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## Invasion of the species *Alaus oculatus* (Linnaeus, 1758) (Coleoptera; Elateridae) in the zone Palearctica

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### ABSTRACT

In 2009 we for the first time found a look in a neighborhood of the city of Geledzhik. Still this look wasn't specified for the territory of Russia, but also Palearktiki as a whole. In 2013 this look was noted repeatedly. It testifies about not accidents of detection. The species is resulted for the first time for Russia and will be included in base Zoological institute the Russian Academy of Sciences ([www.zin.ru/ANIMALIA/COLEOPTERA/eng/atl\\_elat.htm](http://www.zin.ru/ANIMALIA/COLEOPTERA/eng/atl_elat.htm))

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### 1. INTRODUCTION

The *Alaus oculatus* it is extended to territories of east part of the United States, from Quebec (a province of Canada) to Florida (state of USA) and on the West of Texas and South Dakota (states). It lives in deciduous woods and in areas with a considerable quantity of trees with firm breed, for example, a cherry, an apple-tree, but in particular in places with decaying wood. Is more often than larvae it is possible to meet on the earth where they eat seeds, roots and underground small stalks of plants. Develop in the earth from two till six years. Beetles eat nectar a flower. Larvae - phitophageus, also are wreckers of cultural plants, for example, eat corn roots, roots of vegetables and some flowers. Also larvae zoophagous, eating larvae of some insects which hatched in trunks of a cherry, an apple-tree and an oak. Time of summer of beetles - autumn and meet in September is more often.

### Invasion

In ecology and biology - intrusion on any territory or in экосистему not characteristic for them a biological species which occurs, unlike интродукции, without conscious participation of the person. Invasion alien species now is a part of global natural changes and can often cause essential losses of a biological variety and are characterized by the economic importance ecosystems, subject similar biological invasion. At times similar invasion can cause a considerable economic damage and represent health hazard of people.

### Palaearctica

The Palaearctic or Palaearctic is one of the eight ecozones dividing the Earth's surface. Physically, the Palaearctic is the largest ecozone. It includes the terrestrial ecoregions of Europe, Asia north of the Himalaya foothills, northern Africa, and the northern and central parts of the Arabian Peninsula. The Palaearctic ecozone includes mostly boreal and temperate climate ecoregions, which run across Eurasia from Western Europe to the Bering Sea.



Figure 1

Photo of a collection *Alaus oculatus* (B). Card of a place of detection (A). Landscape of dwelling of a species (C)

## 2. MATERIALS AND METHODS

Researches were conducted in 2009–2013 in vicinities of Gelendzhik, Krasnodar area. Biotope of dwelling of a look - a forest belt presented generally one look – gledichey (*Gleditsia triacanthos* L.). Biotopes dwellings look figure 1. Collecting a material was carried out by the standard methods. The imago is found under bark of trees. The material is stored in the zoological museum (North Caucasian Federal University) Stavropol, Russia.

## 3. RESULTS

Leng and Mutchler (1914) listed *A. patricius* under the generic name *Calais* but Blackwelder (1944) listed that name as a subgenus of *Alaus*. The latter placed *A. luscus* Olivier as a synonym of *A. patricius*, but *A. luscus* Fabricius is a synonym of *A. oculatus*. *A. oculatus* is widespread in the eastern United States, being recorded by Leng (1920) from "Indiana, Atlanta States - Texas, Florida." Blatchley (1910) listed it from throughout Indiana; Fattig (1951) listed 19 localities scattered over Georgia; and Dietrich (1945) listed it as being found throughout the state of New York. Becker indicated that *A. oculatus* also occurs in southern Ontario and Quebec.

*A. myops* is more common in the southeastern United States although it is occasionally found in the northern states; recorded by Leng (1920) reported from "Indiana, Middle and Southern States, Florida." Blatchley (1910) listed one record for Indiana and stated "rare north of the Ohio River". Fattig (1951) listed 20 localities scattered over Georgia. Dietrich (1945) listed nine localities in New York.

*A. patricius* (Candeze) is present in the Florida Keys. Schaeffer (1909) listed this species from Cuba and recorded the first United States specimen from Chokoloskee, Florida. Knull (1932) discussed many records of foreign Lepidoptera from Chokoloskee and concluded that some were sold by a commercial collector and validity of the labels was doubtful. It is likely that Schaeffer's specimen was mislabeled also, but the three collected specimens

### Elateridae

Family of insects from group of beetles. For today it is described over 10 000 species divided into more than 400 genus. The biology щелкунов is better studied at Palearctic species, less studied at not Arctic, it is very bad - at tropical species, and about them there are only small sketchy records.

served to confirm its presence in Florida, at least on Key Largo. Leng and Mutchler (1914) listed *A. patricius* (under the generic name *Calais*) from Cuba only. Blackwelder (1944) listed *A. patricius* from "Cuba, I. de Pinos, USA".

The ferocious looking larva and the large beetle might be expected to be a serious pest. However, the adults probably feed little and the larvae are effective predators on many wood-boring beetle larvae. They are most often encountered in rotting stumps of oak, cherry, and apple, whereas *A. myops* is usually found in pine stumps and logs. Rohwer (1920) listed *Xorides catomus* Davis (Ichneumonidae) as a parasite of the larvae.

### 4. DISCUSSION

We studied 5 Individuals of a look: 4 males 1 female. Visible distinctive signs from standard species aren't revealed (figure 1). There is not found out a way of penetration of a look, most likely a look was delivered from North America, and got accustomed having formed local population. According to the personal message Darryl Le Shuler conditions and habitat of a look around Geledzhik (Russia) are very similar with those in the State of Texas (figure 1).

### 5. CONCLUSION

Based on the above it is necessary to draw the main conclusion: *Alaus oculatus* (Linnaeus, 1758) look new to the Palearctic zone. The vector of penetration is connected with intensive transport connection with the American continent.

It seems to us that possibility of installation of the alien look is defined:

- existence of transit ways ("the invasive corridors");
- existence of ways of transfer (vectors invasions);
- adaptive opportunities of the look;
- size of the press of recruits;
- vulnerability of native ecosystems.

Addition of all listed factors caused penetration of a look into a new zoogeographical zone.

### SUMMARY OF RESEARCH

1. While we know one local habitat near Gelendzhika.
2. During research 5 individuals of a species *A. oculatus* are studied.
3. The next years it will be clear the species will get accustomed in the given territory. It awakes intensively to be settled or will be limited to areas with moderated at the Black Sea climate.

### FUTURE ISSUES

I believe that many processes of transformation of a biota occurring in the last time are connected directly with economic activity of the person. Invasions of types in alien habitats, set important theoretical and practical tasks for researchers. Now it isn't clear as the look in the new environment will lead.

### DISCLOSURE STATEMENT

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