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Dataset of Little Terrestrial Mammals and Birds in Barun Valley, Himalaya, Nepal (1973)

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Abstract: The article is based on collection of 139 small terrestrial mammals and 94 birds collected in the Barun Valley, Mt. Makalu region, Himalaya, eastern Nepal, at altitudes of 3,450–5,950 m above sea level, during the Czechoslovak Expedition to Makalu in the pre-monsoon period of 1973. Zoogeographic and ecological characteristics and altitudinal stratification of collected species are analyzed, depending on both abiotic (geomorphological and climatic) and biotic (vegetation, and human presence and activities) factors. All the captured animals were examined for ecto- and endoparasites. Infestations of ixodid ticks and trombiculid chigger mites were tightly linked to the local habitat where these ectoparasites must survive during their non-parasitic phase. Analysis of their occurrence completes the reconstruction of migration routes during the expansion of small mammals into the Barun Valley and the influence of human activities (summer pasturing, mountaineering expeditions, trekking parties, etc.). The potential medical importance of these findings is discussed. It is assumed a possible occurrence of arboviruses transmitted by ixodid ticks and also rickettsioses (transmitted by ticks and trombiculid mites). The data is archived in .xlsx, .jpg, .kmz and .shp data format, and the compressed data size is 23.2 MB.

Keywords: Nepal; Himalaya; Barun-Makalu region; small mammals; birds; ixodid ticks; trombiculid mites

1 Introduction

Our study area was the valley of the Barun Glacier and the Barun Khola River[1–2]. This area is not permanently settled and is only partly used as summer pasture, mainly in the higher part up to the front of the Barun Glacier. Thus it is possible to follow the gradual influence of human activity on this high mountain environment. Makalu Barun National Park (1,500 km^2) with a buffer zone (830 km^2) was established in 1992 in this territory. So our data and analysis document were twenty years before of the nature conservation in this area. It has been designated as a Strict Nature Reserve, the first in Nepal, in order to protect natural ecosystems and processes in an undisturbed state for scientific study, environmental monitoring, education and the maintenance of genetic resources[3].

Many publications concern geomorphological and glaciological characteristics of this re-

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gion. Attempts to reconstruct the glaciation of this area reveal the substantial extent of the Late Glacial-, Neoglacial- and historical glaciations of the Barun Valley[4–5]. These can be explained by the catchment areas exceeding an altitude of 7,000−8,000 m. Kalvoda published a detailed geomorphological characterization and described the dynamics of its evolution based on his own findings[6–8]. The physical characteristics of the Makalu-Barun region have been studied since the middle of the 20th century, mainly focusing on geology, geophysics, geomorphology and physical geography. In the context of environmental problems and geo-ecology, publications have dealt with human disturbance[9], forest ecology[3] and landscape analyses using satellite data[10–11].

Hitherto, zoological studies in the Barun Valley have been sporadic. Gregori and Petrov[12] reported small terrestrial mammals collected during the Yugoslav Himalayan expedition to Makalu in 1972, six months prior to our expedition. Our collections of small terrestrial mammals and their ectoparasites (chigger mites and ixodid ticks) are discussed in the paper[1]. Other publications concern birds in the Barun Valley[13], fleas of small mammals[14], chigger mites[15], mites[1–17] and parasitic helminths[18–20]. Soil micromycetes in samples collected up to 4,900 m have also been described[21].

Our present study focused on the occurrence of small terrestrial mammals tightly linked with a particular habitat in the Barun-Makalu region. Their ectoparasites, which have particular zoogeographical affiliations, were also considered.

Expansion of animals (both wild and grazed agricultural animals) and their haematophagous parasites (mainly ixodid ticks[22]) in newly exposed areas introduces the risk of vector-borne diseases caused by viral and bacterial pathogens circulating among vertebrates by means of vectors-haematophagous ectoparasites. Under particular circumstances they are transmissible to humans and can cause severe and even fatal disease. It is assumed a possible occurrence of arboviruses transmitted by ticks and also rickettsioses transmitted by ticks and chigger mites.

Our main intention is to determine the altitudinal limit of risk of the vector-borne diseases occurrence based on the analysis of environmental conditions required for the survival of small terrestrial mammals and their parasites, and to estimate possible further development of this risk linked with observed changes in climate, glaciations and human activities.

2 Metadata of Dataset

The metadata summary of the dataset of little terrestrial mammals and birds in Barun Valley, eastern Nepal (1973) was recorded at Table 1[2]. The information include the dataset full name, short name, author, geographical region of the dataset content, year of the dataset, spatial and temporal resolution, dataset format and size, data publisher and data sharing policy. The information of photos was listed in Table 2.

3 Methods

3. 1 Study Area and Sample Sites

Small mammals and birds were collected in the Barun Valley (the region of Mt. Makalu 8,475 m in Eastern Nepal)**,** which is formed by the Barun Glacier and the Barun Khola River rising from it. The river is the right tributary of the Arun River.

Table 1 Metadata summary of the little terrestrial mammals and birds in Barun Valley, eastern Nepal (1973)

Items	Description
Dataset full name	Little terrestrial mammals and birds dataset in Barun Valley, eastern Nepal (1973)
Dataset short name	TerMamBirdData BarunValleyNepal_1973
Author	Daniel, M. 0000-0002-9768-6445, National Institute of Public Health, midaniel@seznam.cz
Geographical region	Barun Valley, Himalaya, Nepal 27°44′20.86″N to 27°51′47.50″N; 87°11′15.04″E to 87°05′16.08″E
Year	1973
Data format	.xlsx, .jpg, .kmz, .shp
Data size	23.2 MB (Compressed)
Data files	Dataset is composed of 5 parts: (1) Geo-locations of 7 localities in this study; (2) 16 photos in the survey; (3) Table of 139 small terrestrial mammals collected; (4) Table of 94 birds collected, (5) Table of ixodid ticks
Data publisher	Global Change Research Data Publishing & Repository, http://www.geodoi.ac.cn
Address	No. 11A, Datun Road, Chaoyang District, Beijing 100101, China
Data sharing policy	***Data*** from the Global Change Research Data Publishing & Repository includes metadata, datasets (data products), and publications (in this case, in the *Journal of Global Change Data & Discovery*). ***Data*** sharing policy includes: (1) ***Data*** are openly available and can be free downloaded via the Internet; (2) End users are encouraged to use ***Data*** subject to citation; (3) Users, who are by definition also value-added service providers, are welcome to redistribute ***Data*** subject to written permission from the GCdataPR Editorial Office and the issuance of a ***Data*** redistribution license; and (4) If ***Data*** are used to compile new datasets, the 'ten per cent principal' should be followed such that ***Data*** records utilized should not surpass 10% of the new dataset contents, while sources should be clearly noted in suitable places in the new dataset[23]

There were selected seven localities (in a span of altitude 3,450−5,950 m) of differing configuration of the terrain relief, the current environmental conditions, and geomorphologic, and glaciologic history (Figure 1). At these locations the collection was carried out in all local habitats (biotopes) allowing the occurrence of small terrestrial mammals. These places are in the further text designated as collection sites.

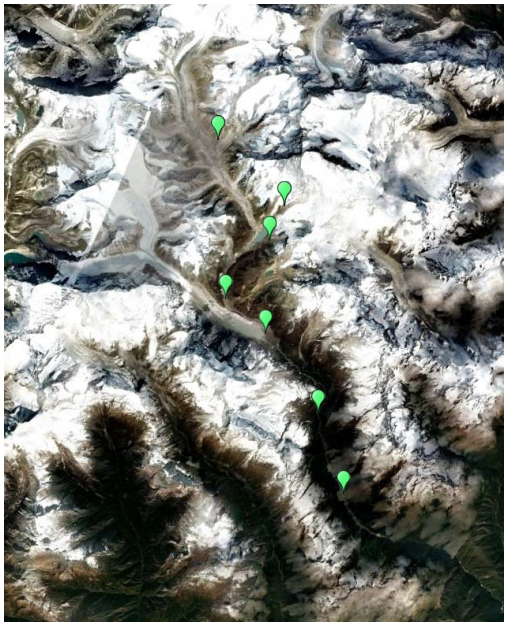

Figure 1 Locations of sample sites

Native names are used for localities in this study: Phematan, 27°44′20.86″N, 87°11′15.04″E, 3,483 m above sea level; Yanle Khalka, 27°46′21.31″N, 87°09′15.72″E, 3,743 m; Tadosa, 27°47′59.25″N, 87°06′26.43″E, 4,555 m; Shershon, 27°48′29.00″N, 87°04′40.07″E, 4,752 m; Front of the Barun Glacier, 27°50′40.01″N, 87°05′16.08″ E, 4,930 m; Junction of the Barun and Chago Glacier, 27°52′49.80″N, 87°02′14.32″ E, 5,490 m; Top of the rock tower at the base of the SW face of Mt. Makalu, 27°51′47.50″N, 87°05′16.08″E, 5,950 m. Geographic coordinates and altitudes were acquired from Google Earth, version 4.3 (http://earth.google.com). Altitudes were also

measured directly at the sample sites using an aneroid altimeter.

Environmental characteristics of the sample sites (in 1973) were as follows (Figure 1):

1. Phematan: 1A—Fluvial terrace on the valley floor, on the right bank of the Barun Khola River (running from NWW to SEE), comprised coarse sandy or gravel material over grown with turf. The terrace was bordered by a humid coniferous forest mixed with rhododendrons. In summer the terrace serves as pasture and an occasional camping site for shepherds. 1B—Fluvial terrace on the left bank of the Barun Khola River, densely overgrown with low creeping shrubs and partly covered with large rock fragments, devoid of any traces of human activity. 1C—Agglomeration of rock fall with coarse sandy material, covered with turf and moss, on the left bank. 1D—Forest margin near the preceding biotope, with numerous uprooted trees, on the left bank.

2. Yanle Khalka: 2A—River terrace dating from the Holocene, composed of coarse gravel and boulders covered with sand, with the vegetation strongly modified by grazing, when the terrace is inhabited by shepherds. 2B—Edge of a fir-tree forest (*Abies spectabilis* and rhododendrons). 2C—Fluvioglacial terrace with chaotic piles of rocky blocks, covered with boulders and scattered areas of turf. The uneven surface of the terrace is a result of intensive periglacial processes. 2D—Fir-tree forest on the end of a talus slope. 2E—Edge of a fir-tree forest with numerous uprooted trees.

3. Tadosa: 3A—Loamy screes under rock walls of the eastern side of the valley. The surface consists of a sandy accumulation resulting from perennial melt water from snow fields, and is overgrown with *Lonicera* sp. 3B—River banks and moraines in front of the Lower Barun Glacier, with willow shrubs. 3C—Sandy-debris talus fixed by vegetation (rhododendrons, tsuga, willows, developed herb layer), serving as summer pasture.

4. Shershon: 4A—Depression between the fossil moraine and the right side of valley covered with debris and sandy material. Turfs and creeping rhododendrons are present. 4B—Surface of the washed out fluvioglacial cone on the floor of the valley where a stone enclosure for temporary round-up of sheep and goats had been built at the highest level of the valley which was utilized as pasture. 4C—Southern edge of the sub-recent moraine front of slope glacier in the eastern face of Peak IV, contacting the edge of the plateau of fine granular lacustrine sediments.

5. Front of the Barun Glacier: 5A—The base camp of the expedition at the base of Late Pleistocene fossil moraine. 5B—Boulders scattered at the base of a large fossil moraine. 5C—Sub-Recent moraine of slope glacier of the face of Peak IV. 5D—The upper part of the fossil moraine of the Barun Glacier. The surface has formed periglacially and is covered with initial polygonal soils. 5E—The left side of the valley, the Holocene lateral fossil moraine of the Barun Glacier.

6. Junction of the Barun and Chago Glacier: 6A—Rampart of a Holocene moraine above the junction of the glaciers, formed by chaotic block accumulations. In this site Camp 1 of the French climbing expedition was pitched in 1954, 1955 and 1971. 6B—NW of the preceding biotope, about 500 m away, there are stone fields developed in the form of slope block deposits.

7. The top of the rock tower at the base of the SW face of Mt. Makalu: at the end of a rock ridge between hang glaciers. The only ice-free way leading to this site is crossing precipitous slopes covered by rock debris.

Information on photos taken by Milan Daniel in 1973 was listed in Table 2.

Table 2 Photos by Milan Daniel in Barun Valley, eastern Nepal (1973)

No. of photos	Description of the photo	No. of photos	Description of the photo
1	The Phematan locality (3,450 m) —river terrace where *Episoriculus caudatus soluensis, Soriculus nigrescens centralis, Niviventer eha eha* and *Neodon sikimensis sikimensis* were found	9	A lacustrine terrace in place of the emptied glacial lake in the foreland of the Barun Glacier. This lake caused a discontinuity of the small terrestrial mammals fauna still apparent today
2	The Barun Valley, section between the Phematan (3,450 m) and Yanle Khalka (3,600 m) localities	10	The base camp of the Czechoslovak expedition (1973) near the front of the Barun Glacier at the foothill of a fossil moraine (4,900 m) where voles *Alticola stoliczkanus* concentrated during the expedition activity
3	The Phematan locality (3,450 m)—a heap of old shattered rocks, with rich vegetation, a typical biotope of the pika *Ochotona roylei roylei*	11	The top of fossil moraine at the junction of the Barun and Chago Glaciers (5,450 m) —the highest site where *Alticola stoliczkanus* was trapped
4	The Yanle Khalka locality (3,600 m) — a plateau in the vicinity of the summer hut of herdsmen where *Neodon sikimensis sikimensis* occurred	12	A panorama of western side of the Barun Glacier valley taken from the place of junction of the Barun and Chago Glaciers (see Figure 11)
5	The Yanle Khalka locality (3,600 m) — trees damaged by herdsmen cutting branches as firewood	13	The end of the Barun Glacier valley. The mountain Lhotse (8,501 m), Lhotse Shar (8,330 m) and Mount Everest (8,848 m) are on the horizon (from left to right)
6	The Tadosa locality (3,900 m)—the mountain cloud forest, grade of coniferous trees *(Abies spectabilis)* with rododendrons	14	Beyond the top of a black rock tower (5,950 m) at the Makalu foothill was the highest site where *Ochotona roylei roylei* was trapped (see also Figure 15)
7	The Tadosa locality (3,900 m)—the timber line	15	The top of rock tower shown in Figure 14; the highest site where *Ochotona roylei roylei* was trapped
8	The Tadosa locality (3,900 m) —characteristics of the valley immediately above the timber line	16	The pika *Ochotona roylei roylei* (Phematan locality, 3,450 m)

3.2 Field Collection

Small terrestrial mammals were collected using snap-traps. The traps were set in sites showing traces of small mammal activity. They were set at each site for 48 hours and examined twice daily, in the morning and the evening. In all the collection sites, trapping was supplemented with the shooting of pikas.

Altogether 139 small terrestrial mammals were collected (Table 3) and evaluated taxonomically[24]. At the same time, birds were collected in the same localities. Most of them were shot by gun and only a few were caught in nets. A total of 94 birds of 28 species were collected (Table 4): Galliformes (three species), Charadriiformes (one), Columbiformes (one), Coraciiformes (one) and Passeriformes (22 species). They have been evaluated taxonomically by Daniel and Hanzák[13].

All specimens collected were weighed, measured and examined for ectoparasites. Collections have been deposited in the Department of Zoology of the National Museum in Prague.

3.3 Evaluation of Field Findings

To compare the results of small mammal trapping obtained in different localities and biotopes, the number of traps and the duration they were set is expressed by the ratio of number of trap-days. The total number of trap-days during the expedition amounted to 13,626. In-

festation of small mammals by ixodid ticks in specific localities is expressed as the number of infested specimens from the total number of collected animals (Table 3).

Table 3 Distribution of small terrestrial mammals by locality found in the Barun Valley (1973)

Locality	Date	Species	Number
Phematan	25/03−4/04	*Episoriculus caudatus soluensis*	4
3,450 m		*Soriculus nigrescens centralis*	7
		Neodon sikimensis sikimensis	44
		Niviventer eha	2
		Ochotona roylei roylei	7
Yanle Khalka	4−9/04	*Episoriculus caudatus soluensis*	3
3,600 m		*Soriculus nigrescens centralis*	4
		Neodon sikimensis sikimensis	35
		Ochotona roylei roylei	1
Tadosa	12−19/04	*Neodon sikimensis sikimensis*	17
3,900−4,000 m			
Shershon	26/04−2/05	*Neodon sikimensis sikimensis*	3
4,600 m			
Front of the Barun Glacier	21/04−14/05	*Alticola stoliczkanus*	9
4,900 m		*Ochotona roylei roylei*	1
Junction of Barun and Chago Glaciers	8/05	*Alticola stoliczkanus*	1
5,450 m			
Top of the rock tower SW face of Makalu	8/05	*Ochotona roylei roylei*	1
5,950 m			
Total			139

4 Results and Validation

4.1 Altitudinal Distribution of Small Terrestrial Mammals

The results are summarized in Table 3. Representatives of the Soricidae (*Soriculus nigrescens* and *Episoriculus caudatus*) were found only in the first two valley zones described (Phematan and Yanle Khalka). Soricidae have not extended their range to higher altitudes, although suitable biotopes (primarily the forest composed of *Abies spectabilis*, drained by rivulets and with humid sparsely overgrown places) exist (Tadosa locality). Similar observations apply to *Niviventer eha.*

Neodon sikimensis is the most abundant small terrestrial mammal in the Barun Valley penetrating, ranging from the lowest zone to the level of the second lacustrine terrace in front of the sub-recent moraine of the Barun Glacier. The great ecological adaptability of this species enables it to occupy all biotopes with favorable vegetation cover in the lower part of the valley, irrespective of their ages and origins. In the higher part of the valley, this species inhabits the fossil moraines stabilized by present day vegetation (primarily rhododendrons). As for the configuration of terrain, the upper boundary line of its observed distribution is formed by the sub-recent moraine of the hanging glacier tongue on the eastern face of Peak IV, which originally participated in the obstruction of the middle glacial lake.

Table 4 Distribution of birds by locality found in the Barun Valley (1973)

Locality	Date	Species	Number
Phematan	25/03−4/04	*Parus dichrous dichrous* Hodgson	1
3,450 m		*Troglodytes troglodytes nipalensis*	2
		Aethopyga ignicaudata ignicaudata	1
		Corvus macrorhynchos	1
Yanle Khalka	4−9/04	*Ithaginis cruentus cruentus*	2
3,600 m		*Pycnonotus leucogenys leucogenys*	2
		Erithacus hypererythrus	1
		Chaimarrornis leucocephalus	3
		Phoenicurus frontalis	1
		Phylloscopus proregulus chloronotus	1
		Muscicapa strophiata	1
		Anthus sylvanus	1
		Motacilla alba personata	2
Tadosa	12−19/04	*Ithaginis cruentus cruentus*	2
3,900−4,000 m		*Lophophorus impejanus*	1
		Parus rubidiventris rubidiventris	1
		Pycnonotus leucogenys leucogenys	1
		Erithacus hypererythrus	1
		Phoenicurus frontalis	3
		Anthus roseatus	2
		Carpodacus puniceus puniceus	1
		Mycerobas carnipes carnipes	3
Shershon	26/04−4/05	*Tetraogallus tibetanus aquilonifer*	1
4,600 m		*Tringa ochropus*	1
		Columba leuconota	2
		Calandrella cinerea dukhunensis	1
		Phoenicurus frontalis	3
		Prunella collaris nipalensis	8
		Prunella strophiata strophiata	7
		Anthus roseatus	1
		Carpodacus puniceus puniceus	2
		Leucosticte brandti	2
Front of the Barun Glacier	21/04−14/05	*Tetraogallus tibetanus aquilonifer*	2
4,900 m		*Upupa epops saturata*	1
		Alauda gulgula gulgula	1
		Pyrrhocorax graculus digitatus	4
		Phoenicurus frontalis	3
		Prunella collaris nipalensis	13
		Prunella strophiata strophiata	1
		Leucosticte brandti	7
Total			94

Table 5 Tick infestation of small terrestrial mammals in the Barun Valley region

Locality/Date	Biotope	Hosts	Host number infested / trapped	Ticks infesting trapped mammal	
				Species	Stage* and number
Phematan 3,450 m 25−28/ 3, 1973	Forest edge on river terrace	*E. caudatus*	0/5		
		S. nigrescens	1/7	*Ixodes ovatus*	1 L
		N. eha	0/2		
		N. sikimensis	13/44	*Ixodes ovatus* *I. acutitarsus*	1 L +12 N 2 L
		O. roylei	0/7		
Yanle Khalka 3,600 m 4−10/ 4, 1973	Surroundings of shepherd's summer shelter	*E. caudatus*	0/3		
		S. nigrescens	0/4		
		N. sikimensis	7/35	*Ixodes ovatus*	1 L + 7 N
		O. roylei	0/1		
Tadosa 3,900−4,000 m 12−19/4, 1973	Pastureland on old debris	*N. sikimensis*	7/17	*Ixodes ovatus*	18 L + 12 N
Shershon 4,600 m 26/4−2/5, 1973	Moraine	*N. sikimensis*	0/3		
Front of Barun Glacier 4,900 m 21/4−14/5, 1973	Fossile moraine	*A. stoliczkanus*	0/9		
		O. roylei	1/1	*Ixodes ovatus*	1 N
Confluence of Barun-Chago Glaciers 5,450 m 10/5, 1973	Fossile moraine	*A.stoliczkanus*	0/1		
SW rib of Mt. Makalu, 5,950 m 8/5, 1973	Camp 1 of the Czech expedition	*O. roylei*	0/1		

* L—Larva; N—Nymph

The occurrence of *Alticola stoliczkanus* follows the upper range of *N. sikimensis*. The accumulated surface formations described and designated as the upper limit of the distribution of *N. sikimensis*, demarcate the lower limit of the distribution of *A. stoliczkanus*. This species is a distinct hypsobiont in a landscape otherwise devoid of small terrestrial mammals. Despite the fact that *Ochotona roylei* was found at the highest altitude, its distribution is concentrated in much lower elevations, primarily in the section between Yanle Khalka and Tadosa. A photo of *Ochotona roylei* by Milan Daniel was shown in Figure 2.

Comparison of the results obtained in all localities where *N. sikimensis* occurred (Table 3) reveals how the presence of humans and pastured sheep flocks as well as economic activities producing heaps of organic waste in otherwise sterile landscape, can affect the occurrence of this species, which is showing a tendency towards synanthropy.

Association of *A. stoliczkanus* with higher elevations of the valley is seen from Table 3. The occurrence of this species also was notably influenced by human activities. Table 3 shows how the base camp of the mountaineering expedition, with stored foodstuffs and concentrated garbage, attracts *A. stoliczkanus.* The animals concentrated in locality 5A within three weeks of the base camp being established.

Figure 2 The pika *Ochotona roylei roylei* (Phematan locality, 3,450 m), by Milan Daniel, 1973

The highest altitude at which *A. stoliczkanus* was found (5,450 m—locality 6A) topographically coincides with an islet of Alpine tundra vegetation. Even in this case, however, the survival of local population may have been affected by human activities: in this locality the camps of French expeditions were pitched in 1954, 1955 and 1971. A considerable amount of garbage (primarily tin cans and other packaging) suggests that in those years there was an unusual supply of food for small terrestrial mammals.

Our finding of the pika *O. roylei* at 5,950 m is also evidence of human influence on the Alpine fauna. This pika was found at the site of camp 1 of the Czechoslovak mountaineering expedition, and also in the previous year (in the autumn post-monsoon period 1972) a camp of the Yugoslav expedition to Makalu was pitched there. It is situated above the snowline and is devoid of any vegetation except for lichens on rocks. The animal, in order to reach this place, had to overcome a slope of unconsolidated debris. The Czech camp (4 tents) was supplied with foodstuffs which attracted the animal.

4.2 Origin of Small Terrestrial Mammals in the Barun Valley Region

Comparison of the presented occurrence (1973) of fauna and flora and the detailed geomorphological situation in the Barun region, primarily in the key sector between the southern part of the Makalu massif and the tongue of the Lower Barun Glacier near Shershon, facilitates an ecological reconstruction of relations between oscillations of mountain glaciation and the spread of small terrestrial mammals since the Late Pleistocene until the present time. Based on our analyses, predictions can be made about the probable future spread of small terrestrial mammals in Barun Valley region.

First, it is most likely that *N. sikimensis* will advance to places close to the present front of a glacier. For this there are biocenotic as well as climatic conditions and the extensive summer pasturing of sheep as high as these elevations may further accelerate this process. Even today we can see by the burrowing activity of *N. sikimensis* how the presence of man and pastured animals affect the occurrence of this vole species, e.g., in Shershon (see locality 4B). Their traces may be observed around the stone enclosure serving for the temporary round-up of cattle, but not in the extensive surroundings.

The greatest changes in the colonization may be anticipated in the highest part of the Barun Valley. However, it should be borne in mind that in newly exposed places the climate is more severe than near the front of a glacier. Aridity accompanying an extremely cold climate plays an important role here for the regression of ice masses and can be endured only by representatives of distinct psychrophilic hypsobionts, such as *A. stoliczkanus* and *O. roylei*. Consequently, it may be anticipated that their population will gradually increase and the islet-like character of their distribution will be preserved according to local conditions. Even human activities may play a positive role. This is indicated by the concentration of *A. stoliczkanus* in and around the base camp and by the penetration of *O. roylei* into camp I of the Czechoslovak expedition (locality 7), the stored foodstuffs and garbage being the main attraction to them. This factor cannot be ignored given the ever-increasing frequency of mountaineering expeditions and trekking parties.

5 Discussion and Conclusion

All the trapped animals were examined for the presence of ecto- and endoparasitic infestation. Some of the results provided important information supplementing knowledge of the migratory routes of small mammals in the Barun Valley during glacial recession and of the role of human activity.

Only the first active developmental stage (larva) of chiggers (family Trombiculidae) parasitizes an animal hosts (including man), while the succeeding stages (nymph and adult) live in the organic detritus and upper soil layers as typical edaphic organisms (pedobionts). In the Barun Valley, five species were found, of which three new species were described[10]. Most numerous (515 specimens) were *Trombiculindus mehtai*, previously known only as four specimens from Sikkim (3,200−3,800 m), parasitizing *Neodon sikimensis*. *T. mehtai* has followed this host in the Barun Valley along the whole vertical scale of its occurrence (3,450−4,600 m), not only in all localities but also in all collection sites of different habitats, except Yanle Khalka, 2A. Regarding other hosts, it was found only on six specimens of *Ochotona roylei* (3,450−3,600 m). The firm linkage of *T. mehtai* with its host *N. sikimensis* and particularly their common occurrence in all localities and habitats strongly indicate coincidental migration. A striking association of *T. mehtai* with the habitat it colonizes without any possibility of active spreading is evidence that the distribution of this species in the Barun Valley and its adaptation to particular habitats has been a lengthy process without any influence from human activities. The species of *I. acutitarsus* presents a different picture. There is no doubt that it is an oriental element extending to higher elevations, often through human economic activities, as confirmed by our collections. The adult ticks attack various medium-sized to large wild and domestic animals as well as humans, and the immature stages parasitize rodents and insectivores.

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