

“TAXONOMIC STUDIES ON ANURAN AMPHIBIANS OF NORTH EAST INDIA PRESENT IN THE UNIDENTIFIED COLLECTION OF NERC/ZSI, SHILLONG”

BHASKAR SAIKIA & JENNIFER LYNGDOH

North Eastern Regional Centre, Zoological Survey of India, Shillong

INTRODUCTION

North East India comprises of eight hilly states. These are Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Sikkim and Assam. This region is bordered by five countries viz. China, Myanmar, Bangladesh, Bhutan and Nepal. The topography of the entire region consists of tall, snow clad mountains of Arunachal to the floodplains of the mighty Brahmaputra River in Assam to the rain lashed hills of Meghalaya. The region varies not only in topography but in tribes, customs and wildlife. At the centre of a major biodiversity region, North East India is also known for its varied amphibian diversity. In fact, North East India falls under two biodiversity hotspots: Himalaya & Indo-Burma (<http://www.conservation.org>). Altogether, 119 species of amphibians were reported from the region recently (Mathew & Sen, 2010), which is increasing year after year.

In recent times many new amphibian species were discovered from North East India. The most prominent among these that caught the attention of common people were those of legless amphibians (caecilians) found in this region, including the discovery of a new amphibian family (Chikilidae) that has an African link (Kamei et. al., 2012).

The present study was undertaken to clear the back log collection of unidentified amphibian specimens present at the holdings of North Eastern Regional Centre of Zoological Survey of India in

Shillong. During the year 2011-12 and 2012-13, taxonomic studies were done on 399 specimens belonging to the Order Anura. These anurans were identified into 19 species belonging to 11 genera and 6 families. A new district record of *Amolops assamensis* Sengupta, Hussain, Choudhury, Gogoi, Ahmed and Choudhury, 2008 was confirmed from Janitia Hills and Ri-Bhoi districts of Meghalaya during the study. Classification followed after Frost (2014). IUCN status followed after <http://www.iucnredlist.org>.

SYSTEMATIC LIST

Class AMPHIBIA

Order ANURA

Family BUFONIDAE

Duttaphrynus melanostictus (Schneider, 1799)

Family DICROGLOSSIDAE

Euphlyctis cyanophlyctis (Schneider, 1799)

Euphlyctis hexadactylus (Lesson, 1834)

Zakerana limnocharis (Gravenhorst, 1829)

Zakerana nepalensis (Dubois, 1975)

Zakerana pierrei (Dubois, 1975)

Zakerana syhadrensis (Annandale, 1919)

Zakerana teraiensis (Dubois, 1984)

Hoplobatrachus tigerinus (Daudin, 1802)

Family MEGOPHRYIDAE

Megophrys robusta (Boulenger, 1908)

Family MICROHYLIDAE

Microhyla ornata (Dumeril & Bibron, 1841)

Family RANIDAE

Amolops assamensis Sengupta, Hussain, Choudhury, Gogoi, Ahmed and Choudhury, 2008*

Amolops formosus (Gunther, 1876)

Amolops gerbillus (Annandale, 1912)

Clinotarsus alticola (Boulenger, 1887)

Hylarana erythraea (Schlegel, 1937)

Family RHACOPHORIDAE

Polypedates leucomystax (Gravenhorst, 1829)

Rhacophorus bipunctatus Ahl, 1927

Rhacophorus maximus Gunther, 1858

Class AMPHIBIA

Order ANURA

Family BUFONIDAE

1. *Duttaphrynus melanostictus* (Schneider, 1799)

Common Indian Toad (Fig. 1)

1799. *Bufo melanostictus* Schneider, *Hist. Amph.*, 1: 216 (Type locality: "Ex India Orientalis")

Material Examined: 1 ex. (Regd. no. V/A/NERC/1050) Daribokgre IB compound, East Garo Hills dist., Meghalaya, 25.06.2008; 1 ex. (Regd. no. V/A/NERC/1077), Rekdekon vill., Kolasib dist., Mizoram, (night collection), Alt. 890m asl, 25.09.2005, coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1078), Chamata, Nalbari, Assam, 29.08.2004, coll. Riyaz uddin Ahmed; 2 exs. (Regd. no. V/A/NERC/1079), Zero, 13 Kms from Circuit House, Tlangung, Lunglei dist., Mizoram, Alt. 103m asl, 9.06.2006, coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1039), MeECL IB, Kyrdem kulai, Ri-Bhoi dist, Meghalaya, Alt. 771m asl, 18.06.2012, coll. Dr. D. Khyrniam & party; 2 exs (Regd. no. V/A/NERC/1149), Nokrek Biosphere Reserve, Manchuri Chiring, West Garo Hills, Meghalaya, Alt. 650m asl, 23.06.2008, coll. R. Mathew & party.

Distribution: INDIA: Meghalaya, Assam, Arunachal Pradesh, Manipur, Mizoram, Nagaland,

Sikkim, Tripura in NE India and also throughout India. *Elsewhere:* Bali, Borneo, China, Hong Kong, Indonesia, Java, Malaysia, Myanmar, Nepal, Pakistan, The Philippines, Sumatra, Thailand, Sri Lanka.

Remarks: Widely distributed species. *IUCN Status:* Least Concern.

Family DICROGLOSSIDAE

2. *Euphlyctis cyanophlyctis* (Schneider, 1799)

Indian Skipper Frog (Fig. 2)

1799. *Rana cyanophlyctis*, Schneider, *Hist. Amph.*, 8: 137 (Type locality: "Eastern India")

Material Examined: 12 exs. (Regd. no. V/A/NERC/1041), Goirangre, West Garo Hills dist., Meghalaya, 1.10.2008, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1042), Rongram Causeway over Rongram river, West Garo Hills, Meghalaya, Alt. 466m asl, 18.6.2008, coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1043), Didari Chiring and around, East Garo Hills, Meghalaya, 28.9.2008, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1046), Forest area behind NHPC Guest House, Ziro-Hapoli, Subansiri dist, Arunachal Pradesh, 2.6.2007, coll. R. Mathew & party; 6 exs. (Regd. no. V/A/NERC/1047), Near river Bairang, Mawbang vill., East Khasi Hills dist, (on the way to Shella), Meghalaya, 28.8.2009, coll. A. Rana & party; 1 ex. (Regd. no. V/A/NERC/1058), Nokrek Biosphere Reserve, Shrut Majang sill, Fishery compound, East Garo Hills, Meghalaya, Alt. 854m asl, 12.2.2008, coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1060), Stream, Nongstoin vill., West Khasi Hills dist., Meghalaya, coll. J. Lyngdoh & party; 14 exs. (Regd. no. V/A/NERC/1081) Chisobibra from stream flowing to Samsang river, Nokrek BR, Meghalaya, 27.06.2008, coll. R. Mathew & party; 17 exs. (Regd. no. V/A/NERC/1082), Dilpai river downstream, Gerukamukh, Dhemaji, Assam, 3.07.2007, coll. coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1091), Near Kanchakhuli, East Khasi Hills, Meghalaya, 7.09.2011, coll. A. Rana & party; 5 exs. (Regd. no. V/A/NERC/1092), Near Dharam Basti area, East Khasi Hills,

Meghalaya, 7.09.2011, coll. A. Rana & party; 6 exs. (Regd. no. V/A/NERC/1093), Near Dharam Basti area, East Khasi Hills, Meghalaya, coll. A. Rana & party; 1 ex. (Regd. no. V/A/NERC/1115), Ialong paddy field, Jaintia Hills district, Jowai, Meghalaya, Alt. 1363m asl, 16.06.2005, J. Lyngdoh & party; 13 exs. (Regd. no. V/A/NERC/1116), Theobonggre Soil Conservation Farm, on Rongram-Dadengiri Road, West Garo Hills, Meghalaya, 23.03.2007, J. P. Sati & party; 5 exs. (Regd. no. V/A/NERC/1117), Mandalgre (paddy field), East Agro Hills, Meghalaya, Alt. 934m asl, 19.01.2008, Dr. D. Khyntiam & party; 20 exs. (Regd. no. V/A/NERC/1118), Dilpai river above bridge, Gerukamukh, Assam, 2.07.2007, R. Mathew & party; 6 exs. (Regd. no. V/A/NERC/1120), Near river Bairong, Mawbong vill., East Khasi Hills, Meghalaya, on the way to Shella, 28.8.2009; 1 ex. (Regd. no. V/A/NERC/1132), Wah Umdap, Shakhoikuna vill., Ri-Bhoi dist., Meghalaya, Alt. 172m asl, 27.02.2012, J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1133), Umtyilli Str (II), Diwon vill., Ri-Bhoi, Meghalaya, Alt. 509m asl, 1.03.2012; 2 exs. (Regd. no. V/A/NERC/1138), Umbagor stream, Nongkyllerm RF, Ri-Bhoi, Meghalaya, Alt. 609m asl, 20.06.2012, Dr. D. Kynriam & party; 4 exs. (Regd. no. V/A/NERC/1146), Munglai Nadi, Talukie, Peren Dist., Nagaland, Alt. 394 m asl, 12.09.2006, R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1150), Amjalong, Umjalong Kyrweng vill., Jaintia Hills dist., Meghalaya, Alt. 25m asl, 18.10.2006, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1152), Umsharhei, Tasku, Lailad, Ri-Bhoi dist., Meghalaya, Alt. 873 ft. asl, 20.09.2012, coll. Dr. D. Khyntiam & party; 3 exs. (Regd. no. V/A/NERC/1155), Nokrek Biosphere Reserve, West Garo Hills, Selbalgre Chirang, Meghalaya 26.04. 2008, coll. R. Mathew & party; 8 exs. (Regd. no. V/A/NERC/1157), Rynku area, Indo-Bangladesh border, East Khasi Hills, Meghalaya, 24.03. 2012, coll. A. Rana & party; 1 ex. (Regd. no. V/A/NERC/1158), Umsahong, Mawshainam village, Ri-Bhoi dist., Meghalaya, Alt. 781m asl, 6.11. 2012, coll. J. Lyngdoh & party; 5 exs. (Regd. no. V/A/NERC/1159), Umtarku stream, Them-Pahambir village, Ri-Bhoi dist., Meghalaya, Alt.

536m asl, 7.11. 2012, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1161), Bansada Stream, Sohriewblei village, Ri-Bhoi dist., Meghalaya, Alt. 870m asl, 8.11. 2012, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1166), Umdu stream, Umdu village, Ri-Bhoi dist., Meghalaya, Alt. 285m asl, 6.12. 2012, coll. D. Khyntiam & party; 1 ex. (Regd. no. V/A/NERC/1168), Wah Kynshi, Vill. Ranikor, West Khasi Hills dist., Meghalaya, Alt. 9m asl, 05.03. 2013, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1169), stream, Vill. Gumaghat, West Khasi Hills dist., Meghalaya, Alt. 14 m asl, 04.03. 2013, coll. J. Lyngdoh & party; 2 exs. (Regd. no. V/A/NERC/1170), Wah Pathar, Vill. Pyndengrei, West Khasi Hills dist., Meghalaya, Alt. 1312m asl, 08.03. 2013, coll. J. Lyngdoh & party.

Distribution: INDIA: Meghalaya, Assam, Arunachal Pradesh, Manipur, Mizoram, Nagaland, Tripura in NE India and also throughout India. *Elsewhere:* Afghanistan; Bangladesh; Bhutan; Malaya, Myanmar; Nepal, Pakistan, Saudi Arabia; Sri Lanka

Remarks: Widely distributed species. *IUCN Status:* Least Concern.

3. *Euphlyctis hexadactylus* (Lesson, 1834)

Indian Pond Frog (Fig. 3 (A) & 3 (B))

1834. *Rana hexadactylus* Lesson, *Voy. Ind. Or. Rept.*,: 331 (Type locality: "South India")

Material Examined: 1 ex. (Regd. no. V/A/NERC/1043), Didari Chiring and around, East Garo Hills, Meghalaya, 28.9.2008, coll. R. Mathew & party; 73 exs. (Regd. no. V/A/NERC/1048), Paomari stream, Walong, Anjaw district, Arunachal Pradesh, 10.03.2007 coll. R. Mathew & party; 7 exs. (Regd. no. V/A/NERC/1059), Thebonggre, Soil Conservation Farm, on Rongram-Dadengiri Road, West Garo Hills, Meghalaya, 23.03.2007; J. P. Sati & party; 3 exs. (Regd. no. V/A/NERC/1080), Stream, Lamsaki village, Jaintia Hills dist., Meghalaya, 4.02.2007, J. Lyngdoh & party; 3 exs. (Regd. no. V/A/NERC/1089), Near Lyngkyrdem vill., on the way to Pynursla, Meghalaya, 9.09.2011,

coll. A. Rana & party; 2 exs. (Regd. no. V/A/NERC/1090), Near Ischamati, Beltoli area, East Khasi Hills, Meghalaya, 7.09.2011, coll. A. Rana & party; 1 ex. (Regd. no. V/A/NERC/1104), Forest area of Doguria Baba Mandir, Pasighat, Arunachal Pradesh, 15.07.2010, donated by K. K. Jha; 3 exs. (Regd. no. V/A/NERC/1119), Thelenchee river, 3 Kms South-West of Kherapara, West Garo Hills, Meghalaya, 24.03.2007, coll. J. P. Sati & party; 1 ex. (Regd. no. V/A/NERC/1034), Wah Umling (upstream), Umling vill., Ri-Bhoi, Meghalaya, Alt. 246m asl, 26.02.2012, coll. J. Lyngdoh & party; 5 exs. (Regd. no. V/A/NERC/1035), Umdu stream, Umdu vill., Ri-Bhoi, Meghalaya, Alt. 296m asl, 26.02.2012, coll. J. Lyngdoh & party; 5 exs. (Regd. no. V/A/NERC/1036), Beltoli area, East Khasi Hills, Meghalaya, Alt. 29m asl, 22.03.2012, coll. A. Rana & party; 4 exs. (Regd. no. V/A/NERC/1037), Mawblei area (near Indo Bangla Border), East Khasi Hills, Meghalaya, Alt. 50m asl 22.03.2012, coll. A. Rana & party; 3 exs. (Regd. no. V/A/NERC/1147), Umnlai, Pysadwar, Jaintia Hills, Meghalaya, Alt. 21m asl, 17.10.2006, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1162), Stream, Mawhati village, Ri-Bhoi dist., Meghalaya, Alt. 1040m asl, 6.11. 2012, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1163), Stream-2, Umbir village, Ri-Bhoi dist., Meghalaya, Alt. 1116m asl, 9.11. 2012, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1167), Umdu Stream, Umling Nongkhyllum RF, Ri-Bhoi dist., Meghalaya, Alt. 246m asl, 6.12. 2012, coll. D. Khyntiam & party; 2 exs. (Regd. no. V/A/NERC/1171), Stream, Rajai (A) Vill. West Khasi Hills Dist., Meghalaya, Alt. 13m asl, 05.03. 2013, coll. J. Lyngdoh & party.

Distribution: INDIA: Meghalaya, Assam, Arunachal Pradesh, Manipur, Mizoram, Nagaland, Tripura in NE India and also throughout India. *Elsewhere:* Bangladesh; Myanmar; Pakistan; Sri Lanka

Remarks: Predominantly a peninsular India species, Sen & Mathew (2004) reported its presence in North East India. *IUCN Status:* Least Concern.

4. *Zakerana limnocharis* (Gravenhorst, 1829)

Cricket Frog

1829. *Rana limnocharis* (Gravenhorst), *Del. Mus. Zool.*, : 42 (Type locality: "Java", Indonesia).

Material Examined: 3 exs. (Regd. no. V/A/NERC/1072), Sonaichori, Riangpara, Belonia, South Tripura, Alt. 24m asl, 16.09.2005, coll. R. Mathew & party; 2 exs. (Regd. no. V/A/NERC/1083), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party.

Distribution: INDIA: Assam, Manipur, Nagaland, Arunachal Pradesh, Manipur, Mizoram, Tripura in NE India and Rest of India. *Elsewhere:* Nepal; Borneo; China; Japan; Malaya Peninsula; Myanmar; Pakistan; Philippines; Sri Lanka; Indonesia; Taiwan; Thailand; Vietnam.

Remarks: Population trend stable. *IUCN Status:* Least Concern.

5. *Zakerana nepalensis* (Dubois, 1975)

Nepal Warty Frog

1975. *Rana nepalensis* Dubois, *C. R. Acad. Sc.*, Paris, t. (D) 281: 1771-1720.

Material Examined: 4 exs. (Regd. no. V/A/NERC/1073), Sonaichori, Riangpara, Belonia, South Tripura, Alt. 24m asl, 16.09.2005, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1113), Ialong paddy field, Jaintia Hills district, Jowai, Meghalaya, Alt. 1363m asl, 16.06.2005, coll. J. Lyngdoh & party; 2 exs. (Regd. no. V/A/NERC/1156), Nokrek Biosphere Reserve, West Garo Hills, Selbalgre Chirang, Meghalaya, 26.04. 2008, coll. R. Mathew & party.

Distribution: INDIA: Assam, Manipur, Nagaland, Arunachal Pradesh, West Bengal, Uttar Pradesh, Uttrakhand. *Elsewhere:* Nepal.

Remarks: Population trend stable. *IUCN Status:* Least Concern

6. *Zakerana pierrei* (Dubois, 1975)

Pierre's Cricket Frog

1975. *Rana pierrei* Dubois, *C. R. Acad. Sc.*, Paris, t. (D) 281: 1771-1720.

Material Examined: 4 exs. (Regd. no. V/A/

NERC/1074), Sonaichori, Riengpara, Belonia, South Tripura, Alt. 24m asl, 16.09.2005, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1108), Nongmynsong – Polo, East Khasi Hills, Shillong, 15.07.2004, coll. R. Mathew & N. Sapkota; 1 ex. (Regd. no. V/A/NERC/1109), District Park, Lunglei, Mizoram, Alt. 1128m asl, 3.06.2006, coll. R. Mathew & party; 2 exs. (Regd. no. V/A/NERC/1111), Risa Colony Forest area, Shillong, East Khasi Hills, Meghalaya, 13.05.2007, coll. N. Sapkota; 1ex. (Regd. no. V/A/NERC/1114), Ialong paddy field, Jaintia Hills district, Jowai, Meghalaya, Alt. 1363m asl, 16.06.2005, coll. J. Lyngdoh & party; 1 exs. (Regd. no. V/A/NERC/1148), Umnlai, Pysadwar, Jaintia Hills, Meghalaya, Alt. 21m asl, 17.10.2006, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1160), Umtarku stream, Them-Pahambir village, Ri-Bhoi dist., Meghalaya, Alt. 536m asl, 7.11. 2012, coll. J. Lyngdoh & party.

Distribution: INDIA: Assam, Manipur, Nagaland, Meghalaya, Mizoram, Arunachal Pradesh, West Bengal, Bihar, Uttar Pradesh, Uttrakhand. *Elsewhere:* Nepal.

Remarks: Common species. *IUCN Status:* Least Concern.

7. *Zakerana syhadrensis* (Annandale, 1919)

Syhadra Frog (Fig. 4)

1919. *Rana limnocharis syhadrensis* Annandale, *Rec. Indian Mus.*, 16: 123.

Material Examined: 1 ex. (Regd. no. V/A/NERC/1049), Daribokgre IB compound, East Garo Hills dist., Meghalaya, Nokrek BR Survey, 25.06.2008, coll. R. Mathew & party; 6 exs. (Regd. no. V/A/NERC/1061), Umsohthiang, Warsohthiang vill., West Khasi Hills dist., Meghalaya, 2.08.2011, coll. J. Lyngdoh & party; 18 exs. (Regd. no. V/A/NERC/1075), Sonaichori, Riengpara, Belonia, South Tripura, Alt. 24m asl, 16.09.2005, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1084), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party; 7 exs. (Regd. no. V/A/NERC/1160), Srilake, near Kibali Village, 5 kms after Roing, Arunachal Pradesh 6.3.2007, coll. R. Mathew

& party; 4 exs. (Regd. no. V/A/NERC/1107), Nongmynsong – Polo, East Khasi Hills, Shillong, 15.07.2004, coll. R. Mathew & N. Sapkota; 3 exs. (Regd. no. V/A/NERC/1110), District Park, Lunglei, Mizoram, Alt. 1128m asl, 3.06.2006, coll. R. Mathew & party; 3 exs. (Regd. no. V/A/NERC/1112), State Agricultural Research Station, Yisemyong, Mokokchung, Nagaland, Alt. 1042m asl, 08.08.2005, coll. R. Mathew & party; 1 ex. (Regd. no. V/A/NERC/1151), Umsharhei, Tasku, Lailad, Ri-Bhoi dist., Meghalaya, Alt. 873 ft. asl, 20.09. 2012, coll. Dr. D. Khyntiam & party; 1 ex. (Regd. no. V/A/NERC/1164), Stream, Umraling village, Ri-Bhoi dist., Meghalaya, Alt. 851m asl, 8.11. 2012, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1172), Birbah Lake, Nonkhyllum WLS, Ri-Bhoi dist., Meghalaya, Alt. 649m asl, 13.13 2013, coll. Dr. D. Khyntiam & party.

Distribution: INDIA: Assam, Manipur, Meghalaya in NE India and Northern India. *Elsewhere:* Nepal; Bangladesh; Pakistan.

Remarks: Fairly common. *IUCN Status:* Least Concern.

8. *Zakerana teraiensis* (Dubois, 1984.)

Terai Warty Frog

1984. *Rana (Fejervarya) teraiensis* Dubois, *Alytes*, 3: 143-159.

Material Examined: 2 exs. (Regd. no. V/A/NERC/1076), Sonaichori, Riengpara, Belonia, South Tripura, Alt. 24m asl, 16.09.2005, coll. R. Mathew & party; 2 exs. (Regd. no. V/A/NERC/1085), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party.

Distribution: INDIA: Meghalaya, Mizoram, Manipur, Tripura, Nagaland, Arunachal Pradesh, Assam in NE India, West Bengal, Bihar, Uttar Pradesh, Uttrakhand. *Elsewhere:* Nepal.

Remarks: Not common in the area under report. *IUCN Status:* Least Concern.

9. *Hoplobatrachus tigerinus* (Daudin, 1803)

Indian Bull Frog (Fig. 5)

1803. *Rana tigerina* Daudin, *Hist. Rain. Gren. Crap.*: 64. (Type Locality: "Bengal").

Material Examined: 4 ex. (Regd. no. V/A/NERC/1086), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party,

Distribution: INDIA: Meghalaya, Assam, Arunachal Pradesh, Manipur, Mizoram, Nagaland, Tripura in NE India and also throughout India
Elsewhere: Bangladesh; China; Madagascar (Introduced); Myanmar; Nepal, Pakistan, Sri Lanka

Remarks: Not common in occurrence. *IUCN Status:* Vulnerable

Family MEGOPHRYIDAE

10. *Megophrys robusta* (Boulenger, 1908)

White lipped horned toad (Fig. 6)

1908. *Megalophrys robusta* Boulenger, *Proc. Zool. Soc. London*: 418 (Type locality: "Darjeeling", West Bengal, India).

Material Examined: 1 ex. (Regd. no. V/A/NERC/1051), War Umsning, East Khasi Hills, Meghalaya, 19.8.2006, coll. S. Swell.

Distribution: INDIA: Assam, Nagaland, Meghalaya, Arunachal Pradesh, Sikkim in NE India and West Bengal. *Elsewhere:* China; Myanmar; Vietnam; Hong Kong; Bangladesh; Nepal.

Remarks: Rarely found. *IUCN Status:* Data deficient.

Family MICROHYLIDAE

11. *Microhyla ornata* (Dumeril & Bibron, 1841)

Ornate Narrow Mouthed Frog

1841. *Engystoma ornatum* Dumeril & Bibron, *Erp. Gen.*, **8**: 745

Material Examined: 1 ex. (Regd. no. V/A/NERC/1094), Near Tyrna area, East Khasi Hills, Meghalaya, 8.09.2011, coll. A. Rana & party.

Distribution: INDIA: Throughout India.
Elsewhere: China; Japan; Taiwan; Malaysia; Myanmar; Bangladesh; Bhutan; Nepal; Pakistan.

Remarks: Not very common in the area under report. *IUCN Status:* Least Concern.

Family RANIDAE

12. *Amolops assamensis* Sengupta, Hussain, Choudhury, Gogoi, Ahmed and Choudhury, 2008

Sengupta's Cascade frog (Fig. 7)

2008. *Amolops assamensis* Sengupta, Hussain, Choudhury, Gogoi, Ahmed and Choudhury, *Hamadryad*, **32**(1): 5-12 (Type locality: "Mayeng Hill Reserve Forest, Kamrup District, Assam, north-eastern India").

Material Examined: 1 ex. (Regd. no. V/A/NERC/1052), Krem Umshangkhet, Thangski vill., Janitia Hills Dist., Meghalaya, 1.02.2007, coll. I. J. Kharkongor & party; 1 ex. (Regd. no. V/A/NERC/1163), Stream, Ummyrkng village, Ri-Bhoi dist., Meghalaya, Alt. 905m asl, 9.11. 2012, coll. J. Lyngdoh & party.

Distribution: INDIA: Assam, Meghalaya in NE India. *Elsewhere:* Nil.

Remarks: Both the specimens are new district records. *IUCN Status:* Data deficient.

13. *Amolops formosus* (Gunther, 1876)

Assam Cascade Frog

1876. *Polypedates formosus* Gunther, *Proc. Zool. Soc., London*: 570. (Type locality: "Khasya" India)

Material Examined: 2 exs. (Regd. no. V/A/NERC/1053), Krem Umshangkhet, Thangski vill., Janitia Hills Dist., Meghalaya, 1.02.2007, coll. I. J. Kharkongor & party; 2 exs. (Regd. no. V/A/NERC/1055), Krem Ummadoh, Lumshnong vill., Jaintia Hills dist., Meghalaya, 2.02.2007, coll. I. J. Kharkongor & party.

Distribution: INDIA: Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Sikkim in NE India and Punjab, West Bengal, Uttar Pradesh.
Elsewhere: Nepal.

Remarks: Population trend decreasing. *IUCN Status:* Least Concern.

14. *Amolops gerbillus* (Annandale, 1912)

Gerbil's Stream Frog

1912. *Rana gerbillus* Annandale, *Rec. Indian Mus.*, **8**(1): 10 (Type Locality: Yembung, Abor foothills at an altitude of 1100 feet, Arunachal Pradesh).

Material Examined: 4 exs. (Regd. no. V/A/NERC/1054), Krem Umshangkhet, Thangski vill., Janitia Hills Dist., Meghalaya, 1.02.2007, coll. I. J. Kharkongor & party, 4 exs. (Regd. no. V/A/NERC/1056), Krem Ummadoh, Lumshnong vill., Janitia Hills dist., Meghalaya, 2.02.2007, coll. I. J. Kharkongor & party, 5 exs. (Regd. no. V/A/NERC/1057), Ganol river, Nokrek BR, East Garo Hills dist., Meghalaya, Alt. 964 m asl 13.02.2008, coll. R. Mathew & party, 1 ex. (Regd. no. V/A/NERC/1153), Um-mluh river, Nongkhyllum WLS, Lailad, Ri-Bhoi dist., Meghalaya, Alt. 951 ft. asl, 19.09. 2012, coll. Dr. D. Khyntiam & party.

Distribution: INDIA: Arunachal Pradesh, Meghalaya, Assam, Mizoram, Manipur, Nagaland, Sikkim in NE India and West Bengal. *Elsewhere:* China; Myanmar.

Remarks: Fairly common. *IUCN Status:* Least Concern.

15. *Clinotarsus alticola* (Boulenger, 188)

High altitude frog

1882. *Rana alticola* Boulenger, *Cat. Batr. Sal. Brit. Mus.*: 62

Material Examined: 1 ex. (Regd. no. V/A/NERC/1062), Umkyllain, Urkali vill., West Khasi Hills, Meghalaya, 1.08.2011, coll. J. Lyngdoh & party; 1 ex. (Regd. no. V/A/NERC/1087), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party.

Distribution: INDIA: Arunachal Pradesh, Meghalaya, Assam, Mizoram, Manipur, Nagaland NE India and West Bengal. *Elsewhere:* China; Myanmar; Bangladesh.

Remarks: Rarely found. *IUCN Status:* Least Concern.

16. *Hylarana erythraea* (Schlegel, 1937)

Green Paddy Frog

1837. *Hyla erythraea* Schlegel, *Abbild. Neuer Unvollst. Amph.*, 1: 27.

Material Examined: 1 ex. (V/A/NERC/ZSI/1173), Umrah huleng, Nongkhyllum WLS, Ri-Bhoi dist., Meghalaya, Alt. 422 m asl 13.03.2013, coll. Dr. D. Khyntiam & party.

Distribution: INDIA: Manipur, Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland in NE India. *Elsewhere:* Cambodia; Laos; Indonesia; Malaysia; Singapore; Thailand; Vietnam; Bangladesh.

Remarks: Rarely found. *IUCN Status:* Least Concern.

17. *Polypedates leucomystax*
(Gravenhorst, 1829)

Common Tree Frog (Fig. 8)

1829. *Hyla leucomystax* Gravenhorst, *Syst. Rept.*: 31 (type Locality: "Java")

Material Examined: 1 ex. (V/A/NERC/ZSI/1070), Lawngtlai (2 Km from PWD Rest House) dist., Mizoram (night collection), Alt. 834 m asl 7.06.2006, coll. R. Mathew & party; 5 ex. (V/A/NERC/ZSI/1088), Kharsand, Arunachal Pradesh, Alt. 167m asl, 2.06.2005, coll. R. Mathew & party.

Distribution: INDIA: Manipur, Mizoram, Assam, Meghalaya, Arunachal Pradesh, Tripura, Sikkim in NE India, Nicobar island, West Bengal. *Elsewhere:* Bangladesh; Cambodia; China; Indonesia; Laos; Malaysia; Myanmar; Nepal; The Philippines; Thailand; Singapore; Vietnam.

Remarks: A species complex. *IUCN Status:* Least Concern.

18. *Rhacophorus bipunctatus* Ahl, 1927

Double Spotted Red Webbed Tree Frog
(Fig. 9)

1927. *Rhacophorus bipunctatus* Ahl, *Sitzungsber. Ges. Naturforsch. Freunde Berlin*, 1927: 46.

Material Examined: 4 exs. (Regd. no. V/A/NERC/1045), Motinagar forest area, Shillong, East Khasi hills, Meghalaya. 21.5.2007, coll. R. Mathew: 4 exs. (Regd. no. V/A/NERC/1071), ERS/ZSI Qtr. Forest area, Risa colony, Shillong, 09.05.2007, coll. J. P. Sati & party: 4 exs. (Regd. no. V/A/NERC/1145), Motinagar forest area, Shillong, East Khasi Hills, Meghalaya, 21.05.2007, coll. R. Mathew.

Distribution: INDIA: Manipur, Assam, Meghalaya, Arunachal Pradesh, Tripura, Nagaland in NE India. *Elsewhere:* Bangladesh; China; Indonesia; Malaysia; Myanmar; Thailand.

Remarks: Commonly found. *IUCN Status:* Least Concern.

19. *Rhacophorus maximus* Gunther, 1858

Large Tree Frog

1858. *Rhacophorus maximus* Gunther, *Arch. Naturgesch.*, **24**: 325.

Material Examined: 1 ex. (Regd. no. V/A/NERC/1105), from the tank of the Department of Zoology, J. N. College, Pasighat, Arunachal Pradesh, 25.03.2011, donated by K.K.Jha.

Distribution: INDIA: Manipur, Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland in NE India. *Elsewhere:* Bangladesh; China; Nepal; Myanmar; Thailand.

Remarks: Population trend decreasing. *IUCN Status:* Least Concern.

SUMMARY

Altogether 399 specimens of anuran amphibians were studied. They were identified into 19 species belonging to 11 genera and 6 families. A new district record of *Amolops assamensis* Sengupta *et. al.*, 2008 was confirmed from Jaintia Hills and

Ri-Bhoi districts of Meghalaya during the study. The number of species in terms of examples studied is less, as two major taxonomic works were done by Mathew and Sen (2009 & 2010) on amphibia before this project, where many new amphibian species including new India records were reported. Therefore, this project got to study what was left unidentified and hence resulted in not any exciting findings. However, with the recent discoveries of many new records and new species from this region by Mathew & Sen (2009 & 2009a), Kamei *et. al.* (2012), Das *et. al.* (2013) and others, the region promises of many new future findings.

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REFERENCES

- http://www.conservation.org/where/priority_areas/hotspots/asia-pacific/Pages/asia-pacific.aspx
<http://www.iucnredlist.org/>
- Frost, D. R. 2014. Amphibian Species of the World: an Online Reference. Version 6.0 (10 June, 2014). Electronic Database accessible at <http://research.amnh.org/herpetology/amphibia/index.html>. American Museum of Natural History, New York, USA.
- Das, A., Chetia, M., Dutta, S. K. and Sengupta, S., 2013. A new species of *Duttaphrynus* (Anura: Bufonidae) from Northeast India. *Zootaxa*, **3646**(4): 336-348.
- Kamei, R. G., Mauro, D. S., Gower, D. J., Bocxlaer, I. V., Sherratt, E., Thomas, A., Babu, S., Bossuyt, F., Wilkinson, M., Biju, S. D., 2012. *Pr. R. Soc.*: doi:10.1098/rspb.2012.0150 (Published online).
- Mathew, R. and Sen, N, 2009. *Studies on little known amphibian species from North East India*: 1-64 (Published by the Director, *Zool. Surv. India*, Kolkata).
- Mathew, R. and Sen, N, 2009a. Studies on Caecilians (Amphibia: Gymnophiona: Ichthyophiidae) of North East India with description of three new species of *Ichthyophis* from Garo Hill, Meghalaya and additional information on *Ichthyophis garoensis* Pillai and Ravichandran, 1999. *Rec. zool. Surv. India, Occ. Paper No.*, **309**: 1-56 (Published by the Director, *Zool. Surv. India*, Kolkata).
- Mathew, R. and Sen, N, 2010. *Pictorial Guide to Amphibians of North East India*: 1- 144 (Published by the Director, *Zool. Surv. India*, Kolkata).
- Sen, N. and Mathew, R. 2004. Occurrence of *Euphyllctis hexadactylus* (Lesson, 1834) (Amohibia: Anura: Ranidae) in North East India with notes on its morphological characters. *Cobra*, Vol. **5**: 1-6.

PLATE-I



Fig. 1. *Duttaphrynus melanostictus* (Schneider, 1799)



Fig. 2. *Euphlyctis cyanophlyctis* (Schneider, 1799)



Fig. 3(A). *Euphlyctis hexadactylus* (Lesson, 1834)



Fig. 3(B). *Euphlyctis hexadactylus* (Lesson, 1834), showing the large inner metatarsal tubercle.



Fig. 4. *Zakerana syhadrensis* (Annandale, 1919)

PLATE-II



Fig. 5. *Hoplobatrachus tigerinus* (Daudin, 1802)



Fig. 6. *Megophrys robusta* (Boulenger, 1908)



Fig. 7. *Amolops assamensis* Sengupta et al., 2008

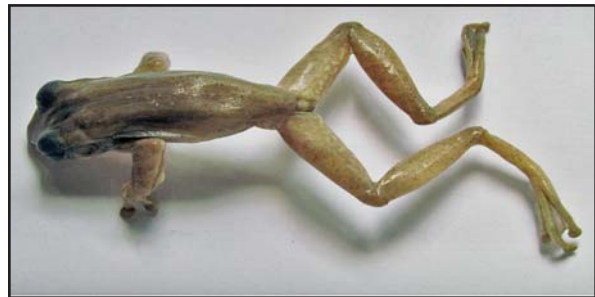


Fig. 8. *Polypedates leucomystax* (Gravenhorst, 1829)



Fig. 9. *Rhacophorus bipunctatus* Ahl, 1927