

NEW RECORDS OF TETRAPLOID TOADS (*Bufo viridis* GROUP) FROM ALMA-ATA AND TALDY-KURGAN REGION, KAZAKHSTAN

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Tetraploid toads have been identified by means of DNA flow cytometry. The samples were collected at four localities from Alma-Ata City and southern part of the Dzhungar Alatau Mountains area.

Key words: tetraploid toads, *Bufo viridis* group, eastern Kazakhstan.

Two species of green toads (*Bufo viridis* group) have been found to be distributed in the former USSR region of Central Asia: diploid *B. viridis* Laurenti, 1768, and tetraploid *B. danatensis* Pisanetz, 1978. The tetraploids range throughout the vast arid territory between the Caspian Sea and western Mongolia, mostly associated with mountain areas (see map in Borkin et al., 1986). Data on only three localities with tetraploids, identified by means of DNA flow cytometry and/or chromosome number analysis, have been published for Kazakhstan, the largest country of former Soviet Central Asia (Fig. 1). One locality is a lowland desert point close to Burubaital, a village situated on the south-western corner of the Balkhash Lake ("Burylbaital" — Egemberdieva, 1983; this point was incorrectly mapped on the Ili River by Borkin et al., 1986). Tetraploid toads have also been identified from Kapchagai on the Ili River and from the Aksiiir Farm, Zaissan Depression (Borkin et al., 1986).

MATERIAL AND METHODS

Five samples comprising 19 toads in total have been taken at four more localities in south-eastern Kazakhstan (Fig. 1). The specimens are deposited at

the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZISP).

1. Alma-Ata City, Z. K. Brushko, September 5–8, 1987, 9 sps. (ZISP 5298); a fountain near the Kazakhstan hotel, S. L. Kuzmin, June 15, 1993, 3 sps.: 1 female and 2 males (ZISP).

2. A ditch in the vicinity of the village Baschi (or Basshii), a stony semi-desert area with sparse bushes, 1 km to the south of the Altyn-Emel Mountain Range, 44°10' N and 78°45' E, Taldy-Kurgan Region, S. L. Kuzmin, June 12, 1993, 1 female (ZISP).

3. The southern foothills of the Koyandytau Mountain Range, Taldy-Kurgan Region, Z. K. Brushko, July 15, 1987, 1 sp. (ZISP).

4. Ayan-Saz Point, the Borokhudzir River Valley between Koyandytau and the Dzhungar Alatau Mountains, about 2000 m above sea level,



Fig. 1. Distribution of tetraploid toads in south-eastern Kazakhstan. 1) Burubaital, 2) Alma-Ata, 3) Kapchagai, 4) Baschi, 5) the southern foothills of the Koyandytau Mountain Range, and 6) Ayan-Saz Point, the Borokhudzir River Valley.

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Taldy-Kurgan Region, S. L. Kuzmin, June 9, 1993, 5 males (ZISP).

Genome size (nuclear DNA amount) from erythrocytes was measured by means of flow cytometry for each specimen. Mouse spleenocytes were used as the standard. The details of the technique have been published by Borkin et al. (1987) and Vinogradov et al. (1991).

RESULTS AND DISCUSSION

The relative DNA amount of toads examined was 3.38 ± 0.012 (mean \pm S.D.), ranging between 3.36 and 3.40. Based on measurements of 42 diploid and 16 tetraploid green toads from many localities, Borkin et al. (1986) determined that the relative DNA content varies between 1.68 and 2.06 in diploid *B. viridis*, and between 3.47 and 3.73 in tetraploid *B. danatensis* (mice thymocytes were reference cells). Our estimates are apparently similar to the values for tetraploid toads, especially from Kapchagai, Kazakhstan (3.47). Therefore, our toads collected in southeastern Kazakhstan proved to be tetraploid.

It is interesting that these toads were found in very different habitats such as the stony semi-desert and alpine meadows as well as the center of big city. This seems to reflect an ecological plasticity of the tetraploid species, which allows it to inhabit vast areas of Central Asia. All toad records listed above were

taken at elevations between 900 and 2000 m above sea level.

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