Karyological Data of Terrestrial Mollusks (Mollusca: Gastropoda: Pulmonata) of Georgia

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Abstract. The results of karyological studies of Georgian terrestrial mollusks of 2013-2015 years are summarized. Three values of basic chromosome number (23, 26 and 27) and 1 value of somatic chromosome number (60-62) are registered in species of families Helicidae, Hygromiidae and Limacidae. These numbers are characteristic chromosome numbers for Caucasian terrestrial mollusks, the Georgian ones included.

Kay words: Chromosome numbers, Terrestrial mollusks, Georgia.

Introduction

The diversity of the terrestrial mollusks of Georgia (Caucasus region) is represented by 254 species which are united in 114 genera of 34 families. 56 species are Georgian and 161 are Caucasian endemics [1]. Until our investigations the taxonomy, distribution, biogeography and ecology of this group has been studied. From the karyological and karyosystematic point of view the land snails and slugs of Georgia had been not investigated. We started the karyological studies of Georgian terrestrial malacofauna in 2013. Some data of studies are given in our first publications [2, 3]. This communication summarizes the results of our researches of 2013-2015 years.

Materials and methods

The specimens of the land snails and slugs for investigations were collected in the spring-autumn periods of 2013-2015. The samples from different regions and localities of Georgia: Chakhati, Kapandibi, Khala, Kokhi, Maradidi, Vaio villages, settlement Gonio in Batumi, Ochkhamuri town, Kintrishi State Reserve (Adjara), Didi Katskhi, Gordi, Gubistskali, Zhoneti villages, resort Sairme, Ajameti Managed Nature Reserve, Sataplia Strict Nature Reserve, Kutaisi botanical garden, Navenakhevi cave (Imereti), Didi Tsemi village, pass Tskhratskaro (Samtskhe-Javakheti), Akhmeta town (Kakheti) and Tbilisi city were used. Chromosome preparations were made from gonadal tissue of animals. Slides were obtained on the basis of air-drying and squash methods for molluscan species described by different authors [4 - 10], with certain modification [2]. The chromosome numbers (somatic and basic) for species belonging to three families: *Helicidae Rafinesque*, 1815, *Hygromiidae* Tryon, 1866 and *Limacidae* Lamarck, 1801 were

established. The studied species, their distribution, dates of specimen collection, number of studied specimens and chromosome numbers are given in table.

Results and discussion

Two different values of basic chromosome number n=26 (*Caucasotachea calligera* Dubois de Montpéreux, 1840) and n=27 (*Helix buchii* Dubois de Montpéreux, 1839 and *H. lucorum* Linnaeus, 1758) were registered in the family Helicidae. The number n=23 and n=26 were recorded for hygromiid snails *Circassina frutis* (L. Pfeiffer, 1859) and *Xeropicta derbentina* (Krynicki, 1836), respectively.

The information about species studied.

Table.

Family	Species	Distribution	Dates of specimen collection	Number of specimens	Chromosome number	
					n	2n
Helicidae Rafinesque, 1815	***Caucasotachea calligera*** (Dubois De ontpéreux, 1840)	Caucasian endemic	October, 2013; April, 2015	12	**26**	-
	Helix buchii Dubois de Montpéreux, 1839	Caucasian endemic	October, 2013	4	**27**	-
	Helix lucorum Linnaeus, 1758	Widespread	May-June, October-November, 2013; April, 2015	29	**27**	-
Hygromiidae Tryon, 1866	***Circassina frutis*** (L. Pfeiffer, 1859)	Caucasian endemic	June and October, 2013	15	**23**	-
	Xeropicta derbentina Krynicki, 1836	Widespread	August, 2014; June, 2015	8	**26**	-
Limacidae Lamarck, 1801	***Gigantomilax lederi*** (O. Boettger, 1883)	Caucasian endemic	October, 2013	2	-	ca **60-62**

The meiotic chromosome spread with 26 bivalents for *X.derbentina* is published for the first time (Fig.1). Approximately 2n=60-62 somatic chromosome number was found in limacid slug *Gigantomilax lederi* (O. Boettger, 1883).

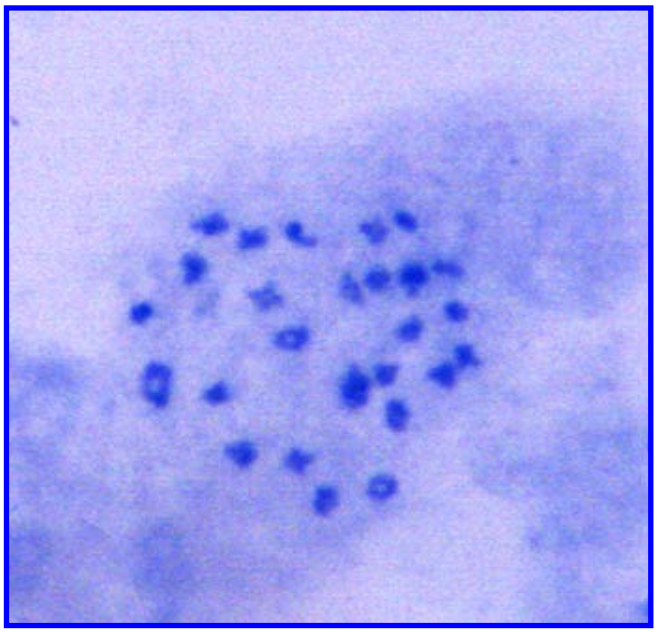

Fig.1. Meiotic chromosome spread of *Xeropicta derbentina* (n=26). Scale bar indicates 5 μm.

Chromosome numbers registered by us in the investigated species of Georgian land snails and slugs of families Helicidae, Hygromiidae and Limacidae are within the ranges of chromosome numbers reported by Barker [11, 12] and Thiriot-Quiévreux [13] in these families. In particular, n=22-31 for Helicidae, n=21-30 for Hygromiidae and n=20-25 or 30-35 for Limacidae (Fig. 2).

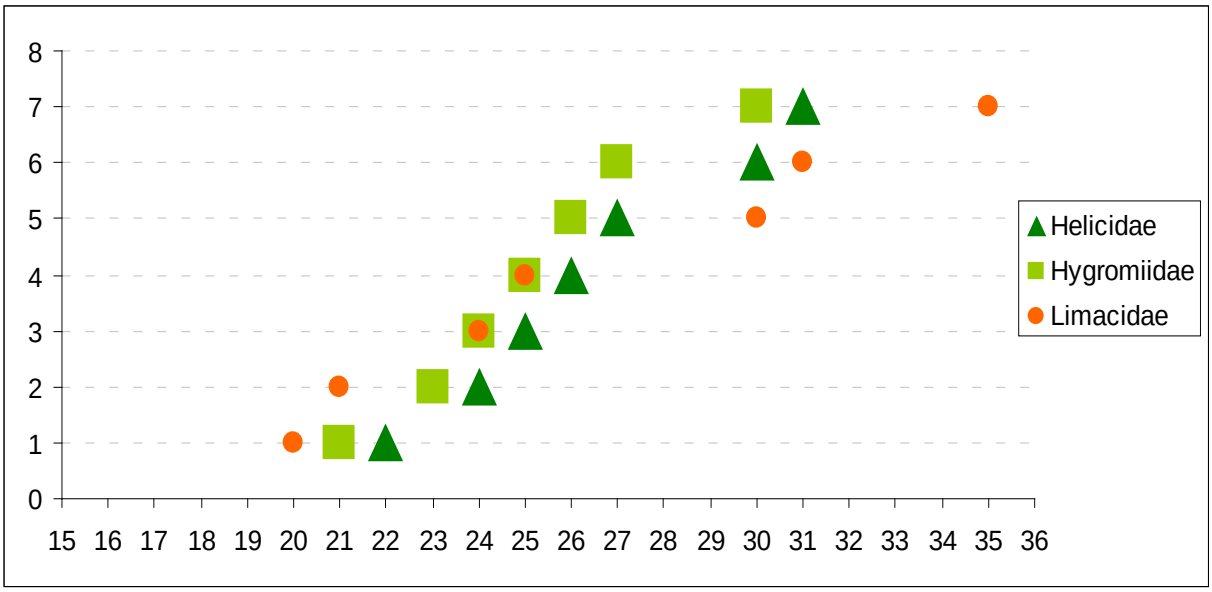

Fig. 2. Range of basic chromosome numbers in families: Helicidae (n=22-31); Hygromiidae (n=21-30) and Limacidae (n=20-25 or 30-35). X-axis – chromosome numbers; Y-axis –group of species

It is significant that the basic and somatic numbers n=23, n=26, n=27 and 2n=60-62 are found in those species which are endemic to Caucasus: *C. calligera*, *C. frutis*, *G. lederi* and *H. buchii* (see table). It can be inferred from these data that these numbers are characteristic basic and somatic numbers for Caucasian terrestrial mollusks, the Georgian ones included. They are also probably evolutionarily the initial chromosome numbers, which presumably participated in formation of species of Caucasian (Georgian among them) land snails and slugs.

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საქართველოს ხმელეთის მოლუსკების (Mollusca: Gastropoda: Pulmonata) კარიოლოგიური მონაცემები

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რეზიუმე

შეჯამებულია საქართველოს ხმელეთის მოლუსკების 2013–2015 წლებში წარმოებული კარიოლოგიური გამოკვლევების შედეგები. Helicidae-ს, Hygromiidae-ს და Limacidae–ს ოჯახების სახეობებში რეგისტრირებულია სამი ბაზალური (23, 26 და 27) და ერთი სომატური (60–62) ქრომოსომული რიცხვი. ზემოაღნიშნული რიცხვები წარმოადგენენ კავკასიის (და საქართველოს) ხმელეთის მოლუსკებისთვის დამახასიათებელ ქრომოსომულ რიცხვებს.