

LOCALIZATION OF SPECIES OF THE GENUS *NEOTROMBICULA* (ACARIFORMES, TROMBICULIDAE) ON VERTEBRATES OF KYRGYZSTAN

(LOCALISATION DE CERTAINES ESPECES DU GENRE *NEOTROMBICULA* (ACARIFORMES, TROMBICULIDAE) SUR LES VERTEBRES DU KIRGHIZISTAN

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LARVA
NOURISHMENT
LOCALIZATION
TOPOGRAPHICAL ZONE
PARASITE
AND HOST RELATIONSHIP

SUMMARY: The larvae of genus *Neotrombicula* (18368 from 166 animals of 13 species belonging to 10 taxons) are collected. The twelve areas of localization on hosts' body are consolidated into three zones: 1- cochlea (inside, on edge and outside an ear), 2- genitals-anus (around genitals, anus, and under the tail), 3- others (back, loins, belly, breast, chin and/or around the eyes).

The quantitative distribution of the species of genus *Neotrombicula* in various places and zones of satiation of larvae on a breadwinners' body is rated in this article. The regularity and features of larvae's fixing on various species of animals amenably to months and seasons of year are discussed. The data of researches about a phenomenon of a joint nourishment of species of genus *Neotrombicula* with representatives of other genera are cited.

LARVE
NUTRITION
LOCALISATION
ZONE TOPOGRAPHIQUE
RELATION HÔTE PARASITE

RESUMÉ : Les larves du genre *Neotrombicula* (18368 larves appartenant à 10 taxons et collectées sur 166 animaux représentants de 13 espèces hôtes) sont déterminées. Les douze zones de gorgement sur les hôtes définissent 3 grandes zones : l'oreille (intérieur, extérieur sur le pavillon); la région génitale et l'anus (y compris sous la queue) et les autres (dos, ventre, poitrine, reins, menton et autour des yeux). Dans cet article, la distribution spatiale des espèces du genre *Neotrombicula* est étudiée ainsi que les zones de satiété des larves sur le corps des hôtes. Les caractéristiques et la répartition des larves selon les mois et les saisons sur les différents genres d'hôtes sont étudiées. On compare les données communes de la prise de nourriture des larves de *Neotrombicula* avec celles des représentants des autres genres.

INTRODUCTION

The larvae of chigger mites are temporary parasitic on a wide range of vertebrates, with feebly marked

specificity in a choice of the host. The distribution of mites adapted to defined group of animals depends on spreading of hosts, and on abiotic factors. The development of chigger mites needs a phasic larval

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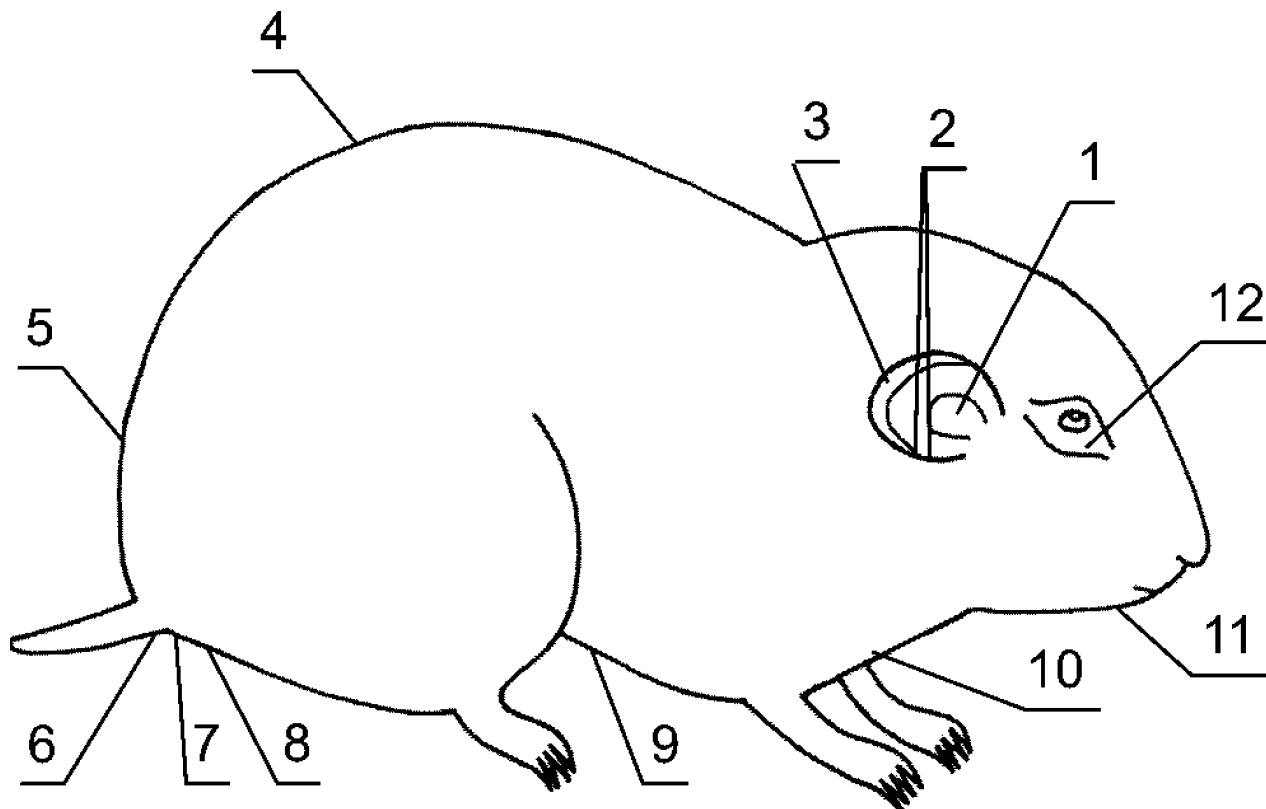


FIG. 1: Localization of some species of genus *Neotrombicula* on host's body: 1 — on inside of an ear, 2 — on edge of an ear, 3 — on outside of an ear, 4 — a back, 5 — loins, 6 — under a tail, 7 — an anus, 8 — genitals, 9 — a belly, 10 — a breast, 11 — a chin, 12 — eyes.

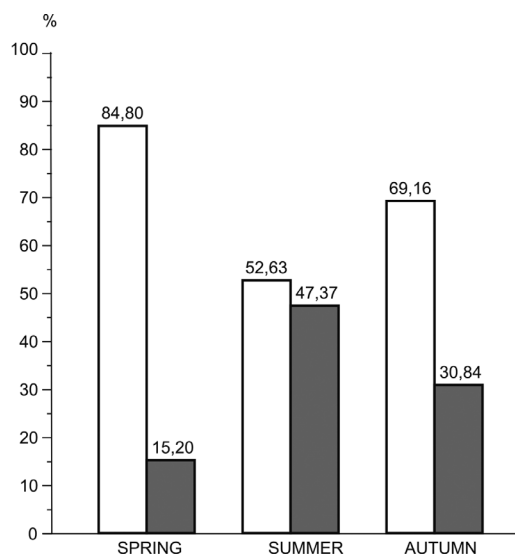


FIG. 2: Localization on host of the genus *Neotrombicula*. — Topographical zones: — cochlea, — genitals-anus, — other.

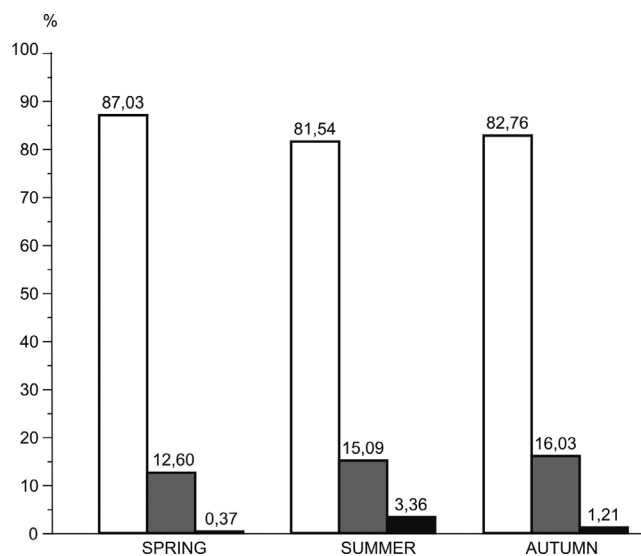


FIG. 3: Seasonal distribution of the genus *Neotrombicula* (fed individuals and found in samplings) Larvae: — fed, — in samplings.

parasitism. The concentration and efficiency of larvae nourishment are rather high (SHATROV 2000). Nymph and imago are predators feeding on small invertebrates and their eggs. The species of mites parasitizing on representatives of more ancient classes of vertebrates (amphibians, reptiles and birds) are largely specific, than it is revealed in relations with mammals. Choosing a place on the host, the mites prefer cochlea, and anus and genitals. The cycle of Trombiculidae is characterized by three quiescent stages: egg, protonymph (nymph chrysalis), tritonymph (imago chrysalis); and by three active phases: larva, nymph (deutonymph) and adult. The chigger mites have the spermatophoric insemination (external-internal) and are oviparous.

An important parameter in the cognition of features of host-parasite relation is the choice of concrete area of the body by certain species to various groups of ectoparasites. Nevertheless, this question remains insufficiently investigated for the species of most of parasitic arthropods. The study of topical specificity of Ereynetidae mites has shown that the typical site of these mites is an ethmoturbinal bone of animals and less often other areas of respiratory tract of hosts (ZABLUDOVSKAYA 1994). The gamasid mite *Varroa jacobsoni* Oudemans, 1904 prefers to feed on hemolymph under edge of an abdominal segment of a bee (AKIMOV *et al.* 1988). The rhinonyssides (genera *Sternostoma*, *Sternostomoides*, *Ptilonyssus*, and *Passeronyssus*) were parasitizing together in the nasal cavity of thrushes (BUTENKO & STANYUKOVICH 1999). GREBENYUK (1966) identified the localization of 10 species of ticks (Ixodidae) on wild and domestic animals. The nourishment of larvae of chigger mites of genus *Neotrombicula* inside cochleae of rodents, and the parasitizing of species of genus *Leptotrombidium* along the edge of ears has been revealed (KHARADOY 1992, MITROPOLSKAYA 2002). The nourishment of larvae of chigger mites of genus *Eutrombicula* under scales on a tail of the lizard has been ascertained (VERCAMMEN-GRANDJEAN & AUDY 1965). The localization of two subspecies of chigger mites of genus *Whartonia* on wings, around of the anus, the ears and genital tracts of hosts has been ascertained (VERCAMMEN-GRANDJEAN *et al.* 1965). The habitat of eight species of three genera (*Walchia*,

Schoengastiella and *Schoutedenichia*) in mammals' nasal cavities was revealed (VERCAMMEN-GRANDJEAN 1975).

These works described the character of nourishment but did not give a quantitative evaluation or the "species-specificity" of the parasites to the defined place of localization. With the exception of S. KONSTANTINOV's work (1995) which contains the maps of the layout of 22 areas of a cow's body where 12 species of horse-flies (Tabanidae) used to stick to. The degree of similarity and distinction between topography of different species were evaluated as well.

The distribution on the body of 13 species of hosts-breadwinners of 10 species of genus *Neotrombicula* Hirst, 1925 and their zones of localization are cited in the present work.

The regularities and features of larvae's nourishment amenably months and seasons of year are revealed. The phenomenon of simultaneous fixing with other taxons of chigger mites is considered.

MATERIALS AND METHODS

The mammals, and less often birds, chiropters and arthropods serve for mites of genus *Neotrombicula* as basic hosts. Fourteen species representing three subgenera *Neotrombicula*, *Digenulea* and *Polymasticula* are found in Kyrgyzstan. When engorged, the size of the idiosome of satiated individuals of increases from 1.69 up to 3 times. Many of these species are with wide distribution. The larvae were taken off from 166 animals and were collected in tracts of ridges, namely:

Kirghiz ridge (Ala-Archa, Alamedin, Ak-Suu, Kegety, Cholok-Kaindy, Tuyuk, Boom, Kuvaky, Belogorka), **Kungey Ala-Too** ridge (Baysorun, Sukhaya Shel, Kyrchyn, Kichi-Uriukty), **Teskey Ala-Too** ridge (Semiz-Bel), **Chatkal** ridge (Sary-Chelek reservation, bottom-land of Chatkal river), **Alay** ridge (Irkeshtam), **Borkoldoy** ridge (Ashu-Suu); and **Issyk-Kul** Lake basin (Ottuk), **Chui** Valley (Tokmok hunting ground) and **Kochkor** Valley (Ak-Zhar) as well.

The mammal hosts were Insectivorous, Rodentia and Lagomorpha:

Insectivorous	Tien Shan shrew lesser white-toothed shrew	<i>Sorex (S) asper</i> Thorn., <i>Crocidura suaveolens</i> (Pall.);
Rodents	grey hamster silvery high-mountain vole Tien Shan vole common vole Kirghizian vole wood mouse field mouse house mouse Turkestani rat	<i>Cricetulus migratorius</i> (Pall.), <i>Alticola (A.) argentatus</i> (Severtz.), <i>Clethrionomys (Cl.) centralis</i> (Mill.), <i>Microtus (M) arvalis</i> (Pall.), <i>Microtus (M) kirgisorum</i> (Ognev), <i>Apodemus (S.) sylvaticus</i> (L.), <i>A. (A.) agrarius</i> (Pall.), <i>Mus (M.) musculus</i> (L.) <i>Rattus (R.) turkestanicus</i> (Satun);
Lagomorphs -	big-eared pika	<i>Ochotona (C.) macrotis</i> (Gunth.).

From these hosts, 18368 larvae belonging to ten species are gathered, 5090 among them are marked in samplings. The satiation of mites is ascertained on 12 different areas of the host's body, which are consolidated into three topographical zones;

- **cochlea** (on inside, on edge and on outside of an ear),
- **genitals-anus** (under a tail, around genitals and anus),
- **others** (back, loins, belly, breast, chin, and eyes) (FIG. 1).

The mites were gathered basing on methods of ZHOVITY & SCHLUGER (1957) and HUSCHA (1961) with some additions. In particular, the stuck larvae are cautiously cut out together with section of skin and then were preserved in 75° alcohol. Furthermore, the topography of the larva (inside a cochlea, genitals, etc.) was noted on a label together with the standard data (the parasitological number, the date and the place of gathering, the host, the station). In the process of whole mount preparation, this information was transferred to the object-plate. The animals were combed out into a cuvette or onto a white sheet of paper. The received substratum, rodents and sacks were looked through under a microscope MBS-1. The stereomicroscope MBS-9 was applied at manufacturing of preparations. The preparations were dried in thermostatic oven 2B-151 at temperature from +50 to +57°C within three or four days. For the identification of larvae, a biological microscope MBI-6 was used. All gathered materials are kept in the collection of the Laboratory of Arthropod Zoology of the Institute for Biology and Pedology of the

National Academy of Science of the Kyrgyz Republic (in Bishkek).

RESULTS

In March, 220 larvae of genus *Neotrombicula* are found fed inside an ear only (TABLE 1). In April, mites have made up 83% in this area of a hosts' body. Other distribution of parasites is revealed in May. So, there were 27% of fed mites inside an ear, 31% around of an anus, and 29% under a tail from among 418 (or 87%) stuck individuals. The most of mites (91%) fed on inside an ear in June. Solitary individuals were sating on a belly and outside of an ear in July. In August, larvae were concentrating inside an ear, making up 71% from among fed individuals. In September the number of the stuck mites inside an ear decreased (54%) due to the increase on the edge of an ear (up to 19%). In October distribution of the most of fed mites (877 specimens) in three places was marked again — on inside of an ear (21%), — on outside of an ear (22%) and — around of genitals (25%).

The greatest quantity of the suction places is revealed in April and October (in 8s), in September (7), in August (6), and in May and November as well (in 5s). High suction intensity of larvae is established in spring: in April, this parameter has made up 87%, being reduced up to 51% during summer and being raised again up to 79% in autumn (September). On the whole, the mites of genus *Neotrombicula* were obviously preferring an internal surface of an ear for satiation, indeed 73% from among all stuck individuals.

Localization of <i>Neotrombicula spp.</i> on months																				
T o p o g r a p h i c a l z o n e s																		In samplings		Total collected
months	Fed mtes	% from general gathering	Inside		Edge		Outside		Genitals		Anus		Under a tail		A back, loins, a belly, a breast, a chin, eyes					
			Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering				
March	220	100.0	220	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220
April	4552	86.69	3785	83.15	391	8.59	—	—	67	1.47	164	3.60	126	2.77	19	0.42	699	13.31	5251	
May	418	64.41	112	26.79	9	2.15	—	—	46	11.01	129	30.86	122	29.19	—	—	231	35.59	649	
June	122	69.32	110	90.16	5	4.10	—	—	7	5.74	—	—	—	—	—	—	54	30.68	176	
July	4	66.67	—	—	—	—	1	25.00	—	—	—	—	—	—	3	75.00	2	33.33	6	
August	1093	51.22	781	71.45	97	8.87	—	—	73	6.68	104	9.52	—	—	38	3.48	1041	48.78	2134	
September	1863	78.81	1011	54.27	353	18.95	65	3.49	123	6.60	216	11.59	60	3.22	35	1.88	501	21.19	2364	
October	1278	72.99	274	21.44	213	16.67	281	21.99	322	25.20	140	10.95	—	—	48	3.75	473	27.01	1751	
November	3728	64.09	3426	91.90	62	1.66	—	—	98	2.63	137	3.68	5	0.13	—	—	2089	35.91	5817	
T o t a l	13278	72.29	9719	73.20	1130	8.51	347	2.61	736	5.54	890	6.70	313	2.36	143	1.08	5090	27.71	18368	

TABLE 1: Localization of *Neotrombicula spp.* on months

Host' species	Topographical zones												In samplings		Total collected larvae		
	Fed mites	Cochlea				Genitals-anus				Other							
		Inside		Edge		Outside		Anus		Under a tail		A back, loins, a belly, a breast, a chin, eyes					
Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering	Quantity L	% from general gathering				
1	50.00	1	100.0	—	—	—	—	—	—	—	—	—	—	1	50.00	2	
5	50.00	3	100.0	—	—	—	—	—	—	—	—	—	—	3	50.00	6	
28	66.67	25	89.29	—	—	—	—	—	3	10.71	—	—	—	14	33.33	42	
10441	74.72	8703	83.35	1023	9.80	—	—	—	345	3.30	194	1.86	173	1.66	3533	25.28	13974
345	76.84	331	95.94	3	0.87	—	—	—	—	—	11	3.19	—	—	104	23.16	449
108	18.06	32	29.63	45	41.67	—	—	—	10	9.26	6	5.55	—	—	490	81.94	598
104	58.43	95	91.35	9	8.65	—	—	—	—	—	—	—	—	—	74	41.57	178
422	82.58	407	96.45	—	—	—	—	—	15	3.55	—	—	—	—	89	17.42	511
1420	70.30	60	4.22	37	2.61	282	19.86	—	362	25.49	477	33.59	140	9.86	600	29.70	2020
271	65.30	26	9.59	13	4.80	65	23.98	—	4	1.48	120	44.28	—	—	144	34.70	415
99	81.15	—	—	—	—	—	—	—	—	—	79	79.80	—	—	23	18.85	122
11	61.11	11	100.0	—	—	—	—	—	—	—	—	—	—	—	7	38.89	18
25	75.76	25	100.0	—	—	—	—	—	—	—	—	—	—	—	8	24.24	33
Total	13278	72.29	9719	73.20	1130	8.51	347	2.61	736	5.54	890	6.70	313	2.36	5090	27.71	18368

TABLE 2: Localization of some species of genus *Neotrombicula* on months

	Topographical zones											
	Cochlea				Genitals-anus				Other			
	Inside		Edge		Outside		Genitals		Anus		Under a tail	
	Quantity of meetings	% from general cases	Quantity of meetings	% from general cases	Quantity of meetings	% from general cases	Quantity of meetings	% from general cases	Quantity of meetings	% from general cases	Quantity of meetings	% from general cases
1. <i>Multisetosa</i> Hsu et Wen	10	13.16	2	5.26	—	—	—	—	—	—	—	—
2. <i>Shunsemia</i> Jam. et Tos.	10	13.16	6	15.79	2	66.67	3	20.00	2	14.29	1	25.00
3. <i>Leptotrombidium</i> Nag. et al.	26	34.21	27	71.05	—	—	6	40.00	3	21.43	2	50.00
4. <i>Montivagum</i> Kud.	12	15.79	1	2.63	—	—	—	—	—	—	—	—
5. <i>Ericotrombidium</i> Verc.-Grand.	—	—	—	—	1	33.33	—	—	—	—	—	—
6. <i>Eutonella</i> Kud.	1	1.32	—	—	—	—	—	—	—	—	—	—
7. <i>Aboriginesia</i> Kud.	3	3.94	1	2.63	—	—	—	—	1	7.14	—	—
8. <i>Helenicula</i> Audy	1	1.32	—	—	—	—	—	—	—	—	—	—
9. <i>Euschoengastia</i> Ew.	13	17.10	1	2.63	—	—	6	40.00	8	57.14	1	25.00
T o t a l	76	100.0	38	100.0	3	100.0	15	100.0	14	100.0	4	100.0

TABLE 3: Combined localization of some species of genus *Neotrombicula* with representatives of genera of chigger mites on animals of Kyrgyzstan

№	M i t e ' s s p e c i e s	collected mites(total)	Fed larvae			Increase ratio of idiosome after satiation	Hosts		Quantity		In samplings		
			Quantity	% from general collecting	Months		Species	Quantity	Places of localization	Tracts of ridges	Quantity	% from general collectings	Months
1.	<i>N. (N.) monticola</i> Schlug. et Dav.	11759	8930	75.94	III-VI, X, XI	2.24	9	90	7	12	2829	24.06	IV-VI, X, XI
2.	<i>N. (N.) sympatrica</i> Stek.	2662	1629	61.20	IV, VII-XI	2.34	8	64	9	9	1033	38.80	IV, VIII-XI
3.	<i>N. (N.) irata</i> Kud.	1729	1264	73.11	IV, VII-XI	3.00	9	59	8	12	465	26.89	VII-XI
4.	<i>N. (N.) kharadovi</i> Kud.	710	488	68.73	VIII-XI	2.37	5	8	5	2	222	31.27	VIII-XI
5.	<i>N. (N.) karashoriensis</i> Kud.	527	282	53.51	IV, VIII-XI	2.05	7	42	6	8	245	46.49	VIII-XI
6.	<i>N. (D.) microti</i> (Ew.)	412	328	79.61	VII-IX	1.93	3	7	6	2	84	20.39	VIII-IX
7.	<i>N. (N.) nagayoi</i> Sasa et al.	406	221	54.43	IV, VIII-XI	2.34	7	39	7	9	185	45.57	VIII-XI
8.	<i>N. (N.) pseudomonticola</i> Khar.	115	111	96.52	IV	—	1	1	1	1	4	3.48	IV
9.	<i>N. (N.) ovalis</i> Schlug. et Dav.	31	9	29.03	IX-XI	1.81	4	8	4	3	22	70.97	XI
10.	<i>N. (N.) georgyi</i> Khar.	17	16	94.12	IV, V	1.69	2	8	2	1	1	5.88	IV
T o t a l		18368	13278	72.29	III-XI	2.21	13	166	12	21	5090	27.71	IV-XI

TABLE 4: Localization of chigger mites of genus *Neotrombicula* on animals of Kyrgyzstan

The distribution of fed *Neotrombicula* in the different body zones on the host amenably to the seasons was approximately identical (FIG. 2).

During summer, the number of larvae in cochlea decreased slightly and increased in anus-genital zone if compared to spring. The greatest increase (larvae up to 16%) in anus-genital zone is during autumn.

During spring, more than 6000 larvae of *Neotrombicula* were collected, the 5190 (85%) were fed. Only 930 specimens (15%) were found in samplings (FIG. 3). Ratio of stuck mites and mites found in samplings was almost identical (53% and 47% accordingly).

During autumn, the number of sating mites (69, 16%) increased and the number of parasites found in samplings (31%) decreased if compared with summer statistics.

Nourishment of representatives of genus *Neotrombicula* is established on 166 animals belonging to 13 small vertebrates (TABLE 2). The larvae were found exceptionally inside cochlea on Tien Shan shrew (1 piece), lesser on white-toothed shrew (3 pcs), Turkistani rat (11 pcs), and big-eared pika (25 pcs). On grey hamster, the larvae were affecting internal surface of ear (25 pcs) and area around anus (3 pcs). From the silvery high-mountain vole 10441 fed larvae were took off, 83.35% among them were sating inside an ear. The greater preference of mites to an internal ear is established on Tien Shan vole (96%). Only 30% from among 108 parasites have stuck to an internal ear on the common vole but the preference has been given to edge of an ear (42%). High rate of fed mites inside a cochlea is marked on Kirghizian vole (91%) and tamarisk gerbil (96%). Quite other distribution of the stuck individuals is registered on wood mouse and field mouse. So, the said species of rodents had 4% and 10% of mites inside of an ear, 34% and 44% around of an anus accordingly. The greatest preference to nourishment around of an anus (80%) is established on the house mouse. High suction intensity is revealed on tamarisk gerbil- 83%, and on house mouse (81%) from among all collectings from these species of rodents. Silvery high-mountain vole, Tien Shan vole and the wood mouse were marked next (75%, 77% and 70% respectively). Chigger mites of

genus *Neotrombicula* most frequently exposed the silvery high-mountain vole and the wood mouse to an attack — 71 and 53 individuals in respect. From the wood mouse, it has been collected 7 (6.92) times less larvae than from the silvery high-mountain vole. However, the wood mouse had 11 places of mites' satiation while the silvery high-mountain vole had 6 places only.

Distribution of fed mites of genus *Neotrombicula* in various topographical zones on two species of the basic breadwinners had essential distinctions (FIG. 4). So, the larvae preferred patently to stick to in cochlea on the silvery high-mountain vole (93%), and in anus-genital area on the wood mouse (69%). Only 3 specimens (<1%) are registered in other places of satiation on the silvery high-mountain vole, while the wood mouse had 62 specimens (4%).

A simultaneous nourishment of some species of genus *Neotrombicula* with representatives of 9 genera of chigger mites in various places on a hosts' skin is established. Seventy-six meetings are registered inside a cochlea. The greatest quantity of meetings was happening with species of genera *Leptotrombidium* (26), *Euschoengastia* (13) and *Montivagum* (12) (TABLE 3). Twenty-seven (or 71%) out of 38 meetings on edge of an ear were with the species of genus *Leptotrombidium*. In other places of joint nourishment with representatives of other genera, the larvae of genus *Neotrombicula* had solitary instances. The species of genus *Neotrombicula* were meeting with mites of 8 genera inside an ear, with mites of 6 genera on edge of a cochlea, and with mites of 4 genera in area around of an anus. In total 311 meetings are recorded, 155 (or 50%) out of them were marked as a joint nourishment of mites of genus *Neotrombicula* with species from other genera.

The analysis of quantity of meetings of mites of genus *Neotrombicula* with larvae of 9 genera at joint nourishment in various topographical zones on a hosts' skin has revealed the non-uniformity of their distribution. Thus, in cochlea the species of genus *Neotrombicula* most frequently fed on with representatives of genus *Leptotrombidium* (53 from among 117 meetings, or 45%), and next *Shunsennia* (15%), *Euschoengastia* (12%), *Montivagum* (11 %), and *Multisetosa* (10%) (FIG. 5). With species of other genera, the single instances of joint suction in cochlea are

Topographical zones:	I. Silvery high -mountain vole	II. Wood mouse
1. cochlea -	26.69	93.15
2. genitals-anus -	68.94	6.82
3. other -	4.37	0.03

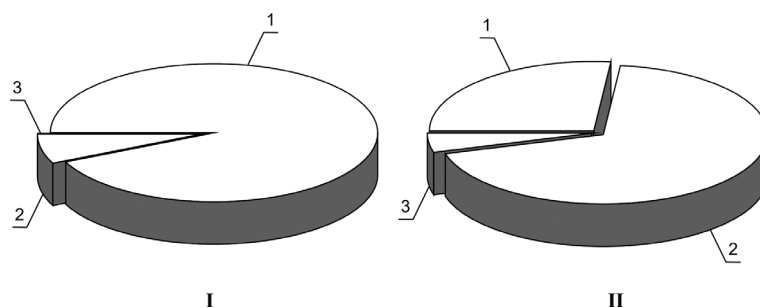


FIG. 4: Localization of *Neotrombicula* spp. on the body of the basic hosts (in %)

	I. Cochlea	II. Genitals-anus	III. Other
1. <i>Leptotrombidium</i>	45.30	33.33	20.00
2. <i>Shunsennia</i>	15.39	18.18	40.00
3. <i>Euschoengastia</i>	11.97	45.46	40.00
4. <i>Montivagum</i>	11.11	—	—
5. <i>Multisetosa</i>	10.26	—	—
6. <i>Aboriginesia</i>	3.42	3.03	—
7. <i>Ericotrombidium</i>	0.85	—	—
8. <i>Eutonella</i>	0.85	—	—
9. <i>Helenicula</i>	0.85	—	—

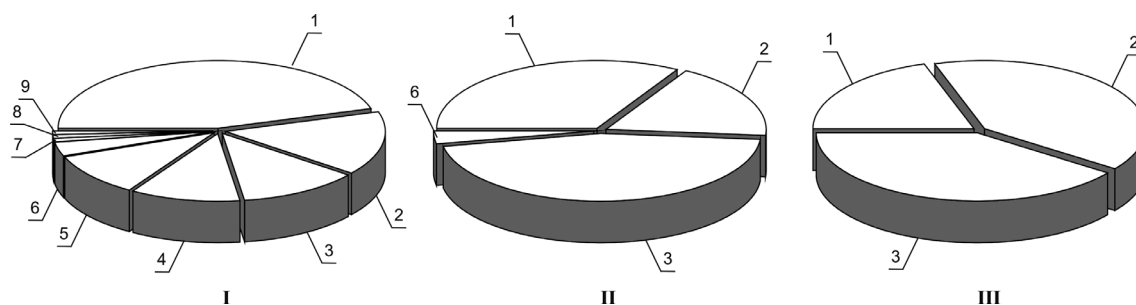


FIG. 5: Ratio of number of meetings of genus *Neotrombicula* with representatives of other genera of chigger mites at joint localization on the body of hosts (in %)

marked. In anus-genital area, 33 meetings of joint satiation of species of genus *Neotrombicula* with larvae of 4 genera are recorded. More often mites met with *Euschoengastia* (15 meetings, or 45%) and *Leptotrombidium* (11 meetings, or 33%). Solitary meetings (5) at joint nourishment in other suction places are marked for species of three genera.

In samplings, 156 meetings of species of genus *Neotrombicula* with representatives of 10 genera of chigger mites are revealed. From among all meetings in samples, the greatest frequency was observed with species of genera *Shunsennia* (50 or 32%), *Leptotrombidium* (43 or 28%) and *Euschoengastia* (38 or 24%). As a whole in samplings, it is established the co-occurrence (in more than half of presence) of *Neotrombicula* with larvae belonging to other genera, namely 311, - or 50% from among all cases of joint nourishment.

The ratio of fed larvae in the general gatherings of species of genus *Neotrombicula* was unequal. For example, *N. (N.) pseudomonticola* amounted 96,52%, and *N. (N.) ovalis* - 29% only (TABLE 4). However, as a whole the representatives of the given genus made up 72%. The size of idiosome considerably increased on engorged larvae from 1.69 times (*N. (N.) georgyi*) up to 3 times (*N. (N.) irata*). The species *N. (N.) monticola* and *N. (N.) irata* could feed on 9 species, while *N. (N.) georgyi* and *N. (N.) pseudomonticola* - on 2 and 1 host species. The greatest number of places on a hosts' body belonged to species *N. (N.) sympatricus* and *N. (N.) irata* (9 and 8 accordingly). Satiation of larvae *N. (N.) monticola* and *N. (N.) irata* is recorded in 12 tracts of various ridges. The species *N. (N.) ovalis* prevailed in samplings (71%). However, on the average this parameter has made up 28% out of all gatherings of larvae of genus *Neotrombicula*.

DISCUSSION

In mountain conditions of Tien Shan (21 tracts) the 10 species of genus *Neotrombicula* fed on 13 species of vertebrates, affecting 12 areas on a hosts' skin. Among three topographical zones of satiation of larvae, the prevailing number of larvae (>70%) was fed inside an ear, reaching the greatest number (92%) in November. During spring-summer-autumn

season the representatives of genus *Neotrombicula* also prevailed in cochlea (>80%). In anus-genital area, this parameter did not exceed 16% in autumn, and 3.4% in other places in summer. In overall collections of larvae, the fed individuals reached 85% during a spring season. During the summer, relative equality was setting in when the stuck mites have made up 53%, and 47% in samplings. In spite of the fact that the silvery high-mountain vole fed the greatest number of larvae of genus *Neotrombicula* (10441 specimens), solely six places of fixing were observed. On the wood mouse, 1420 mites were collected, distributed in 11 places. It is interesting to note that in cochlea 93% of the larvae were sating on silvery high-mountain vole and 27% on wood mouse: in the anusgenital area, the first rodent had 7% of larvae and the latter 69%. The greatest quantity of meetings (76) of joint suction of species of genus *Neotrombicula* with representatives of other genera is established inside a cochlea. But more often, they fed on with representatives of genus *Leptotrombidium*, namely 34 % from the general number of meetings in this place of localization. In total (from among fed and found in samplings) 311 meetings are recorded, 155 of them (or 50%) are marked as joint nourishment of mites of genus *Neotrombicula* with species of other genera. The analysis of joint localization in topographical zones on a hosts' body has shown that a ratio of quantity of meetings of some species of genus *Neotrombicula* with representatives of other genera of chigger mites was unequal. For example, in cochlea the larvae of *Neotrombicula* were most frequently meeting species of genus *Leptotrombidium* (45%) then in anus-genital area there were mites of genus *Euschoengastia* (45%). In samplings the overwhelming majority of meetings (84%) of species of genus *Neotrombicula* has fallen on representatives of three genera, namely *Shunsennia* (32%), *Leptotrombidium* (28%) and *Euschoengastia* (24%).

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