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INVESTIGATION OF RESPIRATORY METABOLISM IN
LEIOTROPIC AND DEXIOTROPIC
MORPHS OF *Bradybaena lantzi* LNDH.

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Of late an ever greater number of investigations has been devoted to a determination of the inter-relations between environmental conditions and the phenotypic composition of populations of various species of land snails (Cain and Sheppard, 1950; Schnetter, 1951; Sedlmair, 1956; Lamotte, 1959; Bondi, 1961; Parkin, 1972, et al.). In some of them, beginning with the classical work of G. F. Gauze and N. P. Smaragdova (1939) on *Bradybaena lantzi*, differences were established between genetic variants with respect to certain morphological and physiological indices (De Ruiter, 1958; Gaudiosi and Sacchi, 1960; Wolda, 1963). N. P. Dubinin (1966) presented a review of the data on other animal species.

In a previous article (Khokhutkin and Dobrinskii, 1973) we showed that the "bandless" and "banded" morphs of two close species of land snails, *Bradybaena fruiticum* (Mull.) and *Bradybaena schrencki* (Midd.), differ rather distinctly in rate of liberation of CO₂ during respiration. On the average the older animals of the banded morph liberate 1.3-1.5 times more CO₂ than the bandless. It was established in the article of G. F. Gauze and N. P. Smaragdova (1939) that the process of consumption of energy reserves occurs considerably more economically in leiotropic than in dexiotropic snails.

The present study was made to obtain the quantitative characteristics of metabolic processes in lei- and dexiotropic morphs of *B. lantzi*.

By means of the OA-5501 optico-acoustic gas analyzer for small concentrations of CO₂ we studied the rate of liberation of CO₂ during respiration of the two morphs of *B. lantzi*. We took snails of this species from the following habitats: I, right bank of the Issyk River near its outlet from Lake Issyk; II, garden in the city of Alma-Ata; III, left bank of the Issyk River, and also a forest planting along the

TABLE 1. Liberation of CO₂ by Two Morphs of *B. lantzi*

Habitat	Morph	Number of animals in sample, specimens	Weight of animals in sample, g	Average weight of one animal, g	Liberation of CO ₂ , ml/g fresh weight per hour
I	Sinistral	79	37,5	0,5	0,13
		79	87,9	1,1	0,11
		45	100,9	2,2	0,11
		44	131,3	3,0	0,10
		28	97,5	3,5	0,10
II	Dextral	170	88,0	0,5	0,14
		69	95,9	1,4	0,12
		60	105,9	1,8	0,10
		65	116,4	1,8	0,10
		74	162,1	2,2	0,08
III	Sinistral	47	53,7	1,1	0,09
		42	47,0	1,1	0,10
	Dextral	33	34,6	1,1	0,13
		25	29,2	1,2	0,13

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Kul'dzhin highway and road to the city of Issyk (36 km from Alma-Ata). In the first habitat the sinistral morph was represented almost completely and in the second, exclusively the dextral. In the third habitat, directly on the precipitous bank terrace, both morphs were collected in equal numbers, and in forest stands, exclusively the leiotropic. An insignificant number of animals of both morphs were collected along the right side of the road leading to Issyk.

From two to six days passed from the time of collecting the snails to setting up the experiment. The samples from the third habitat were combined owing to their small number and were investigated twice. Sluggish animals were discarded in the reinvestigation. As we see from Table 1, with an increase of the average weight of the sinistral and dextral morphs there is a decrease of the rate of CO₂ liberation. On the whole an analysis of the results of the investigations shows that there is no difference in the rate of CO₂ liberation of leio- and dextrotropic morphs of snails, but physiological differences in metabolism related with age are established rather distinctly.

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