in one day. This was on the fifth day after laying. The remaining eggs decayed after a few more days.

Major Wall mentions that 'the usual month for the deposition of eggs is May' (*J.B.N.H.S.*, 1913, Vol. xxii, p. 551). In this instance it was early in March. A hatchling of this species was caught at a place near Trivandrum and brought to me in the second week of May. It was below a foot in length and evidently not more than a few days old. Taking the period of incubation to be just over two months as ascertained at Parel, the mother might have deposited the eggs in the month of February.

A Green Whipsnake (*Dryophis mycterizans*) was caught in the grounds of the Zoological Gardens on May 4, 1943, and was kept in one of the cages of the reptile house. Though without a mate since its capture, it gave birth on October 23 to 9 young ones born alive and 1 undeveloped embryo in its egg envelope. The young when born measured 11.4 inches.

The period of gestation for this species has not been definitely ascertained. Ferguson who in 1891 recorded the breeding habits of this snake (*J.B.N.H.S.*, Vol. x, p. 6) put the minimum at 59 days. Wall (*J.B.N.H.S.*, Vol. xvi, p. 548) records the instance of an allied species *D. prasinus*, which having remained in the London Zoological Gardens without male companionship for nearly two years and five months, gave birth to 8 young. In the present case (*D. mycterizans*) a minimum of 172 days or nearly six months had elapsed since it had been mated. This long period for gestation might be explained by assuming either that this period must be comparatively longer for the ovoviviparous snakes than for those which are oviparous, or that the fertilisable period of the spermatozoa of these reptiles is of long duration and therefore fertilisation of the ova may take place after a long interval.

ZOOLOGICAL GARDENS,
TRIVANDRUM. E. S. SIMON.
November 10, 1943.

[A pair of cobras have been seen mating on January 2, 1944; the same pair again mated on the 4th. The female of this pair laid 17 eggs on March 5, thus bringing the duration of gestation to 62 days.—E.S.S.]

XV.—A NOTE ON *RANA CRASSA* JERDON, WITH EXTENSION OF ITS RANGE.

Rana crassa Jerdon.

Rana crassa Jerdon, *Journ., Asiat. Soc., Bengal*, xxii, p. 531 (1853).
Rana crassa, Anderson, *Proc. Zool. Soc., London*, p. 199 (1871).
Rana tigrina, part, Boulenger, *Fauna Brit. India*, p. 449 (1890).
Rana tigrina, part, Annandale, *Mem. Asiat. Soc., Bengal*, vi, pp. 122-26 (1917).
Rana crassa, Annandale and Rao, *Rec. Ind. Mus.*, xv, p. 35 (1918).
Rana tigrina var. *crassa*, Boulenger, *Rec. Ind. Mus.*, xv, pp. 51-58 (1918).
Rana crassa, Annandale, *Rec. Ind. Mus.*, xv, pp. 61-63 (1918).
Rana tigrina var. *crassa*, Boulenger, *Rec. Ind. Mus.*, xv, p. 66 (1918).
Rana tigrina var. *crassa*, Boulenger, *Rec. Ind. Mus.*, xx, pp. 20-21 (1920).[1]

[1] Other synonyms of this frog are given on p. 17, under *forma typica*,

There has been much discussion with regard to *Rana tigrina* and its allies, especially in reference to the systematic rank of Jerdon's frog *Rana crassa* (Boulenger, 1918, and Annandale, 1918). Boulenger (1918) holds that *R. crassa* should be given the status of a variety of the typical *R. tigrina* Daud., since the distinction between the two is a perfect parallel to that between the typical *R. esculenta* and the var. *lessonae*. Annandale (1918), with all deference to Boulenger's contention, gives it the status of a true species. In spite of its structural and ethological differences from *R. tigrina, s.s.*, as pointed out by Annandale, Boulenger (1918, p. 66, and 1920, pp. 20-21) firmly adheres to his former contention of considering it a variety of the typical *R. tigrina*.

During the months of August and September, 1943, my pupil Mr. A. N. Choudhury, B.SC., brought me a number of specimens of this frog from the irrigated rice-field of Garia, very near south Calcutta. He also obtained a few young specimens from the Royal Botanic Gardens, Sibpore, near Calcutta. Further, Mr. B. M. Biswas, another pupil of mine, was fortunate enough to catch a single female specimen from a way-side ditch in Hasua, a village in the Gaya District, Bihar, on October 15, 1943. The collection is made up of a dozen specimens, 5 males and 7 females. My thanks are due to Messrs. Choudhury and Biswas for handing over the specimens to me for study.

External characters.—The differences which separate *R. crassa* from the typical *R. tigrina*, as noted by Boulenger (1918 and 1920), are noticeable in my specimens in certain respects. Annandale (1918) has laid considerable stress on the structure of the inner metatarsal tubercle, and in this respect I fully agree with him. The difference in the structure of the metatarsal tubercle of *R. crassa* and *R. tigrina, s.s.*, lies not so much in the shape and size, as in its pronounced shovel-shaped character in the former species. In living specimens I have found it to be fairly sharp on its free concave edge. This structure can be superficially compared with that of *R. breviceps* Schneider. In all my specimens the tibio-tarsal articulation reaches between the tympanum and the eye.

Sex characters.—An examination of the reproductive organs reveal that most of the specimens are juveniles. In some males, however, the nuptial pads are feebly developed and their surface is finely granular. The vocal sacs are external and are shaded black, but they are without any longitudinal folds as present in the *forma typica* of *R. tigrina* (Boulenger, 1920, p. 18). It appears from the cases recorded so far that mature males must be smaller in size than females.

Coloration.—Boulenger (1920) notes that a yellow vertebral streak is frequently absent, and that black spots on the gular region are present in some specimens. Annandale (1918, p. 62) observes, 'The colour of living specimens from Madras is similar to that of *R. tigrina*, but much duller, a dull brown being substituted for the greens and yellows, and with the exception that the throat is spotted with black.' The coloration in my specimens is, however, quite characteristic, and differs a good deal from that of the typical

Calcutta forms of *R. tigrina*. The yellow vertebral streak is totally absent, and the large black spots on the gular region are present in all the specimens at my disposal. Further, a few black spots are frequently seen to extend irregularly over the pectoral region and very rarely over the abdominal region. The median gular spots frequently tend to be connected together in such a way as to form a more or less longitudinal bar running from the chin to a little over the pectoral region. In specimens preserved in formalin the black spots faded to a dusky colour. The ground colour of the dorsal surface varies somewhat individually. No doubt it is much duller than that of the typical *R. tigrina*, as noted by Annandale (1918). The black spots of the dorsum get obscured against a dusky ground colour in most of the specimens, while in those with a dull brown ground tone these spots are fairly pronounced. Attention may here be drawn to the apparent similarity between its dorsal colour pattern and that of *R. cyanophlyctis* collected from Calcutta. Furthermore, a parietal fleck, whitish in appearance, is clearly visible between the eyes, while it is almost obscured in the typical *R. tigrina*, as it is placed on the yellow vertebral streak passing over the head.

Tadpole.—Annandale and Rao (1918) and Annandale (1918, pp. 62-63) have assigned two tadpoles obtained from Madras (town) to this species, and showed their slight difference from the typical *R. tigrina* tadpoles. Unfortunately I could not obtain any tadpoles of this species, from Calcutta.

Measurements of seven specimens of *R. crassa* in my collection are given here.

Measurements in millimetres.

—	1 ♀	2 ♀	3 ♀	4 ♂	5 ♂	6 ♂	7 ♀
From snout to vent ...	86	81	80	77·5	77	74	65
Head ...	27	25·5	26	25	24·5	23	21
Width of head ...	29	27	29	27	27	26·4	20·5
Snout ...	12·3	11	11·3	10·2	11	10	9
Eye ...	9	8	9	8	7·5	8	6·5
Interorbital width ...	5	4	4	4·5	5	3·5	3
Tympanum ...	6·3	5·5	6	5·5	6	5·5	5
Fore limb ...	38	37·2	36	31	37	32·5	30
First finger ...	7·8	6·5	8·5	6	7	7·5	5
Second finger ...	6	6	7	5·5	6	6·8	4
Third finger ...	9	8	8	7	8·5	8	6·5
Fourth finger ...	5·7	5	6	5·5	5	6	5
Hind limb ...	112	104	110	93	108	95	76
Tibia ...	37	35	35	33	32	31·5	26·5
Foot ...	36·5	34	34·5	31	33	31	25·5
Third toe ...	16	15	15	16·3	15·5	15	11
Fourth toe ...	23	26	25·5	21	22	21·5	20
Fifth toe ...	21	17	15·8	15	13	15	14
First toe ...	7	7·2	7	5·5	6·5	7	5
Inner metatarsal tubercle ...	5	6	5	5	5	5	4·5

1—6, Suburbs of Calcutta (Bengal) ; 7, Hasua (Gaya District, Bihar).

Distribution.—Boulenger (1920) gives the distribution of *R. tigrina* var. *crassa*, as Benares and Agra in the United Provinces, Chandbally in Orissa, Madras town, Malabar and Ceylon. This includes the distribution recorded by Annandale and Rao (1918, p. 35) and Annandale (1918, p. 63). Now, the find of *R. crassa* in the suburbs of Calcutta as well as in Hasua is very interesting in that it not only adds another *Rana* to the provinces of Bengal and Bihar, but also bridges over the gap in the distribution of this species. It thus gives *R. crassa* a continuous range from south to north, passing through Bengal and Bihar as far as the United Provinces.

Conclusion.—Unless specimens which intergrade between *R. crassa* and the typical *R. tigrina* could be discovered, as supposed and believed by Boulenger (1918 and 1920) to be present, *R. crassa* should stand as a distinct species; for it can be readily distinguished from the typical *R. tigrina* by its shorter hind-limbs and well-marked shovel-shaped inner metatarsal tubercle, and by its different coloration and peculiar burrowing habits. Further, since the range of its distribution overlaps that of *R. tigrina*, *s.s.*, it may be taken as an additional piece of evidence of considering it specifically distinct (*vide* Annandale, 1918, p. 59).

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XVI.—FURTHER LOCALITY RECORDS OF *RANA HEXADACTYLA* LESSON IN BENGAL, WITH BRIEF NOTES ON ITS TADPOLES.

Previous to 1920, *Rana hexadactyla* Lesson was known only from South India and Ceylon (Boulenger, 1920). Its occurrence in Bengal and probably also in the Punjab (Bhaduri, 1933) and in the Bombay Presidency (McCann, 1934) considerably extends its range, and proves that it is fairly widely distributed. Its rarity is due to its secretive nature helped by its thoroughly aquatic habits and concealing coloration.

Ten large specimens of this frog were caught from a well in Sonarpur near South Calcutta in the month of December, 1942. During last September and November, 1943, a large series of this frog and its tadpoles was obtained by Mr. Satyadeb Mitra, a pupil of mine, from a pond at Konnagar, about nine miles from Calcutta. Further, 2 male specimens were also collected by another pupil of mine, Mr. Sudhir Chandra Mallick, from a pond in Duilla in the Howrah District, some eight miles south-west of Calcutta. He was, however, unable to obtain any tadpoles. To both my pupils I offer my hearty thanks. The entire collection consisted of 12 females, 13 males and 20 tadpoles.