

Updates in amphibian systematics and nomenclature for the Indian region

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Globally, the total number of amphibians now exceed those of all other land vertebrate groups (Glaw and Köhler, 1998) and the trends indicate that the pattern will continue for many decades to come. Dramatic new discoveries are being made in the Neotropics and southeast Asia but new species continue to turn up even in well explored parts of the world such as North America and Europe. In the species-rich tropics faunal revisions, sometimes aided by molecular techniques or methods such as acoustic analysis, have led to the discovery of new species, many of which are taxonomically cryptic. A single paper by Pethiyagoda and Manamendra-Arachchi (1998) reported the discovery of nearly 200 new species of frogs and toads from Sri Lanka, more than quadrupling the amphibian fauna. Table-1 lists amphibian species reported in the last five years or after the last published review of Inger (1999; the cut-off date for inclusion of species in this work was 1994).

There is growing interest in the systematics and nomenclature in India and adjacent countries, which is reflected in the large number of workers as well as those interested in these subjects (listed in Molur, 2000). In this communication I shall attempt to list recent developments, many published in journals not widely available, as relevant to the region.

• Auffenberg and Rehman (1997) reviewed the variation shown by *Bufo stomaticus* and concluded that

Bufo olivaceus Blanford, 1874 is a valid species.

• Two species were added to the fauna of Pakistan- *Paa liebigii* Baig (1998) and *Uperodon systema* Baig and Gvozdik (1998).

• Das (2000) discussed the dates of publication of the Proceedings and Journal of the Asiatic Society of Bengal and concluded that the former was issued a few months before the latter (generally considered to be the formal organ of the Society). As a result, several species and one genus of amphibian were shown to have been formally described (according to the International Code of Zoological Nomenclature) earlier, in the proceedings. Curiously, the type localities for a few taxa are slightly different in the two publications.

• *Rhacophorus lateralis* Boulenger, 1883 known from the holotype collected by Captain Richard Henry Beddome, was redescribed based on fresh material from Kodagu, Karnataka, India by Das (2000b).

• A unique phytelmonous species of ranid, *Rana charlesdarwini*, was described from near the peak of Mount Harriet, South Andaman Islands, India by Das (1998). Tentatively retained in the cosmopolitan genus *Rana*, its closest relatives appear to be ranids from Myanmar and southern China, that are allocated to the genus *Micrixalus*. This once again shows the affinities of the fauna of the Andaman Islands, which are presumed to have been

connected to the Arakan coast during Pleistocene times.

• A new species of megophryid, *Scutigera mokochungensis*, was described by Das and Chanda (2000) from Mokochung, Nagaland, India. It appears close to the poorly known *S. adungensis* from northern Myanmar.

• After reviewing two works on south Asian amphibians, Dubois (1999) concluded that southern Asia represented a new frontier for amphibian taxonomists but care and caution needed to be exercised in order to proceed. International cooperation would enhance the quality of work produced.

• Dubois and Ohler (1999) reviewed nominal species of Asian toads of the *Bufo melanostictus*, *Bufo scaber* and *Bufo stejnegeri* groups. Novel conclusions include the synonymy of *Ansonia kamblei* with *Bufo melanostictus* and *Bufo fergusonii* with *Bufo scaber*.

• *Microhyla sholigari* was described by Dutta and Ray (2000) from the Biligirirangan Hills, Karnataka, India.

• Iskandar (1998) in a work published in Bahasa Indonesia and English validly used the genera *Fejervarya* Bolkiay for the taxon referred to as *Rana limnocharis*.

• Matsui et al. (1999) restricted *Leptobrachium hasseltii* to Java and renamed the populations from mainland Asia (Thailand and possibly Myanmar) as *L. smithi*. Sengupta et al. (2000) subsequently reported this taxon from north-eastern India.

• Pillai and Ravichandran (1999) in a long-awaited work reviewed the caecilian fauna of India describing several new species from the Western Ghats and north-eastern India—*Ichthyophis garoensis*, *I. husaini*, *Uraeotyphlus interruptus*, *Gegeneophis krishni* and *G. krishni*.

• Vasudevan and Dutta (2000) described a new species of rhacophorid, *Rhacophorus pseudomalabaricus*, from the Andiparai Shola, Indira Gandhi Wildlife Sanctuary, Tamil Nadu, India.

- Marmayou *et al.* (2000) and Vences *et al.* (2000) presented phylogenies of ranid frogs allocated to the genus *Tomopterna* based on sequences of the mitochondrial 16S rRNA genes, morphology and/or acoustic evidence and concluded that the group is paraphyletic. The genus *Tomopterna* is thus restricted to sub-Saharan Africa; Madagascan species were referred to *Laliostoma*; and the earliest available name for southern Asian species is *Sphaerotherca*. Thus, the often evoked continental drift theory is not informative to explain Madagascar-India relationships in the modern-day fauna. Bossuyt and Milinkovitch (2000) showed how identical ecomorphs, including convergence in morphological, physiological and developmental characters, might have been produced independently in Madagascar and the Indian region.
- A hands-on training workshop in field techniques, identification and taxonomy was organised by the tireless personnel of the Zoo Outreach Organisation (notably Sanjay Molur) at Kempholey, the frog-collecting haunt of Prof. C. R. N. Rao, the remarkable early 20th Century Indian herpetologist. Participants from India and Sri Lanka were introduced to sampling techniques and principles of systematics and nomenclature, as relevant for Indian amphibians. The results are briefly summarised in Molur (1999).
- And finally, the long-awaited fourth edition of the International Code of Zoological Nomenclature was issued in 1999. This replaces the third edition of 1985.

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Table 1: List of Asian amphibians described since 1995.

Species	Author	Distribution
Bufonidae		
<i>Adenomus dasi</i>	Manamendra-Arachchi & Pethiyagoda (1998)	Sri Lanka
<i>noellerti</i>	Manamendra-Arachchi & Pethiyagoda (1998)	Sri Lanka
<i>Ansonia inthanon</i>	Matsui <i>et al.</i> (1998)	Thailand
<i>Bufo siachinensis</i>	Khan (1997)	Pakistan
<i>Pelophryne rhopophilus</i>	Inger & Stuebing (1996)	Sarawak, Malaysia
Ranidae		
<i>Amolops cremnobatus</i>	Inger & Kottelat (1998)	Laos
<i>spinapectoralis</i>	Inger <i>et al.</i> (1999)	Vietnam
<i>Limnonectes kadarsani</i>	Iskandar <i>et al.</i> (1996)	Nusa Tenggara, Indonesia
<i>orissaensis</i>	Dutta (1997a)	India
<i>shompenorum</i>	Das (1996a)	Nicobar Islands, India
<i>Nyctibatrachus vasanthi</i>	Ravichandran (1997)	India
Platymantis		
<i>banahao</i>	Brown <i>et al.</i> (1997)	Luzon, Philippines
<i>luzonensis</i>	Brown <i>et al.</i> (1997)	Luzon, Philippines
<i>mimulus</i>	Brown <i>et al.</i> (1997)	Luzon, Philippines
<i>naomii</i>	Alcala <i>et al.</i> (1998)	Luzon, Philippines
<i>negrosensis</i>	Brown <i>et al.</i> (1997)	Negros, Philippines
<i>panayensis</i>	Brown <i>et al.</i> (1997)	Panay, Philippines
<i>pygmaeus</i>	Alcala <i>et al.</i> (1998)	Luzon, Philippines
<i>rabori</i>	Brown <i>et al.</i> (1997)	Bohol, Philippines
<i>reticulatus</i>	Brown <i>et al.</i> (1997)	Luzon, Philippines
<i>sierramadrensis</i>	Brown <i>et al.</i> (1999)	Luzon, Philippines
Rana		
<i>archotaphus</i>	Inger & Chan-Ard (1997)	Thailand
<i>asperata</i>	Inger <i>et al.</i> (1996)	Kalimantan, Indonesia
<i>attigua</i>	Inger <i>et al.</i> (1999)	Vietnam
<i>charlesdarwini</i>	Das (1998)	Andaman Islands, India
<i>chitwanensis</i>	Das (1998b)	Nepal
<i>rhacoda</i>	Inger <i>et al.</i> (1996)	Kalimantan, Indonesia
<i>tipanan</i>	Brown <i>et al.</i> (2000)	Luzon, Philippines
<i>Sphaerotheca maskeyi</i>	(Schleich & Anders, 1998)	India, Nepal
Megophryidae		
Leptobranchium		
<i>banae</i>	Lathrop <i>et al.</i> (1998a)	Vietnam
<i>echinatum</i>	Dubois & Ohler (1998)	Vietnam
<i>gunungensis</i>	Malkmus (1996)	Sabah, Malaysia
<i>smithi</i>	Matsui <i>et al.</i> (1999)	India, Thailand
		(and possibly Myanmar)
<i>xanthospilum</i>	Lathrop <i>et al.</i> (1998a)	Vietnam
Leptolalax		
<i>arayai</i>	Matsui (1997)	Sabah, Malaysia
<i>hamidi</i>	Matsui (1997)	Sarawak, Malaysia
<i>nahangensis</i>	Lathrop <i>et al.</i> (1998b)	Vietnam
<i>sungi</i>	Lathrop <i>et al.</i> (1998b)	Vietnam
<i>tuberosus</i>	Inger <i>et al.</i> (1999)	Vietnam
Scutiger		
<i>mokokchungensis</i>	Das & Chanda (2000)	India
Rhacophoridae		
Philautus		
<i>abditus</i>	Inger <i>et al.</i> (1999)	Vietnam
<i>bunitus</i>	Inger <i>et al.</i> (1995)	Sabah, Malaysia
<i>refugii</i>	Inger & Stuebing (1996)	Sarawak, Malaysia
<i>sanctisilvaticus</i>	Das & Chanda (1997)	India
<i>saueri</i>	Malkmus & Riede (1996)	Sabah, Malaysia
<i>terebrans</i>	Das & Chanda (1998)	India
Polypedates		
<i>insularis</i>	Das (1995)	Nicobar Islands, India
<i>pseudocruciger</i>	Das & Ravichandran (1998)	India
Rhacophorus		
<i>baliogaster</i>	Inger <i>et al.</i> (1999)	Vietnam
<i>cyanopunctatus</i>	Manthey & Steiof (1998)	Malaysia/Indonesia
<i>exochopus</i>	Inger <i>et al.</i> (1999)	Vietnam
<i>pseudomalabaricus</i>	Vasudevan & Dutta (2000)	India
Microhylidae		
Kalophrynus		
<i>minusculus</i>	Iskandar (1998)	Java, Indonesia
Microhyla		
<i>erythropoda</i>	Tarkhishvili ("1994" 1995)	Vietnam
<i>sholigari</i>	Dutta & Ray (2000)	India
Ichthyophiidae		
Ichthyophis		
<i>gaoensis</i>	Pillai & Ravichandran (1999)	India
<i>husaini</i>	Pillai & Ravichandran (1999)	India
Uraeotyphlidae		
Uraeotyphlus		
<i>interruptus</i>	Pillai & Ravichandran (1999)	India
Caeciliidae		
Gegeneophis		
<i>krishni</i>	Pillai & Ravichandran (1999)	India

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If you have information on biodiversity, if you have ideas for workshops, public hearings, if you would like to develop a local level action plan, or in any other way to contribute to the NBSAP process, please contact us now.

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