

L.—*Descriptions of new Frogs of the Genus Rana.*

By G. A. BOULENGER, F.R.S.

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*Rana phrynoides.*

Vomerine teeth in small oblique groups just behind the choanæ. Head much broader than long, much depressed; snout rounded, scarcely projecting beyond the mouth, as long as the eye; canthus rostralis indistinct; loreal region very oblique, slightly concave; interorbital space narrower than the upper eyelid; tympanum hidden or very indistinct,  $\frac{1}{2}$  to  $\frac{2}{3}$  the diameter of the eye. Fingers obtuse, first longer than second; subarticular tubercles small, moderately prominent. Hind limb short, the tibio-tarsal articulation reaching the shoulder or the temple, the heels just meeting when the limbs are folded at right angles to the body; tibia  $2\frac{1}{5}$  to  $2\frac{1}{2}$  times in length from snout to vent. Toes short, with obtuse tips, entirely webbed; subarticular tubercles small, moderately prominent; a feeble tarsal fold; inner metatarsal tubercle narrow, feebly prominent,  $\frac{1}{2}$  the length of the inner toe; no outer tubercle. Upper parts granular, with numerous small warts on the back, some of which may be elongate; these granules and warts may bear black horny spinules; a strong fold across the head behind the eyes, and a very strong glandular fold from the eye to the shoulder; lower parts smooth. Dark olive above, uniform or with rather indistinct darker spots; lips with or without dark vertical bars; dark cross-bars on the limbs very irregular, if present; lower parts whitish, uniform or throat and limbs spotted or marbled with blackish. Male with internal vocal sacs; during the breeding-season the arms are remarkably thickened and black horny spines form two patches on the breast and more crowded patches on the inner metacarpal tubercle and on the upper side of the two inner fingers.

From snout to vent 110 mm.

Yunnan at Tongchuan fu, where the species was found in great numbers by Messrs. J. Graham and Dymond.

I had first referred these specimens to *R. boulengeri*, Gthr., which is no doubt identical with the earlier *R. spinosa*, David. I now find they differ in the shorter hind limbs, the heels not overlapping, in the shorter inner metatarsal tubercle, and in the absence of swellings to the tips of the toes.



*Rana tibetana.*

Vomerine teeth in small oblique groups between the choanæ and extending a little beyond the level of their posterior borders. Head much broader than long, much depressed; snout rounded, shorter than the eye, scarcely projecting beyond the mouth; canthus rostralis distinct; loreal region very oblique, concave; interorbital region much narrower than the upper eyelid; tympanum distinct,  $\frac{3}{5}$  the diameter of the eye. Fingers obtuse, first slightly longer than second; subarticular tubercles moderate. Hind limb moderately long, the tibio-tarsal articulation reaching the anterior border of the eye, the heels strongly overlapping when the limbs are folded at right angles to the body; tibia twice in length from snout to vent. Toes with the tips swollen into small disks, entirely webbed; subarticular tubercles moderate; a very distinct tarsal fold; inner metatarsal tubercle narrow, feebly prominent,  $\frac{5}{7}$  the length of the inner toe; no outer tubercle. Upper parts rough with granules and numerous round or oval warts tipped with black horny spinules; a feeble fold across the head, behind the eyes; a strong glandular fold from the eye to the shoulder; lower parts smooth. Brown above, with numerous ill-defined dark spots on the back and cross-bars on the limbs, the larger warts lighter; a light cross-bar between the eyes; lips with dark vertical bars; lower parts brownish, throat and limbs mottled with brown. Male with internal vocal sacs; arms thick; breast with black horny spines; similar spines, but more crowded, on the inner metacarpal tubercle and on the upper surface of the two inner fingers.

From snout to vent 61 mm.

A single male specimen from Yin tsin wau, Wassu State, Tibet.

Distinguished from *R. gammiei*, And., by the distinct tympanum, the presence of a tarsal fold, the larger metatarsal tubercle, and the presence of vocal sacs; from *R. feæ*, Blgr., by the swollen tips of the toes and the distinct canthus rostralis; from *R. yunnanensis*, And., by the less prominent metatarsal tubercle (*fide* Anderson); from *R. rugosa*, Schleg., by the broader head, the larger metatarsal tubercle, and the presence of vocal sacs.

*Rana macrognathus.*

I now regard as deserving specific distinction the frog from Upper Burma referred by me to *R. doriae*, Blgr. (Ann. Mus. Genova, [9] xiii. 1893, p. 328, pl. viii. fig. 1), the



males of which differ in the very large head with strong swellings on the lower surface of the mandible and on each side of the occiput, and in the presence of a strong tooth-like process on each mandibular ramus, near the symphysis, as in *R. kuhlii* and *R. macrodon*. In these males, when fully developed, the interorbital region is broad and very convex, the swelling produced posteriorly as in *Pelobates fuscus*, and the tympanum is quite as large as or even larger than the eye. Females are hardly distinguishable from *R. doriae*.

From snout to vent 57 mm.

The types are from the Karin Hills, Upper Burma, 1300 to 1600 feet, and from the district of the Karin Bia-po, collected by the late L. Fea.

*R. macrognathus* is intermediate between *R. doriae*, Blgr., and *R. pileata*, Blgr., and nearer the latter, which differs in the dermal flap on the head of the males and in the usually smaller inner metatarsal tubercle.

### *Rana grahami*.

Vomerine teeth in transverse or slightly oblique series between the choanæ or extending a little beyond the level of the posterior borders of the latter. Head as long as broad or a little broader than long, much depressed; snout rounded or obtusely pointed, feebly or rather strongly projecting beyond the mouth, as long as the eye or a little shorter; canthus rostralis obtuse; loreal region feebly oblique, concave; interorbital region narrower than the upper eyelid; tympanum very distinct,  $\frac{2}{5}$  to  $\frac{3}{5}$  the diameter of the eye. Fingers rather long, the tips feebly swollen, first as long as or a little longer than the second; subarticular tubercles moderate. Tibio-tarsal articulation reaching the tip of the snout or a little beyond; heels overlapping when the limbs are folded at right angles to the body; tibia  $1\frac{3}{5}$  to  $1\frac{7}{8}$  times in length from snout to vent, shorter than the fore limb, as long as or a little longer than the foot. Toes with the tips slightly swollen, entirely webbed; subarticular tubercles rather small; no tarsal fold; inner metatarsal tubercle feebly prominent,  $\frac{1}{3}$  to  $\frac{2}{5}$  the length of the inner toe; no outer tubercle. Skin smooth above or finely corrugated, often with large flat warts on the back; sides granular with large warts, some of which may bear minute white spinose tubercles; a broad glandular dorso-lateral fold sometimes present, but much broken up; one or two large glands behind the angle of the mouth; lower parts smooth or posterior part of belly granular. Olive above, with more or less distinct darker spots and often



speckled or mottled with black; sides yellow, with large black spots or marblings; limbs with numerous dark cross-bands, which may be broken up into spots or marblings; hinder side of thighs yellow, spotted or marbled with black; lower parts white, throat and breast sometimes spotted with blackish. Male with internal vocal sacs; fore limb much thickened; inner finger with a large pad, covered during the breeding-season with a velvety yellowish or greyish horny layer.

From snout to vent 102 mm.

Yunnan at Yunnan fu; numerous specimens from the collection of Mr. J. Graham.

This species is very similar to *R. andersoni*, Blgr., with which I had at first confounded it; but the absence of disks to the fingers and toes readily distinguishes it.

### *Rana tarahumaræ.*

Vomerine teeth in small oblique groups just behind the level of the posterior borders of the choanæ. Head much depressed, broader than long; snout rounded, feebly projecting beyond the mouth, as long as the eye; canthus rostralis very obtuse; loreal region very oblique, slightly concave; nostril equidistant from the eye and from the tip of the snout; tympanum distinct,  $\frac{2}{3}$  to  $\frac{1}{2}$  the diameter of the eye. Fingers with feebly swollen tips, first longer than second; subarticular tubercles moderate. The tibio-tarsal articulation reaches the tip of the snout or between the eye and the tip of the snout; heels meeting when the limbs are folded at right angles to the body; tibia  $1\frac{5}{6}$  to 2 times in length from snout to vent. Toes with the tips swollen into very small disks, the base of which is involved in the very broad web; no tarsal fold; a feebly prominent, elliptic inner metatarsal tubercle, measuring  $\frac{1}{3}$  to  $\frac{2}{5}$  the length of the inner toe; no outer tubercle. Skin smooth, or upper parts with small pustules; a feeble curved glandular fold from the eye to the shoulder; no dorso-lateral fold. Brown or olive above, with small blackish spots or numerous dots; limbs with irregular dark cross-bands; lower parts white, uniform or throat, breast, and limbs mottled with greyish brown. Male without vocal sacs, with a thick blackish pad on the inner side of the first finger.

From snout to vent 77 mm.

Several specimens, from Iquiro and Barranca del Cobre, Sierra Tarahumaré, N.W. Mexico, form part of a collection presented by Dr. H. Gadow a few years ago. I had



referred this frog to *R. pustulosa*, Blgr., from which it differs by the more broadly webbed toes and the absence of a dorso-lateral glandular fold. The larger eye, the more oblique loreal region, the more distinct tympanum, the shorter tibia, and the absence of vocal sacs distinguish it from *R. boylii*, Baird.

*Rana floweri*.

Vomerine teeth in very short oblique series close to the anterior corners of the choanæ. Head much depressed, as long as broad; snout pointed, projecting, slightly longer than the eye; canthus rostralis rounded; loreal region very oblique, slightly concave; interorbital space much narrower than the upper eyelid; tympanum very distinct,  $\frac{2}{3}$  the diameter of the eye. Fingers short and obtusely pointed, first and second equal; subarticular tubercles moderate. Hind limb short, the tibio-tarsal articulation reaching the tympanum, the heels feebly overlapping when the limbs are folded at right angles to the body; tibia  $2\frac{1}{2}$  times in length from snout to vent, slightly longer than the foot. Toes short, obtusely pointed,  $\frac{2}{3}$  webbed, 2 phalanges of fourth and  $\frac{1}{2}$  a phalanx of fifth free; subarticular tubercles small and feebly prominent; an oblique fold on the inner side of the tarsus; inner metatarsal tubercle oval, moderately prominent,  $\frac{1}{2}$  the length of the inner toe; a small flat outer tubercle. Skin smooth above, with feebly prominent, interrupted, glandular longitudinal folds, 4 on the occipital region and 6 on the body; a stronger and continuous dorso-lateral glandular fold; a glandular fold from below the eye to above the arm; sides and posterior part of belly and base of lower surface of thighs granular. Grey above, with large dark spots forming rather irregular transverse series, the dorso-lateral fold whitish; a V-shaped dark marking between the eyes; a dark streak from the end of the snout to the eye and a large dark temporal spot; a white streak from below the eye to the shoulder, followed by a round white spot; limbs with regular dark cross-bands; hinder side of thighs with dark marblings and a light longitudinal streak; lower parts white. Male with blackish external vocal sacs projecting through a slit on each side of the throat, parallel with and close to the ramus of the mandible.

From snout to vent 45 mm.

A single male specimen from Rosaires on the Blue Nile, obtained by Capt. S. S. Flower and presented by him to the British Museum in 1909.



Closely allied to *R. mascareniensis*, D. & B.; distinguished by the stouter and shorter hind limbs.

By an unfortunate oversight, the frog recently described by me in these 'Annals' (vol. xix. p. 407) as *R. leonensis* is stated to be from Sierra Leone; it was obtained by Dr. Spurrell at Bibianaha, Gold Coast.

# LI.—*New Genera and Species of Brisingidæ* \*.

By WALTER K. FISHER, Stanford University, California.

THE new genera of starfishes of the family Brisingidæ which are described in this paper are partly derived from an analysis of *Brisinga* and *Freyella* of authors and partly from new species dredged by the U.S. Fisheries Steamer 'Albatross' in the East Indies and in the North Pacific. *Craterobrisinga* and *Stegnobrisinga* have already been proposed as subgenera, but a further study of the material has convinced me that they are good generic groups.

The complete diagnosis of any genus in the following synopsis is obtained by starting with the *a* which heads the particular section in which the genus is found and reading each pertinent section until the genus is reached. For example, the account of *Brisinga* is contained in paragraphs  $a^3, b^2, c^2, d^1, e^1, f^1, g^1$ ; that of *Gymnobrisinga* in paragraphs  $a^3, b^1$ ; that of *Astrocles* in  $a^3, b^2, c^2, d^2, e^2$ ; and so on.

It is hoped that this preliminary account will be of use to my colleagues. Any corrections, or information regarding the generic position of known species of "*Brisinga*" and "*Freyella*," will be gratefully received.

## *Synopsis of the known Genera of Brisingidæ.*

- $a^1$ . Abactinal surface of disk and genital region of ray provided with numerous conspicuous papulæ; two gonads to each ray; mouth-plates broad and fan-shaped toward actinostome, nearly closing the entrance to the ambulacral furrow; genital region of ray with transverse skeletal arches, between which the integument is strengthened by immersed plates and pierced by papular

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