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DISCOVERY OF *ALLONYX QUADRIMACULATUS* (SCHALLER, 1783) (COLEOPTERA CLERIDAE CLERINAE) IN RUSSIA

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Ruchin A.B., Egorov L.V. – Discovery of *Allonyx quadrimaculatus* (Schaller, 1783) (Coleoptera Cleridae Clerinae) in Russia.

The paper presents data on a record of *Allonyx quadrimaculatus* (Schaller) in the Republic of Mordovia (Russia, Central European Territory) and also the whole known information about specimens of the species stored in Russian museums. We discuss the species' distribution which is considered as intermittent. Data on biology of *Allonyx quadrimaculatus* and description of its newly found habitat are presented.

KEY WORDS: Coleoptera, Cleridae, Clerinae, *Allonyx quadrimaculatus*, new record, Mordovia, Russia.

Cleridae is a family of predatory beetles with a cosmopolitan distribution (GERSTMEIER & EBERLE, 2011; OPITZ, 2010). Most are predatory as adults and larvae, including some (e.g., *Thanasimus* Latreille, *Enoclerus* Gahan) that are important in controlling outbreaks of forest pests such as bark beetles (Curculionidae: Scolytinae) (GAYLORD *et al.,* 2006; BOUCHARD *et al.,* 2017). The world fauna of the Cleridae contains over 3400 valid species and subspecies (BOUCHARD *et al.,* 2017). The Palearctic fauna of the family is presented by about 215 species (GERSTMEIER, 1998; LÖBL *et al.,* 2007; GERSTMEIER, 2014). In the fauna of Russia there are no less 35 species from 19 genera (RICHTER, 1961; LÖBL *et al.,* 2007).

Allonyx Jacquelin du Val is a monotypic clerid genus, belonging to the subfamily Clerinae; the single species being *A. quadrimaculatus* (Schaller). Prior to its discovery, RICHTER (1961) had supposed that *A. quadrimaculatus* might occur in the south-western regions of USSR adjoining Europe, however, the first Russian records of *A. quadrimaculatus* were presented by specimens collected in the Bor and Vyksa districts of the Nizhniy Novgorod region (ANUFRIEV, 2004; MOKROUSOV, 2008). This species has been included in the Red Data Book of the Nizhniy Novgorod region (2014).

During our entomological research in 2017, a new location of the species in Russia was discovered in the Mordovia State Nature Reserve; its specimens are stored in the collections of Zoological Institute of the Russian Academy of Sciences (St. Petersburg, Russia) (ZIN) and of Zoological Museum of Lomonosov Moscow State University (Moscow, Russia) (ZMMU).

Allonyx quadrimaculatus (Schaller, 1783)

MATERIAL EXAMINED – Russia: Nizhniy Novgorod region, Vyksa district, Vyksa town, Vyksunskiy forestry, lower warehouse, 20.VI.2001, 1 ex., collected by Kozin, Mokrousov (ZMMU). Republic of Mordovia, Temnikov district, 17 km N Temnikov city, 54°45.65′ N, 43°08.18′ E, Mordovia State Nature Reserve, quarter 354, 20.V.2017, 1 ex., collected by A.B. Ruchin (stored in ZIN) (Fig. 1). One exemplar collected in the Nizhniy Novgorod region is stored in ZIN collection. Greece, 1 ex., without any else data (ZMMU). Moravia (Brno), 1 ex., Formanek, without any else data (ZMMU).

DISTRIBUTION (Fig. II) – Austria, Belgium, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Macedonia, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Switzerland, Turkey (SCHMIDL, 1997; MAJZLAN *et al.,* 1999; BAHILLO DE LA PUEBLA & LÓPEZ-COLÓN, 2006; LÖBL *et al.,* 2007; KURZELUK, 2012; SARIKAYA & IBIS, 2016), Russia (Central European Territory).

The range of *A. quadrimaculatus* shows a fragmented distribution with two main continuous part of the species' range located in Western and Central Europe. The Romanian record might represent an isolated surviving population within what might constitute its earlier range across most of Europe. In contrast, the range of species within Russia has a local character, and to date it is limited to the central part of European Russia.

Over the last 30 years, publication of range extension records for *A. quadrimaculatus* throughout Europe has increased in frequency (SCHMIDL, 1997; MAJZLAN *et al.,* 1999; JAŁOSZYŃSKI *et al.,* 2005; BAHILLO DE LA PUEBLA & LÓPEZ-COLÓN, 2006; SANCHEZ *et al.,* 2015; LÓPEZ VERGARA *et al.,* 2017). According to the map presented by KURZELUK (2012), the range of *A. quadrimaculatus* includes Slovenia, although we did not find any confirmation of this information. KURZELUK (2012) did also not include Greece in the species' range despite earlier inclusion of Greece in the species' range by LÖBL *et al.* (2007), which we confirmed by specimens deposited in the Zoological Museum of Lomonosov Moscow State University. Thus, to date there are three locations of this species in Russia: two records from the Nizhniy Novgorod region and one in the Republic of Mordovia. We predict that the distribution of *A. quadrimaculatus* in Russia may

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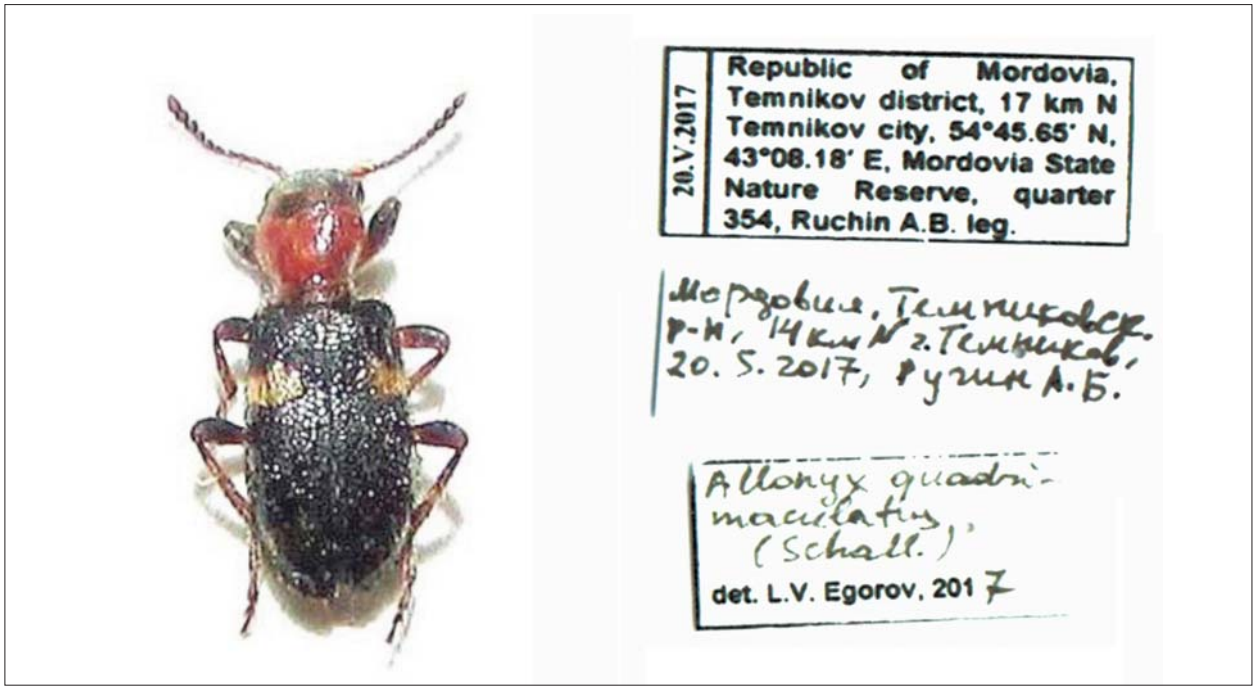

Fig. I – *Allonyx quadrimaculatus* and labels of the collected specimen.

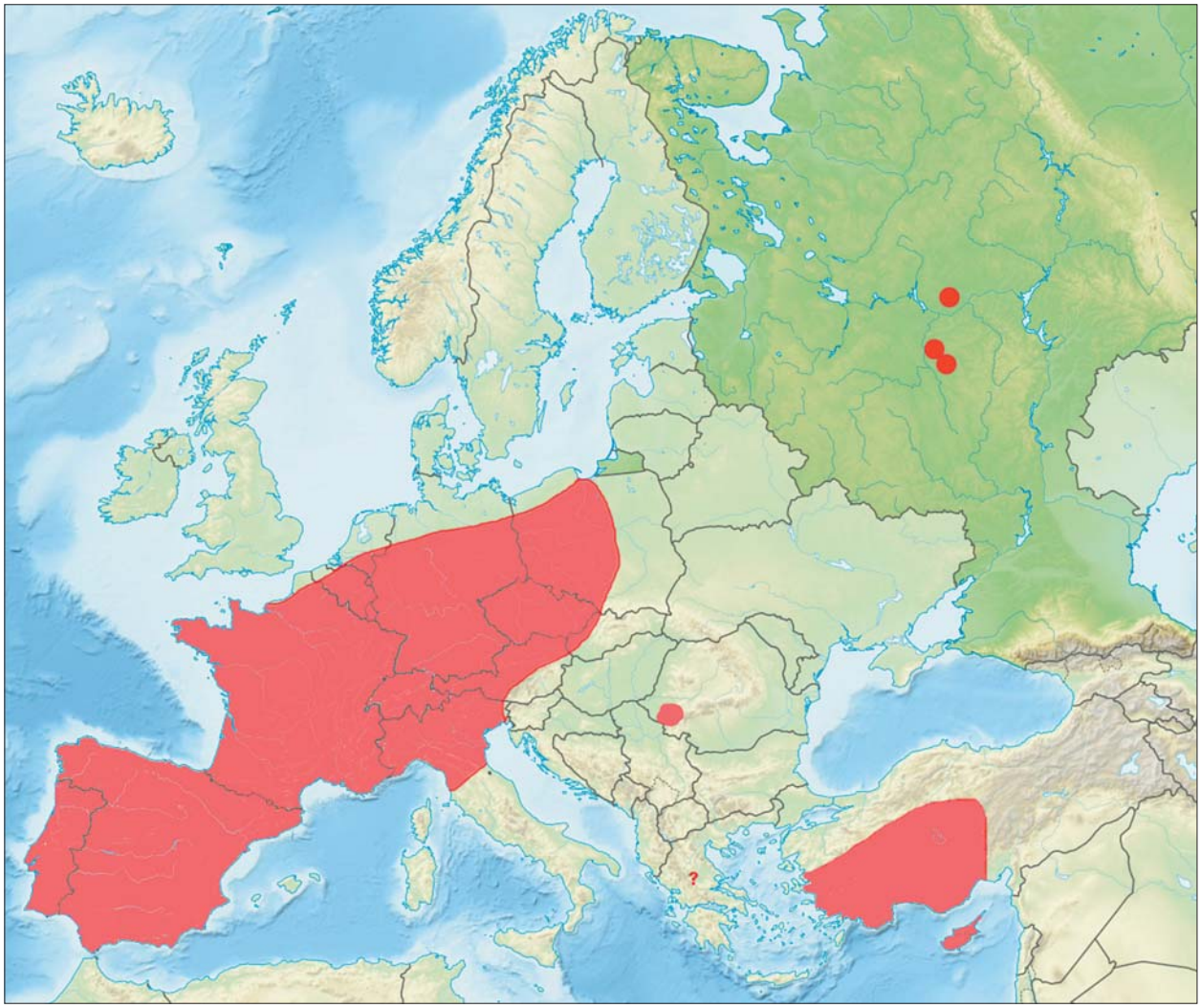

Fig. II – Map of the *Allonyx quadrimaculatus* distribution in Europe.

include the Kaliningrad region, bordering Poland, and likely also in regions adjacent to the Nizhniy Novgorod region and the Republic of Mordovia.

Biotopes – The habitat of the collection sites of *A. quadrimaculatus* was significantly damaged by wildfire in 2010, and moderately vigorous surface fire has been observed in the area since. Despite extensive damage to the habitat, some of mature pine trees have remained. Originally the floristical composition of the newly discovered site was pine forest plant community (*Pinus sylvestris* L.) with green mosses (*Pleurozium schreberi* Mitt., *Climacium dendroides* (Hedw.) F. Weber & D. Mohr, and less commonly *Dicranum polysetum* Sw.), in the ground layer. Most shrub, herb and ground layer plants were damaged by wildfire during in 2010 (Khapugin *et al.,* 2016a). In 2017 an undergrowth of secondary growth trees (*Betula pendula* Roth, *Populus tremula* L.) covered most of the study site area. Among other trees and shrubs *Acer platanoides* L., *Tilia cordata* Mill., *Sorbus aucuparia* L., *Quercus robur* L., *Rubus nessensis* Hall were represented by six-year plants or their stool shoots. *Pteridium aquilinum* (L.) Kuhn (about 15%), *Viola rupestris* F.W. Schmidt (about 10%) and *Convallaria majalis* L. (about 5%) were the most abundant herb layer plants at the study site. Other species of the herb layer included *Chamaecytisus ruthenicus* (Fischer ex Woloszczak) Klásk., *Genista tinctoria* L., *Calamagrostis epigejos* (L.) Roth, *Rumex acetosella* L., *Epilobium angustifolium* L., *Stellaria media* (L.) Vill., *Erigeron canadensis* L., *Milium effusum* L., *Rubus saxatilis* L., *Chelidonium majus* L., *Solidago virgaurea* L., *Lactuca serriola* L., *Hieracium umbellatum* L., *Polygonatum odoratum* (Mill.) Druce., *Melampyrum pratense* L. (Shugaev *et al.,* 2015; Khapugin *et al.,* 2016b).

Bionomics – *A. quadrimaculatus* is a thermophilous species inhabiting trunks and bark of *Pinus* and *Picea* trees (Kühnel & Mai, 1985; Mokrousov, 2008; Peres-Otero *et al.,* 2009; Sarikaya & Ibis, 2016; López Vergara *et al.,* 2017). The chorology (Taglianti *et al.,* 1992) (European-Mediterranean chorotype) and the range limits of *A. quadrimaculatus* in the Western Palaearctic coincides with those of *Pinus* but the clerid species can be found only in the parts of the tree species range where the mean annual temperatures approaches to sub-Mediterranean values. In Spain, the species is known in mesophilous habitats (Gómez De Dios *et al.,* 2015). *Allonyx quadrimaculatus* is a predator of various larvae and imago of xylophagous insects plus flatbugs of the genus *Aradus* Fabricius (Richter, 1961; Majzlan *et al.,* 1999; Peres-Otero *et al.*, 2009; Sanchez *et al.,* 2015).

The newly found location of *A. quadrimaculatus* in the Republic of Mordovia is not a first unique record of a Coleopteran species in the Mordovia State Nature Reserve. As a result of active investigations of this protected area in recent years, the ranges of a number of Coleoptera species have been specified (Legalov *et al.,* 2014; Egorov & Shapovalov, 2017; Ruchin & Egorov, 2018; Tomaszewska *et al.,* 2018). Such numerous and interesting findings indicate and underline the uniqueness of the forest massif of the Mordovia State Nature Reserve.

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