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A New Genus and Species of Leptodactylid Frog from Australia

By John A. Moore[1]

A number of frogs were secured near Point Lookout, New South Wales, that did not seem to belong to any known species. Adults and embryos were dug from a sphagnum bog.

In Parker's (1940) monograph on the Australasian Leptodactylidae, there is described a new species, *Philoria loveridgei*. The Point Lookout frogs appeared to be more like this species than any other mentioned by him. Further study showed, however, that the frog that Parker had described was not *Philoria* at all but a species belonging to an undescribed genus. This confusion can be best resolved by a short account of what is known of all the species involved.

In 1898 Frost collected a tiger snake on Mt. Baw Baw in Victoria. The snake had itself collected five frogs, and these were disgorged after it had been placed in a bag. Subsequently Frost secured two other frogs of the same species. All the specimens were studied by Spencer (1901) and described by him as *Philoria frosti*. The genus was new and thought to be similar to *Limnodynastes*. It now appears that these seven specimens are the only ones known of this genus and species. The only literature citations are Lucas and le Souëf (1909), Nieden (1923, who repeats some of the description of Spencer), Fry (1912), and Noble (1931).

Loveridge (1935) had six specimens from the MacPherson Range in

[1] Research Associate, Department of Amphibians and Reptiles, the American Museum of Natural History; Professor of Zoölogy, Barnard College and Columbia University.

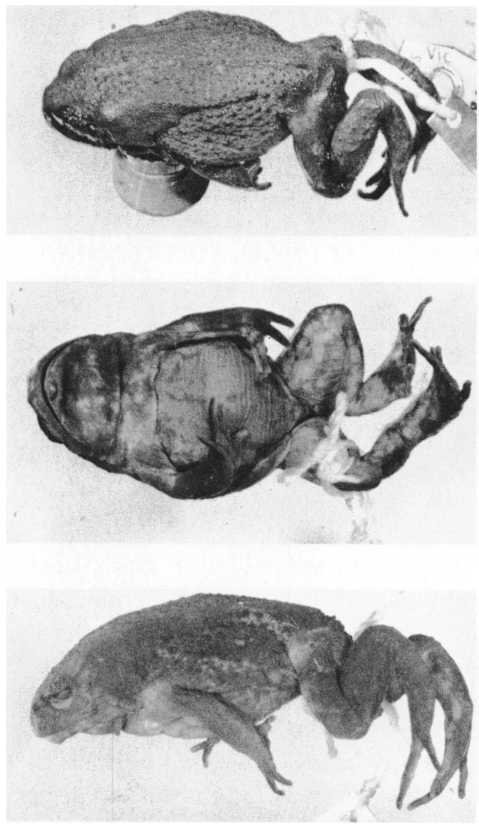

FIG. 1. Dorsal, ventral, and lateral views of the type of *Philoria frosti* Spencer. Natural size.

Queensland that he thought were *Philoria frosti*, but he mentioned many ways in which his specimens differed from the description of *Philoria frosti* as given by Spencer.

Loveridge sent one of his specimens to Parker, who thought it different enough from Spencer's description of *Philoria frosti* to be recognized as new. He named it *Philoria loveridgei* (Parker, 1940). There was some doubt in Parker's mind, however, that his specimen was actually a *Philoria*.

I had the opportunity of collecting in the MacPherson Range and there secured some frogs that seemed identical with Parker's *Philoria loveridgei*. They were similar to but specifically different from the Point Lookout frogs mentioned at the beginning of the present article.

There seemed to be so little in common between the Point Lookout and MacPherson Range specimens on one hand and Spencer's description of *Philoria frosti* on the other, that it was necessary to examine the type of *Philoria frosti*. Fortunately, this is in the Victoria National Museum and Mr. Brazenor allowed me to study and photograph it.

Philoria frosti Spencer is a very different frog from the *Philoria frosti* of Loveridge and *Philoria loveridgei* of Parker. This fact necessitates a new genus to include the species studied by Loveridge and Parker and the species I collected at Point Lookout. Before the new genus is described, however, the following notes on *Philoria frosti* are given.

The type, now in the Victoria National Museum, has the number DO8497 and the notations "*Philoria frosti* Spencer; Loc. Mt. Baw Baw, Vict.; Coll. by C. Frost; Type. Proc. Roy. Soc. Vict. Vol. XIII p. 176, 1901." Three views of the type are shown (fig. 1 of the present paper). Spencer's original description is accurate and covers the essential points. Some other features follow. The dimensions are: total length, 43 mm.; tibia length, 16.7 mm.; foot length, 26.2; head width, 16.1 mm.; parotoid gland length, 16 mm.; parotoid gland width, 9.3 mm. The parotoid gland is very prominent. The two inner fingers have flanges. The dorsal surface is of a uniform brownish color. There is no longer any trace of its "small irregular light patches" mentioned by Spencer. The sequence of finger length is $3>2>4>1$.

Both Loveridge (1935) and Parker (1940) realized that the frogs from the MacPherson Range were different from *Limnodynastes* and all other leptodactylid genera known to them. They were in error, however, in believing that they belonged in *Philoria*. This error is understandable, as neither author saw the type and no illustrations of *Philoria* had been published. It is necessary, therefore, to provide a new generic name for *Philoria frosti* of Loveridge (1935) (=*Philoria loveridgei* of Parker, 1940), and the related species that I collected near Point Lookout, New South Wales. The name here proposed is a word meaning "frog" that was used by a New South Wales tribe of Australian natives. It was suggested by F. McCarthy and A. Keast of the Australian Museum.

KYARRANUS, NEW GENUS

A cycloranine related to *Limnodynastes*. It differs strikingly from *Limnodynastes* and other genera such as *Lechriodus, Adelotus,* and *Heleioporus* in the type of embryo. *Limnodynates, Lechriodus, Adelotus,* and *Heleioporus* lay small eggs, which develop in the "typical" manner for frogs (as exemplified by the Northern Hemisphere *Rana*

and *Bufo* species). *Kyarranus* lays huge eggs, and the main portion of the body of the early embryo is partly separated from the yolk mass by a prominent constriction. The embryos of *Kyarranus* pass a modified tadpole stage and develop rapidly into juveniles. The yolk present in the egg is sufficient to last until the juvenile stage.

Because Parker's (1940) description of *Philoria* is based on *Kyarranus*, it serves for the latter. The following additional points should be noted. Parker's single specimen had five pre-sacral vertebrae, though he thought it might be anomalous. In a single skeleton of *Kyarranus* from Point Lookout, New South Wales, there are seven free pre-sacral vertebrae. X-ray photographs of four other specimens (two from Point Lookout, New South Wales, and two from Binna Burra, Queensland) seem to show the same condition, but it must be remembered that X-ray photographs cannot establish such features unequivocally.

In Parker's (1940, p. 13) key to the genera of the subfamily Cycloraninae, *Limnodynastes* and *Philoria* (= *Kyarranus*) are separated as follows:

"(i) Vomerine series moderately extensive, extending laterally beyond the inner borders of the choanae.....*Limnodynastes*
"(ii) Vomerine series short and oblique, not extending laterally beyond the inner borders of the choanae.....*Philoria*"

Unfortunately this distinction cannot be maintained. The vomerine teeth of *Limnodynastes fletcheri* do not extend laterally beyond the inner borders of the choanae.

The type species of this genus is *Kyarranus sphagnicolus*, described below. The only other species that can be assigned to the genus is *Kyarranus loveridgei* (Parker).

Kyarranus sphagnicolus, new species

THE SPHAGNUM FROG

Figure 2

HOLOTYPE: A.M.N.H. No. 60697, an adult male, collected November 21, 1952, at 5000 feet on Point Lookout, near Ebor, New South Wales. (This specimen will be deposited in the Australian Museum in Sydney.)

PARATYPES: A.M.N.H. Nos. 60698–60709, collected November 21–22, 1952, at the type locality.

DEFINITION: A combination of the following characteristics will distinguish this species from all others in eastern New South Wales: a leptodactylid with vomerine teeth posterior to and extending to the inner edge of the choanae; throat heavily mottled; a brown band ex-

tending from the eye to the arm, another along the flank, and still another at an oblique angle over the ilium (this last one frequently extending to the midline); a horizontal black band extending from the cloaca to the ventral surface of the thigh.

DESCRIPTION: There is a considerable sexual difference in coloration:

Female: The background color of the dorsal surface is a rich brown or reddish brown, which may be nearly uniform or have numerous small dark spots and blotches. There is a dark stripe on each side over

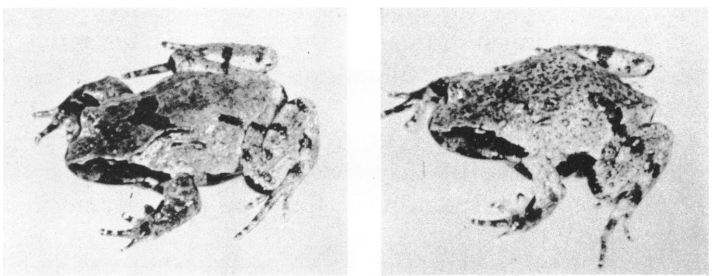

FIG. 2. Two adults of *Kyarranus sphagnicolus,* new species. Natural size.

the ilium, which may be restricted to the flank or it may extend in an anterior-median direction to meet the corresponding stripe on the other side. These stripes, when complete, form a V, with the apex directed anteriorly. Another dark stripe extends from the snout through the nostrils and eye nearly to the base of the arm. This stripe widens posterior to the eye. There is another stripe that extends along the side of the body, which may extend from the arms to the legs or it may be somewhat shorter. A horizontal dark band, frequently in the form of a much flattened triangle, has its apex at the cloaca and the arms extending along the posterior and ventral surfaces of the thighs.

The ventral surface varies from pale to dark brick red. Some individuals have numerous black spots on the throat. The sole of the foot is usually dark, but the toes, especially the inner ones, tend to be light. The palm of the hand also shows extensive light areas.

Male: The male tends to be greenish gray above, and the darker areas on the back are usually more extensive. The ventral surface may be nearly white, except for the throat, which is heavily mottled.

There is nothing extreme about the body proportions of this species. The largest specimen collected is 34.4 mm. in body length. The body proportions of five females (body length, 30.3–34.0 mm.) and eight males (body length, 29.7–34.4 mm.) are as follows: tibia length/body

length, females, 0.43 (σ 0.01, range 0.42–0.45), males, 0.45 (σ 0.00, range 0.42–0.47); head width/head length, females, 1.12 (σ 0.01, range 1.08–1.14), males, 1.19 (σ 0.01, range, 1.14–1.24); head length/body length, females 0.31 (σ 0.01, range 0.30–0.32), males, 0.32 (σ 0.00, range 0.30–0.33).

The tympanic membrane is indistinct.

The sequence of finger lengths is 3>2>4>1. The first and second fingers of the female have flanges. The tubercles on the hand are not unduly enlarged, but in some individuals they are striking as the hand is pigmented except for the tubercles. The dorsal surface of the thumb of the male has a brownish nuptial pad. When this is examined under increased magnifications it is found to consist of numerous tiny spines. The fingers are not webbed.

The toes are not webbed. There is an inner but no outer metatarsal tubercle. As is the case with the hand, the tubercles on the ventral surface of the foot are frequently colorless and the remainder are pigmented.

The tongue is broad and oval. The vomerine teeth are posterior to the choanae and extend laterally to the level of the inner edge of the choanae.

Habitat

All my specimens were collected in a small area at 5000 feet on Point Lookout (near Ebor, New South Wales). Observations were made only during the daytime on November 21 and 22, and they are consequently very incomplete. Males were calling from tiny crevices between rocks near a small stream. Females and males were also taken in a sphagnum bog. The males were calling, and a search for them was made by my pulling apart the sphagnum mat. The males and females were frequently as much as 15 cm. below the surface of the sphagnum.

Voice

The call of the male is a low and soft growl, "gurr-gurr." It is exceedingly difficult to localize. The internal vocal sac is beneath the chin.

Breeding Habits

Many egg masses were found in the sphagnum mat, frequently at a depth of as much as 15 cm. They were not in water, but the sphagnum was fully saturated. Generally a female was adjacent to the egg mass. The egg masses were about 2.5 cm. in diameter. The number of eggs

contained in three was 44, 49, and 52. The jelly mass was closely packed with eggs, instead of the eggs' being well spaced as they are in *Adelotus* and *Limnodynastes*. The jelly mass contains numerous bubbles, as in *Limnodynastes* and *Adelotus*.

The male clasps the inguinal region of the female.

COMMENTS

Kyarranus sphagnicolus resembles *Kyarranus loveridgei* (which is *Philoria frosti* of Loveridge, 1935, and *Philoria loveridgei* of Parker, 1940) more closely than any other leptodactylid. *Kyarranus sphagnicolus* has a proportionately longer tibia, wider head, and larger body size. In *Kyarranus sphagnicolus* there is a brown band on the flank (absent in *Kyarranus loveridgei*), the throat is heavily mottled (lightly mottled in *Kyarranus loveridgei*), and there is a horizontal black band across the cloacal region (absent in *Kyarranus loveridgei*).

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