INTRODUCTION

Xylobiont beetles, that is, beetles living under the bark and inside the wood of trees, are represented by species from several dozen families. Among these insects, the longhorn beetles (Cerambycidae), jewel beetles (Buprestidae), and bark beetles (Curculionidae: Scolytinae) are dominant. These are taxa consisting predominantly of xylophages. Hylotomous beetles often invade new territories with a substrate (trees, wood products, and so on), where they stay as larvae and, sometimes, imagos. This is more typical of the Scolytinae bark beetles (because they are small and live in hidden places) and, particularly, the representatives of the large and widespread Xyleborini LeConte, 1876 tribe.

The species belonging to this tribe are ambrosia xylomycetophages. They inhabit many deciduous and coniferous trees and make tunnels in the wood of the latter (less commonly, under the bark). For these beetles, the host plant serves as a habitat and substrate for growing ambrosia fungi, which are the food for their larvae (Stark, 1952; Pfeffer, 1995; etc.). A hidden lifestyle and diversity of host trees help them invade new territories with transported timber and naturalize even better than other hylotomous coleoptera.

CONCERNING THE TRANSFERS OF XYLEBORINI TO NEW TERRITORIES: LITERATURE REVIEW

According to the number of transfers registered at importing ports of different countries (Haack, 2003) and the number of alien species naturalized in new territories, Xyleborini are dominant over other xylobionts. For example, 25 alien species of hylotomous beetles (2 Buprestidae, 5 Cerambycidae, and 18 Scolytinae), 10 of which belong to the Xyleborini tribe (9 of 10 are invaders from Asia), have been registered in the Continental United States over the period from 1985 to 2005 (Haack, 2006). In recent years, all the more cases of invasion of Xyleborini representatives into new territories have been registered. Thus, eight alien Xyleborini species were registered in American and Canadian fauna up to 1985 (Haack, 2003), and American fauna was enriched with ten more species in the next 20 years. Then, an invasion of Anisandrus maiche studied by us was registered in 2006 (Rabaglia et al., 2009), and in 2010, Coptoborus pseudotenuis (Schedl) (Atkinson et al., 2010) and Xyleborinus andrewesi (Okins and Thomas, 2010).

Relatively species-poor insular faunas can also be invaded by the alien Xyleborini, which can be illustrated by the example of New Zealand. In 2003, only 29 bark beetles were registered here, 11 of which were invaders (that is, they made up 38% of the total number of species). Among them, six species were the Xyleborini representatives, five of which were invaders (Brockerhoff et al., 2003).

At the moment, considering the invaders, nine representatives of the Xyleborini tribe can be counted in the Ukrainian fauna: Anisandrus dispar (Fabricius, 1792), A. maiche Stark, 1936, Xyleborus cryptographus (Ratzburg, 1837), X. dryographus (Ratzburg, 1837), X. eurygraphus (Ratzburg, 1837), X. monographus
In the Ukrainian fauna, there are now two species of the Anisandrus genus, which have similar morphology and lifestyle: Anisandrus dispar and A. maiche. Both species were earlier considered within the Xyleborus (Anisandrus) genus (Stark, 1952; Wood and Bright, 1992; Pfeffer, 1995; etc.). The Anisandrus genus was restored as a result of recent studies, which included the cladistic analysis of morphological characters in Xyleborini (Hulcr et al., 2007).

The natural habitat of the Anisandrus maiche Stark, 1936 species (maikhinsk unpaired bark beetle) is Western Siberia, Primorsky krai, Kunashir Island, China (Heilongjiang), and North Korea (Kurentsov, 1941; Stark, 1952; Krivolutskaya, 1996; Wood and Bright, 1992; Rabaglia et al., 2009). The habitat of this species has been expanding only in recent years. In 2006, A. maiche was for the first time found in North America, in Pennsylvania (Colpeter, 2006). Shorty afterwards, this species was reported to have naturalized successfully and invaded two more states — Ohio and West Virginia. Nevertheless, its biological peculiarities and host plants in America are still unknown (Rabaglia et al., 2009).

In Europe, A. maiche was first found in 2007 in Ukraine, in Donetsk oblast. The beetles were caught in window flight traps with an ethanol solution scent. The host plants in Ukraine have not been registered (Nikulina et al., 2007b).

The biological peculiarities of this species are known only within its natural habitat. The larvae develop on thin stipitates and branches of drying-out trees, where the adult females make ringlike egg galleries (Kurentsov, 1941). The species is sporadic, but it can propagate for the most part in hardwood and floodplain stands, and the wood of deciduous trees is damaged: Syringa amurensis, Juglans mandshurica, Betula dahurica, Betula japonica, Phellodendron amurense, Fraxinus mandshurica, Acer barbinerve, Acer mandshuricum, Alnus fruticosa, Alnus hirsuta, Corylus mandshurica, and Euonymus sp. (Stark, 1952). Ulmus sp. has also been registered as a host plant (Wood and Bright, 1992).

The biology of A. maiche in the invasion zones, particularly in Ukraine and Europe on the whole, has been poorly studied. In the literature, there is only one indication that “the silver birch (Betula pendula Roth.) has been registered as the host plant” (Nikulina, 2008 (2009)), which is not proven by any factual material.

MATERIALS AND METHODS

The study of A. maiche was performed in the forest-steppe zone of Left–Bank Ukraine in 2009–2010. Before 2009, we also studied the fauna of xylobiont beetles inhabiting this area. Nevertheless, A. maiche was not registered in our earlier collections. Commonly accepted entomological methods, such as the sweep-net method and light traps, did not produce positive results. The main methods used to find the A. maiche colonies were the observation of drying-out tree branches and stipitates, as well as hand-picking of insects and their damage. The tunnels were dissected and measured under laboratory conditions. The collected samples containing larvae were kept in the laboratory at the temperature of 20–23°C to make preimaginal forms develop into imagos; the samples were moistened from time to time to avoid the wood drying in the laboratory. In some cases, we measured the humidity of the invaded substrate in the field with the help of an AWD-6100 humidity meter.

We also used window flight traps of the Polytrap™ type with cruciform transparent plates to collect the beetles (Bouget et al., 2008). An ethanol solution (40%) was used as a scent and fixing fluid; the total area of the lobes was 0.5 m².

Material: Sumy oblast, Sumy district, environs of Vakalovshchina rural area, 51°01′27.90″N, 34°54′07.97″E, June 13, 2009, young planting, on northern red oak, imagos in the egg galleries—4++; at the same place, June 15, 2010, hardwood forest, in the window flight trap, ethanol solution as a scent—3QQ; V. Terekhova leg.; Kharkiv oblast, Kharkiv district, Dokuchaev, 3 km from Rogan’ settlement, 49°52′48.50″N, 36°26′04.17″E, steepficated gully, on Populus tremula L. May 4, 2009 leg. (larvae), May 17, 2010—imago—3QQ; Yu. Skrylnik leg.; Kharkiv oblast, Krasnokutsk district, environs of Krasnokutsk urban settlement, 50°2′45.24″N, 35°7′36.72″E, hardwood forest, English oak, June 7, 2010—6QQ, dead insects in the egg galleries. Yu. Skrylnik leg.

The material collected is stored at the Zoology and Animal Ecology Department of Kharkiv National...