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## A New Species of *Rana* from the Terai of Nepal

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**ABSTRACT.**—A new species of *Rana* is described from the terai region of Nepal on the basis of three specimens. The new species is diagnosable from known congeners in possessing the following characteristics: head longer than wide; tympanum rounded, smaller than orbit diameter; supratympanic fold absent; finger I longer than finger II; a series of large, flat glands on lateral aspect of body; broad webbing on toe IV to penultimate subarticular tubercle, reaching tip of toes as a narrow sheath; tips of digits flattened to form disks with distinct circummarginal grooves separating dorsum of disks from ventrum; tibia length/snout-vent length ratio 47.23–54.15; and absence of humeral gland on forelimb of males. The snout-vent length range shown by the type series is 30.4–32.5 mm.

The Terai region of Nepal, at the foothills of the Himalayan range, comprises extensive

marshes and associated grasslands, formed by the seepage of the larger streams (Mani, 1974a). Once 80–100 km in width, the Terai, which is dominated by tall grass and *Tamarix*, with patches of *Shorea* forest, has been reduced to a relatively narrow belt through anthropogenic

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TABLE 1. Measurements (in mm) on the type series of *Rana chitwanensis* sp. nov. (see text for details).

	USNM 266837	USNM 266838	USNM 266839
Snout-vent length	32.5	30.7	30.4
Trunk length	11.5	12.7	13.4
Head length	11.1	10.3	10.1
Head width	10.0	9.1	4.4
Head depth	5.7	6.2	5.5
Eye diameter	4.2	4.0	3.7
Interorbital diameter	6.1	5.3	4.9
Internarial distance	3.5	3.0	3.2
Eye-snout-tip distance	5.4	4.4	4.7
Eye-nostril distance	3.2	2.6	2.8
Eye-tympanum distance	1.3	0.7	1.2
Tibia length	17.6	14.5	14.9
Disk diameter finger II	0.6	0.6	0.6
Horizontal tympanum diameter	2.9	2.3	2.2
Vertical tympanum diameter	2.7	2.2	2.3

pressures (Mani, 1974b). Within the various forest types represented in Nepal, the Terai supports the highest amphibian species diversity (Swan and Leviton, 1962; Dubois, 1973, 1974, 1975, 1976; Dubois and Matsui, 1983).

A new species of *Rana* is here described from the Terai of Nepal, based on three examples that have been reported earlier as *Rana danieli* Pillai and Chanda (1977) by Zug and Mitchell (1995) and Mitchell and Zug (1995). Schleich et al. (1993) have also included the species in their checklist, and Maskey and Schleich (1992) listed a species as "*R. cf. danieli*."

#### MATERIALS AND METHODS

Measurements were taken with a Mitutoyo<sup>®</sup> dial vernier calliper (to the nearest 0.1 mm) from specimens preserved in 70% ethanol. The following measurements were taken: snout-vent length, SVL (from tip of snout to vent); tibia length, TBL (distance between surface of knee to surface of heel, with both tibia and tarsus flexed); trunk length, TL (distance between posterior edge of forelimb at its insertion to body to anterior edge of hind limb at its insertion to body); head length, HL (distance between angle of jaws and snout-tip); head width, HW (measured at angle of jaws); head depth, HD (greatest transverse depth of head, taken beyond orbital region); eye diameter, ED (diameter of orbit); eye to tympanum distance, E-T (distance between posterior-most point of eyes and anterior-most point of tympanum); interorbital width, IO (least distance between upper eyelids); internarial distance, IN (distance between nostrils); eye to snout-tip distance, E-S (distance between anterior-most point of eyes to tip of snout); eye to nostril distance, E-N (distance between anterior-most point of eyes and nostrils);

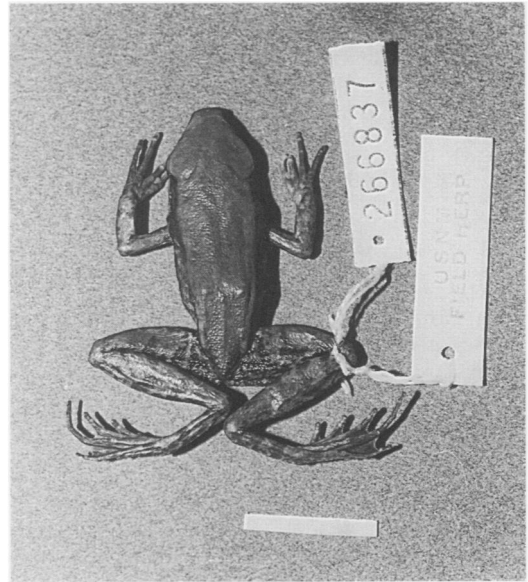


FIG. 1. Holotype of *Rana chitwanensis* sp. nov. (USNM 266837). Marker = 15 mm.

greatest horizontal diameter of tympanum, HTYD (measured along horizontal plane); greatest vertical diameter of tympanum, VTYD (measured along vertical plane); and diameter of disk on finger III, FIID (width of disk at tip of finger II). Measurements of fingers and toes were taken from base of each phalange to tip, on right fore and hind limbs, respectively. Sex was determined through examination of gonads.

Institutional abbreviations follow Leviton et al. (1985). Sources of information on distribution of congeners with which the new species have been compared are Boulenger (1920), Duellman (1993), and Frost (1985), supplemented with distributional information associated with comparative material examined (see Appendix I).

#### *Rana chitwanensis* sp. nov. (Figs. 1–2)

*Holotype*.—USNM 266837 (adult female with developing eggs), from seven km SSE Kasara, Royal Chitwan National Park (27°30'N; 84°20'E), Nepal, 29 April, 1985. Collected by J. C. Mitchell.

*Paratypes*.—USNM 266838 and USNM 266839 (both juvenile males), from ca. six km S Sauraha, Royal Chitwan National Park (27°30'N; 84°20'E), Nepal, 1 November, 1985. Collected by G. R. Zug.

*Diagnosis*.—*Rana chitwanensis* sp. nov. is diagnosable from congeners in possessing the following characteristics: head longer than wide; tympanum rounded, smaller than orbit diameter; supratympanic fold absent; finger I longer