

# Poison spiders, green lacewings and Russian literature: the minor mystery of a neuropteran biblio-sleuth<sup>1</sup>

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**Abstract:** *Chrysopa karakurti* ROSSIKOV 1904, belongs to the family Hemerobiidae, genus *Hemerobius* or *Wesmaelius*. Its species-level identity can not be determined from its original description or illustration, and its unique holotype could not be located. In order to fix the interpretation of this name in such a manner that it will not destabilize the nomenclature of other sympatric brown lacewing species, a neotype is designated for *Chrysopa karakurti* that renders it a junior subjective synonym of *Hemerobius humulinus* LINNAEUS 1758.

**Key words:** Chrysopidae, *Chrysopa*, *Chrysopa karakurti*, green lacewings, Hemerobiidae, *Hemerobius*, *Hemerobius humulinus*, *Wesmaelius*, brown lacewings, neotype, taxonomy, nomenclature.

## The quest for *Chrysopa karakurti*

I (J.D. O.) first learned of the mystery of *Chrysopa karakurti* while leisurely perusing the details of the species list appended to BROOKS & BARNARD's (1990) monumental review of world chrysopid genera. Floating innocuously amongst the global flotsam and jetsam of „*Chrysopa incertae sedis*," on page 279, was the innocent-looking entry „*karakurti* ROSSIKOVA, 1904." Sitting alone in my small post-doctoral office in the bowels of the National Museum of Natural History, on the Mall and down the street from the Capitol building in Washington, D.C., USA, it hardly looked mysterious or troublesome. But first looks can be deceiving.

After having ambitiously set for myself the task of compiling the first comprehensive world catalogue of the Neuroptera, Megaloptera and Raphidioptera since that of our revered forefather Hermann August HAGEN (1866), I had assiduously applied myself to the task. I had begun the assault several years earlier, as a Ph.D. student haunting the halls of the entomology department founded by another forefather, John Henry COMSTOCK, at Cornell University. If the goal had then seemed distant, it had also seemed reachable. With the naive innocence of youth I was emboldened with the knowledge that persistence could move mountains (of literature), and besides, the quest carried with it the benefit of providing a plausible excuse for indulging my overt bibliophilic tendencies. It had been my pleasant task to frequent the var-

ious rooms and stacks of the excellent Cornell libraries, ferreting out the works of almost 250 years of prior neuropterists. And ferret I did, for five solid years, through the stacks and the rare book rooms of the Mann, Olin, Entomology, Annex and Kroch libraries, through interlibrary loans reaching across the country and around the world, and through visits to the libraries of many other universities and museums – all the while copying, copying, copying, through thousands of papers, and thousands more of pages. Surely now I was a biblio-sleuth. Had I not tracked the DENIS & SCHIFFERMÜLLER (1776, if not 1775) to its lair and seen it with my own eyes; had I not dogged the trails of multiple FABRICIUS', LINNAEUS', PALLAS', SCHÄFFERS, THUNBERGS, REAMURS and MÜLLERS, bringing each one to bay in its turn; had I not cornered in a small room the complete Encyclopedie Méthodique behemoth and grappled with it to pluck the jewels of neuropteran content from its grasp? All these, and more, I had done. Yes, surely now I was a full-fledged biblio-sleuth!

These things were all behind me now as I sat in my office looking at „*Chrysopa karakurti* Rossikova." Yes, true, it was a name new to me; but all of the other thousands had also been new to me too not so long before. It was, after all, only published in the early 20<sup>th</sup> Century. How difficult could it be to trace? Where to begin? Why, of course, by simply turning to B & B's „References" and just looking it up. Mysteriously though, „Rossikova" did not appear in the References. Was this a portent? No,

<sup>1</sup> We fondly dedicate this note to our good friend and colleague Univ.-Prof. Dr. Horst Aspöck on the occasion of his milestone 65<sup>th</sup> birthday. Knowing full well that he is more severely afflicted by the bibliophilic bug than any of us, we trust that he will appreciate the saga of a bibliographic/taxonomic mystery story, with its varied twists and turns and a surprise ending.

surely, this must be a simple oversight in a large monograph. Upon closer examination, however, it became clear that the original citations of many of the species in the world list did not occur in the References. Then it occurred to me. Of course, BROOKS & BARNARD had simply not had the time, nor the space, to include all of these references in their work, their world species list being just the frosting on the delicious cake of their generic review of the green lacewings. But, no matter, the issue could be quickly resolved (by that point in history) with a simple e-mail to them requesting the needed citation. I applied shortly thereafter to Steve Brooks for the needed information. Steve was happy to reply, and his citation, though concise, did not at first seem illusory: „Rossikova. 1904. Russ. Imp. Dept. Agric. Mem. Bureau Ent. 5 (2): 129.“ With additional gentle coaxing Steve related that he had included *Chrysopa karakurti* in the list of world chrysopid species on the authority of a citation to the name that he had found in an ancient card file in The Natural History Museum (London). He had not had any success in tracing the paper – yet another ill omen – but he was happy for me to give it a try.

OK, engage biblio-sleuth mode. Step One: expand the serial title. As easy as this normally is, I soon ran into difficulties. I quickly exhausted the normal sources, CASSI, World List of Scientific Periodicals, Union List of Serials, etc., all with no luck. Step Two: ask local reference librarians. Done, with the same luck as before – that is, none. Step Three: find an alternate citation source. What about the Zoological Record? They're pretty good at recording new taxa world wide. No luck; the Zoo. Rec. hadn't managed to pick this one up. Step Four: trace another paper by the same author and pray for a cross reference. No luck. By now I was discouraged. I was shut out, stymied. I knew that I was looking for a pre-revolutionary Russian governmental publication, but with only a highly abbreviated citation of an English translation of its serial title, I was making no headway. Knowing further that Russian governmental organizations of that era were often ephemeral, and changed names frequently, it seemed unlikely that anyone could make any kind of a logical guess as to what the real title might have been.

At this point, I should have turned to the wisdom of a Russian colleague. But, this not being an option fully palatable to any self-respecting, full-fledged, biblio-sleuth, I did not. I was not done. I would trace this citation myself! However, having plenty of other matters to keep me busy just then, I let the sleeping dog lie. And so it lay, through the completion of one post-doc, through an extra year, through another post-doc, through a couple more „extra“ years, and through my move to the Department of Entomology at Texas A&M University. During all of this time, every year or so I would try to rouse the dog and make it divulge its secret. Along the way I

would inflict the citation – as a flea from the dog's back – upon various colleagues and librarians, anyone whom I thought might help. But, though scratching (of the head) was frequently observed, my pestifications were all to no avail. At last I was beaten. I give up! ROSSIKOVA wins round one. Its time for a new strategy.

One of my new committee assignments as a newly-minted Assistant Professor was as departmental representative to the Texas A&M University libraries – a duty that I enjoy to this day, and which eventually put me into contact with some of the denizens of the library that lurk behind the scenes and attend to the crucial details that make libraries hum and prosper. It was suggested one day, by a colleague not remembered, that I should place my challenge before the Slavic language cataloguer – David Chroust – of Evans library, the main library at Texas A&M. And so the computers hummed once again and the e-mail flew and I shared with David what little I knew about „Russ. Imp. Dept. Agric. Mem. Bureau Ent.“ The early results were not encouraging – David could not expand the citation either; but a new frontier of enquiry had emerged. It seems that librarians, like some of the rest of us mortals, have banded together through list servers, and through the same can, with a degree of groveling suitable for the audience and medium, sometimes extract pearls of wisdom from the collective consciousness of librarian-dom. So, into the ether my humble abbreviation flew, though to whence or where, neither of us knew. And from the void, several days hence, emerged an answer from the Slavic language librarian list serv: „Trudy po prikladnoi entomologii.“ Say what!?! Even allowing for liberal transliteration, the answer from the oracle hardly seemed plausible. And yet, in the end, it was – although at the time even the oracle had expressed its doubts.

With my shiny new nugget clutched tightly I considered the next step. Could I actually locate a copy of this serial in a library somewhere? Anywhere? Preferably somewhere in the English-speaking world where I might be able to actually communicate my request effectively! And so the e-mail flew again, the many mysteries of interlibrary loan were invoked, and the jealous gods of literature were entreated to return the location of „Trudy po prikladnoi entomologii.“ But the gods saw fit not to answer. Though I entreated twice, several months apart, the oracle this time remained silent. Trudy's whereabouts was not to be revealed in this manner. Discouraged, yet still feeling a residuum of new life, I carried my precious unpronounceable, and barely spellable, bauble back to the books, back to the classic references that had served me well over the years. And there I found it, nestled comfortably in the Union List of Serials between „Leningrad, Institut zashchity rastenii, Otdel prikladnoi entomologii i zoologii, Trudy“ and „Leningrad, Institut zemledelii“ (right where you'd expect it, right?). And

below the name, a list of libraries that Trudy called home. And amongst the list „NIC-A“ – wait! – that’s a Cornell University library. So off to the Internet I lumbered, and pointed my web browser to the Cornell University libraries’ web page. Clickity, clickity, clack on the keyboard and up pops the record. Gasp! – my Trudy’s in the Entomology library! Oh Irony, thou hast come full circle back to the beginning of my quest! How could this be! Had I stayed yet another year longer I surely would have found you, Trudy, rendering moot my tribulations recounted above!

How jealous had the gods of literature become to deny me the simple pleasure of my Trudy’s photocopy from my alma mater via interlibrary loan? And yet, I held a final ace. Perhaps my good friend and colleague, Rick HOEBEKE, Collection Manager of the Cornell University Insect Collection, would accept a private commission to walk the length of the second floor of the new Comstock Hall, from the Insect Collection north to the Entomology Library, and to inspect the stacks personally on my behalf for my elusive Trudy. And so it came to pass that a week or two after yet another long and detailed e-mail – replete with groveling and excuses appropriate for the medium and audience – had left my computer, that upon my desk – sent by that old and trusted medium „snail mail“ – landed a crisp photocopy of my long elusive quarry, complete with illustrations and title pages. Thank you Rick! The riddle of Rossikova had finally been solved! There remained, however, one glaring problem – THE TEXT WAS ENTIRELY IN RUSSIAN (a language – which you can tell from the shouting capitals above – in which I am not only not fluent, but in which I can manage to only fully comprehend some of the letters)! But this complication, which was, after all, not entirely unexpected, could be overcome too. I had been humbled by my pursuit, and, no longer trusting completely the lone-wolf biblio-sleuth ways, I turned to my Russian colleague Vladimir MAKARKIN for help in deciphering the further mysteries of *Chrysopa karakurti*. And additional surprises and mysteries there were.

Though the depths of the text would remain unplumbed until Vladimir could provide a translation of the work, ROSSIKOVA had had the courtesy to provide a very nice color plate of illustrations. This was surely the place to start my examination. How many times have we all (admit it!), when confronted with unknown languages printed in strange characters or packed with quizzical combinations of familiar letters, sought comfort and refuge in „the figures.“ I, for one, will confess to this failing. I turned immediately to the plate. There I hoped to find, at last, the visage of the long-sought *Chrysopa karakurti*. What I saw both delighted and disappointed me. There, in the middle of plate IV as figure 8, was the only neuropteran on the page, an unmistakably clear image of a fully-spread hemerobiid! Now I will admit to

having a soft spot in my heart for hemerobiids, so I was delighted to see such a clear illustration of one. But then the thought occurred to me: if Rossikova had figured only a hemerobiid, his chrysopid would be unfigured, and thus, probably more difficult to identify. This was disappointing, but only momentarily, for when I turned to the figure legend, the more surprising truth was revealed – the hemerobiid and *Chrysopa karakurti* were one and the same! This taxon is, to the best of my knowledge, the only true hemerobiid that was ever originally described as a chrysopid (that is, in a genus now placed in the Chrysopidae). And now, with that bold statement begging for refutation, it will, alas, be best to depart from the narrative style of above and to return to the usual impassive voice of a „normal“ scientific paper in order to consider the true identity of *Chrysopa karakurti*. Such a pity; it was fun while it lasted!

### What is *Chrysopa karakurti*?

Konstantin Nikolaevich ROSSIKOV (1904: 129; I will switch here to the more correct „Rossikov,“ not „Rossikova,“ see note in References below) described the new neuropteran species *Chrysopa karakurti* (cited as „karakurti“ [sic]) from a single specimen reared from field-collected cocoons of the spider *Lathrodectus tredecimguttatus* (cited as „*Lathrodectus* [sic] *tredecim-guttatus* [sic]“), a wide spread, venomous, Old World „widow“ or „black widow“ spider of the family Theridiidae (comb-footed spiders). The species-group name *karakurti* is derived from the regional colloquial name for this ‘poison spider,’ the Kara-Kurt, and alludes to Rossikov’s rearing association. ROSSIKOV (1904: 130-131) inferred from his rearing that the hemerobiid „*Chrysopa karakurti*“ was a spider egg-sac parasite. This interpretation is probably erroneous. No hemerobiids with reasonably well-known biologies are currently known to be closely associated with spiders, or to be regular egg-sac inhabitants. This includes the biologies of all known Palearctic species of the hemerobiid genera *Hemerobius* and *Wesmaelius*, to one or the other of which genera the original holotype of *C. karakurti* certainly belonged (see below). This said however, ROSSIKOV makes the following interesting statement in reference to the cocoon from which the holotype of *C. karakurti* emerged (translated): „I have found in the cocoons of the Kara-kurt, in its silk threads, only two larval skins, and therefore I believe, that the larva of *C. karakurti* moults up only two times.“ If it is assumed that ROSSIKOV correctly identified the cast skins that he observed as belonging to *C. karakurti*, this could be taken as evidence that hemerobiids may occasionally enter spider egg-sacs and feed in-place, across multiple instars, on spider eggs. As all known hemerobiids (like most neuropterans) have three larval instars, ROSSIKOV’s observation of only two cast skins (not three) might imply that the egg-sac was originally penetrated by a second instar hemerobiid larva (the cast skins representing those of the

second and third instars). If ROSSIKOV incorrectly identified the cast skins as attributable to *C. karakurti*, then the most plausible interpretation of the observation of a hemerobiid cocoon inside a spider egg-sac is that it represents the adventitious use of an egg-sac as a pupation site by a wandering hemerobiid larva.

The true species identity of *C. karakurti* is problematic. ROSSIKOV explicitly mentions obtaining only one specimen. Consequently, the specimen illustrated on plate IV as figure 8, which is clearly a hemerobiid and which is clearly labeled as *Chrysopa karakurti* in the plate legend, must have been the holotype. Based on the venational characters given below, which are visible in the figure, *C. karakurti* belongs to either the genus *Hemerobius* or *Wesmaelius* [contrasting characters of other hemerobiid genera likely to be encountered in the same region are given in square brackets]: (1) forewing with only three oblique branches of the radius (ORB's) [only two in most *Symphorobius*, four or more in most *Micromus*, *Megalomus*, *Drepanepteryx* and *Neuronema*]; (2) forewing with third ORB pectinately branched [simpler in *Symphorobius*]; (3) hind wing with only two crossveins in inner gradate series [more than two in *Micromus*, *Drepanepteryx* and *Neuronema*]. It is not possible to more precisely identify, with certainty, the taxonomic identity of *C. karakurti* from the illustration or text provided by ROSSIKOV.

The geographic origin of the original holotype of *C. karakurti* can not be identified with precision either. ROSSIKOV (1904: 130) cited the collecting locality as (transliterated and/or translated): „Bistyubinskaya volost' of Khodzentskii uezd of Samarkandskaya oblast“. The geographic names cited by ROSSIKOV pertain to geopolitical regions current in pre-revolutionary Russia. Because similar names have been used for regions with different boundaries during subsequent periods of political administration, and because some names have changed outright, the precise correlation of ROSSIKOV's regions with current geopolitical entities has been difficult. Below, we individually document our best interpretation of each of ROSSIKOV's regions. The „Samarkandskaya oblast“, or Samarkand region, sensu ROSSIKOV, was a Russian administrative unit in western Turkestan (capital: city of Samarkand [=Samarqand, =Samarcand]) that contained parts of current-day Uzbekistan and Tadjikistan [=Tajikistan]. Subsequently and variously restricted (now a province, Samarkand [=Samarqand], of Uzbekistan), the larger region of ROSSIKOV's era was abolished in the 1920's. The „Khodzentskii uezd“, or Khodzhent district, sensu Rossikov, was a Russian administrative unit centered on the city of Khodzhent (=Khojend, =Khujand; renamed Leninabad in 1936, renamed Khudzhand in 1990). We have been unable to determine its precise extent, but it encompassed areas surrounding the city of Khodzhent, probably including local parts of both

current-day Uzbekistan and Tadjikistan. We have been unable to identify ROSSIKOV's „Bistyubinskaya volost“, or Bis-Tyube volost'. Volosts were third-order administrative subdivisions of pre-revolutionary Russia. They were the smallest Russian administrative unit of their day (not used in present-day Russia) and were located mostly in rural areas. Unfortunately, because the pre-revolutionary Russian atlases available to us do not indicate the names or boundaries of volosts, we have not been able to correlate the „Bistyubinskaya volost“ with any current geopolitical unit. Based on the above analysis, the type locality of *C. karakurti* may be cited in current-day geopolitical terms as: Tadjikistan: northwestern region, precise locality unknown, somewhere in the vicinity of Khudzhand (city) [=Khodzhent, =Leninabad; 40°14'N 69°40'E].

We have attempted to trace the original holotype of *C. karakurti*, but without success. ROSSIKOV appears to have been employed by the St. Petersburg Bureau of Entomology of the Ministry of Farming and State Property. This bureau later became, through a series of intermediate organizations, part of the All-Russian Institute of Plant Protection (VIZR). Most of the valuable materials (e.g., types) contained in the former St. Petersburg Bureau were transferred to the Zoological Institute (ZISP) of the Russian Academy of Sciences in St. Petersburg prior to the origin of the VIZR (Sergey BELOKOBYLSKY, pers. comm. 2003). Examination of the pinned collections of the ZISP (by V.N.M.) has revealed no materials of appropriate age and provenance to be ROSSIKOV's *C. karakurti* holotype. Detailed searches of the VIZR collections to locate ROSSIKOV materials (e.g., ROSSIKOV's ichneumonid Hymenoptera types, sought by Dmitry KASPARYAN, ZISP) have also failed, suggesting that ROSSIKOV's materials are no longer contained in that collection. Although there remains an extremely remote possibility that some of ROSSIKOV's original materials may remain unrecognized (unrecognizable?) among unlabelled materials in the VIZR or ZISP (Victor KRIVOKHATSKY, pers. comm., 2004), it seems reasonably certain from the data above that the original holotype of *C. karakurti* is no longer extant.

Because publication of the poorly documented taxon *Chrysopa karakurti* predates – and thus poses a potential threat to the nomenclatural stability of – several of the hemerobiid species known to inhabit the general region from which its holotype originated, we believe that a neotype designation is needed to properly fix the application of this name and to clarify its taxonomic status relative other known, or potentially, sympatric hemerobiid species.

The following 12 species of *Hemerobius* and *Wesmaelius* are known to occur in the historical region of Russian Turkestan (=Turkistan; encompassing Turkmenistan, Uzbekistan, Kyrgyzstan, Tadjikistan, S Kazakhstan, W

China and NE Afghanistan), and are either known, or likely, to occur in Tadjikistan: *Hemerobius humulinus* LINNAEUS 1758; *H. montanus* KIMMINS [1961]\*; *H. simulans* WALKER 1853; *H. friedeli* H. & U. ASPÖCK 1966\*; *Wesmaelius sufuensis* TJEDER 1968\*; *W. subnebulosus* (STEPHENS 1836); *W. variatae* (H. & U. ASPÖCK 1966)\*; *W. alissimus* (OHM 1967)\*; *W. mongolicus* (STEINMANN 1965)\*; *W. zhiltzovae* MAKARKIN 1986\*; *W. conspurcatus* (MCLACHLAN in FEDCHENKO 1875); *W. navasi* (ANDRÉU 1911)\*. Of these, seven (asterisked above) post-date the publication of *C. karakurti*, and could be nomenclaturally impacted by a neotype designation for it.

As noted above, the text and illustrations of ROSSIKOV do not allow for positive identification of *C. karakurti* below generic level (it belongs either to *Hemerobius* or *Wesmaelius*). Based on ecological evidence, there is some reason to believe that *C. karakurti* might be conspecific with *Wesmaelius navasi*, which appears to occur more frequently in low-elevation grassland habitats than the other species in the list above (which are primarily montane in this region). This observation might correlate with the distribution of the spider *Kara-kurt*, which also appears to be primarily a grassland species, and with the possibility of a low-elevation type locality for *C. karakurti* (though this is not known for certain, see discussion of type locality above). However, we judge these factors to be too uncertain to form a strong logical basis for the selection of a neotype for *C. karakurti* that would render it conspecific with *W. navasi*, particularly as this would require replacement of the existing name for this well-established and very-widespread Palearctic species. Thus, with no strong evidence for believing that *C. karakurti* is conspecific with any particular species in the region of the type locality, we are persuaded that the objectives of nomenclatural stability are best served in this case by designating a neotype for *C. karakurti* that will minimize the possibility that it will have any future nomenclatural impact on the hemerobiids of this region. With this objective in mind, we choose to designate for the neotype of *C. karakurti* ROSSIKOV 1904, a specimen that will render it a junior subjective synonym of *Hemerobius humulinus* LINNAEUS 1758. *Hemerobius humulinus* is known to occur in Tadjikistan and we here designate as the neotype of *C. karakurti* a specimen from an adjacent part of Uzbekistan (see below).

### Synoptic Data and Citations

Beyond the citations of ROSSIKOV (1904) and BROOKS & BARNARD (1990), our investigations have revealed only three subsequently published references to *C. karakurti*. None of these add substantively to our knowledge of this taxon, though MARIKOVSKY (1956) was apparently the first author to correctly associate this species with the family Hemerobiidae. Below, we record pertinent taxonomic, nomenclatural and bibliographic information in standard synoptic form.

### *Hemerobius humulinus* LINNAEUS 1758

*Chrysopa karakurti* ROSSIKOV 1904: 129-131, pl. IV, fig. 8 (as „*Chrysopa kara-kurti*“ [sic] [original description, distribution, biology]; SEMENOV 1905: 60 (as „*Chrysopa kara-kurti*“ [sic] [mentioned in book review]; SHEVYREV 1909: 425 [implied reference in book review]; MARIKOVSKY 1956: 188 (as „*Chrysops*“ [sic] „*kara-kurti*“ [sic] [listed, assigned to the Hemerobiidae], 196 (as „*Chrysopa kara kurti*“ [sic] [mentioned]; BROOKS & BARNARD 1990: 279 (as „*Chrysopa karakurti* ROSSIKOVA“ [sic] [listed]. Nov. syn.

Neotype (by present designation), male (Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia), examined by Victor KRIVOKHATSKY and Vladimir MAKARKIN.

Type locality: Uzbekistan: Surkhondaryo [=Surxondaryo]: Chosh (village) [=Chash; 38°41'59"N 67°40'02"E], see Notes below.

Date and Collector: 24.viii.1929 (E. Kuznetsova). Verbatim label data [bracketed information added]: (1) transliterated/translated from Russian: „Kishlak [=village] Chash [a village name] na [=on] b[yvshei(?; =intermittent), or bereg(?; =bank)]. r[eke; =river] Chash [a river name], Fergana, Gissar. khr[ebet]. [=Gissar mountain range], na svet [=at light], 24 VIII 1929, E. Kuznetsova“; (2) „NEOTYPE / *Chrysopa karakurti* / ROSSIKOV, 1904; desig[nated by]. / Oswald & Makarkin“ [red rectangle, handwritten by Oswald]; (3) „*Hemerobius / humulinus* L[INNAEUS]. / det[ermined by]. V[ladimir]. Makarkin 2004“ [white rectangle, handwritten by Oswald].

Notes: We have selected for the neotype of *Chrysopa karakurti* a male of *Hemerobius humulinus* contained in the collections of the ZISP. Because specimens of *Hemerobius humulinus* collected near the original type locality of *Chrysopa karakurti* are rare in collections, our best options for the neotype selection have been limited. We have selected the specimen identified above primarily because of its male sex and the relative proximity of its collection site to the original type locality – even though the locality label of the neotype contains some apparently self-contradictory information. The locality label of the neotype contains the names of three geopolitical entities: „Chash,“ „Fergana“ and „Gissar. khr[ebet].“ „Chash“ is cited as the name of a village and river. „Fergana“ appears to refer to the Fergana valley, a broad, mountain-ringed, geophysical basin that forms part of eastern Uzbekistan, and, to a lesser extent, parts of western Kyrgyzstan and northern Tadjikistan. „Gissar. khr[ebet].“ clearly refers to the Gissar mountains, which run east-west across the border between eastern Uzbekistan and western Tadjikistan. The Fergana valley and the Gissar mountains are, however, neither overlapping nor contiguous geopolitical entities, and the inclusion of both names on a single locality label appears to be an error. We have been unable to locate any populated place „Chash“ in the Fergana valley. But, one large-scale Sovi-

et-era map available to us shows a small settlement by this name in eastern Uzbekistan. The GEOnet geographic names server (<http://earth-info.nga.mil/gns/html/index.html>) gives „Chash“ as a variant spelling of the populated place „Chosh,“ which is located near Khurvatan in the upper northwestern reaches of the watershed of the Surkhan Darya [=Sur khan dar'ya] River, whose major tributaries (including those in the vicinity of Chosh) arise from the southwestern Gissar mountains. Based on this information, we infer that „Fergana“ is the incorrect element on the locality label of the neotype, and we identify the collecting locality of the neotype as noted above under „Type locality“.

Former holotype (by monotypy), sex unknown, depository unknown (assumed lost or destroyed, see attempts to locate cited above). Type locality (in current geopolitical terms): Tadjikistan: northwestern region, precise locality unknown, somewhere in the vicinity of Khudzhand (city) [=Khodzhen, =Leninabad; 40°14'N 69°40'E]; (transliterated from original description): „Bistyubinskaya volost' of Khodzhenstskii uезд of Samarkandskaya oblast'“.

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## References

For more detailed bibliographic information on the references cited below see the Bibliography of the Neuropterida (OSWALD 2004). Use the reference number (r#) cited to search the Bibliography for the specific work.

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