

# AN INVESTIGATION OF NEST BUILDING AND NESTS OF THE RED-BACKED SHRIKE (*Lanius collurio*) IN BULGARIA

**Boris Petrov Nikolov**

## ABSTRACT

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Total information for 52 nests of the Red-backed Shrike from 4 localities in Bulgaria has been used in this paper. Nest building began about 2 weeks after the spring arrival of the birds; both males and females took part in it. It appeared only in the morning (9.40-11.30) and usually lasted 5-6 days. Eight main types of nest-location were distinguished. More than half of the nests were with predominantly southern orientation. Nests were found on 8 plant species – most of them (67.3%) were in Dog Rose (*Rosa canina*) and Whitethorn (*Crataegus monogyna*) bushes. The nests were built at a height of 0.11-2.25 m (average 0.97 m) – the greater part of nests (47.1%) was 0.5-1.0 m above the ground. The following nest parameters were established (mm): outer diameter – 124 (100-155), inner diameter – 78 (63-90), depth – 51 (40-65), height – 90 (70-125); weight (g) – 24.9 (16.8-39.5). Nest material from 16 nests was examined in detail – components of animal origin, accidental materials, mosses (7 species), lichens (5 species) and angiosperms (52 taxa) were distinguished. Nests had determinate composition and structure; they were made up of 3 layers and a nest bed (the latter was not obligatory element).

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**Key words:** Red-backed Shrike, *Lanius collurio*, nest building, nest composition, nest structure, Bulgaria

## INTRODUCTION

The Red-backed Shrike breeds in the Palearctic and winters in eastern and southern Africa (Moreau 1972). This species is comparatively well studied throughout its areal and there is some information about nest building, as well as various nest measurements. However, data on the composition and structure of nests is usually very scarce and presented in general terms only, or missing.

In Bulgaria, the Red-backed Shrike is an almost unstudied species. General information about the composition of nests and nest-location was given in single monographs and papers about various regions of the country (Klein 1909; Pateff 1950; Donchev 1961, 1970, 1977; Mountfort and Ferguson-Lees 1961; Prostov 1963, 1964; Nankinov and Spiridonov 1979; Nankinov 1982; Soufi 1986). Nankinov and Darakchiev (1975) gave more detailed information on this species breeding biology.

Some observations of nest building are presented in this paper and an attempt is made to clarify nest types in detail, as well as nest-location, orientation, shape, size, composition and structure.

## MATERIAL AND METHODS

Material for the present study was collected in May-August during three years (1995-1997); fieldwork was carried out for 122 days. Four localities in Sofia region (western Bulgaria) have been investigated. They are characterised mainly by low-mountain relief or valleys and moderate-continental climate. More complete study was done in two of the regions – Pasarel and Kambanite area (close to Sofia), while from the others (Bezden, Dragoman) additional information was gathered.

Orientation of nests was determined using compass. When the nest was located in the interior of shrub or tree, its orientation was determined as the direction of most frequent birds' arrival.

After the completion of nesting season (usually during August) remaining unspoilt nests were gathered and the type, quantity and proportion of the building material were determined. An electronic scale „SARTORIUS” (0.001 g accuracy) was used for weighting of nest components.

The nomenclature of mosses and lichens is given according to Corley *et al.* (1981), Popnikolov and Zhelyazova (1964), Makarevicz *et al.* (1971), Golubkova *et al.* (1996).

## RESULTS AND DISCUSSION

### Nest-building

Data on Red-backed Shrikes building of nests in Bulgaria is very scarce. In the Rhodope mountains (southern Bulgaria) the birds begin nest building during the third decade of May (Nankinov and Darakchiev 1975). In Eastern Bulgaria (Bourgas region) building of nests was established in the middle of May – 14-18 May (Prostov 1964).

During the years of study, there were differences up to 11 days in the first dates of the species' appearance in spring (25 April – 5 May). Near Sofia, starting of nest building was observed during 21 days (7-27 May) – around two weeks after spring arrival of the Red-backed Shrikes to the breeding grounds. In 1995, in Pasarel, first nest-building was observed on 20 May, *i.e.* 15 days after the first appearance of the

birds in the region. However, in the same year, in other parts of Sofia region (Bezden) building of nests was observed 7-8 days earlier (Maria Veleva – pers. comm.). In 1997, at the Kambanite area, the interval between the first spring arrival of the birds (25 April) and the first observed nest building (7 May) was 13 days.

There are various individual patterns of birds' behaviour concerning their share in the building of nests (Cramp and Perrins 1993). In the region near Pasarel, a nest in its initial stage of construction (about 1 day) was found on 20 May 1995. It was loose aggregation of stems, unshaped as nest yet. During 47 min. of observation, 9 alightings of birds with building material were recorded (male – 6, female – 3). A week later this almost ready nest was abandoned (probably because of the heavy rainfalls) and the birds started building another nest inside the neighbouring bush. During 32 min. the birds brought and added material to the nest 8 times (male – 4, female – 4). In both cases birds incorporated material into the nest on their own and fed in the intervals. Building material was being brought to the nest from various distances around – from 0 m (the ground below the nest) to 25 m, on average 10.9 m ( $N = 10$ ). Material for nest-building birds gathered mainly on the ground. Frequently they put spiny twigs in the nests, more often from Dog Rose – several times Red-backed Shrikes were observed to break off dry twigs (usually 5-6 cm in length) from bushes, not gathering them on the ground. However, they did not succeed each time, the pliant twigs of Traveller's Joy (*Clematis vitalba*) caused also trouble to them. The birds happened to bring to the nest under construction single pieces of straw or stalk, as well as tuft. Length of the material brought to the nest varied from 5-6 to 25 cm. Nest material was carefully incorporated into the nest. During the initial stages of its construction, it was necessary for the nest cup to be formed and the nest to become cup-shaped. The bird sat down in the nest under construction, body caved in, head and tail protruded upright and started to turn in both directions. Probably these actions were repeated during some of the stages of nest building up to the final formation of nest cup.

Nest building was observed only in the morning between 9.40 and 11.30, which coincided with the general morning activity of the birds.

According to Simkin (1990), the construction of nests lasts 3-4 days, in nasty weather longer. The duration of the building of nests according to different authors, vary from 2-3 days (Györfi 1968) to 10-12 (even 15) days (Bonaccorsi and Isenmann 1994). Sometimes a previous year's nest may be repaired and re-used (Györfi 1968, Korodi Gál 1969). In the Belovezha Pushcha (Belarus), Red-backed Shrikes made new nests every spring, because the old ones had been destroyed by the winds during the autumn and winter (Gavrin and Datskevich 1958). Frequently, the nests of this species around Sofia were preserved in comparatively good condition until the next year, especially those in dense and sheltered bushes. Nevertheless, the use of the previous year's nest has not been established with certainty.

In the regions under study, nest building usually lasted 5 or 6 days, replacement nests took on average shorter time. A partial destruction of first nests (in cases of unsuccessful first breeding), because of taking building material from them, was re-

corded many times. There are at least three possible explanations of this: (1) the same pair of Red-backed Shrikes took material for a second nest, (2) some of the neighbouring pairs „stole” nest material, (3) other species of birds profited by the abandoned nest. Eventual future studies in this direction will explain these observations.

### Nests

Eight main types of nest-location have been distinguished based on 22 nests found (Fig. 1) – the number of nests (%) is shown in brackets for each type:

**Type 1** (23%) – the nest is constructed between several vertical branches (in Dog Rose mainly, rarely in Juniper *Juniperus communis*),

**Type 2** (18%) – the nest is built between many chaotically interlaced branches in more or less dense Dog Rose bushes,

**Type 3** (13.6%) – typical location of nest on a side branch, close to the main trunk (more often in Juniper),

**Type 4** (9%) – the nest is constructed at the base of two almost identical vertical branches (Dog Rose, Whitethorn),

**Type 5** (9%) – the nest is supported by several slender branches (some of them may pierce it through the walls), but from one side it is propped on a strong branch (Dog Rose, Dog Rose + Dwarf Elder *Sambucus ebulus*),

**Type 6** (4.6%) – the nest is constructed on a stable branch, without being at the base of a side branching (Wild Pear *Pyrus pyraeaster* + Juniper),

**Type 7** (4.6%) – the nest is built at the base of two similar horizontal branchings,

**Type 8** (4.6%) – the nest is constructed steadily at the base of several (three in this case) strong vertical branches,

**Intermediate types** (13.6%) – they are mainly between types 2 and 5 (9.1%) and between types 4 and 8 (4.5%).

It has been established that most nests are built on the sunny side of a bush or tree (Cramp and Perrins 1993). In the regions of study around Sofia, 90.9% of the nests were located in the interior of the bushes or trees, in their periphery – 9.1%.

Nests of Red-backed Shrike have been recorded in Bulgaria till now in bramble (*Rubus* sp.), Whitethorn, Dog Rose, wild pear (*Pyrus* sp.), Juniper (*Juniperus* sp.), elder (*Sambucus* sp.), oak (*Quercus* sp.), Meadow Sweet (*Filipendula ulmaria*) (Donchev 1961, 1970, 1977; Mountfort and Ferguson-Lees 1961; Prostov 1963; Nankinov and Spiridonov 1979; Nankinov 1982; Soufi 1986). For the region of Sofia, nests were found on 8 plant species, mainly deciduous. Most of the nests (67.3%) were in Dog Rose and Whitethorn bushes – 35 from total number of 52 nests (Table 1). On rare occasions other spiny bushes (Juniper, Dewberry *Rubus caesius*) or low thorny trees (Wild Pear, Cherry Plum *Prunus cerasifera*) were used. Three nests (5.7%) were built simultaneously on two plant species.

Usually the nests are located up to 2 m above the ground (Nankinov and Darakchiev 1975, Nankinov 1982). The lowest nest, built and found so far in the country, was at 0.15 m, while the highest – at 3 m (Mountfort and Ferguson-Lees 1961,

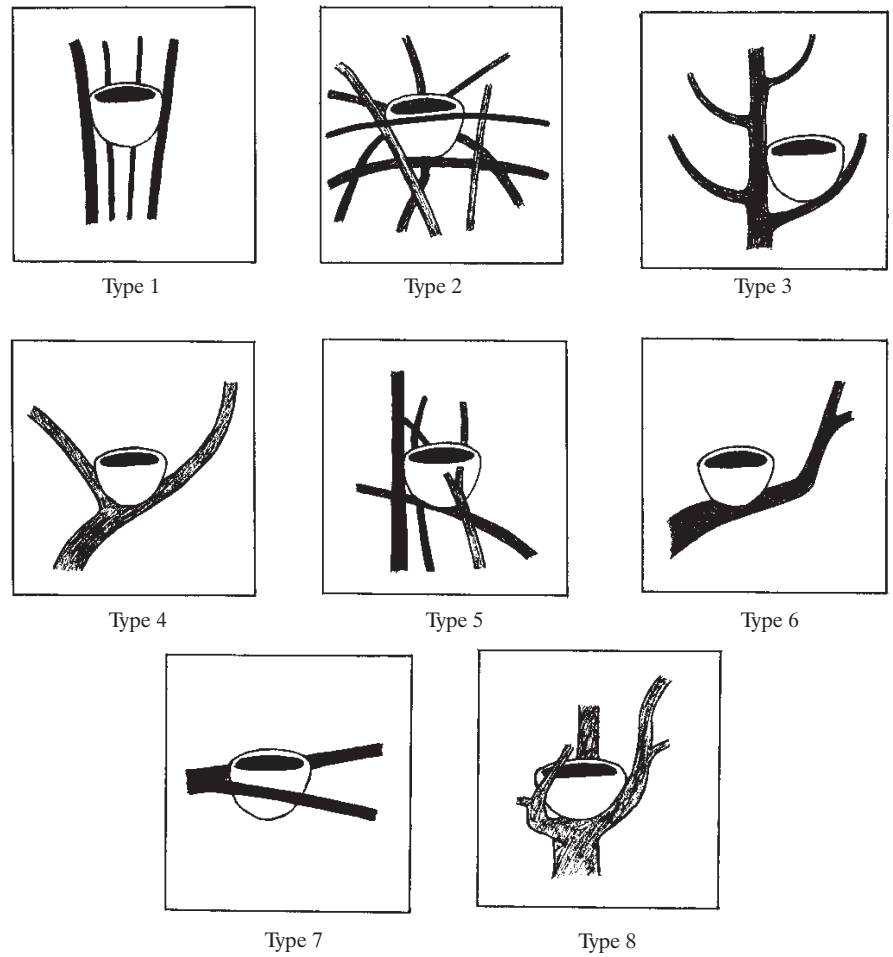


Fig. 1. Types of Red-backed Shrike nests according to their location.

Table 1  
Number of Red-backed Shrike's nests built on different plant species  
( $N = 52$ ) in Bulgaria

	%
<i>Rosa canina</i>	44.2
<i>Crataegus monogyna</i>	21.2
<i>Juniperus communis</i>	13.5
<i>Pyrus pyraeaster</i>	5.8
<i>Prunus cerasifera</i>	3.8
<i>Rubus caesius</i>	3.8
<i>Carpinus orientalis</i>	1.9
<i>Sambucus ebulus</i> + <i>Rosa canina</i>	1.9
<i>Pyrus pyraeaster</i> + <i>Juniperus communis</i>	1.9
<i>Rosa canina</i> + <i>Crataegus monogyna</i>	1.9

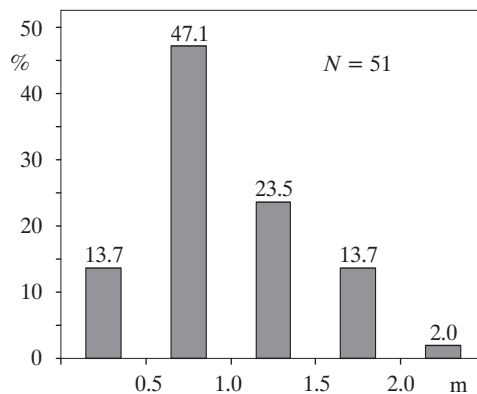


Fig. 2. Height distribution of Red-backed Shrike nests.

Donchev 1970). Some of the Red-backed Shrike nests have been recorded on the ground in grass or under Bramble (Simkin 1990, Cramp and Perrins 1993). Single nests have been described as built at a height of 8 m on Black Poplar *Populus nigra italica* (Holán 1993) and even at 25 m on pine *Pinus* sp. (Cramp and Perrins 1993). Near Sofia, nests were located from 0.11 to 2.25 m above the ground, on average – at 0.97 m ( $N = 51$ ). Almost half of the nests – 24 (47.1%) were 0.5-1.0 m above the ground and only one nest (2%) was found at a height greater than 2 m (Fig. 2).

The orientation of 28 nests of the Red-backed Shrike has been determined – Table 2. The varied landscape in Pasarel and Kambanite area determines the great variety of nest-location and orientation – nests orientated to almost all directions were found. For the region close to Pasarel, most of nests (69.3%) had predominantly southern orientation (from ESE to WSW) in contrast to Kambanite area, where 60% of the nests had predominantly northern orientation (from WNW to ENE). In both places no nests directly orientated to the north, east and west have been found. More than half of the nests recorded around Bezden were with direct eastern (E) orientation. That is because of the predominant westerly winds, which are an important environmental factor – they exert significant influence on the life on the un-

Table 2  
Orientation of Red-backed Shrike nests in Sofia region in Bulgaria

Regions	Nest orientation								Total
	N	NNE NE ENE	E	ESE SE SSE	S	SWS SW WSW	W	WNW NW NNW	
Pasarel	0	3	0	4	1	4	0	1	13
Kambanite	0	2	0	1	1	0	0	1	5
Bezden	0	0	5	0	1	2	1	0	9
Dragoman	0	0	0	1	0	0	0	0	1
<b>Total</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>28</b>

wooded stony slopes facing south. In the region of Dragoman, an orientation of only one nest was determined. Overall, a good half of the nests of this species in Sofia region – 15 (53.5%) were with predominantly southern orientation (from ESE to WSW). No nests directly orientated to the north (N) have been found.

Red-backed Shrike's nests are quite massive compared to the birds, cup-shaped, more or less well formed (frequently they are built relatively carelessly). Nankinov and Darakchiev (1975) indicated the following nest parameters for 24 nests of the species from Southern Bulgaria (mm): outer diameter – 110-125, inner diameter – 68-80, depth of cup – 46-57, height – 75-80. These measurements are almost the same or on average smaller (except for the height of nests) compared to the nest parameters, measured around Sofia: outer diameter – 124 (100-155,  $n = 42$ ), inner diameter – 78 (63-90,  $n = 41$ ), depth of cup – 51 (40-65,  $n = 40$ ), height – 90 (70-125,  $n = 43$ ). According to Makatsch (1976), the average weight of the dry Red-backed Shrike's nest is 43 g, whereas the average weight of the dry nests gathered around Sofia was 24.9 g (16.8-39.5,  $n = 15$ ).

Data on the composition of the Red-backed Shrike nests in Bulgaria is very limited and general – there were found rootlets, pieces of straw, stems, herbs, twigs, moss, feathers, fur, cotton and wool in them (Klein 1909, Pateff 1950, Nankinov and Darakchiev 1975). In the cases when the birds breed close to man there is frequently a great variety of nest components – sometimes half of the nest consists of cotton, paper, pieces of wool, bandage, cloths *etc.* (Malchevskiy 1959, Panow 1983). The composition of nests differs widely depending on the nesting biotope (Gavrín and Datskevich 1958, Fedyushin and Dolbik 1967, Cramp and Perrins 1993).

The following nest components were recorded in 16 nests collected and examined in detail (Table 3): components of animal origin (sheep's wool, goat's fur, hen's feathers), accidental materials of artificial origin (coloured textile wool, threads, sisal fibres), mosses – 7 species, lichens – 5 species, angiosperms – 52 taxa (32 determined to species, 17 – to genus, 1 – to subfamily, 2 – to family).

Frequency of various components is differentiated very much (Table 4):

**POACEAE** – the presence of corn plants in all nests was due mainly to the Common Bent Grass (*Agrostis capillaris*), which was the basic element of the inner layer and nest bed (if present); on rare occasions other species were recorded – Cock's Foot (*Dactylis glomerata*), Bermuda Grass (*Cynodon dactylon*), fescue (*Festuca* sp.), meadow-grass (*Poa* sp.), *etc.*

**RUBIACEAE** – two species were determined: Yellow Bedstraw (*Galium verum*) – in the outer layer and nest bed, and Goosegrass (*Galium aparine*) – found mainly in the outer layer of the nest.

**ASTERACEAE** – even though a great number of species was determined in the nests, there were mostly remains of various thistle species (racemes of *Centaurea* spp., flower-heads of *Carduus* sp. and *Cirsium* spp.), parts of leaves and racemes of Milfoil (*Achillea millefolium*).

**RANUNCULACEAE** – under the guise of twigs and bark the Traveller's Joy was presented in 93.8% of the nests.

Table 3  
Composition of Red-backed Shrike nests in Bulgaria. For each nest component,  
the number of nests where it occurred is indicated.

Nest components	Pasarel		Kambanite	Total
	1995 <i>n</i> = 7	1996 <i>n</i> = 6	1996 <i>n</i> = 3	<i>N</i> = 16
Sheep's wool	7	2	3	12
Goat's fur			1	1
Hen's feathers	2	1		3
Textile wool			1	1
Threads			2	2
Sisal fibres		1	1	2
<i>BRYOPHYTA</i>				
<i>Brachythecium salebrosum</i>			1	1
<i>Eurhynchium hians</i>			1	1
<i>Homalothecium lutescens</i>	4		1	5
<i>Hypnum cupressiforme</i>	7	4	1	12
<i>Racomitrium canescens</i>		2		2
<i>Thuidium abietinum</i>		1		1
<i>Th. recognitum</i>		1		1
<i>LICHENOPHYTA</i>				
<i>Cladonia furcata</i>		2		2
<i>Cl. rangiformis</i>	1			1
<i>Cl. subrangiformis</i>	1	2		3
<i>Hypogymnia physodes</i>	1			1
<i>Pseudevernia furfuracea</i>	1			1
<i>APLACEAE</i>				
<i>Anthriscus</i> sp.	1	3		4
<i>Chaerophyllum</i> sp.			1	1
<i>Eryngium campestre</i>	5	5	3	13
<i>ASTERACEAE</i>				
<i>Achillea millefolium</i>	2	3		5
<i>Carduus</i> sp.		2	1	3
<i>Centaurea rutifolia</i>	3			3
<i>C. solstitialis</i>	1			1
<i>C. stoebe</i>		1		1
<i>Centaurea</i> sp.	3	3	2	8
<i>Cichorium intybus</i>	4	1		5
<i>Cirsium arvense</i>	1			1
<i>C. vulgare</i>	1			1
<i>Cirsium</i> sp.		2	2	4
<i>Crepis</i> sp.		2		2
<i>Filago arvensis</i>			1	1
<i>Hypochaeris radicata</i>	1			1
<i>Liguliflorae</i>	1			1
<i>Tragopogon balcanicum</i>			1	1
<i>Tragopogon</i> sp.		1		1
<i>Xanthium italicum</i>			1	1



Nest components	Pasarel		Kambanite	Total
	1995 <i>n</i> = 7	1996 <i>n</i> = 6	1996 <i>n</i> = 3	<i>N</i> = 16
<i>BORAGINACEAE</i>				
<i>Onosma</i> sp.		1		1
<i>BRASSICACEAE</i>				
<i>Allysum</i> sp.			1	1
<i>DIPSACACEAE</i>	1			1
<i>EUPHORBIACEAE</i>				
<i>Euphorbia helioscopia</i>			1	1
<i>FABACEAE</i>				
<i>Dorycnium herbaceum</i>	1			1
<i>Medicago minima</i>			1	1
<i>Ononis arvensis</i>	3			3
<i>O. spinosa</i>		1		1
<i>Vicia</i> sp.		1	1	2
<i>LAMIACEAE</i>				
<i>Ballota nigra</i>	1			1
<i>Mentha</i> sp.		1		1
<i>Salvia</i> sp.		2		2
<i>Thymus</i> sp.	4			4
<i>ONAGRACEAE</i>				
<i>Epilobium</i> sp.		1		1
<i>POACEAE</i>				
<i>Agrostis capillaris</i>	7	6	3	16
<i>Cynodon dactylon</i>	2			2
<i>Dactylis glomerata</i>	3	2	1	6
<i>Elymus hispidus</i>		1		1
<i>Festuca</i> sp.		1		1
<i>Poa bulbosa</i>		1		1
<i>Poa</i> sp.	1			1
<i>RANUNCULACEAE</i>				
<i>Clematis vitalba</i>	6	6	3	15
<i>ROSACEAE</i>				
<i>Agrimonia eupatoria</i>			1	1
<i>Crataegus monogyna</i>	1			1
<i>Prunus spinosa</i>	1			1
<i>Rosa canina</i>	4	5	1	10
<i>Rubus caesius</i>	1	1	1	3
<i>RUBIACEAE</i>				
<i>Galium aparine</i>	5	1	1	7
<i>G. verum</i>	7			7
<i>Galium</i> sp.		6	3	9
<i>SCROPHULARIACEAE</i>	1			1
<i>Verbascum phoeniceum</i>		1		1

Table 4  
Frequency of occurrence of the nest components  
in Red-backed Shrike nests ( $N = 16$ ) in Bulgaria

Nest component	No. of nests
<i>POACEAE</i>	16
<i>RUBIACEAE</i>	16
<i>ASTERACEAE</i>	15
<i>RANUNCULACEAE</i>	15
<i>APIACEAE</i>	14
<i>BRYOPHYTA</i>	13
<i>ROSACEAE</i>	13
Sheep's wool	12
<i>FABACEAE</i>	7
<i>LAMIACEAE</i>	7
<i>LICHENOPHYTA</i>	6
Hen's feathers	3
Threads	2
Sisal fibres	2
<i>SCROPHULARIACEAE</i>	2
<i>BRASSICACEAE</i>	1
<i>BORAGINACEAE</i>	1
<i>DIPSACACEAE</i>	1
<i>EUPHORBIACEAE</i>	1
<i>ONAGRACEAE</i>	1
Goat's fur	1
Textile wool	1

*APIACEAE* – Field Eryngo (*Eryngium campestre*) was found in most cases, chervil species (*Chaerophyllum* sp., *Anthriscus* sp.) have rarely been established.

*ROSACEAE* – the presence of these plants was due mainly to the Dog Rose – small spiny twigs were found frequently in the outer and intermediate nest layers.

*BRYOPHYTA* – in a weight ratio the quantity of mosses in the nests was on average 5.58%, but in some cases up to 27.1% – larger numbers of mosses kept their green colour long after the breeding period.

*Sheep's wool* – the percentage share in the nest composition was on average 1.32% (0.09-3.7%) – birds gathered the wool, left over the thorny bushes when the sheep herds had passed through.

Families *FABACEAE* and *LAMIACEAE*, each presented with several species in 43.8% of the nests.

*LICHENOPHYTA* – lichens had a low percentage share in the composition of nests where they occurred (average 1.04%). The larger number and the wider spread of the ground species (cup-mosses *Cladonia* spp.) compared to the epiphytes was a proof that birds had gathered nest material mostly on the ground. Lichens were found in nests in the region of Pasarel only – beside differences in size of the samples (Pasarel –  $n = 13$ , Kampanite area –  $n = 3$ ) probably the reason for that was polluted environment because of the closeness of Kampanite area to the outlying suburbs of Sofia and especially to the ring road characterised by intensive traffic.

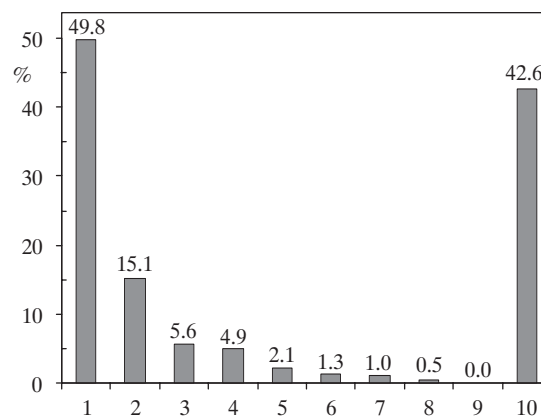


Fig. 3. Composition of Red-backed Shrike nests ( $N = 16$ ). Mean percent of weight is given at the Figure and the range of variation is listed below:

- 1) herbs (stems, racemes, flower-heads, fruits), twigs, bark: 19.8-85.7%
- 2) goat's fur: 15.1%
- 3) mosses: 0.3-27.1%
- 4) hen's feathers: 0.3-12.5%
- 5) sisal fibres: 2.1%
- 6) sheep's wool: 0.1-3.7%
- 7) lichens: 0.4-2.3 %
- 8) threads (white and coloured): 0.5%
- 9) textile coloured wool: 0.03%
- 10) undetermined material: 11.5-70.8%

*Hen's feathers (plumulae and plumae)* – they were found in nests from Pasarel only – the birds might have gathered them from the yards of the houses at the edge of the village (the distance was 700-800 m in a bee-line) or among the remains of predator's table.

*Accidental materials* (sisal fibres, threads, textile wool) – their occurrence mainly in the nests from Kambanite area is easily explained with the increased human presence in that region.

*Goat's fur* – found only in one nest, the percentage share in a weight ratio was 15.1%.

The presence of the families *BRASSICACEAE*, *BORAGINACEAE*, *DIPSACACEAE*, *EUPHORBIACEAE*, *ONAGRACEAE* and *SCROPHULARIACEAE* in the composition of nests had an accidental character.

Nest components had different percentage share in the composition of the Red-backed Shrike's nests (Fig. 3). Nine types of components have been determined – their share in the construction of nests varied from 0.03% (coloured textile wool) to 85.7% (angiosperms). The nests were built mainly from various herbs (stems, racemes, flower-heads, fruits), twigs and bark – average 49.85% (19.8-85.7%). In all nests there was material of undetermined character (it consisted of the remains of angiosperms), which ranged from 11.5 to 70.8% (average

42.57%). Taking into account the complete participation of the angiosperms (determined and undetermined material) in the composition of the Red-backed Shrike nests, it is clear that in most cases it exceeds 90% of the nest components.

In the structure of nests, three layers (outer, intermediate, inner) and a nest bed could usually be clearly outlined. The nest bed not always was observed as a separate element. For most nests, separate layers could be relatively easily differentiated:

- (1) **outer layer** – usually very well expressed (sometimes even divided into two sublayers). It was constructed mainly from Yellow Bedstraw and Goosegrass. Frequently, even though not in so large quantity, moss, sheep's wool, Field Eryngo, Traveller's Joy (twigs and bark), cornflower's (*Centaurea* sp.) racemes, corn plants were found. There were rarely and in quite small quantities lichens, feathers, parts of stems of Chicory (*Cichorium intybus*), flower-heads (*Carduus* sp., *Cirsium* spp.), accidental materials (sisal fibres, threads) etc. there. Usually the nest components mentioned above were fastened tight with short spiny twigs – mostly from Dog Rose (up to 19 in one nest) or Rest-harrow (*Ononis* sp.) (up to 9 in a nest). The spiral-curved twigs of the Traveller's Joy had the same functions. All of them stabilised and strengthened the construction of nests.
- (2) **intermediate layer** – might be not clearly distinguished, as sometimes it formed one layer with the inner layer. Almost full absence of spiny twigs was very typical – rarely 1 or 2 twigs of Dog Rose were found. The basic component could be moss, bark of Traveller's Joy or Yellow Bedstraw. Frequently there were flower-heads of composite plants (*Carduus* sp. mainly), sheep's wool, *Centaurea* racemes, Field Eryngo's dry leaves, corn plants (Common Bent Grass mainly), Chicory. Lichens, accidental materials (sisal fibres, coloured textile wool), hen's feathers (from 5 to 91 per nest), various fruits and rootlets of herbs were less presented.
- (3) **inner layer** – it might consists mainly of Traveller's Joy bark or moss, but more often of corn plants (Common Bent Grass) and Yellow Bedstraw. Frequently, sheep's wool and Field Eryngo could be found, rarely – *Centaurea* racemes, accidental materials (sisal fibres, coloured textile wool), flower-heads of composite plants and hen's feathers.
- (4) **nest bed** – usually presented by fur, cotton, feathers, delicate rootlets, wool (Klein 1909, Pateff 1950); it might consists of the thin dry stems of corn herbs and fluff of willow (*Salix* sp.), or of feathers, sheep's wool, lichens, pine needles, peatmoss (*Sphagnum* sp.), rarely horse's hair in addition (Gavrín and Datskevich 1958, Fedyushin and Dolbik 1967). In the Red-backed Shrike's nests gathered around Sofia, the nest bed could not always be observed as a separate element. When it existed it was composed almost entirely of stems and rootlets of Common Bent Grass. In one case, it was presented entirely by goat's fur, which „upholstered” the nest cup inside. Flower-heads of composite plants, bark of Traveller's Joy, moss, small feathers, accidental materials (sisal fibres, threads) were found in the composition of nest bed as well.

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