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TO THE SYNONYMY OF *ANGARACRIS BARABENSIS* (PALLAS, 1773) (ORTHOPTERA, ACRIDIDAE) WITH CLARIFYING THE PECULIARITIES OF ITS FEEDING AND DISTRIBUTION

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The specimens of *Angaracris barabensis* (Pallas, 1773) with dark hind wings are found beside specimens with light wings in the same locality of Pavlodar region in Kazakhstan. New synonymy is proposed: *Angaracris barabensis* (Pallas, 1773) = *Angaracris nigripennis* Lian et Zheng, 1984, **syn. n.** New data on nutrition and distribution of *A. barabensis* in Kazakhstan are given.

KEY WORDS: Orthoptera, Acrididae, Oedipodinae, *Angaracris*, synonymy, distribution, food plants, Kazakhstan.

М. К. Чильдебаев, И. И. Темрешев, С. В. Колов. К синонимии барабинской трещотки *Angaracris barabensis* (Pallas, 1773) (Orthoptera, Acrididae) с уточнением особенностей ее питания и распространения // Дальневосточный энтомолог. 2013. N 263. С. 1-7.

В одном и том же месте в Павлодарской области Казахстана найдены как темнокрылая, так и светлокрылая формы *Angaracris barabensis* (Pallas, 1773). Установлена новая синонимия: *Angaracris barabensis* (Pallas, 1773) = *Angaracris*

nigripennis Lian et Zheng, 1984, **syn. n.** Приводятся новые данные по питанию и распространению *A. barabensis* в Казахстане.

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INTRODUCTION

The genus *Angaracris* Bey-Bienko, 1930 includes nine species, seven of which are known from the different parts of China. *Angaracris barabensis* was described based on few specimens as *Gryllus barabensis* from Barabinskaya steppe in the south part of West Siberian plane (Pallas, 1773). This species is widely distributed in Kazakhstan, Russia, Mongolia, and China (Bey-Bienko, 1930), but the data on its distribution and range of host plants are incomplete or contradictory (Bey-Bienko & Mishchenko, 1951; Sergeev, 1986; Lachininsky *et al.*, 2002; Hao & Kang, 2004; Zhao *et al.*, 2005). In present paper we clarify the synonymy of *A. barabensis*, its food plants and distribution in Kazakhstan. The material examined here is deposited at the Institute of Zoology, Almaty.

TAXONOMY

Angaracris barabensis (Pallas, 1773)

Figs 1–4

Gryllus (Locusta) barabensis Pallas, 1773: 728 (type locality: Russia, West Siberia, Barabinskaya steppe [now Novosibirsk region]; types probably lost).

Angaracris nigripennis Lian et Zheng, 1984: 305, figs. 23-27 (holotype – male, China: Gansu province, Sunan; in Shaanxi Normal University, P.R. China), **syn. n.**

MATERIAL EXAMINED. **Kazakhstan:** Pavlodar region, Bayanaul area, 12.VIII 1972, 2 ♂, 2 ♀ (M.P. Malkovsky) (1 ♂ and 1 ♀ belongs to rose-wing form, other male and female to dark-wing form); Akmola region, Korgalzhyn Biosphere Reserve: floodplain of Nura River, 50°37'40.4" N, 70°02'31.1" E, 339 m, sagebrush-fescue station with inclusion of *Parmelia*, 6.VII 2012, 7 larvae of V instar (M.K. Childebaev, I.I. Temreshev); the same locality, 9.VII 2012, 1 ♂, 5 ♀, 4 larvae of IV-V instars (M.K. Childebaev, I.I. Temreshev); the same locality, 10.VII 2012, 1 ♂, 1 ♀ (M.K. Childebaev, I.I. Temreshev), the road to Karazhar cordon, 50°36'06.2" N, 69°48'00.2" E, 334 m., shore covered with sparse and stunted reeds on the banks with *Parmelia* and wormwood, 12.VII 2012, 1 ♂ 1 ♀, (M.K. Childebaev, I.I. Temreshev).

DISTRIBUTION. Kazakhstan: Pavlodar and Kostanay regions, Kent Mountains, Karsakpay Plateau (Lachininsky *et al.*, 2002), Akmola region (new record); Russia, Mongolia, China.

NOTES. During long time two color forms of *Angaracris barabensis* was considered as distinct species or subspecies. In *A. barabensis* the base of hind wings is

greenish or yellowish, and in *A. rhodopa* (Fischer-Waldheim, 1836) described from Katun Ridge in Altai Mountains (Russia) the base of wing is pink and thick veins in the basal part are red. Despite the fact that earlier *A. rhodopa* considered as a variation of *A. barabensis* (Jacobson, 1905), G.Ya. Bey-Bienko (1930) on the base of indistinct differences in their distribution has approved the *A. rhodopa* in the status of separate species. More recent studies have revealed the existence of transitional forms in the color of the wings, and it was suggested to consider *A. rhodopa* as a subspecies of *A. barabensis* (Popov, 1964). A.A. Benediktov (1998) on the large material retraced the entire series of transition from the greenish color of the wings with gray main veins and yellowish wings with transparent main veins to pale pink and intensely pink. The main veins in the latter cases may be gray, transparent or red. He showed that in South Siberia and Mongolia these forms inhabits not only together, but in the same stations, and therefore *A. rhodopa* can not be considered as subspecies of *A. barabensis*. The presence of transitional forms, the similarity in the acoustic signals of males, absence of differences in the structure of the male genitalia, and the same localization of C-heterochromatic blocks in chromosomes (Vysotskaya & Bugrov, 1987) led to the conclusion that *A. rhodopa* is synonym of *A. barabensis* (Benediktov, 1998).

In the collection of the Institute of Zoology (Almaty) we found the series of *A. barabensis* from Bayanaul locality in Pavlodar region collected by M.P. Malkovsky, which consists of greater number of specimens belonging to all three forms (light-wing, rose-wing and dark-wing). We extremely careful study fore specimens. Two of them (σ and ♀) belongs to rose-wing form (Fig. 1). Other two specimens (σ and ♀) belongs to dark-wing form (Fig. 2, 3). The dark-wing form differs from other forms by the saturated dark coloration of hind wings and by red main veins; the male wing apex almost transparent with a very mild dark spots; in female the dark spots are expressed much more clearly.

Angaracris nigripennis Lian et Zheng, 1984 was described from China based on single male with dark colored hind wings. Other characters of this species (painting the inside of the hind femur, tibia, the main veins of the hind wings, the shape of head and pronotum, and male epiphallus) coincide with specimens of *A. barabensis* from Kazakhstan studied by us.

Thus, the existence of all three forms of the same habitats (ecosystems) in the Pavlodar region, the lack of differences in the color of the hind wings, thighs, drumsticks, the structure of the pronotum, head and epiphallus of male *A. nigripennis* and dark-wing form from Kazakhstan allow us to propose new synonymy: *Angaracris barabensis* (Pallas, 1773) = *Angaracris nigripennis* Lian et Zheng, 1984, syn. n.

FOOD PLANTS

We study the food plants of *Angaracris barabensis* in the Korgalzhyn Biosphere reserve (Kazakhstan: Akmola region).



Fig. 1. *Angaracris barabensis*, male, rose-wing form.



Fig. 2. *Angaracris barabensis*, male, dark-wing form.



Fig. 3. *Angaracris barabensis*, female, dark-wing form.



Fig. 4. V instar larvae of *A. barabensis* on the lichen *Parmelia vagans*.

During the research it was noted that *A. barabensis* in the Korgalzhyn reserve were present only in areas covered by lichen *Parmelia vagans* Nyl. In this regard, we have set up an experiment to identify the range of preferred food plants. For this purpose living adults and larvae of IV-V stages were collected.

For keeping insects and determine the characteristics of nutrition used the plastic cylindrical cages with mesh top (size 40 x 10 cm) and a wooden cage (size 20 x 40 cm), 2 walls of which were glass, and 2 others and ceiling - tight with metallic fine mesh, the bottom is wooden, upholstered with polyethylene in several layers. On the bottom cages placed the substrate of 7-8 cm thick, consisting of sand and clay soil in a ratio of 1 : 3. Green forage plants were placed on the surface of the substrate in small glass containers of water on the sides plugged with cotton wool to avoid falling and the death of insects.

In the capacity of fodder plants was proposed that grows in the place of insect's capture – *Parmelia vagans* Nyl., *Artemisia terra-albae* Krash., *A. austriaca* Jacq., *A. schrenkiana* Ledeb., *Dodartia orientalis* L., *Limonium gmelini* (Willd.), *Salsola* sp., *Chenopodium album* L., *Caragana arborescens* Lam., *Medicago romanica* Prod., *Trifolium hybridum* L., *Agropyron repens* L., *Kóchia* sp. The most readily eaten by larvae are *P. vagans*, *D. orientalis*, *A. terra-albae*, and by adults – *P. vagans*, *D. orientalis*, *A. terra-albae*, *A. austriaca*, *A. schrenkiana*, *L. gmelini*, *Salsola* sp., *T. hybridum*. The other plants were eaten insignificantly, or not at all. This confirm the information about the damage of pasture vegetation in general (Bey-Bienko & Mishchenko, 1951), but contrary to reports, according to which *A. barabensis* feeds mainly on cypress and pea shrubs (Sergeev, 1986). The cypress and pea shrubs were little damaged or no ate by insects.

Information about the preferential feeding of *Angaracris barabensis* on lichen *Parmelia vagans* are not provided anywhere else and represent a new and interesting fact. In the steppe areas large insects, such as *A. barabensis*, are potential victims for the birds. It is noteworthy that the color of adults and larvae of *A. barabensis* (Fig. 4) allows them to be invisible among the lichens, which is very important for the survival of this species.

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