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Contributions to the study of the genus *Aconurella* Ribaut, 1948 (Homoptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae: Chiasmini) of the Western Palearctic

К изучению видов рода *Aconurella* Ribaut, 1948 (Homoptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae: Chiasmini) западной Палеарктики

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KEY WORDS: leafhoppers, morphology, variability, vibrational signals, distribution, synonymy, European Russia, Kazakhstan, Central Asia, Siberia.

КЛЮЧЕВЫЕ СЛОВА: цикадки, морфология, изменчивость, вибрационные сигналы, распространение, синонимия, европейская часть России, Казахстан, Средняя Азия, Сибирь.

ABSTRACT. The variability of morphological and bioacoustic traits in four species of *Aconurella* occurring in European Russia, Kazakhstan, Central Asia, and Siberia was studied, traits suitable for species diagnostics in this genus were revealed. New data on the distribution of three species are provided. The synonymy *A. prolixa* (Lethierry, 1885) = *A. aethiopica* (Cogan, 1916), **syn.n.** and *A. sibirica* (Lethierry, 1888) = *A. alticola* Vilbaste, 1980, **syn.n.** is established.

РЕЗЮМЕ. Изучена изменчивость морфологических и биоакустических признаков у четырёх видов *Aconurella*, встречающихся в европейской России, Казахстане, Средней Азии и Сибири, выявлены видоспецифические признаки в этом роде. Приведены новые данные о распространении трёх видов. Установлена синонимия *A. prolixa* (Lethierry, 1885) = *A. aethiopica* (Cogan, 1916), **syn.n.** и *A. sibirica* (Lethierry, 1888) = *A. alticola* Vilbaste, 1980, **syn.n.**

Introduction

The genus *Aconurella* Ribaut, 1948 (Homoptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae: Chiasmini) includes 25 species distributed throughout Palearctic (19 species) and Africa (6 species); the ranges of some Eastern Palearctic species reach the Oriental region [Zahniser, 2007 present]. Presently, only two species, *A. prolixa* (Lethierry, 1885) and *A. quadrum* (Herrich-Schäffer, 1838), were recorded from Europe; for European Russia, only *A. prolixa* has been reported so far [Emelyanov, 1964].

Recent studies of this genus in Iran [Pakarpour Rayeni et al., 2015], Pakistan [Naveed, Zhang, 2018], and China [Duan, Zhang, 2012] revealed five new species and some new records. This inspired us to summarize our data on *Aconurella* of European Russia, Siberia, Kazakhstan, and Central Asia; available material on these species from other regions was also used. Two species from the Russian Far East, *A. ussurica* Anufriev, 1972 and *A. koreana* (Matsumura, 1915), similar in the genitalia shape to the widespread *A. prolixa* and *A. sibirica*, respectively, are not considered here, since the detailed study is needed to clarify their taxonomic status.

The aim of this work is to describe the variability of morphological and bioacoustic traits in four species of this genus and to reveal reliable traits for species diagnostics. The identification of the poorly studied *A. quadrum* was also refined, new data on the distribution of three species were obtained, and two new synonyms were established.

Material and methods

Leafhopper vibrational signals were recorded by means of portable recording equipment consisting of a

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piezocrystal gramophone cartridge GZP-311 connected to the microphone input of a cassette recorder Elektronika-302 (before 2005), minidisk recorder Sony Walkman MZ-NH900 (2005–2016), or Roland R-05 wave/mp3 recorder (2017–2022) via a custom-made matching amplifier. For recording, a stem of the host plant about 10–15 cm in length was attached to the cartridge by a rubber ring with the cartridge needle slightly touching the stem. Then a nylon cage containing a male leafhopper was put on the twig. After some time, the male usually sat on the twig and started singing.

Oscillograms of signals were produced with Cool Edit Pro 2.1 software.

For elements of signal temporal pattern the following terms are used. **Pulse** is a brief elementary fragment of signal (or succession of sine waves) with rapid increase and subsequent decrease of amplitude, i.e. separated from similar fragments by amplitude minimums. Short fragments with constant temporal pattern usually repeated with regular intervals and consisting of uniform or different pulses are referred to as **syllables**. Any more or less prolonged signal with complex pattern (e.g. succession of similar or different syllables) is referred to as a **phrase**.

Digital images of male genitalia were obtained with a Micromed 3 LED M microscope equipped with a MIchrome 5 Pro camera (Tucsen). The map of signal recording localities was produced using free software from www.simplemappr.net.

Materials studied are deposited in the collection of the Zoological Museum of M.V. Lomonosov Moscow State University.

Diagnostic traits in the genus *Aconurella*

1. External morphology and coloration

The body length in different species of *Aconurella* overlaps greatly, so this trait cannot be used for species identification.

In some species, there are macropterous and brachypterous forms, but usually, only one form predominates in each species. Among four species studied, *A. prolixa* and *A. quadrum* are always macropterous (Figs 1–7). In our material on *A. diplachnis* Emelyanov, 1964, brachypterous and subbrachypterous forms prevail (Figs 8–12). All studied specimens of *A. sibirica* (Lethierry, 1888) are brachypterous (Figs 13–15).

Also, the studied species of *Aconurella* differ in the coloration of the dorsal part of the body. In *A. quadrum* and *A. prolixa*, pro- and mesonotum are usually without a black pattern. In *A. prolixa*, females have not spots on the crown (Figs 3–4), males usually have only a small black spot at the crown apex (Fig. 2); individuals with strongly developed dark pigmentation have two more triangular brown spots on the sides of the crown midline (Fig. 1). *A. quadrum* has a black diamond-shaped spot on the crown in both males and females (Figs 6–7). In males of *A. diplachnis*, the dark pattern is strongly developed (Figs 8–10); in males of *A. sibirica*, it has a similar shape, but is less developed, especially on the pronotum (Figs 13–14). Females of *A. diplachnis* and *A. sibirica* are indistinguishable (Figs 11–12 and 15).

In most cases, the forewing length and the coloration of the upper side of the body do not show geographical variability. The studied specimens of *A. prolixa* from Israel, Northern Caucasus, Kazakhstan, Central Asia, and India have exactly the same coloration and dark pattern as specimens from China [Duan, Zhang, 2012] and Pakistan [Naveed, Zhang, 2018]. Our specimens of *A. diplachnis* and *A. sibirica* are also similar in coloration to the Chinese ones [Duan, Zhang, 2012]. *A. prolixa* from different regions is always macropterous, *A. diplachnis* from China is always macropterous (macropterous and brachypterous in our material), *A. sibirica* from China is usually brachypterous (always brachypterous in our material). Thus, the dark pattern and the forewing length can be succesfully used for species diagnostics, so the small series and even typically colored single specimens of these species can be identified by external traits.

2. Male genitalia

In many leafhopper genera, differences in the aedeagus shape are the most reliable traits for species diagnosis. In different species of *Aconurella*, the aedeagus shape is similar (Figs 16–35), and small differences between individuals are the result of intraspecific variability, as can be seen from the study of conspecific males from the same locality (Figs 21–22, 30–31).

The same is true for the shape of the valve, subgenital plates and styles (Figs 36–50). Usually, the distal process of the style in all species has smooth edges; however, in some males it bears one or more small denticles on the outer or inner edges (Figs 41, 43–44).

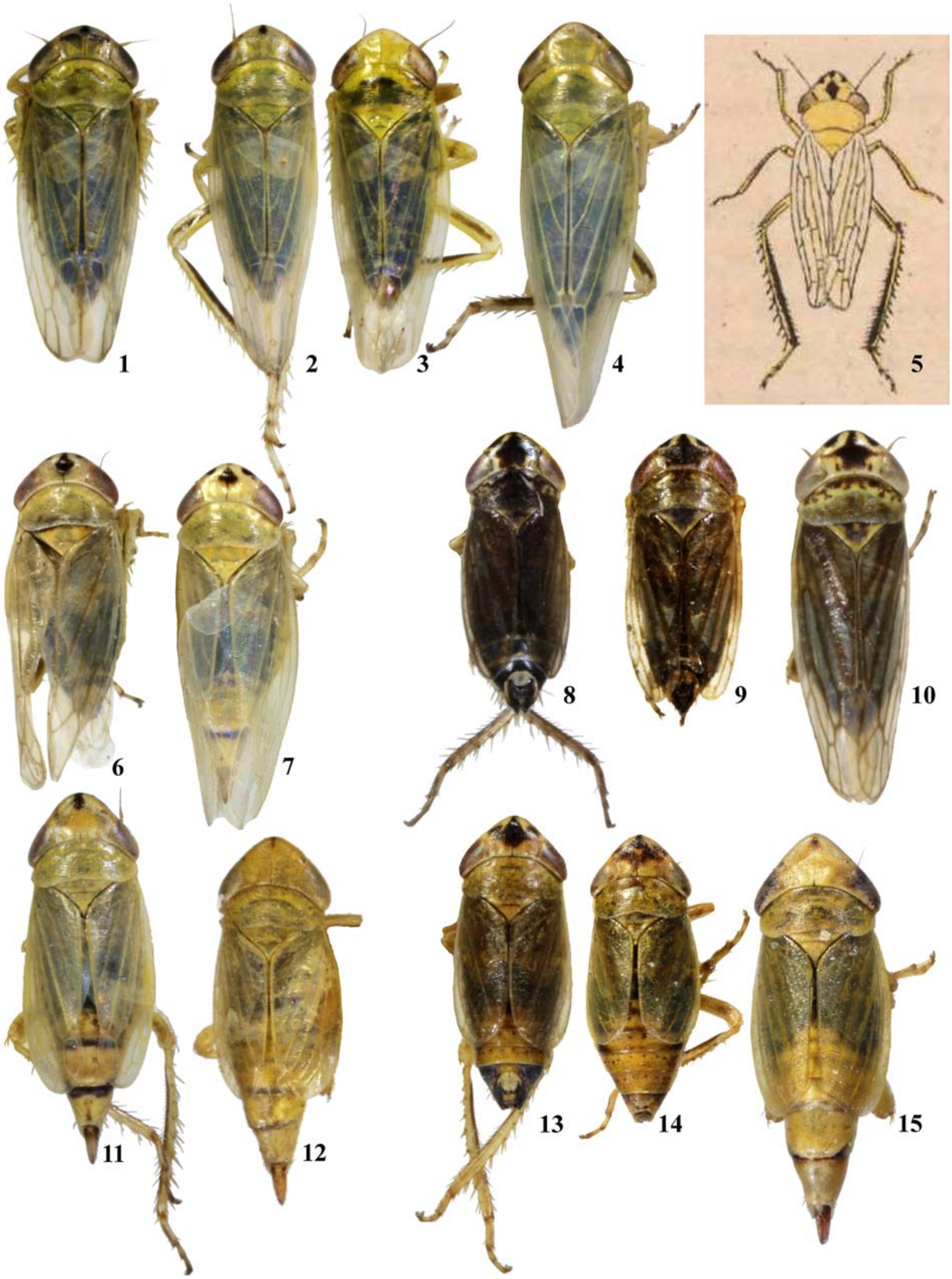
The most reliable diagnostic trait is the shape and arrangement of denticles on the dorsoapical and posteroventral margins of the pygofer lobes; this trait is currently used by all authors describing *Aconurella* species (Figs 51–68).

In some cases, the shape of a semitransparent, weakly sclerotized area in the central part of the pygofer lobes is no less important for species diagnostics. For example, *A. sibirica* and *A. quadrum* are similar in the shape and arrangement of denticles on the pygofer lobes, but differ in the shape of a semitransparent area, band-shaped in *A. quadrum* (Figs 59–60) and oval in *A. sibirica* (Figs 66–68). This trait is still underestimated in the species diagnostics in this genus and was illustrated only for the Far Eastern species [Anufriev, 1972; Anufriev, Emelyanov, 1988].

Therefore, the only trait of the male genitalia suitable for species diagnostics in *Aconurella* is the shape and arrangement of denticles on the pygofer lobes and the pattern of sclerotization of their central parts.

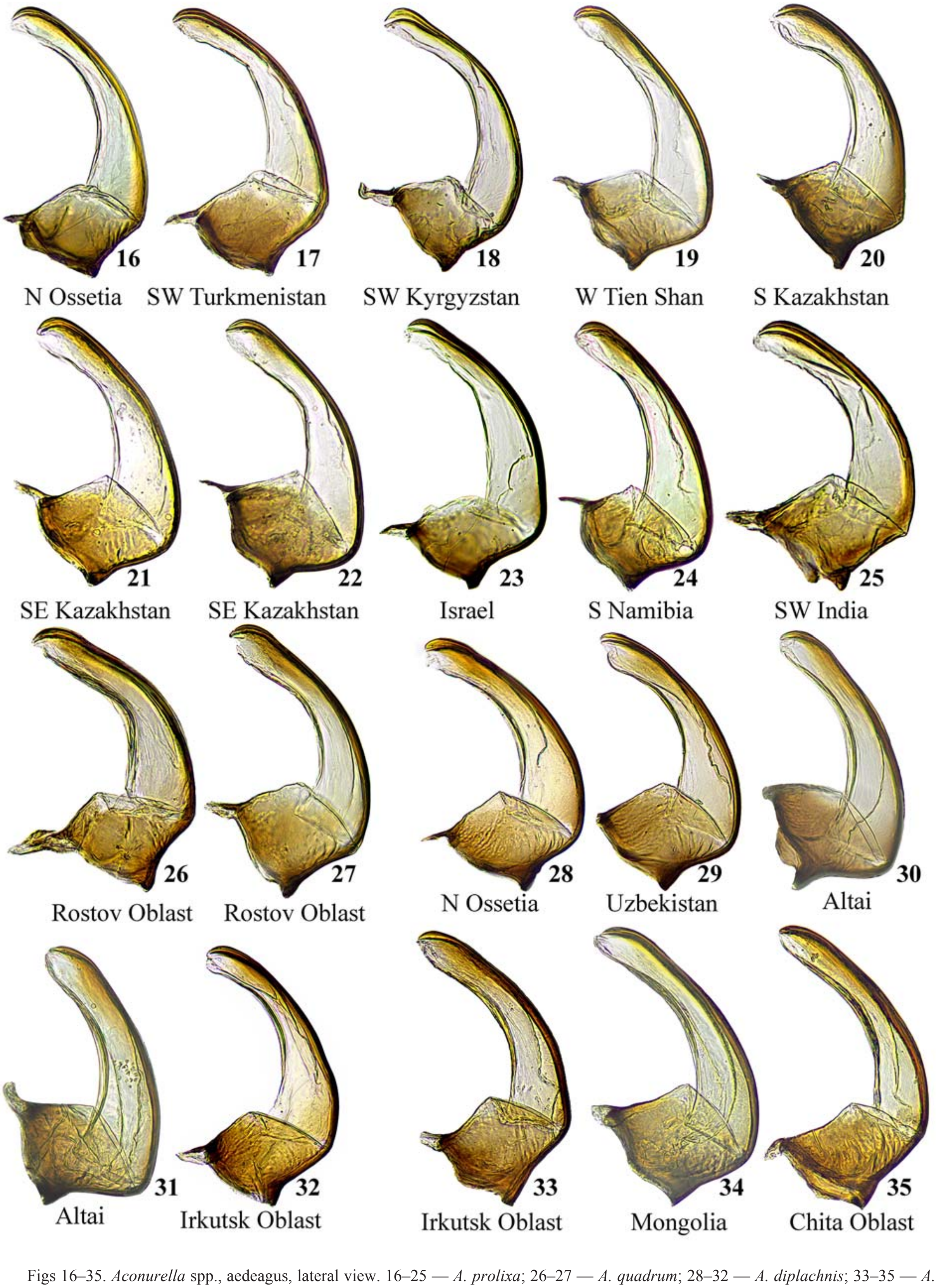
3. Male calling signals

Small Auchenorrhyncha use for intraspecific communication not air-borne sounds, but vibrational signals transmitted via a solid substrate, i.e. plant stems or



Figs 1–15. *Aconurella* spp., dorsal habitus. 1–4 — *A. prolixa*; 5–7 — *A. quadrum*; 8–12 — *A. diplachnis*; 13–15 — *A. sibirica*. 1–2, 6, 8–10, 13–14 — males, 3–4, 7, 11–12, 15 — females, 5 — after Herrich-Schäffer [1838].

Рис. 1–15. *Aconurella* spp., вид сверху. 1–4 — *A. prolixa*; 5–7 — *A. quadrum*; 8–12 — *A. diplachnis*; 13–15 — *A. sibirica*. 1–2, 6, 8–10, 13–14 — самцы, 3–4, 7, 11–12, 15 — самки, 5 — по: Herrich-Schдffer [1838].



16 N Ossetia
17 SW Turkmenistan
18 SW Kyrgyzstan
19 W Tien Shan
20 S Kazakhstan
21 SE Kazakhstan
22 SE Kazakhstan
23 Israel
24 S Namibia
25 SW India
26 Rostov Oblast
27 Rostov Oblast
28 N Ossetia
29 Uzbekistan
30 Altai
31 Altai
32 Irkutsk Oblast
33 Irkutsk Oblast
34 Mongolia
35 Chita Oblast

Figs 16–35. *Aconurella* spp., aedeagus, lateral view. 16–25 — *A. prolixa*; 26–27 — *A. quadrum*; 28–32 — *A. diplachnis*; 33–35 — *A. sibirica*; the localities are given under the figures.

Рис. 16–35. *Aconurella* spp., эдеагус, вид сбоку. 16–25 — *A. prolixa*; 26–27 — *A. quadrum*; 28–32 — *A. diplachnis*; 33–35 — *A. sibirica*; места сбора указаны под рисунками.

leaves on which the insects occur. As shown by ethological experiments, it is the differences in the structure of the calling signals emitted by males to attract conspecific females that constitute the principal precopulatory reproductive barrier in many groups. Therefore, when differentiating close forms by their signals, one can actually discriminate between biological species based on the very criterion of their reproductive isolation. For this reason acoustic analysis in taxonomy is a useful tool for recognition of biological species. On the other hand, species that do nor perceive each other's signals due to allopatry or differences in host specialization can produce signals with an almost identical temporal pattern [review: Tishechkin, 2013].

Male calling signals of four *Aconurella* species from 14 localities in Russia, Kazakhstan, and Kyrgyzstan were studied (Fig. 69). In *A. diplachnis*, *A. quadrum*, and *A. prolixa*, calling is a phrase lasting from about 10 up to 20–30 s and consisting of discrete syllables usually increasing in amplitude (Figs 70–95). In all three species, the syllable temporal pattern, as a rule, changes in the same way from the beginning to the end of the phrase. The syllables in the initial part of the phrase are longer and consist of several discrete pulses (for example, Figs 75, 77–78, 83). Then the number of pulses gradually decreases and they merge with each other (for example, Figs 76, 79, 84–85). Often in the last syllables of a phrase, the pulses are almost indistinguishable (for example, Fig 80). Sometimes, the phrase begins with syllables with almost indistinguishable pulses, so that the shape of syllables remains almost unchanged throughout the phrase (Figs 74, 81). Occasionally, the male produces shorter successions of syllables, as a rule lasting from 2–3 up to 5–7 s; these signals do not show such a distinct change in the syllable pattern as in prolonged phrases (Figs 89–90).

In our recordings, syllable repetition period averages 180–270 ms in *A. diplachnis*, 260–370 ms in *A. prolixa*, and 450–600 ms in *A. quadrum*. Accordingly, the signals of *A. quadrum* (Figs 82–85) distinctly differ from the signals of *A. prolixa* and *A. diplachnis*, whereas the signals of the latter two species sometimes are indistinguishable (cf. Figs 70–81 and 86–95). This similarity of the signal patterns can be explained by the fact that *A. diplachnis* and *A. prolixa*, apparently, do not perceive each other's signals due to differences in host specialization.

A. sibirica has a completely different calling signal pattern. Signals of this species are phrases produced with irregular intervals of about 4–5 s and more; phrase duration averages 2–3 s (Figs. 96–97). Usually the phrase begins with several discrete pulses followed by prolonged monotonous component (Fig. 98). Sometimes discrete pulses at the beginning of a phrase are almost completely reduced (Fig. 99).

In most cases, we have signal recordings of only 1–3 males from each locality. This is not enough for investigation of the geographical variability of signals, but it should be noted that, in general, the signals of conspecific males from different regions are similar.

Thus, the calling signal analysis cannot always help to clarify the status of the species group taxa in this genus. Distinct differences in the signal patterns certainly indicate the species status of taxa, but the similarity of signals may not always be the basis for establishing synonymy.

4. Biology

All species of *Aconurella* are grassland leafhoppers. Usually they inhabit steppes, grassland slopes of low mountains, or meadows on the banks of rivers and lakes in the steppe and desert zones. Data on their host specialization are scarce. Most authors indicate, that they feed on grasses (Gramineae), but the grass species from which specimens were collected, as a rule, remained unidentified.

We collected *A. prolixa* from *Botriochloa ischaemum* (L.) Keng in low mountains of Northern Caucasus (Sunzhenskiy Range) and from *B. ischaemum* and *Cynodon dactylon* (L.) Pers. in Kyrgyzstan. In southern and southeastern Kazakhstan, this species was very numerous on *C. dactylon* on the banks of rivers and lakes in all localities studied. Mityaev [2002] lists a number of grasses as host plants (*Aeluropus*, *Aneurolepidium*, *Elymus*, *Poa*, *Cleistogenes*), but, strangely, *C. dactylon* is absent from this list.

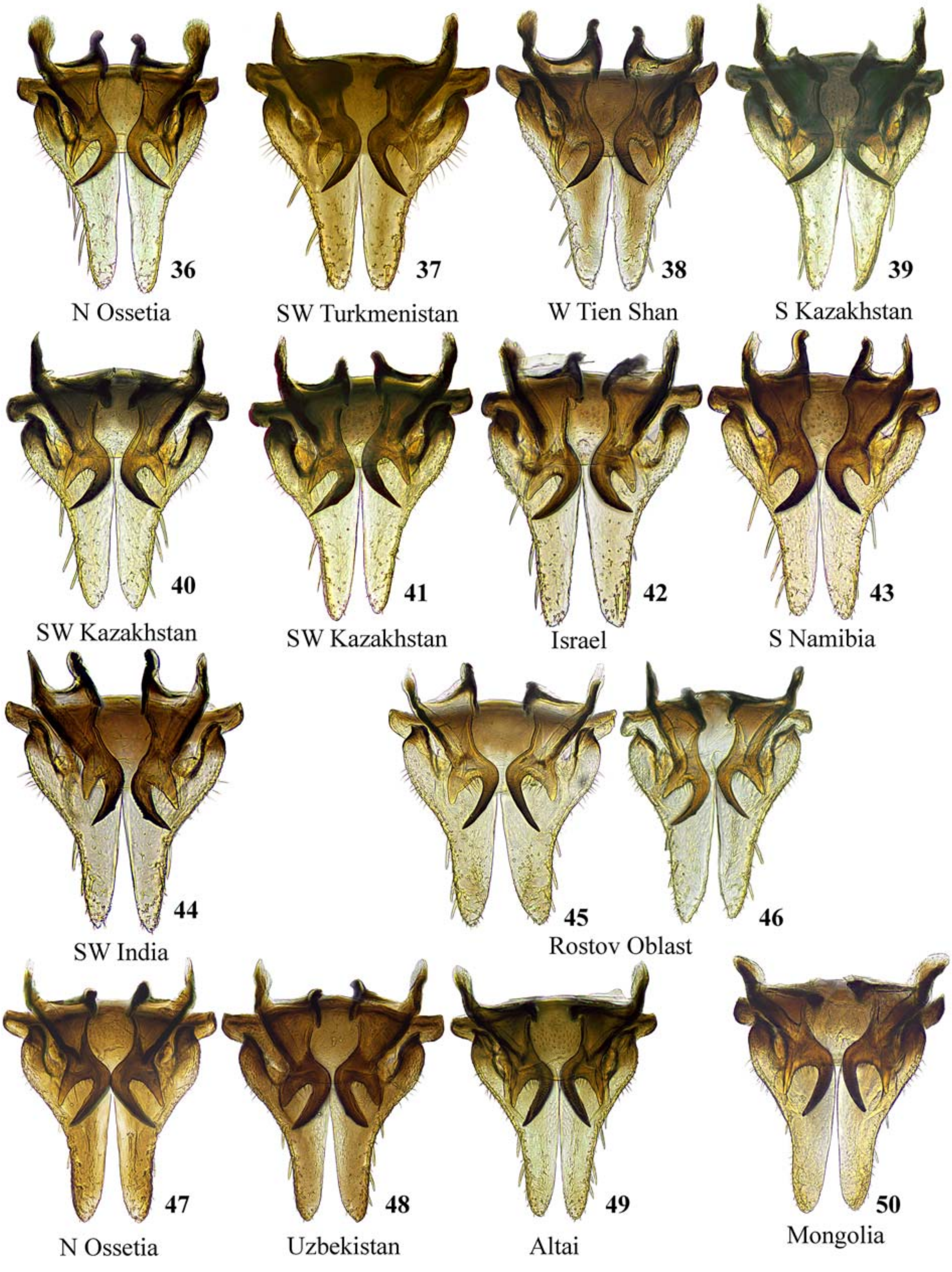
Our specimens of *A. quadrum* were collected from *Salsola tragus* L. (Chenopodiaceae) on sandy soil on the edge of the harvested field in Rostov Oblast. Possibly, this is an accidental find, since only two males and one female were collected. On the other hand, we did not found *A. quadrum* on any other plants in the steppes, meadows, and the river floodplain in this locality. Dlabola [1956] investigated 15 females collected on sandy soil in Slovakia from unknown host. Mityaev [2002] lists *Aeluropus*, *Secale*, and *Agropyron* as host plants.

A. diplachnis is monophagous on *Cleistogenes squarrosa* (Trin.) Keng in Southern Siberia [Anufriev, Emelyanov, 1988 and our data], but we collected it also from *B. ischaemum* in the Sadon-Unal arid depression on Skalisty Range in North Ossetia. Mityaev [2002] considers this species to be oligophagous on *Cleistogenes* spp.

Our specimens of *A. sibirica* were collected from unidentified Gramineae in steppes of Southern Siberia. Mityaev [2002] collected this species in Kazakhstan in steppes and meadows with *Stipa*, *Festuca*, and *Cleistogenes*.

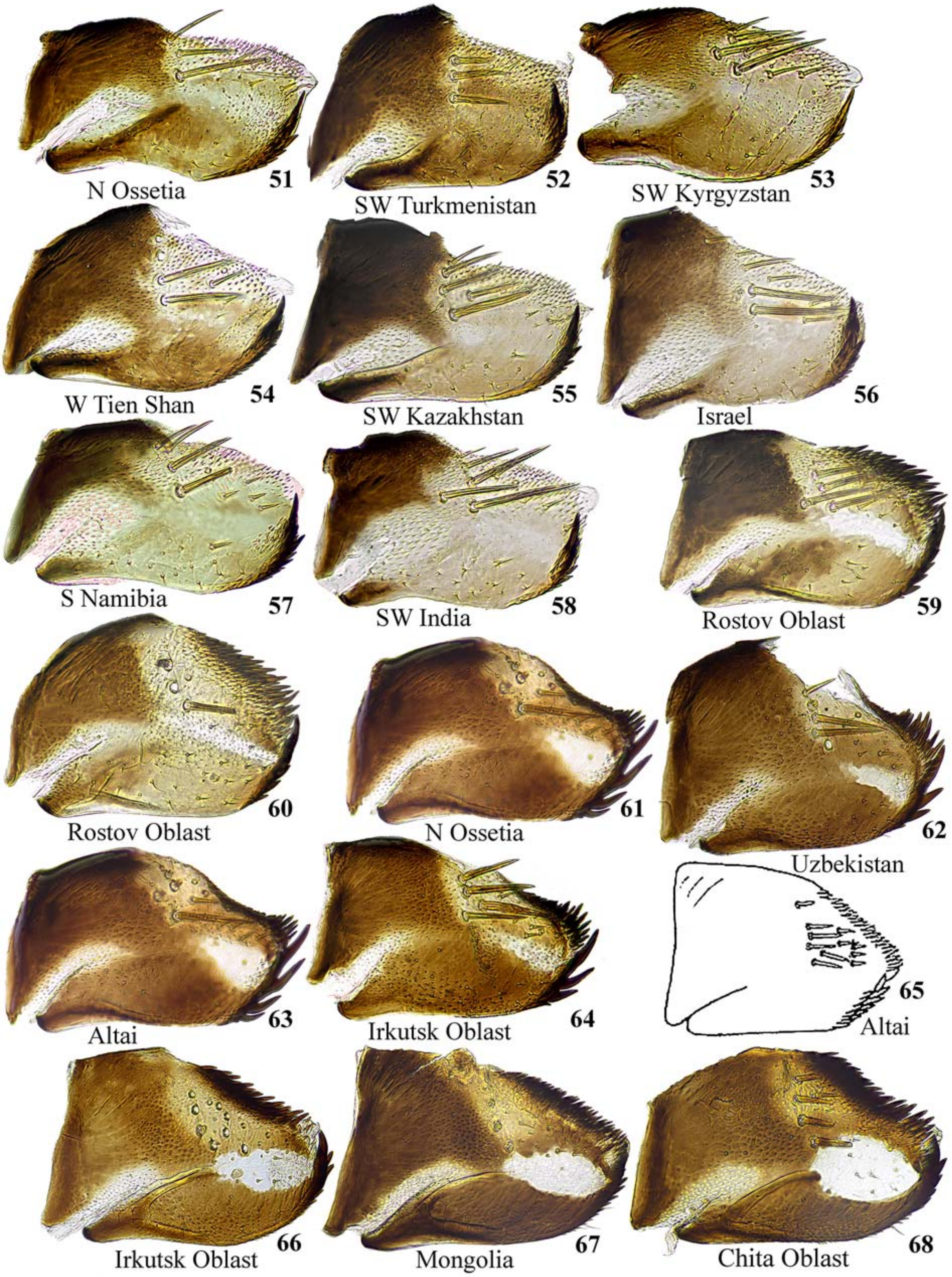
These data indicate that the members of the genus *Aconurella* can feed on different species of Gramineae, but at least some of them have distinct host preferences. In *A. prolixa*, these are *B. ischaemum* and *C. dactylon*, in *A. diplachnis*, this is *C. squarrosa*. Possibly, in *A. quadrum* and *A. sibirica*, the number of host species is actually also less than previously assumed.

The foregoing allows us to conclude that the most reliable trait for species diagnostics in the genus *Aconurella* is the structure of the pygofer lobes. Also for this purpose, the shape of a dark pattern on the upper side of the body can be used. The analysis of



Figs 36–50. *Aconurella* spp., subgenital plates, valve, and styles, dorsal view. 36–44 — *A. prolixa*; 45–46 — *A. quadrum*; 47–49 — *A. diplachnis*; 50 — *A. sibirica*; the localities are given under the figures.

Рис. 36–50. *Aconurella* spp., генитальные пластинки, вальва и стилусы, вид сверху. 36–44 — *A. prolixa*; 45–46 — *A. quadrum*; 47–49 — *A. diplachnis*; 50 — *A. sibirica*; места сбора указаны под рисунками.



Figs 51–68. *Aconurella* spp., pygofer lobe, lateral view. 51–58 — *A. prolixa*; 59–60 — *A. quadrum*; 61–64 — *A. diplachnis*; 65–68 — *A. sibirica*; the localities are given under the figures. 65 — after Vilbaste [1980], modified.

Рис. 51–68. *Aconurella* spp., доля пигофора, вид сбоку. 51–58 — *A. prolixa*; 59–60 — *A. quadrum*; 61–64 — *A. diplachnis*; 65–68 — *A. sibirica*; места сбора указаны под рисунками. 65 — по: Вильбасте (1980), с изменениями.

male calling signals does not always yield good results. Reliable identification of host plants in the field is difficult.

A recent comprehensive study of five *Aconurella* species from China, using various methods previously proposed for species delimitation using molecular data, generally confirmed the recognition of five species recognized by morphological traits [Yan et al., 2022]. Moreover, one of the methods strongly supported the recognition of all five species and thus can be considered the most reliable for species differentiation, as has been also shown in other taxa. These results suggest that the morphological traits previously used to identify *Aconurella* species are indeed reliable and adequately reflect boundaries between genetically distinct taxa.

Species of the genus *Aconurella* of the Western Palearctic

Aconurella prolixa (Lethierry, 1885)
Figs 1–4, 16–25, 36–44, 51–58, 70–81.

A. aethiopica (Cogan, 1916), **syn.n.**

DIAGNOSTIC TRAITS. Macropterous. Male usually with small black spot on crown, sometimes also with two brown triangular spots on both sides of crown midline (Figs 1–2). Female without black pattern on dorsal side of body (Figs 3–4).

Pygofer lobe with poorly sclerotized and semitransparent dorsoapical part densely covered with minute spinules, with more or less uniformly sclerotized distal half, and with row of denticles on posteroventral margin (Figs 51–58).

DISTRIBUTION. The southern part of the Palearctic from the Canary Islands and North Africa to China and Japan, India [Khatri, Webb, 2010], Ethiopia [Heller, Linnavuori, 1968], Sudan [Lindberg, 1927; as *Thamnotettix sanguisuga* Lindberg, 1927], Namibia (new record).

REMARKS. Theron [1970] reinvestigated types of *Athysanus aethiopica* Cogan, 1916 from Cape Town and numerous specimens collected in other widely separated localities in South Africa. He published detailed description of this species and placed it into the genus *Aconurella*. In his article, he emphasizes that *Aconurella aethiopica* is "very closely related to, if not identical with, *Aconurella prolixa*" [Theron, 1970: 312]. Our investigation of a male from the southern part of Namibia (Figs 24, 43, 57) revealed no significant differences from specimens of *A. prolixa* from the Palearctic, which is the reason for establishing synonymy *A. prolixa* (Lethierry, 1885) = *A. aethiopica* (Cogan, 1916), **syn.n.** This synonymy is further supported by the fact that in three localities in South Africa the specimens investigated by Theron [1970] were collected from *Cynodon* (one of the most preferred host plants of *A. prolixa* in the Palearctic). In addition, *A. prolixa* was found outside Palearctic in India and in the northern part of the tropical Africa, so the finding of such a widespread species in the southern part of this continent seems quite natural.

The drawings of the pygofer lobes of *A. ussurica* in Anufriev [1972] are quite similar to our photographs of *A. prolixa*. In addition, *A. prolixa* was recorded from most regions of China [Duan, Zhang, 2012], but has not yet been found in the Russian Far East [Anufriev, Emelyanov, 1988]. One could assume that *A. ussurica* is a junior synonym of *A. prolixa*; however, all of more than 100 specimens of *A. ussurica* studied by Anufriev [1972] from many localities are brachypterous.

Aconurella quadrum (Herrich-Schäffer, 1838)
Figs 5–7, 26–27, 45–46, 59–60, 82–85.

DIAGNOSTIC TRAITS. Macropterous. Male and female with large diamond-shaped black spot on crown (Figs 5–7).

Pygofer lobe with strongly sclerotized and densely covered with spines dorsoapical part, longitudinal semitransparent stripe in middle of distal half, and with row of denticles on posteroventral margin (Figs 59–60).

DISTRIBUTION. Southeastern part of Western Europe, southern European Russia (new record), Kazakhstan, Kyrgyzstan.

REMARKS. Identification of *A. quadrum* is based on comparison with the drawing from the original description

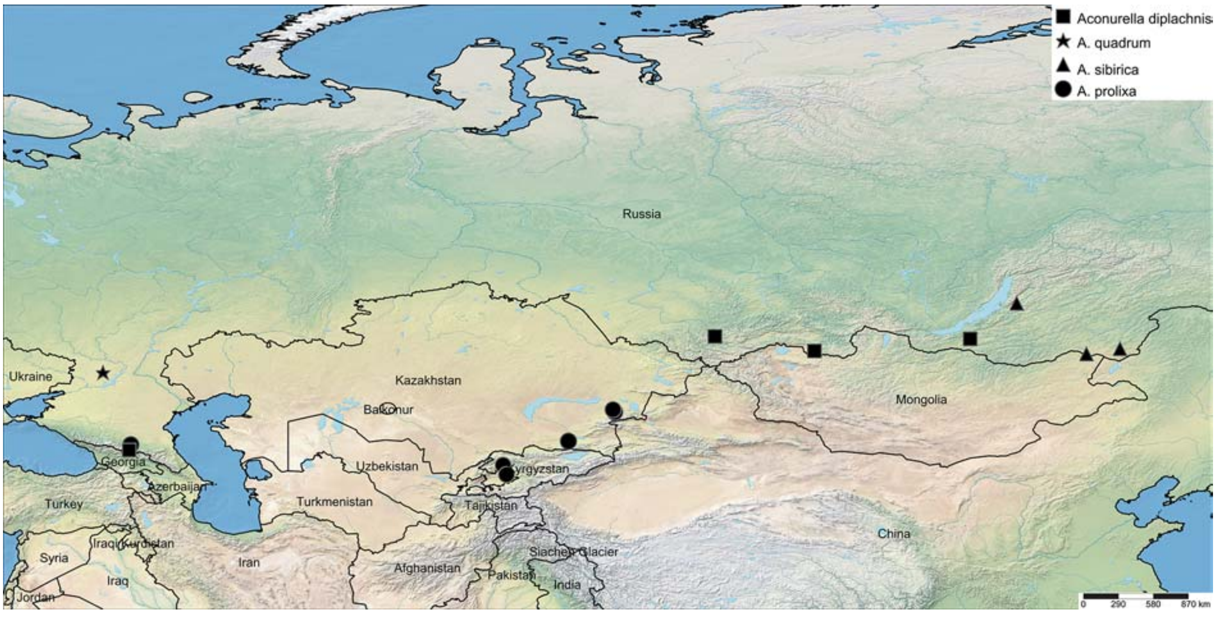
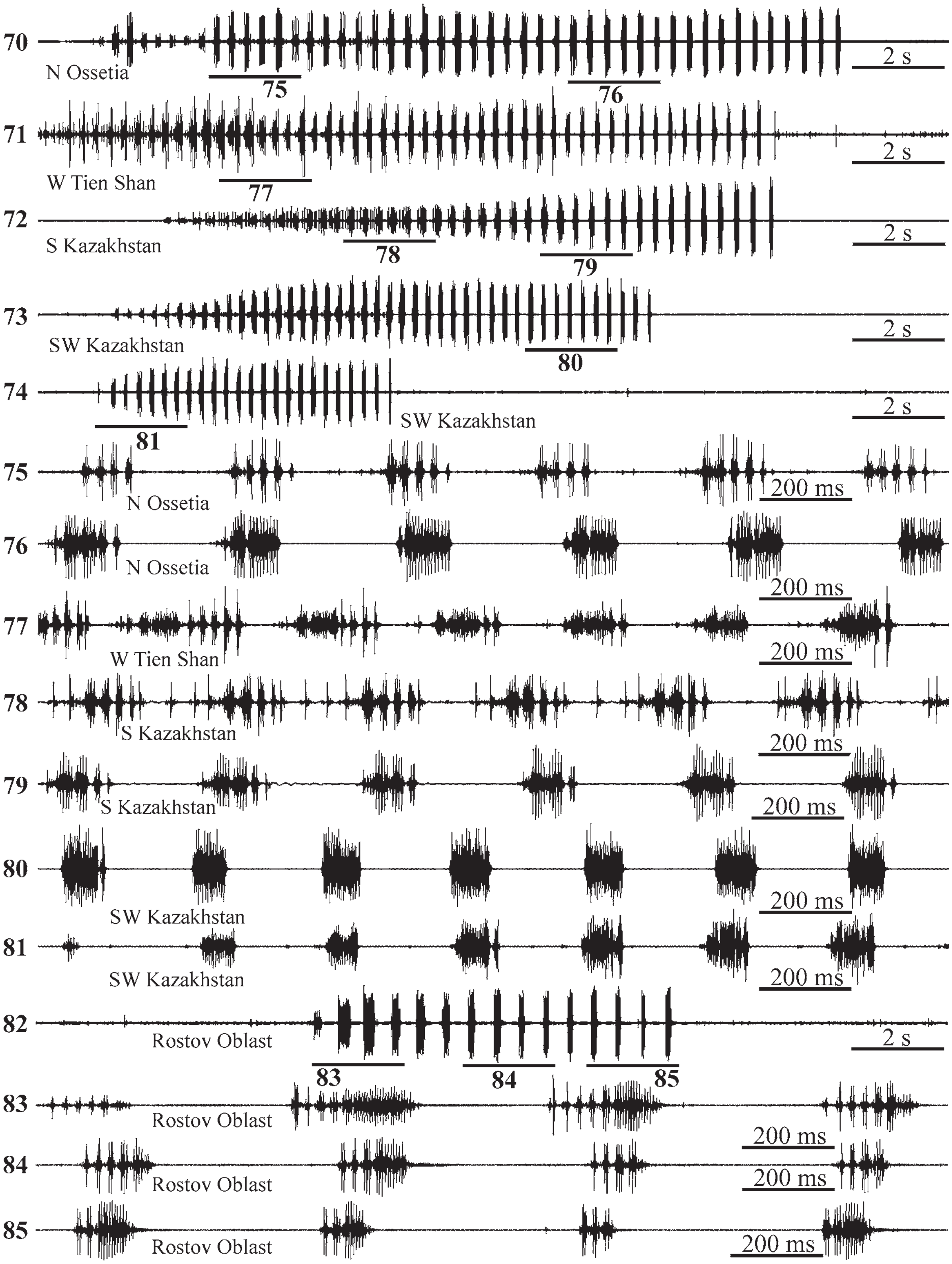


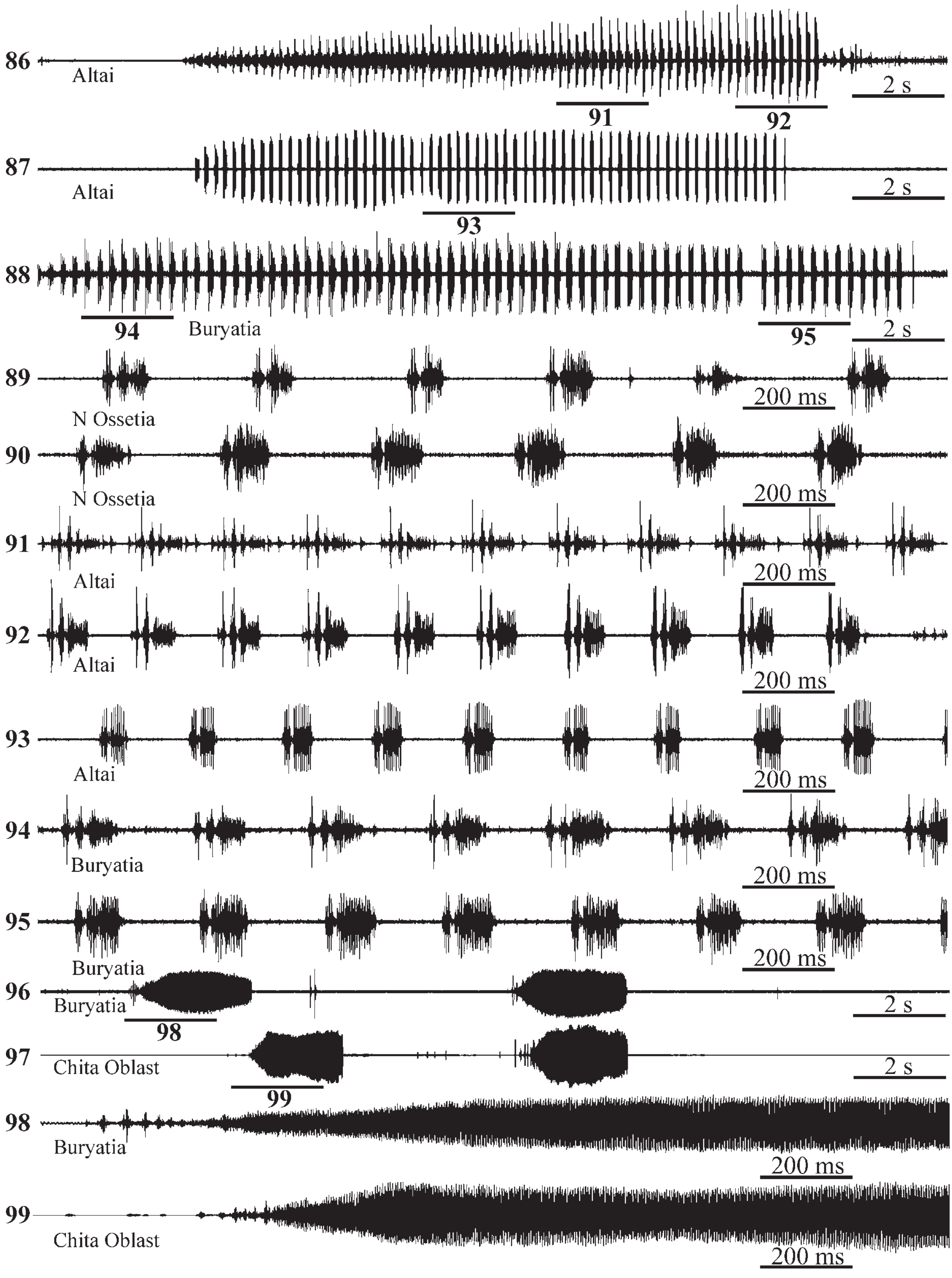
Fig. 69. Map of leafhopper signal recording localities.

Рис. 69. Точки сбора насекомых для записи сигналов.



Figs 70–85. *Aconurella* spp., male calling signal oscillograms. 70–81 — *A. prolixa*; 82–85 — *A. quadrum*. Faster oscillograms of the parts of signals indicated as “75–81” and “83–85” are given under the same numbers, signal recording localities are given under the oscillograms.

Рис. 70–85. *Aconurella* spp., осциллограммы призывных сигналов самцов. 70–81 — *A. prolixa*; 82–85 — *A. quadrum*. Фрагменты сигналов, помеченные цифрами “75–81” и “83–85”, представлены при большей скорости развёртки на осциллограммах под соответствующими номерами, места сбора насекомых для записи сигналов указаны под осциллограммами.



Figs 86–99. *Aconurella* spp., male calling signal oscillograms. 86–95 — *A. diplachnis*; 96–99 — *A. sibirica*. Faster oscillograms of the parts of signals indicated as “91–95” and “98–99” are given under the same numbers, signal recording localities are given under the oscillograms.

Рис. 86–99. *Aconurella* spp., осциллограммы призывных сигналов самцов. 86–95 — *A. diplachnis*; 96–99 — *A. sibirica*. Фрагменты сигналов, помеченные цифрами “91–95” и “98–99”, представлены при большей скорости развёртки на осциллограммах под соответствующими номерами, места сбора насекомых для записи сигналов указаны под осциллограммами.

[Herrich-Schäffer, 1838] (Fig. 5). The drawing of the pygofer lobe in Dlabola [1956] is somewhat inaccurate.

Aconurella diplachnis Emelyanov, 1964
Figs 8–12, 28–32, 47–49, 61–64, 86–95.

DIAGNOSTIC TRAITS. Macropterous, subbrachypterous, or brachypterous. In coloration, differs from *A. quadrum* and *A. prolixa* by strongly developed black pattern on crown in males, but similar in this trait to *A. sibirica* (Figs 8–12).

Pygofer lobe with dorsoapical part strongly sclerotized and densely covered with spines increasing in size towards its distal end, with triangular or stripe-like semitransparent area in middle of distal half, and with 3–4 very large denticles on posteroventral margin (Figs 61–64).

Differs from almost all members of the genus by large denticles on posteroventral margin of pygofer. Similar in this trait only to *A. paradiplachnis* Duan et Zhang, 2012 recently described from southern China (Guangxi Autonomous Region, Sichuan, and Yunnan Provinces).

DISTRIBUTION. Northern Caucasus (new record), steppes in the plains and low mountains of Kazakhstan, Central Asia, Southern Siberia, Mongolia, and China.

REMARKS. In North Ossetia, this species was collected in a mountain steppe with a predominance of xerophytic plant communities including *Astragalus* (*Astracantha*) *denudata* (Steven) Podlech (Fabaceae). Since such biotopes have a local distribution in the Northern Caucasus, apparently, this locality is separated from the main part of the range of *A. diplachnis*.

Aconurella sibirica (Lethierry, 1888)
Figs 13–15, 33–35, 50, 65–68, 96–99.

A. alticola Vilbaste, 1980, **syn.n.**

DIAGNOSTIC TRAITS. Mainly brachypterous. Similar to *A. diplachnis*, but with less developed dark pattern (Figs 13–15).

Pygofer lobe with strongly sclerotized and densely covered with spines dorsoapical part, oval semitransparent area in middle of distal half, and with row of denticles on posteroventral margin (Figs 66–68).

DISTRIBUTION. Southern and eastern Kazakhstan, Kyrgyzstan, southern Siberia, Mongolia, China.

REMARKS. Vilbaste [1980] described two species, *A. alticola* Vilbaste, 1980 and *A. monticola* Vilbaste, 1980, from Tyva.

In terms of body coloration and shape of the pygofer lobes, *A. alticola* Vilbaste, 1980 does not differ from *A. sibirica* (cf. Figs 65 and 66–68). Their synonymy is further supported by the fact that Vilbaste [1980] records from Tyva *A. diplachnis* and two new species mentioned above, but does not list *A. sibirica* which is widespread throughout Southern Siberia and Mongolia [Emelyanov, 1977].

The description of *A. monticola* was based on one male and three females. The shape and arrangement of spines on pygofer lobes in this species is the same as in *A. sibirica*, but in *A. monticola* pygofer lobes are more elongated and coloration is lighter. Possibly, *A. monticola* is an aberrant form of *A. sibirica*, but to solve this problem, it is necessary to study serial material on *A. sibirica* from different regions of Siberia.

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