

ANURANS (AMPHIBIA) OF NORTHERN PAKISTAN WITH SPECIAL REFERENCE TO THEIR DISTRIBUTION

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The present study is based on the collection of anurans made from 33 different localities of northern Pakistan including Federal Capital area, Islamabad. More than 200 specimens belonging to 3 genera and 10 species are described with special reference to distribution. Moreover, a species of *Bufo* and of *Rana*, may be new, are also included.

Key words: Amphibia, Anura, Northern Pakistan.

INTRODUCTION

Boulenger [1] described the frogs belonging to genus *Rana* of South Asia representing all species found in Pakistan. Dubois and Khan [2] described a new species from Hazara Division of North West Frontier Province (N.W.F.P.). Minton [3] and Mertens [4] studied some areas of Sind and Baluchistan, whereas Khan [5] studied Northern Punjab and some areas of Azad Kashmir. However, informations about the amphibians fauna of this mountainous regions of northern Pakistan are still at best meagre. The present study was initiated to define the distribution of anurans in this area of Pakistan. More than 200 specimens of amphibians were collected from different localities (Appendix I and II). The collection is housed in Zoological Sciences Division of Pakistan Museum of Natural History (PMNH), Islamabad.

Geography. On the northwestern side of Pakistan between 34°-37° N and 71°-74° E, the Hind Kush has formed three valleys Chitral, Dir and Swat by extending minor ranges into this area. At present, these are districts of Malakand Division of N.W.F.P. Dir is the smallest of the three districts with only 1840 sq. miles of territory, whereas Swat has 5263 and Chitral has 5663 sq. miles.

To the north, the Himalayas break into many ranges and have shaped the land and climatology of Pakistan. Four great mountain ranges viz., the Himalayas, the Korakoram, the Hindu Kush and the Pamir delineate this region of Pakistan.

Lesser Himalayas include Hazara (N.W.F.P.) and Murree (North Punjab), whereas sub-Himalayas are low lying mountains having average height of 700-1000 meter and extend over southern Hazara and Murree including Islamabad.

Systematic account. Different species of anurans from northern Pakistan are described herein. Morphometric data

of some important characters: snout-vent length (SVL), head length (HL), head width (HW), eye width (EW), tympanum diameter (TD) and, in case of *Bufo*, parotoid length (PL) and parotoid width (PW) has been taken in mm and their range, mean, s.d. (standard deviation) and S.E. (standard error) are given.

Rana tigerina Daudin. It is found all over Pakistan [6] and is the largest of all Pakistani species of amphibians. Its presence from Northern areas is reported from Mansehra, Kotli, Islamabad and Rawalpindi [5]. Besides these areas, collected some specimens, from different localities of Swat and Dir Districts. The specimens match closely the description of *Rana tigerina* [1].

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	78-110	90.4	12.0	5.9	65-160	121.0	43.21	19.32
HL	26-38	30.6	12.0	5.39	65-160	40.4	13.99	6.25
HW	26-40	31.6	5.5	2.46	23-62	45.8	18.37	8.21
EW	8-12	9.6	1.5	0.67	8-14	8.8	3.03	1.35
TD	6-8	6.6	0.8	0.38	8-14	11.6	2.88	1.35

Rana cyanophlyctis Schneider. This is the most common frog of Pakistan. Boulenger [1] gave its distribution as South Arabia, Baluchistan, Afghanistan, Himalays, India and Ceylon. Minton [3], Mertens [4], Khan [6] reported its presence in different areas of Pakistan. In northern areas Khan [5] reported from Abbottabad, Mansehra and adjoining areas. I collected these frogs from Islamabad, Rawalpindi, Swat, Dir and Mansehra districts; however, its presences in other areas of northern Pakistan is not reported. It has a great diversity in size and colour pattern.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	40-64	53.2	10.2	4.5	47-88	65.8	19.1	8.5
HL	14-21	18.2	3.4	1.5	16-30	22.8	6.3	2.8
HW	15-25	20.8	4.4	2.0	17-35	25.8	7.7	3.4
EW	5-7	6.3	0.9	0.4	5-9	7.0	1.8	0.8
TD	3-5	4.3	0.8	0.3	4-6	4.6	0.9	0.4

Rana brevicep Schneider. This burrowing frog has toad like appearance Boulenger [1] gave its distribution as India, Ceylon and upper Burma. Minton [3], Merten [4], Khan [5-8] showed its presence in different areas of Pakistan.

Although the collection is only represented from Islamabad, Rawalpindi and Mardan areas the author is quite certain about the presence of this species in Swat area. The specimen from Mardan has a dorsum with elongated warts and heels slightly overlap when folded at right angle.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	34-47	38.6	7.2	4.1	45-55	48.3	5.7	3.3
HL	13-18	14.6	2.8	1.6	16-18	17.3	1.1	0.6
HW	15-20	16.6	2.8	1.6	18-21	19.6	1.5	0.8
EW	5-6	5.3	0.5	0.3	6-7	6.3	0.5	0.3
TD	2.5-3	2.6	0.3	0.2	3-3.5	3.2	0.3	0.2

Rana hazarensis Dubois and Khan [2]. This frog is thoroughly aquatic and lives in hilly torrents. Present collection of this species suggests that it has very restricted distribution and is only found in type locality or nearby areas.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	48.2-58.0	51.7	5.4	3.1	50.62	56.0	6.0	3.4
HL	19-22	20.0	1.7	1.0	19-23	21.1	2.0	1.1
HW	18-21	19.0	1.7	1.0	18-21.8	20.1	1.9	1.2
EW	5-6	5.3	0.5	0.3	5.2-6.2	5.8	0.5	0.3
TD	3.5-3.8	3.6	0.1	0.1	3.5-4.0	3.6	0.3	0.2

Rana syhadrensis Annandale. In present collection, this species is only represented from Islamabad and adjoining areas. Except Baluchistan, this species is reported from all other provinces of Pakistan. However, its presence in the northern areas of Pakistan is restricted only to low lying mountains of the area. The specimen from Margella (Islamabad) has a dull grey colour with rounded warts on

body dorsum. A very feeble vertebral streak is present and tibio-tarsal articulation reaches to middle of the orbit.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	37-45	41.5	3.3	1.6	33-56	45.25	9.97	4.98
HL	13-16	14.75	1.2	0.6	12-17	15.0	2.44	1.22
HW	13-16	14.75	1.2	0.6	12-17	15.0	2.44	1.22
EW	5-6	5.75	0.5	0.25	4-6	5.25	0.95	0.47
TD	3-3.4	3.1	0.2	0.1	2.5-4	3.37	0.75	0.37

Rana sp. The present reported species is closely related to *R. cyanophlyctis* schneider and *R. hazarensis* Dubois & Khan. It shares some characters with *cyanophlyctis* and some with *hazarensis*, but the set of characteristics like colour pattern, snout, body tuberculation and some morphometric characters suggest that it may be a new species.

Most of its specimens are collected from Mangora (Swat) and few from Dir Distt. Surprisingly all male specimens in my collection are much smaller than females.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	33.5-47	40.6	5.5	2.8	64-65	64.8	0.5	0.3
HL	13-18	15.5	2.0	1.0	23-24	23.5	0.6	0.3
HW	13-18.5	15.9	2.3	1.1	23.5-25	24.4	0.8	0.4
EW	4.8-5	4.8	0.2	0.1	6.8-25	6.95	0.1	0.1
TD	4.5-5	4.7	0.2	0.1	6.2-6.5	6.4	0.2	0.1

Microhyla ornata (Dumeril and Bibron). This is the only species of genus *Microhyla* found in Pakistan. Because of its smaller size, it is called "Ant Frog". It is nocturnal and is very difficult to locate in the field; however, its rasping call is very distinct from rest of the amphibians. It is widely distributed in Azad Kashmir, Punjab and N.W.F.P. [6]. It extends from plains of Punjab to an altitude of 3,000 meter [8]. Because of the smaller size of the species the morphometric characters do not vary significantly except SVL which varies from 22.0 mm to 28.0 mm.

Bufo stomaticus Lutken. Toads belonging to this nominated taxon are quite common throughout Pakistan, however, in high altitudinal hilly areas of northern Pakistan these are replaced with *B. viridis*. It is not only found in open fields but in inhabited houses, too. It comes out at night and feeds on photophilic insects under light posts. It breeds in any standing water without any preference and avoids fast running water.

In this collection, it is represented from many localities of Islamabad. Rawalpindi, Swat and Dir Distts. How-

ever, in Gilgit, Hunza and further north no specimen of this species was collected.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	46-56	50.8	4.3	2.1	44-58	48.8	6.4	3.2
HL	16-20	17.8	1.7	0.9	13.5-20	16.1	3.0	1.5
HW	17-23	20.5	2.6	1.3	16.5-24	19.4	3.4	1.7
EW	5-6	5.5	0.6	0.3	5-6	5.8	0.5	0.3
TD	3-4	3.6	0.5	0.2	3-4	3.3	0.5	0.2
PL	12-15	13.5	1.3	0.6	11-15	12.5	1.9	1.0
PW	6-8	7.2	0.9	0.5	6-8	7.0	0.8	0.4

Bufo melanostictus Schneider. It is most characteristics of the Pakistani toads. It has thorny warts on dorsum and black cranial crests. This south-east Asian toad extends in Pakistan at its north-western range, reaching to Hazara Division and South Waziristan and alpinde Punjab [8]. Present collection is only represented with the specimen of Islamabad area.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	56-66	60.0	3.3	1.6	54-62	57.8	3.3	1.7
HL	20-23	21.6	1.4	0.7	18-29.5	19.5	1.3	0.6
HW	24-26	24.9	0.9	0.4	22-26	23.8	1.7	0.8
EW	5-6	6.8	0.5	0.3	5-5.4	6.6	0.4	0.2
TD	4-4.5	4.2	0.2	0.1	4-4.5	4.3	0.2	0.1
PL	13-15	14.0	0.8	0.4	12-14	12.8	1.0	0.5
PW	5-6	5.6	0.5	0.2	5-5.4	5.2	0.2	0.1

Bufo viridis Laurentii. Terentjev and Chernov [9] gave its distribution as Mediterranean countries, western Europe, U.S.S.R., western Mongolia and Iran. Khan [8] found them in Quetta and other areas of Baluchistan upto 7500 feet. Merten [10] distinguished N.W.F.P. population *B. arabicus*. Leviton [11] showed its presence in Afghanistan. Its presence from Chitral Distt, Gilgit, Hunza and adjoining areas upto Sost, which has 3,300 meter elevation, suggests that it is widely distributed in northern Pakistan almost at the level where *B. stomaticus* stops to exist. Its presence in U.S.S.R. and Iran through Pakistan and Afghanistan reveals its continuous distribution.

Distinguishing characters given by Terentjev & Chernov [9] and Khan [8] are quite contradictory for the presence of double subarticular tubercles. Present collection is according to Terentjev and Chernov [9] description for having single subarticular tubercle. However, variations in colour, and some other morphological characters are quite evident.

	Male (n = ?)				Female (n = ?)			
	Range	Mean	S.D.	S.E.	Range	Mean	S.D.	S.E.
SVL	55-72	65.3	5.9	2.2	52-68	60.7	5.9	2.2
HL	19-23	20.7	1.5	0.6	16-22	19.7	2.2	0.8
HW	21-25	23.1	1.5	0.6	18-23	20.9	2.3	0.9
EW	7-8.5	7.2	0.6	0.2	6.0-6.8	6.6	0.9	0.4
TD	1.8-3.5	3.0	0.6	0.2	1.6-3.5	2.9	0.6	0.2
PL	10-12	10.9	0.7	0.3	9-14	12.0	1.7	0.6
PW	6-8	7.4	0.7	0.3	6-9	7.5	0.9	0.3

Bufo sp. This species is similar to that of *stomaticus* or *viridis*, but absence of tympanum suggests that it is neither. In Pakistan, *B. surdus* and *B. himalayana* are reported to have indistinct tympanum. Presence of double subarticular tubercle on III finger in *surdus* and double tubercle and supraorbital crest in *B. himalayana* suggest that presently reported species is something else, because these characters are lacking in it. The author has only two juvenile specimens of this species collected from Garam Chashma (Distt. Chitral, N.W.F.P.). Adus are necessary to determine the identity of this potentially new species.

APPENDIX I

Collecting Sites

Islamabad (Federal Territory)

- | | |
|------------------------------------|-----------------------|
| (i) Chatter | (ii) Barakahu |
| (iii) Ramna sectors | (iv) Shalimar Sectors |
| (v) Margella | (vi) Rawal dam |
| (vii) Quaid-i-Azam University area | |

Northern west frontier province (N.W.F.P.)

Swat Distt.

- | | |
|----------------|---------------|
| (i) Ronyal | (ii) Mangora |
| (iii) Fazagutt | (iv) Shin |
| (v) Kandar | (vi) Nawagai |
| (vii) Badrigum | (viii) Rehlui |
| (xi) Bunar | |

Dir Distt.

- | | |
|--------------|---------------|
| (i) Chakdara | (ii) Dir |
| (iii) Wari | (iv) Toormang |

Chitral Distt.

- | | |
|---------------------------|--------------------|
| (i) Nagar | (ii) Gahriat |
| (iii) Daroosh | (iv) Garam Chashma |
| (v) Bareer (kafar valley) | |

Mardan Distt.

- | |
|--------------------------|
| (i) Circuit House Mardan |
|--------------------------|

(Continued)

(Appendix I, Continue)

Mansehra Distt.

(i) Dadar

Kohistan Distt.

(i) Thalich

(Continued on Column 2)

Federal Administered Northern Areas (FANA)

(i) Gilgit ii) Hunza

(iii) Gulmit (iv) Sost.

(v) Passu

APPENDIX II

Collecting sites	<i>Rana</i>						<i>Microhyla</i>		<i>Bufo</i>		
	<i>bre</i>	<i>syh</i>	<i>haz</i>	<i>tig</i>	<i>cya</i>	<i>sp</i>	<i>ornata</i>	<i>mel</i>	<i>sto</i>	<i>vir</i>	<i>sp</i>
Badrigum	-	-	-	+	+	-	-	-	+	-	-
Barakahu	+	+	-	+	+	-	+	+	+	-	-
Bareer	-	-	-	-	-	-	-	-	-	+	-
Bunar	-	-	-	+	+	-	-	-	+	-	-
Chakdara	-	-	-	+	+	+	-	-	+	-	-
Chattar	+	+	-	+	+	-	+	+	+	-	-
Circuit house	+	-	-	-	+	-	-	-	+	-	-
Dadar	-	-	+	-	+	-	-	+	+	-	-
Darosh	-	-	-	-	+	-	-	-	-	+	-
Dir	-	-	-	-	+	+	-	-	+	-	-
Fazagutt	-	-	-	-	+	-	-	-	+	-	-
Gahriat	-	-	-	-	-	-	-	-	-	+	-
Garam chashma	-	-	-	-	-	-	-	-	-	-	+
Gilgit	-	-	-	-	-	-	-	-	-	+	-
Gulmit	-	-	-	-	-	-	-	-	-	+	-
Hunza	-	-	-	-	-	-	-	-	-	+	-
Kandar	-	-	-	-	+	-	-	-	+	-	-
Mangora	-	-	-	+	+	+	-	-	+	-	-
Margalla	+	+	-	+	+	-	+	+	+	-	-
Nagar	-	-	-	-	+	-	-	-	-	-	-
Nawagai	-	-	-	-	+	-	-	-	+	-	-
Passu	-	-	-	-	-	-	-	-	-	+	-
QAU	+	+	-	+	+	-	-	+	+	-	-
Ramna sector	+	+	-	+	+	-	+	+	+	-	-
Rawal dam	+	+	-	+	+	-	+	+	+	-	-
Ronyal	-	-	-	+	+	-	-	-	+	-	-
Shalimar sector	+	+	-	+	+	-	+	+	+	-	-
Shin	-	-	-	+	+	-	-	-	+	-	-
Sost	-	-	-	-	-	-	-	-	+	-	-
Tehlui	-	-	-	+	+	-	-	-	+	-	-
Thalachi	-	-	-	-	-	-	-	-	-	+	-
Toormang	-	-	-	-	+	-	-	-	+	-	-
Wari	-	-	-	-	+	-	-	-	+	-	-

Present (+), Not reported (-), Significant variations (?) *breviceps* (*bre*), *syhadrensis* (*syh*), *hazarensis* (*haz*), *tigerina* (*tig*), *cyanophly-*

ctis (*cya*), *species* (*sp*), *melanostictus* (*mel*), *stomaticus* (*sto*) & *viridis* (*vir*).

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