

## OVERVIEW

## SOURCES OF LARVAL IDENTITIES FOR AMPHIBIANS OF INDIA

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**ABSTRACT.**– The systematic status of knowledge of larvae of amphibians occurring within the political limits of India is reviewed. Each description is ranked in order of completeness and the presence or absence of images. Of the 265 species of amphibians (representing three orders– Anura, Gymnophiona and Caudata), 118 have known tadpole stages. This represents 44.5% of the total fauna, significantly lower than those of at least two regional faunas. In addition, the quality of description of a vast majority of species are primarily brief descriptions and basic anatomical sketches, and detailed descriptions and scanning electronic micrography studies have been rarely applied to the larvae of Indian amphibians.

**KEY WORDS.**– Amphibians, larva, tadpole, identification, India.

## INTRODUCTION

At present, 265 species of amphibians (composed of three orders– Anura, Gymnophiona and Caudata) are known from India (Table 1). This review provides an annotated list of Indian species of amphibians, along with details of larval forms in the literature. Nearly 90 years ago, Anandale and Rao (1918) presented a review of the subject, as well as a bibliography of Indian tadpoles, which included 28 citations. As many as 14 of these refer to material from extralimital areas, in addition to three general (monographic works of cosmopolitan nature), leaving just 11 papers based on researches made exclusively on Indian material. The most recent stock-taking of knowledge on tadpoles of Indian amphibians estimated that under 25% of the forms were known to science (Saidapur, 2001).

Because of extreme morphological decoupling of the larval stages of amphibians from that of adults, identification of tadpoles has been a challenge, particularly as species names are based exclusively on adult series and a short supply of specialists on tadpoles. Indeed, the larval stages have not been routinely collected during field sampling. When larval stages are described, voucher series are seldom preserved and identified as such in the published descrip-

tion, making subsequent investigations on their identities uncertain in many instances. Thus, species name allocations in many studies of Indian amphibians remain open to question. In some instances, the species concerned were left unidentified. For instance, one of Anandale's (1905) early papers described an advanced stage tadpole from north-eastern India that lacked hind limbs, representing an unnamed species. Other unnamed tadpoles found in the literature include those described by Rao (1938), that were purported to be of African affinities; Ramaswami's (1932), descriptions and line drawings of unnamed larval *Cacopus* (a junior synonym of *Uperodon*) and Chanda and Talukdar's (1973) description of the tadpoles of an unnamed rhacophorid from north-eastern India. The most recent treatments of the Indian amphibian fauna– those of Pillai and Ravichandran (1999) and Chanda (2002), covering Indian Gymnophiona and all amphibians, respectively, do not provide larval descriptions.

When larval descriptions of Indian amphibians are available, these may be in an abbreviated form, lacking images. A few tadpole descriptions in the literature comprise measurements only. Detailed investigations, including scanning electron micrographs and descriptions of inter-