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FIRST RECORDS OF *PLEA CRYPTICA* RAUPACH, CHARZINSKI & HENDRICH, 2024 (HETEROPTERA: PLEIDAE) FROM RUSSIA

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The species of pygmy backswimmers *Plea cryptica* Raupach, Charzinski & Hendrich, 2024 is recorded for the first time for Russia from the European part (Yaroslavl, Lipetsk, Kursk and Voronezh oblasts) and Western Siberia (Tyumen Oblast), based on material formerly identified as *Plea minutissima* Leach, 1817. It is proposed that all Russian records of the latter species represent *Plea cryptica*. Original photographs of the diagnostic characters of *Plea cryptica* are provided.

Keywords: cryptic species, European Russia, new records, water bugs, Western Siberia

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INTRODUCTION

It has been widely accepted that the genus *Plea* Leach, 1817 is represented in the Palaearctic, including Russia, by a single species, *Plea minutissima* Leach, 1817 [Polhemus, 1995; Kanyukova, 2006, 2024]. Recently, based mainly on molecular data, a second, cryptic species *Plea cryptica* Raupach, Charzinski & Hendrich, 2024 was described from Germany and also recorded from Albania, Austria, Croatia, Finland, Germany, Greece, the Netherlands, Romania, Switzerland, and Ukraine [Raupach et al., 2024].

Based on the published description [Raupach et al., 2024], *Plea cryptica* is a quite variable species, even among individuals within a population, and has no good morphological differences from *Plea minutissima*, which is also variable, except for the characters of male genitalia. According to Raupach et al. [2024], the left paramere of *Plea cryptica* is "more slender and elongated, stretched in an arch shape; base with folding" (vs. *Plea minutissima*: "left paramere compact, hook-shaped; apex distinctly rounded; base without folding").

Following the publication of Raupach et al. [2024], the material stored in the invertebrate collection of the Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences (IBIW), was re-examined to understand which species it contains.

MATERIAL AND METHODS

Photographs of morphological details important for the identification of species were taken with a Leica MC170 HD digital camera mounted on a Leica M165C stereomicroscope, an Olympus DP23 6Mpx digital camera mounted on an Olympus CX43 compound microscope and processed in Helicon Focus 7.7.4, Zerene Stacker 1.04 and Photoshop CS4.

The area of the left paramere was measured in pixels in ImageJ after standardizing the photographs by cropping them at the same level at the base.

RESULTS

Our material shows that the shape of the parameres of specimens from different regions is variable but more similar to that of *Plea cryptica* (Fig. 1). At the same time, a comparison of the areas of the standardized figures of the left parameres (Fig. 2) showed that the specimen from "Poyma Psla" is closer to *Plea minutissima*, and the specimens from "Venevitinovo" and "Zorinsky section" are closer to *Plea cryptica*, illustrated in Raupach et al. [2024].

In addition, our specimens can be distinguished from the typical form of *Plea minutissima* from "France, Pyrénées Orientales, Banyuls-sur-Mer", illustrated in Raupach et al. [2024: figs. 4A–C, 5A], by the head between the eyes frontally with a vertical brown bar, much darker than the surrounding light background; eyes not protruding laterally beyond the head margin, leaving the dorsum of the head visible as a narrow stripe in front of the anterior angles of the pronotum; the scutellum of the same color as the hemelytra and pronotum (Fig. 3).

As a result of the study of the IBIW collection we conclude that all our material belongs to the species *Plea cryptica* Raupach, Charzinski & Hendrich, 2024.

Material. *Yaroslavl Oblast*: Nekouzsky District, Borok, 58.0650N 38.2550E, ichthyological canal, 13.VII.2024, A. Sazhnev leg., 2♀♀; *Lipetsk Oblast*: 52.5605N 39.0537E, Rogozhino, pond, 11.VII.2003, A. Prokin leg., 3♀♀. *Voronezh Oblast*: Venevitinovo environs, 51.8110N

39.4044E, Ugolnoye Lake, 15.VII.1999, A. Prokin leg., 1♀*, 51.819657N 39.384086E, pond in the Usman River floodplane, 02.VI.2024, A. Prokin leg., 1♂; 49.9293N 40.5516E, Boguchar town, Bogucharka River, 15.VIII.2003, A.Ye. Silina leg., 3♀♀. *Kursk Oblast*: Tsentralno-Chernosemny State Nature Biosphere Reserve, Zorinsky section, ~51.191N 36.406E, water body no 48, 17.VII.2001, A. Prokin leg., 1♀, same data, ditch at the border of section, A. Prokin leg., 2♂♂, Poyma Psla section, ~51.186N 36.315E, pool in sand quarry, 23.VI.2003, A. Prokin leg., 1♂1♀. *Tyumen Oblast*: "Tyumen, Tura River, 23.VII.1998, P.N. Petrov leg.", 1♂.

*This specimen was published as *Plea minutissima* [Kanyukova et al., 2002].

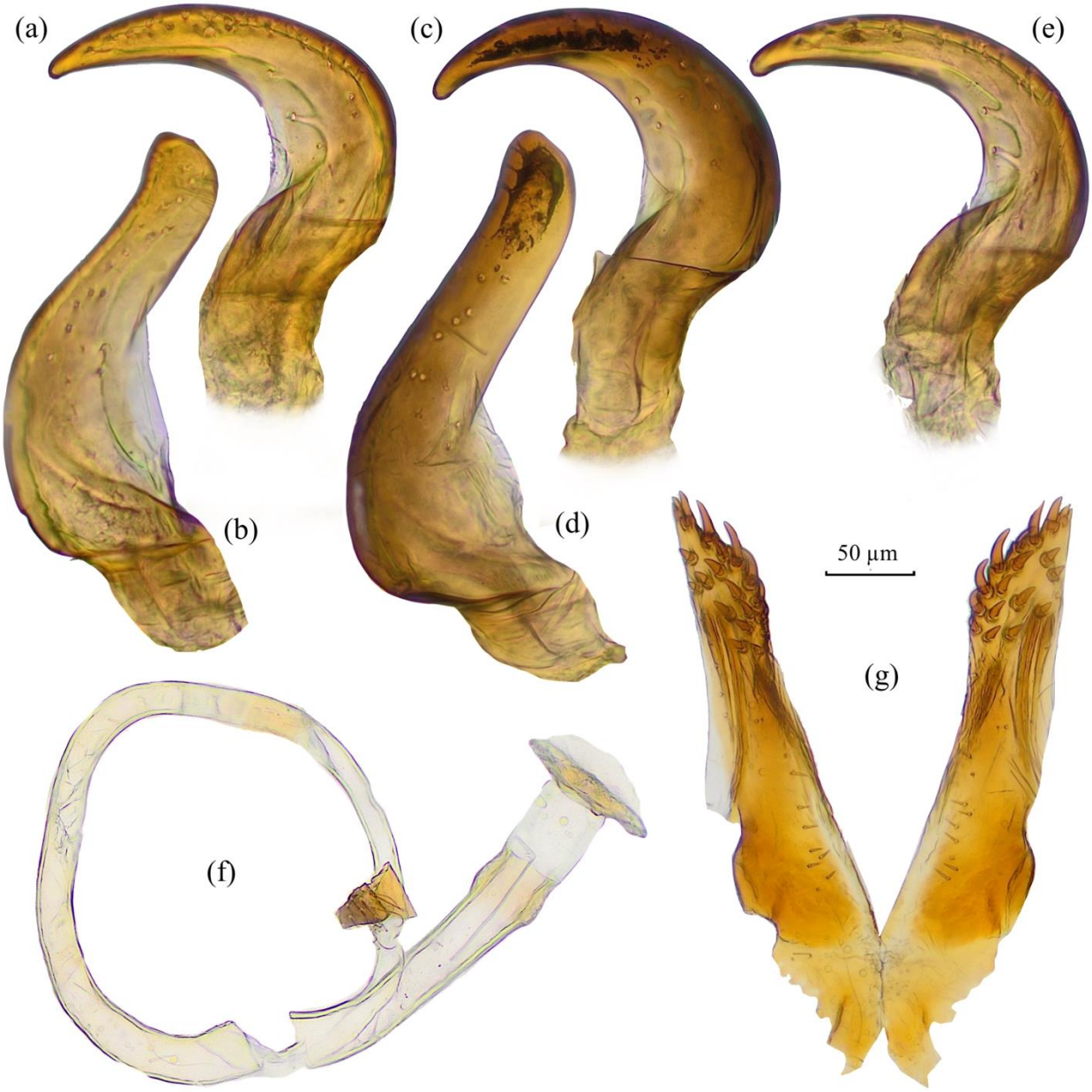

Fig. 1. Male and female genitalia of *Plea cryptica* Raupach, Charzinski & Hendrich, 2024 from Russia: (a, c, e) left parameres of specimens from (a) "Poyma Psla", (c) "Venevitinovo", and (e) "Zorinsky section"; (b, d) right parameres of specimens from (b) "Poyma Psla" and (d) "Venevitinovo"; (f) spermatheca and (g) ovipositors, "Borok".

Рис. 1. Гениталии самцов и самок *Plea cryptica* Raupach, Charzinski & Hendrich, 2024 из России: (a, c, e) левые парамеры экземпляров из следующих локалитетов: (a) "Пойма Псла", (c) "Веневитиново" и (e) "Зоринский участок"; (b, d) правые парамеры экземпляров из следующих локалитетов: (b) "Пойма Псла" и (d) "Веневитиново"; (f) сперматека и (g) створки яйцеклада из локалитета "Борок".

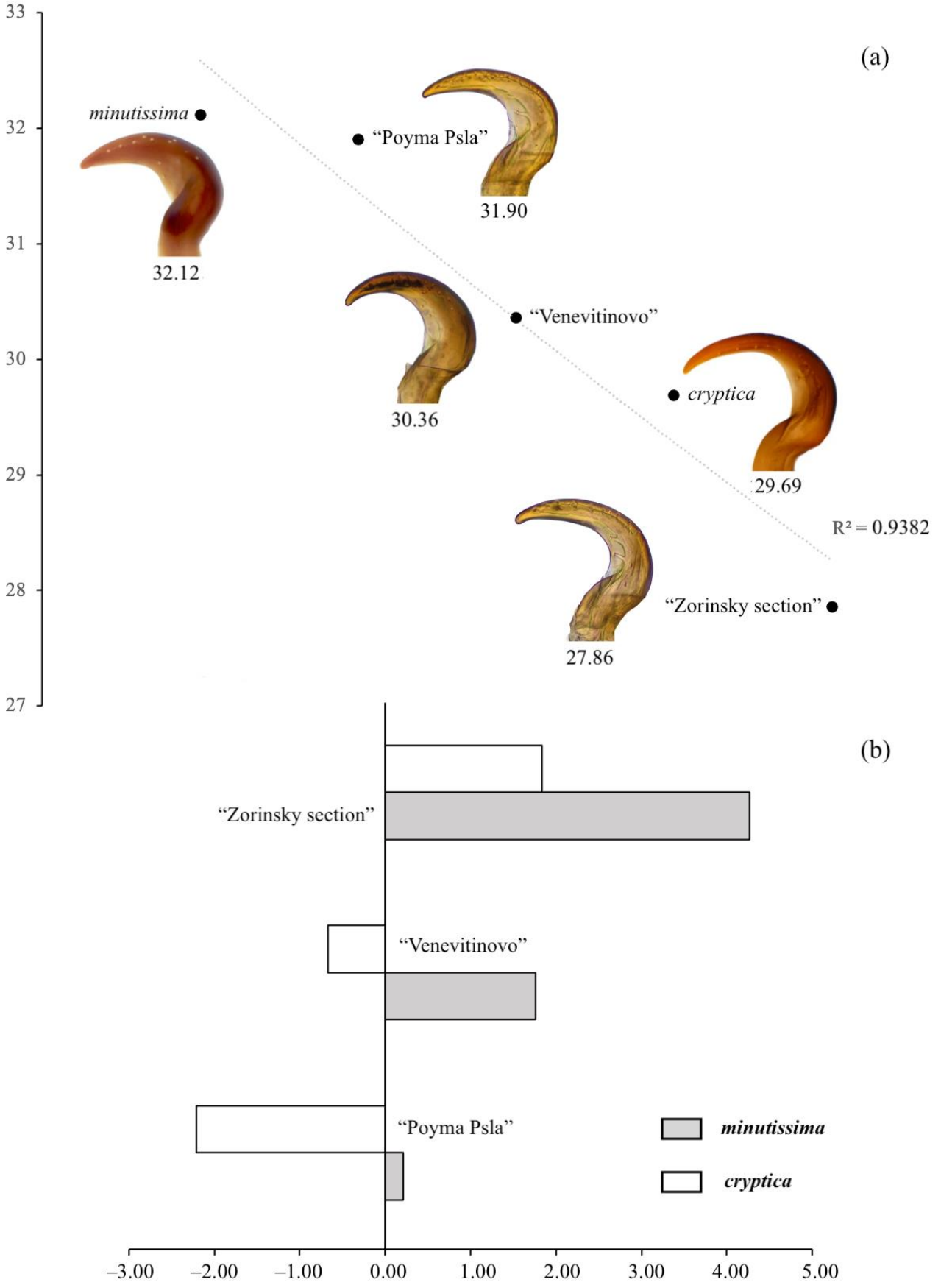

Fig. 2. Comparison of the area of the left parameres in specimens from European Russia and specimens of *Plea minutissima* and *Plea cryptica* illustrated in Raupach et al. [2024]: (a) area, (b) differences in area.

Рис. 2. Сравнение площади левых парамер экземпляров из европейской части России и экземпляров *Plea minutissima* и *Plea cryptica* из публикации Raupach et al. [2024]: (a) площадь, (b) различия площади.

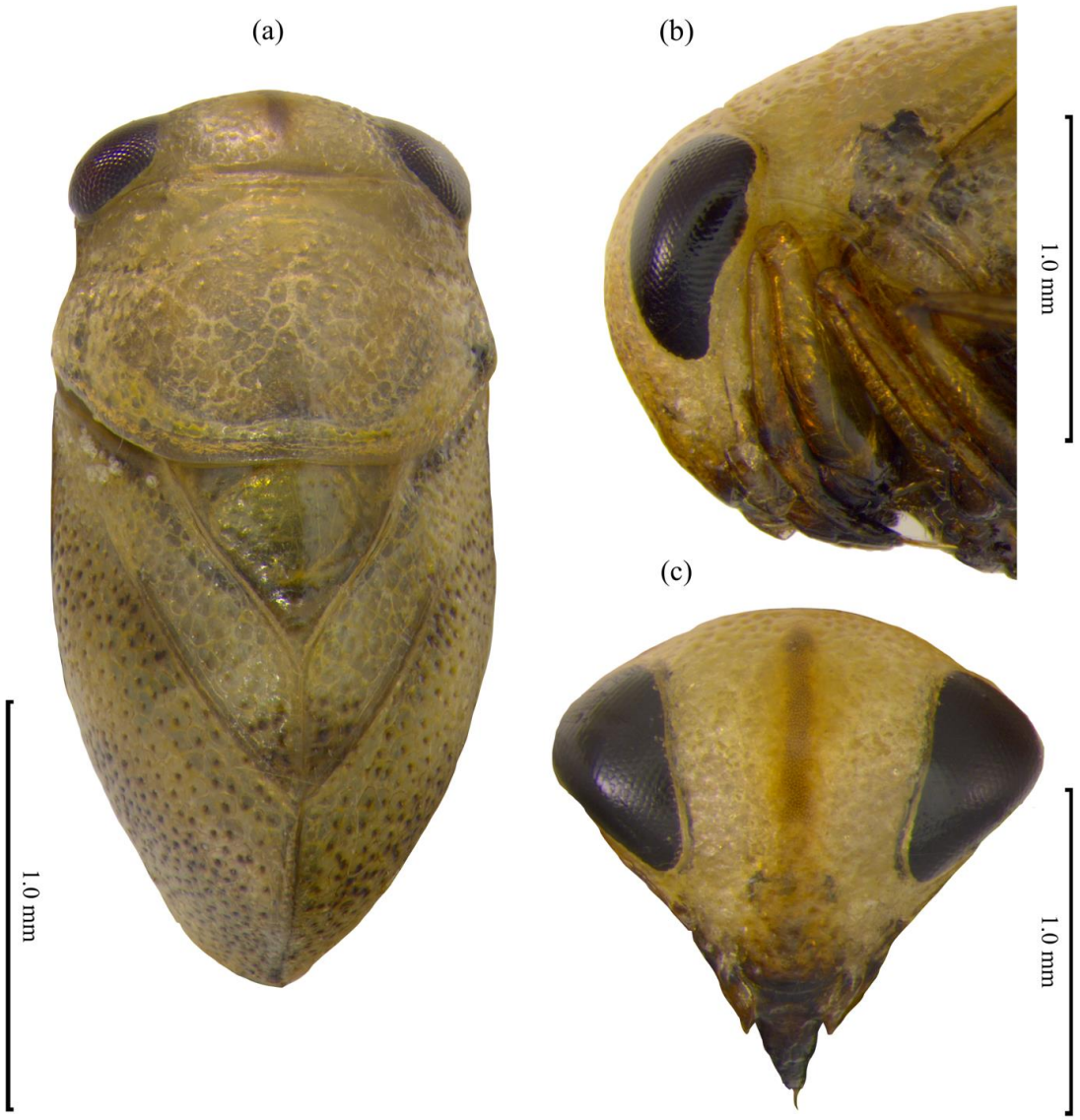

Fig. 3. External characters of *Plea cryptica* Raupach, Charzinski & Hendrich, 2024, female from “Borok”: (a) general dorsal view; (b) head and pronotum laterally; (c) head frontally.

Рис. 3. Внешние признаки *Plea cryptica* Raupach, Charzinski & Hendrich, 2024, самка из локалитета “Борок”: (a) общий вид, дорсально; (b) голова и переднеспинка латерально; (c) голова фронтально.

DISCUSSION

According to published data [Raupach et al., 2024], the range of *Plea minutissima* is limited in the east by western Germany, Corsica, Sardinia, Tunisia, Turkey, and Armenia. Therefore, as expected by Raupach et al. [2024], it is very likely that all records of this species from Russia belong to *Plea cryptica*. This conclusion should be verified using molecular data. The shape of the left paramere as the main morphological diagnostic character for species delimitation also needs to be verified by geometric morphometric methods using a large number of specimens.

It is possible that the range of *Plea cryptica* is currently expanding northwards. According to Kanyukova [2006], the northern limit of the range of the genus *Plea* in European Russia reaches Nizhny Novgorod Oblast and the Republic of Chuvashia. At least, the species (as *Plea minutissima*) has been recorded in the Ild River in Nekouzsky District, Yaroslavl Oblast (near 58.005N 38.228E), since 2010 [Zhgareva, 2015]. In the recently published “Catalogue of the Heteroptera of the European part of Russia and Ural” [Kanyukova, 2024] the species (as *Plea minutissima*) is listed from Pskov, Novgorod, and Vologda oblasts based on records published mainly after 2000 year.

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ПЕРВЫЕ УКАЗАНИЯ *PLEA CRYPTICA* RAUPACH, CHARZINSKI & HENDRICH, 2024 (HETEROPTERA: PLEIDAE) ИЗ РОССИИ

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Вид плей *Plea cryptica* Raupach, Charzinski & Hendrich, 2024 впервые указан для фауны России из Европейской части (Ярославская, Липецкая, Курская и Воронежская области) и Западной Сибири (Тюменская область) на основании переизучения материала, ранее определенного как *Plea minutissima* Leach, 1817. Предположено, что все указания последнего вида с территории России относятся к *Plea cryptica*. Приводятся оригинальные фотографии диагностических признаков *Plea cryptica*.

Ключевые слова: водные клопы, Европейская часть, Западная Сибирь, криптические виды, новые указания.