

Alien ladybirds (Coccinellidae) established in European Russia and neighboring countries



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ABSTRACT: More than 20 species of Coccinellidae were introduced for pest control in the Soviet Union. Six of them have established: *Chilocorus bijugus*, *Cryptolaemus montrouzieri*, *Harmonia axyridis*, *Lindorus lophantae*, *Rodolia cardinalis*, *Serangium parcesetosum*.



Chilocorus bijugus

http://www.angelfire.com/bug2/1_poorani/infemalis1.jpg

- Predator of scale insects (Diaspididae). In Batumi occurs mainly on citrus and ornamental plants.
- Native range: China, India, Pakistan.
- Introduced from India to Georgia in 1973 to control *Quadraspidiotus perniciosus* and established near Batumi. Introduced also to the USA.



Rodolia cardinalis

<http://www.zin.ru/animalia/coleoptera/rus/finlopaww.htm>

- Specialized predator of cottony cushion scale (*Icerya purchasi*). Occurs on citrus plants and *Acacia dealbata*.
- Native range: Australia.
- Current distribution: cosmopolitan.
- One of the first insects introduced outside its native range for biological control of pests. In 1888 introduced to the USA and Europe.
- Released to control *Icerya purchasi* in Georgia and Azerbaijan (many releases since 1932) and established in the Black Sea shore. Current state of population is unknown.



Serangium parcesetosum

<http://www.zin.ru/animalia/coleoptera/rus/finlopaww.htm>

- Predator of whiteflies, in particular *Dialeurodes citri* and *Bemisia tabaci*.
- Established in the USA, Turkey, France, Georgia, and south of European Russia.
- Native range: India.
- Released in 1973 in Georgia, Abkhazia, Azerbaijan and south Russia (Sochi) to control *Dialeurodes citri* (Aleyrodidae), established and began to spread spontaneously. The local populations were re-novated by additional releases from laboratory culture.



Harmonia axyridis

- Polyphagous, mainly entomophagous species. Sometimes feeds on ripe fruits.
- It was released since 1916 all over the world for the biological control of aphids and has become almost cosmopolitan.

- Native range: Asia: Siberia, Far East, the north-east of Kazakhstan, Kyrgyzstan, Mongolia, China, North Korea, South Korea, Japan, and the north of Vietnam (Fig. 1).

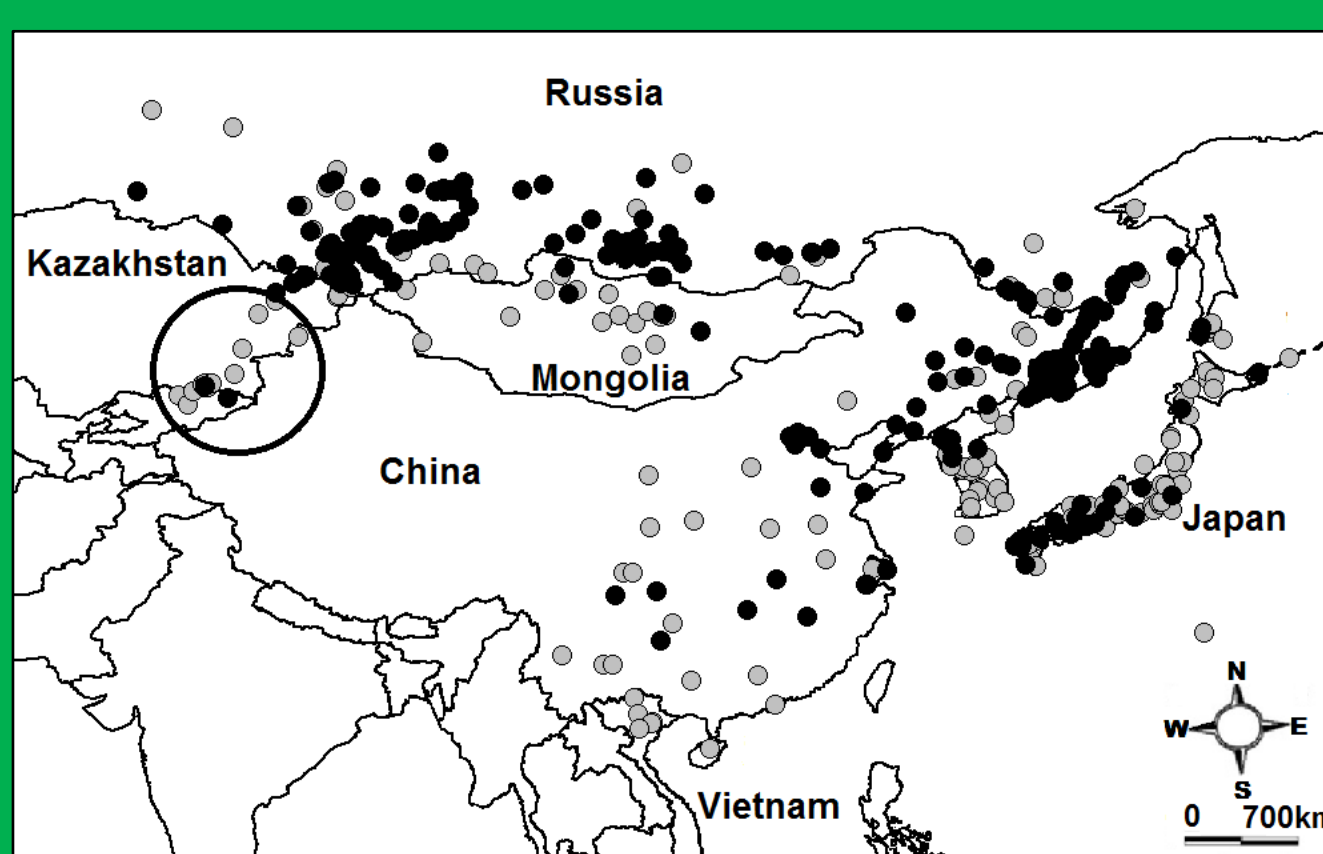


Fig. 1. Localities of findings *H. axyridis* in Asia. Black dots - localities from which the specimens have been examined. Grey dots - localities indicated in the literature. Invasive occurrences outside the native range are circled.

- *Harmonia axyridis* from the Far East was released for control of aphids in Georgia, the Ukraine, Belarus and Kazakhstan. In spite of massive releases since 1927 the species was thought to be not established before 2002.
- Now it is established in the Ukraine, Moldova, Belarus, west and south of European Russia (Fig. 2). Some adults are also found central regions of European Russia
- In some regions individual specimens were found well before the eastern border of European range became close: in 2002 in Eastern Georgia, in 2005 in Abkhazia, in 2003 in Kiev (the Ukraine).

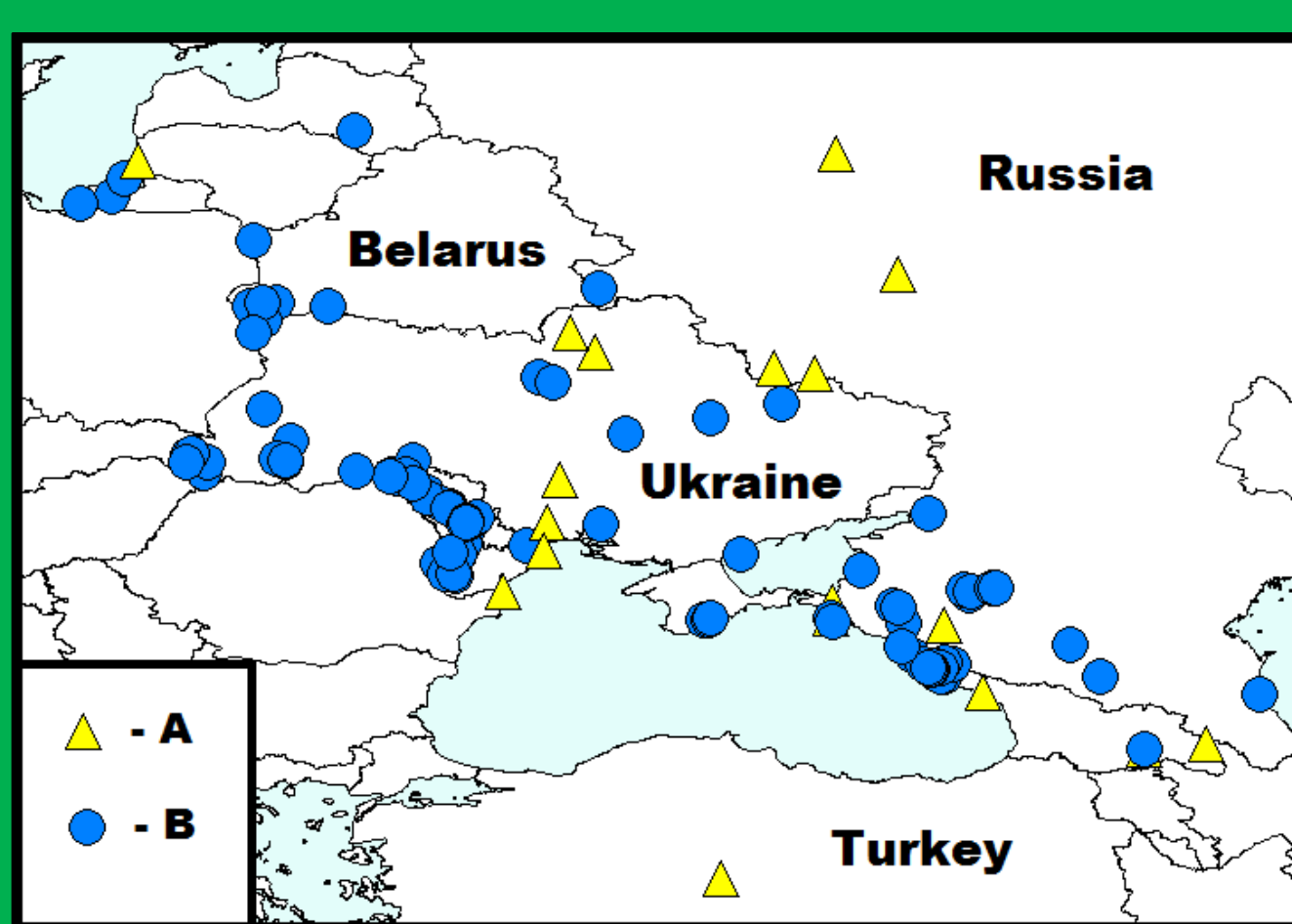


Fig. 2. Localities of findings of *H. axyridis* in European Russia and neighboring regions. A – localities, where individual specimens have been found. B – localities where the species has established.

- Population in the southeastern Kazakhstan and Kyrgyzstan is neither native nor a result of intentional introduction and appeared as a result of unintentional introduction from the western part of the native range (Figs 1 and 3).
- The analysis of dates and places of findings indicates that *Harmonia axyridis* appeared in southeastern Kazakhstan and Kyrgyzstan after the construction of the Turkestan-Siberian Railway. It is hypothesized that the beetles crossed the desert along this railway.

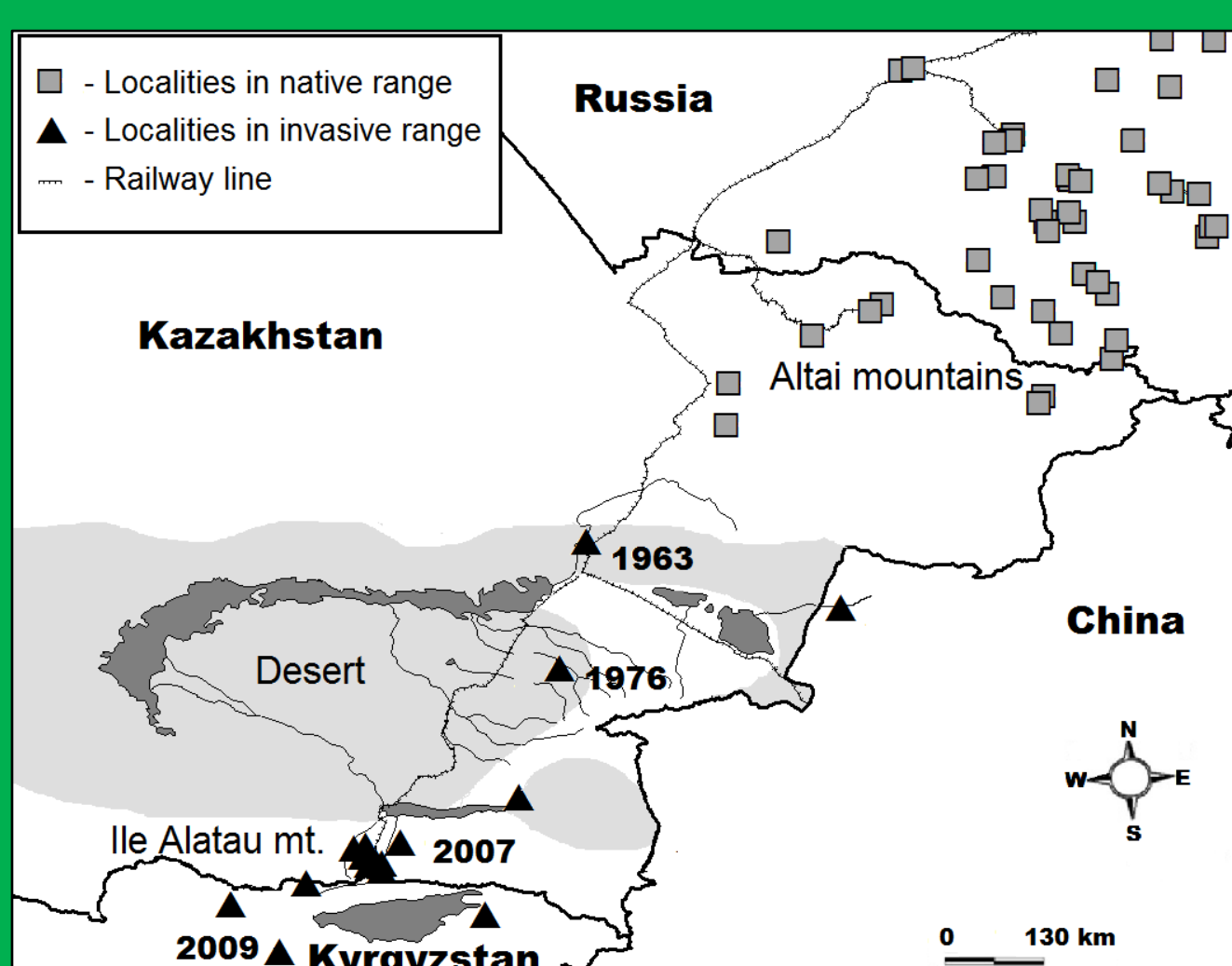


Fig. 3. Invasion of *Harmonia axyridis* to southeastern Kazakhstan and Kyrgyzstan. Years of first findings are indicated.



Cryptolaemus montrouzieri

<http://www.zin.ru/animalia/coleoptera/rus/finlopaww.htm>

- Predator of coccids. In Sochi occurs on oleanders.
- Native range: Australia and New Caledonia.
- Introduced to New Zealand, Europe, Asia, Africa, North and South America. In Europe it was released many times since 1908 and established in Italy, Spain, France, Portugal, Albania, Greece, Czech Republic, Georgia and the south of European Russia.
- It was released to control pests on plantations of citrus plants and grapes in the USSR in Abkhazia (1933), Azerbaijan (1934), Uzbekistan (1940-s) etc., but thought to be not established for a long time. In 2011 and 2012 established populations were found in the south of Russia (Sochi) and Abkhazia.



Lindorus lophantae

<http://www.zin.ru/animalia/coleoptera/rus/finlopaww.htm>

- Predator of scale insects (Diaspididae).
- Native range: Australia and New Zealand.
- Established in Albania, Croatia, France, Greece, Italy, Spain, Yugoslavia, United Kingdom, Crimea, Georgia, Algeria, the Canary Islands, Morocco, Madeira, Tunisia, Iran, Turkey, India as well in Nearctic and Neotropical Regions.
- Released for control of Diaspididae in 1948 in Georgia and Crimea. Established population was detected in Georgia.
- The whole population of *L. lophantae* in the Caucasus derives from laboratory culture, established from just one pair of insects collected in Italy.