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Variability of Conchological and Anatomical Features of the Species Chondrulopsina Intumescens in the Turkestan Range

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Abstract:

The article examines and analyzes the variability of conchological and anatomical features of the species Chondrulopsina intumescens in the Turkestan Range, the variability of shell size in different populations of the species, and the variability of the reproductive organ in different populations.

Keywords: shell, oral reinforcement, population, parietal, columnar, palatal, oval, conchological, oral sculpture, height, large diameter, small diameter.

Chondrulopsina intumescens occurs at an altitude of 500-1800 m above sea level, inhabiting various biotopes: in the stems of semi-shrubs, under relatively small boulders, and the variability of conchological features is manifested in the color of the shell and the structure of the shell's oral framework.

The features of variability of conchological characteristics of the species Chondrulopsina intumescens were studied in populations of the Mirzachul natural geographical region, as well as in adjacent territories.

Population 1. At an altitude of 500-650 m above sea level, the shells of mollusks living in the lower part of various semi-shrubs on the northern slopes of the hills of the Sangzar Valley, not far from the Amir Timur Cave (Fig. 1, A), are conical-cylindrical, thick-walled. The cochlear folds are 6.5, slightly protruding. The upper 4 coils of the shell are dark, while the rest have a light brown structure. The opening of the shell is oval-shaped, its adjacent edges are not close to each other. The edges of the shell are well curved. There is a well-developed labiform process at the mouth of the

shell. The parietal and columnar dentate processes are underdeveloped. The palatal process is barely noticeably developed.

Population 2. At an altitude of 700-850 m above sea level, not far from the villages of Zarbuloq and Chuvulloq in the Gallaorol district, on the southern slopes of the hills, the wormwood plant grows in the lower part of the stem (Fig. 57). B), the shells of mollusks are cylindrical, with 7 shell coils, well protruding and separated by a deep suture. The shell is dark brown. The mouth of the shell has a broad oval structure with well-curved edges and a well-developed labial process. There are no dental processes in the mouth of the shell.

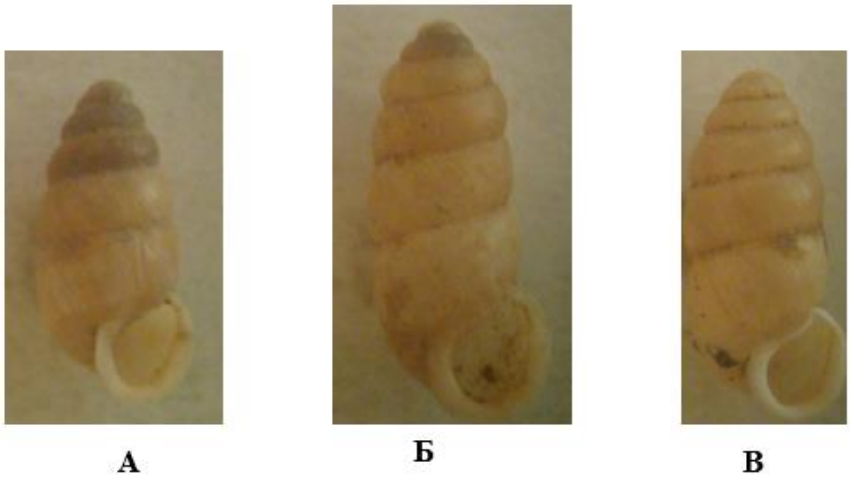

Figure 1. Variability of the shell Chondrulopsina intumescens A-near the Amir Temur cave, B-near the villages of Zarbuloq and Chuvulloq, Gallaorol district. V-Dara-Sai (Turkestan Range).

Population 3. On the southern slopes of the Turkestan Range, in the Darai-Sai gorge, at an altitude of 1000-1500 m above sea level, mollusks live under small boulders (Fig. 57). B) is characterized by a conical-cylindrical shell with a slightly shiny shell and medium wall thickness. The cochlear folds are 5.5-6 and slightly protruding. The shell is light brown. The mouth of the shell is a narrow oval, its junction is moderately close to each other, connected by a rough rim. The parietal dentate is poorly developed, the columnar tooth is absent, and the palatal tooth is well-developed.

In addition to qualitative variability (shell color, oral sculpture) of conchological features of the species Chondrulopsina intumescens, quantitative variability (shell dimensions: height, large diameter, small diameter) was also clearly manifested in the populations (Table 1).

Table 1. Variability of shell size (mm) in different populations of Chondrulopsina intumescens

Population	Chb	Kd	Chob	Chok	Choo'b	Number of turns
Population 1 (Sangzor Valley, Amir Temur Cave)	8	3.5	2.9	2.1	5	6.5
Population 2 (Gallaaral district, Zarbuloq and Chuvulloq villages)	9	3.9	3.5	2.5	5.1	7
Population 3 (Dara-Sai Stream, Turkestan Range)	7	3.5	3.8	2.2	4	5,5-6

As can be seen from the table data, all shell sizes in populations have the property of variability.

The variability of shell size consists of adaptation to living in open areas in arid regions.The variability of the genital organ of the species Chondrulopsina intumescens was studied in the following populations.

The protein glands of mollusks distributed around the Amir Timur Cave (Jizzakh region) are evenly apical, the upper part of the vagina is 1.5 times longer than the lower part. The vas deferens terminally adjoins the epiphallus. The epiphallus is not very long. The cecum is positioned significantly towards the spermatic duct. On the opposite side of the cecum, there is a slightly protruding growth. The walls of the penis are thin, and sometimes a "tubular" papilla can be seen inside it. All parts of the penial appendix are well developed, they are clearly distinguished from each other. The sex retractor is very close to the diaphragm, one of its branches is attached slightly above the middle part of the A1, and the other to the lower part of the penis. The seed receiver path is straight. The diverticulum is in a rudimentary state or undeveloped.

The following variability was noted in the structure of the reproductive organs of mollusks distributed in the Katta-Kamar gorge of the Turkestan mountain range. In 20 of the 30 specimens, all parts of the reproductive organs were fully developed, and in 10 - only the diverticulum was not developed (Table 2).

When studying the reproductive organs of 7 mollusks in the Darasai gorge of the Turkestan mountain range, all parts of the reproductive organs of 2 mollusks were present, and the A1 part of the penile appendix of the remaining 5 was reduced (Table 2).

Of the 16 mollusks distributed not far from the Babatag mountains, the Chakchar gorge, and the village of Kultepa, 3 have all parts of the reproductive organs (Fig. 2, A), and in 9 - due to the absence of part A1 of the penial appendix, A2, having a spherical structure, is directly adjacent to the penis (Fig. 2, B). In 5 cases, parts A1 and A2 of the penial appendix are not developed (Fig. 2, B).

2- Table. ***Structural features of the genital organ of the species Chondrulopsina intumescens.***

Population	Mollusks with studied sexual characteristics	AP		D	Crest
		A_1	A_2		
1	10 5	+	+	+ –	Turkestanskiy
2	10 5	+	+	+ –	Turkestanskiy
3	2 5	+	+	+ –	Turkestanskiy (yujno’y sklon)
4	1 4 1	+ – –	+	+ – –	Babatagskiy
5	1 5 4	+ – –	+ + –	+ – –	Babatagskiy

Note: AP - appendix; D - diverticulum; Q - exists; ± - partially reduced; - absent.

When the papilla of the studied mollusks was dissected, it was found that in mollusks with all parts of the genital organ, the papilla is long (Fig. 71, a), while in those with a reduced penile appendix, the papilla is short and has two transverse folds in its distal part (Fig. 2, b).

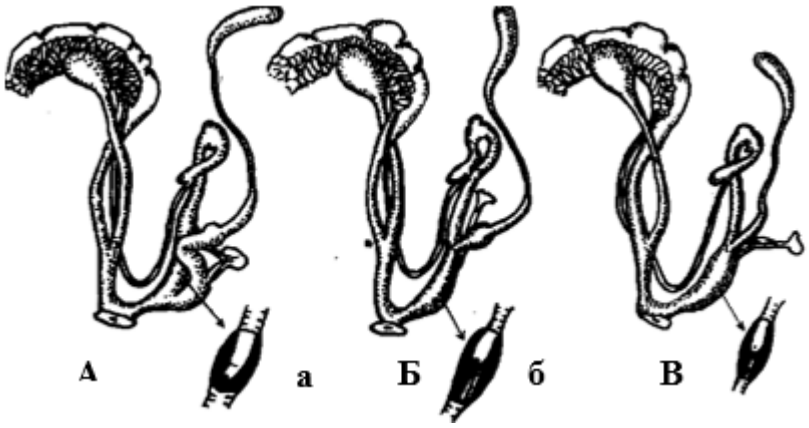

Figure 2. Variability of the genital organ Chondrulopsina intumescens: A - genital organ with full parts, a - appearance of the long papilla of the ruptured penis; B - genital organ without diverticulum development, b - appearance of the short papilla of the ruptured penis; B - a genital organ in which parts A1 and A2 of the penile appendix are reduced.

In terrestrial mollusks, morphological evolution manifests itself in the reduction of the reproductive organ to one degree or another, which is more characteristic of mollusks living in arid landscapes. Reduction of one or another part of the reproductive organ leads to a reduction in the mating time of mollusks during the reproduction process, which is important in a dry continental climate.

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