen has been examined.

A specimen from Crampel, Gribingi (Upper Shari) River, combines the slightly larger size of *A. k. bahr-keetæ* with the dark fulvous colour of *A. k. ubangiensis*. As a matter of fact, the three forms of *Adenota* just described are very closely allied; more material from intermediate localities will most certainly show them to intergrade, but the extremes at hand are different enough from each other to deserve subspecific rank.

LX.—*A Synopsis of the Cichlid Fishes of the Genus Crenicichla.* By C. TATE REGAN, M.A.

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IN 1905 (Proc. Zool. Soc. pp. 152-168) I published a revision of the genera *Crenacara*, *Batrachops*, and *Crenicichla*. Since then Haseman has described *Crenacara altispinosa* from the

Rio Guaporé (Ann. Carnegie Mus. vii. 1911, p. 344, pl. lviii.) and also *Crenicichla simoni* from the Paraguay (t. c. p. 345); the latter is a synonym of *Batrachops ocellatus*, Perugia. Several new species of *Crenicichla* have been described, and those that I regard as valid, together with two described below as new, bring up the number from sixteen to twenty-two.

Synopsis of the Species.

- I. Scales on sides ctenoid; nostril not nearer to end of snout than to eye.
 - A. 38 to 72 scales in a longitudinal series below lateral line.
 1. Maxillary extending beyond vertical from anterior margin of eye.
 - a. D. XVI-XX 13-16. Interorbital width $\frac{1}{3}$ (adult) or $\frac{1}{4}$ (young) the length of head. Often a dark spot or ocellus between pectoral fin and lateral line.

Less than 50 scales in a lateral longitudinal series.....	1. <i>lepidota</i> , Heck., 1840.
50 to 62 scales in a lateral longitudinal series.....	2. <i>savatilis</i> , Linn.
 - b. D. XVIII-XXI 13-15. Interorbital width $\frac{1}{4}$ (adult) or $\frac{1}{5}$ or less (young) the length of head. An ocellus on lateral line above pectoral fin.

D. XVIII-XIX 13-15; $3\frac{1}{2}$ or 4 scales between last dorsal spine and lateral line.....	3. <i>alta</i> , Eigenm., 1912.
D. XIX-XXI 13-14; $4\frac{1}{2}$ to 6 scales between last dorsal spine and lateral line.....	4. <i>lucius</i> , Cope, 1871.
 - c. D. XX-XXII 11-13; no ocellus above the pectoral.

Maxillary extending to below middle of eye; no ocellus on dorsal fin.....	5. <i>geayi</i> , Pellegr., 1903.
Maxillary extending to below anterior $\frac{1}{3}$ of eye; a large ocellated spot on posterior part of spinous dorsal.....	[1911. 6. <i>dorsocellata</i> , Haseman,
 2. Maxillary extending to vertical from anterior margin of eye; 63 to 70 scales in a lateral longitudinal series, 8 to 12 from first and 3 to 6 from last dorsal spine to lateral line.

D. XX-XXIII 12-13. A. III 8-10. Diameter of eye 4 to 7 in length of head (in specimens of 90 to 300 mm.)	7. <i>lacustris</i> , Casteln., 1855.
D. XX-XXII 10-11. A. III 7-8. Diameter of eye $3\frac{1}{3}$ to 4 in length of head (in specimens of 98 to 225 mm.)	[1840. 8. <i>macrophthalmus</i> , Heck.,
 3. Maxillary not extending to vertical from anterior margin of eye; 57 to 65 scales in a lateral longitudinal series, 6 from first and 2 (rarely 3) from last dorsal spine to lateral line.

D. (XVIII) XX-XXI 10-11 (13). A. III 7-9.	
a. Anterior teeth in 5 or 6 series; no ocellus on dorsal fin.	
Last dorsal spine $\frac{1}{2}$ length of head	9. <i>wallacii</i> , Regan, 1905.

Last dorsal spine scarcely more than $\frac{1}{3}$

length of head 10. *nanus*, sp. n.

b. Anterior teeth in 3 or 4 series; a large ocellus near posterior end of spinous dorsal 11. *notophthalmus*, sp. n.

B. 72 to 130 scales in a longitudinal series below lateral line.

1. Maxillary not extending to below eye; snout more than $\frac{1}{3}$ length of head.

a. Interorbital width $4\frac{1}{2}$ to 5 in length of head.

D. XXIII 13-14. A. III 9-10. 84 to 95

scales in a lateral longitudinal series . 12. *vittata*, Heck., 1840.

D. XXIV 14. A. III 11. 113 scales in a [1862.

lateral longitudinal series 13. *acutirostris*, Günth.,

b. Interorbital width about 3 in length of head.

D. XX-XXII 11-12. A. III 9. 72 to 76 [1911.

scales in a lateral longitudinal series . 14. *cametana*, Steind.,

D. XXIV-XXV 13-14. A. III 9-10. 102 [1903.

scales in a lateral longitudinal series . 15. *multispinosa*, Pellegr.,

2. Maxillary extending to below anterior margin of eye or a little beyond; snout $\frac{1}{3}$ the length of head or less.

a. Scales above upper lateral line ctenoid, except anteriorly.

D. XXII-XXIV 15-17. A. III 10-12.

93 to 108 scales in a lateral longitudinal series, 14 to 16 between first dorsal spine and lateral line; snout $3\frac{1}{3}$ to $3\frac{2}{3}$ in length of head; two dark lateral stripes ending in a spot on base of caudal, a third along lateral line, a fourth connecting a series of rings on each side of the back

16. *strigata*, Günth., 1862.

116 scales in a lateral longitudinal series, 15 between first dorsal spine and lateral line; snout $3\frac{1}{2}$ in length of head; an irregular brownish band along middle of side, another above the lateral line. [1903.

17. *marmorata*, Pellegr.,

106 to 113 scales in a lateral longitudinal series, 16 or 17 between first dorsal spine and lateral line; snout 3 to $3\frac{1}{4}$ in length of head; brownish, with a dark spot above pectoral and another at base of caudal

18. *lugubris*, Heck., 1840.

120 scales in a lateral longitudinal series, 20 between first dorsal spine and lateral line; body with dark cross-bars.

19. *cincta*, Regan, 1905.

b. Scales above upper lateral line nearly all cycloid; 112 to 130 in a longitudinal series below it. D. XXI-XXIII 17-19.

A. III 11-12. Blackish spots on head and chest.

Pectoral fin rather less than $\frac{2}{3}$, postorbital part of head more than $\frac{1}{2}$ length of head. A stripe on head behind eye; a series of spots on spinous dorsal fin; a series of narrow vertical bars above lateral line

20. *ornata*, Regan, 1905.

Pectoral fin rather more than $\frac{2}{3}$, postorbital part of head less than $\frac{1}{2}$ length of head. No stripes on head; no series of spots on spinous dorsal; usually a series of broad blotches below lateral line 21. *lenticulata*, Heck., 1840.

II. Scales cycloid, small; nostril nearer to end of snout than to eye. 22. *johanna*, Heck., 1840.

1. *Crenicichla lepidota*, Heck., 1840.

Haseman, Ann. Carnegie Mus. vii. 1911, p. 347.

Formerly known from the La Plata and Rio Grande do Sul, this species occurs, according to Haseman, in the Rio Guaporé and also in the rivers of Eastern Brazil northward to the Rio San Francisco.

2. *Crenicichla saxatilis*, Linn.

? *Crenicichla jaguarensis*, Haseman, Ann. Carnegie Mus. vii. 1911, p. 351, pl. lx.

Haseman's type is a specimen of 65 mm. from the Parana; comparing a specimen of *C. saxatilis* of this size with his figure, I cannot see any differences. Examples of this species from Uruhuasi and the Rio Mambari, Peru, have recently been added to the British Museum collection.

3. *Crenicichla alta*, Eigenm., 1912.

Mem. Carnegie Mus. v. p. 516, pl. lxxviii. fig. 3.

Examples of this form in the British Museum collection are from the Essequibo (*Ehrhardt*), Upper Potaro R. (*Bovallius*), and Rockstone, Nickafaroo, and Gluck Island, British Guiana (*Eigenmann*).

6. *Crenicichla dorsocellata*, Haseman, 1911.

Ann. Carnegie Mus. vii. p. 355, pl. lxiii.

This species is known from a specimen of 180 mm. from the Rio Parahyba.

7. *Crenicichla lacustris*, Casteln., 1855.

Batrachops scottii, Eigenm. Proc. Washington Acad. viii. 1907, p. 455, pl. xxiii. fig. 8.

Crenicichla iguassuensis, Haseman, Ann. Carnegie Mus. vii. 1911, p. 352, pl. lxi.

The dark bar below the eye shown in the figures of Eigen-

mann and Haseman is absent or but faintly indicated in the specimens I described, but is well marked in three from Santa Catharina (*Ehrhardt*) received in 1910.

8. *Crenicichla macrophthalmus*, Heck., 1840.

Crenicichla santaremensis, Haseman, Ann. Carnegie Mus. vii. 1911, p. 354, pl. lxii. fig. 1.

The slight differences from *C. macrophthalmus* noted by Haseman are due to the small size of his specimens as compared with Heckel's type.

9. *Crenicichla wallacii*, Regan, 1905.

? *Crenicichla macrophthalma*, Haseman, Ann. Carnegie Mus. vii. 1911, p. 353.

10. *Crenicichla nanus*, sp. n.

Depth of body $5\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$. Snout a little shorter than diameter of eye, which is $3\frac{1}{3}$ in the length of head; interorbital width 5. Nostril nearly equidistant from eye and end of snout. Maxillary not extending to below eye; anterior teeth forming 5 or 6 series in both jaws. 10 gill-rakers on lower part of anterior arch. 65 scales in a longitudinal series below lateral line, 6 from first and 2 from last dorsal spine to lateral line, 3 between upper and lower lateral lines. Lateral line 19-23+10-11. Dorsal XX-XXI 11; last spine a little more than $\frac{1}{3}$ the length of head. Anal III 8. Pectorals $\frac{3}{2}$, pelvics $\frac{1}{2}$ the length of head. Caudal peduncle longer than deep. A dark lateral band from snout through eye to end of caudal fin; a small ocellus on upper part of base of caudal.

Two specimens, 40 and 45 mm., from British Guiana, received from Prof. Eigenmann as *C. wallacii*, from which they differ especially in the lower dorsal spines. It is doubtful whether all the specimens recorded by Eigenmann as *C. wallacii* (Mem. Carnegie Mus. v. 1912, p. 517) belong to this species.

11. *Crenicichla notophthalmus*, sp. n.

Depth of body 5 to 6 in the length, length of head $3\frac{1}{3}$. Snout as long as or a little shorter than diameter of eye, which is $3\frac{3}{4}$ in the length of head; interorbital width 5 to 6. Nostril nearly equidistant from eye and end of snout. Maxillary not extending to below eye; anterior teeth forming 4 series in the upper jaw, 3 in the lower. 9 gill-rakers on

lower part of anterior arch. 65 scales in a longitudinal series below lateral line, 6 from first dorsal spine, and 2 or 3 from last dorsal spine to lateral line, 3 between upper and lower lateral lines. Lateral line 20-23+9-11. Dorsal XX 10; last spine less than $\frac{2}{3}$ length of head. Anal III 8. Pectorals $\frac{3}{5}$, pelvics $\frac{1}{2}$ length of head. Caudal peduncle longer than deep. A dark band through eye to operculum; a large black ocellus on dorsal fin between the sixteenth and twentieth spines; a small dark spot on upper part of base of caudal; 2 or 3 oblique bars near upper edge of caudal.

Two specimens, 60 and 65 mm. in total length, from the Amazon at Manaos, presented by Herr A. Rachow.

This species differs from *C. wallacii*, Regan, in the fewer teeth, smaller eye, lower dorsal spines, and ocellus on the dorsal fin.

No doubt this is the species recorded by Haseman from Santarem as *C. dorsocellata* (Ann. Carnegie Mus. vii. 1911, p. 355).

14. *Crenicichla cametana*, Steind., 1911.

Anz. Akad. Wien, 1911, p. 369.

This species was described from three examples, 130 to 209 mm. in total length, from the Rio Tocantins.

17. *Crenicichla marmorata*, Pellegr., 1903.

Crenicichla brasiliensis, var. *marmorata*, Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 383, fig.

Crenicichla marmorata, Pellegr. Bull. Soc. Zool. xxx. 1906, p. 167.

? *Crenicichla strigata*, Haseman, Ann. Carnegie Mus. vii. 1911, p. 355.

Known from a single specimen, 320 mm. in total length, without locality. Haseman's examples from Para may be this species.

20. *Crenicichla ornata*, Regan, 1906.

Crenicichla lenticulata (part.), Haseman, Ann. Carnegie Mus. vii. 1911, p. 356.

21. *Crenicichla lenticulata*, Heck., 1840.

Depth of body 5 in the length, length of head $3\frac{2}{3}$. Diameter of eye $5\frac{1}{3}$ in length of head, length of snout $3\frac{1}{4}$, inter-orbital width $3\frac{1}{3}$. Nostril nearly equidistant from eye and tip of snout. Maxillary extending to below anterior margin of eye; depth of præorbital $\frac{1}{2}$ diameter of eye. Anterior

teeth forming 6 series in upper jaw, 5 in lower. 10 gill-rakers on lower part of anterior arch. Scales above upper lateral line mostly cycloid, but some ctenoid ones quite posteriorly; 120 in a longitudinal series below lateral line, 18 from first dorsal spine to lateral line. Lateral line $28 + 16$. Dorsal XXII 18; last spine nearly $\frac{1}{3}$ length of head. Anal III 12. Pectoral more than $\frac{2}{3}$, pelvics $\frac{3}{5}$ length of head. Caudal peduncle much longer than deep. Head and thorax with blackish spots; a series of 9 dark blotches from operculum to base of caudal, confluent below to form an irregular lateral band; a blackish spot in axil of pectoral; some dark spots on soft dorsal and caudal; vertical fins indistinctly dark-edged.

A specimen of 270 mm. from Manaos, presented in 1911 by E. Stanley Sutton, Esq.

Probably if specimens of the same size were compared, this species would have a larger eye than *C. ornata*. Compared with the types of the latter the head has a different appearance; the posterior edge of the eye is equidistant from the end of the snout and of the opercular flap (nearer end of snout in *C. ornata*) and the pectoral fin is longer, as long as the distance from end of bony operculum to anterior edge of eye (to middle of eye in *C. ornata*). The depth of the caudal peduncle is less than the distance from end of dorsal to base of caudal (more in *C. ornata*). The coloration of the two forms is notably different.

22. *Crenicichla johanna*, Heck., 1840.

Crenicichla johanna, var. *carsevennensis*, Pellegr. Bull. Soc. Zool. France, xxx. 1906, p. 168.

Pellegrin describes the variety *carsevennensis* as differing from typical *johanna* only in having two dark lateral bands.

LXI.—On some Mammals from Bali and Mysol, collected by Mr. E. Stresemann during the "Freiburger Molukken-Expedition." By OLDFIELD THOMAS, F.R.S.

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THANKS to the kindness of Mr. E. Stresemann I have had the opportunity of working out the mammals which he obtained during his recent exploring expedition to the Moluccas, and now give descriptions of such of them as seem



Regan, C. Tate. 1913. "A synopsis of the cichlid fishes of the genus *Crenicichla*." *The Annals and magazine of natural history; zoology, botany, and geology* 11, 498–504.

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