A high landscape diversity (mountains and plains, forest and steppes) and abundance of water bodies and streams in the Southern Urals provide favorable conditions for the development of an abundant regional fauna of dragonflies and damselflies. The study of regional faunas has acquired special significance, since human activities affect the species composition, distribution, and abundance of many animal groups. Odonates are a convenient object for such studies: (1) due to the large size and specific behavior of these insects, it is easy to obtain quantitative data on their populations; (2) due to the amphibiontic life mode, they are indicators of changes in different environments; and (3) the 100-year history of studies on the odonate fauna of the Southern Urals provides a basis for tracing long-term changes in the structure of this fauna.

MATERIAL AND METHODS

To date, 64 odonate species have been described in the Southern Urals, including 39 species of dragonflies (suborder Anisoptera) and 25 species of damselflies (Zygoptera). We did not include Aeshna undulata Bartenev in this list, since it was justly reduced to a synonym of A. juncea (Belevich, 2005). We collected these insects mainly in the Eastern Ural geographic province, near Uvil’dy Lake and neighboring groups of lakes. On the whole, we surveyed about 90 lakes with adjoining terrestrial biotopes (below referred to as localities) and took approximately 1000 qualitative censuses of odonates.

In the vicinity of Uvil’dy Lake, relatively rich material on the odonate fauna on this key region of the Southern Urals was collected in late June and July 1906; it provided information on 28 species (Bartenev, 1908). In 1927, Yu.M. Kolosov published data on 23 odonate species based on his own collections made in the vicinity of Chelyabinsk and collections kept at the Chelyabinsk Museum of Regional Natural History. A.Yu. Kharitonov began his studies on odonates of the Urals in the late 1960s (Kharitonov, 1972, 1975a, 1975b, 1976, 1978, 1988–1990, 1997; Belyshev and Kharitonov, 1981; Okorokov and Kharitonov, 1971; etc.). Between 1968 and 1973, he took approximately 500 censuses in 44 localities and collected 8546 adult insects. Thus, a total of 49 odonate species were recorded in the region.

V.A. Yanybaeva joined this research in 1992. As a result of her systematic investigations (Yanybaeva, 1997, 1999–2002, 2004) and episodic studies performed by parasitologists and zoologists of Bashkir State University (Bayanov, 1974, 1986, 1987; Boev et al., 1989; Zei-Nechaeva and Bayanov, 1975), the species list of Southern Ural odonates expanded to 60 species by 2003.

In 2004, we surveyed 15 localities, took approximately 70 censuses, and collected 1207 specimens (972 adult insects and 235 larvae) of 44 odonate species (see Yanybaeva et al., 2006). In 2005, more than 100 censuses were taken in 33 localities and 2428 specimens (2058 adult insects, 242 exuvia, and 128 larvae) of 39 species were collected. In 2006, more than 150 cen-
suses were taken in 55 localities and 2493 specimens of 45 species (2222 adult insects, 7 exuvia, and 264 larvae) were collected. After the 2005 and 2006 expeditions, four more species were added to the list (Macro- mia amphigena, Somatochlora alpestris, Anacathina isosceles, and Erythromma viridulum), and their total number reached 64.

Most localities were surveyed repeatedly during the past century, with censuses being taken by standard methods: adult insects were collected along line transects by sweeping with an entomological net; exuvia were collected from riparian vegetation, in 1-m² plots; and larvae were swept from submerged plants with a dip net. In any field season, studies involved insect collection in July, when adult odonates are at the peak of activity.

To reveal interannual changes in the structure of odonate fauna, we considered comparable data obtained by Bartenev in 1906, by Kharitonov et al. over the period from 1968 to 1973; and in our expeditions (2004–2006). The results obtained in the expeditions of 2004, 2005, and 2006 were also compared with each other. These data are shown in the table. They include species composition and type of the material (larvae, exuvia, or adult insects), relative species abundance, and occurrence frequency. The abundance of a species was calculated as the percent ratio of the numbers of relevant specimens to the total number of specimens in the collection and scored on a four-grade scale: (Pesenko, 1982): 1, sporadic (0–2%); 2, sparse (2–6%); 3, medium abundant (6–16%); and 4, abundant (16–40%). The occurrence frequency was calculated as the percent ratio of censuses in which the species was recorded to the total number of censuses.

### RESULTS AND DISCUSSION

A comparative analysis of collections made in the three periods revealed considerable interannual fluctuations (comparable in magnitude to interregional differences) in the species composition of the odonate fauna. Thus, pairwise comparisons showed that the Jaccard index of similarity between the faunas of the early 20th century and the 1960s–1970s is 54%; of the 1960s–1970s and the early 21st century, 61%; and of the early 20th century and the early 21st century, 39%. Koch’s (1957) index of biotic dispersity for the three periods compared with respect to 25 common species is 43%.

A comparison of the three faunas with respect to proportions of species differing in relative abundance showed that the majority of species in each fauna are sporadic or sparse, with the proportion of medium abundant and abundant species being relatively low (Fig. 1). The difference is that the proportions of sparse and abundant species in the present-day fauna are half as small as those in the early 20th century. The ratio of sporadic and sparse species in the fauna of the early 20th century is equal, but sporadic species obviously prevail over sparse species in the faunas of other periods.

A similar analysis of the fauna composition by years (2004, 2005, and 2006) also revealed both similarities and differences (Fig. 1): the ratios of species with diff-