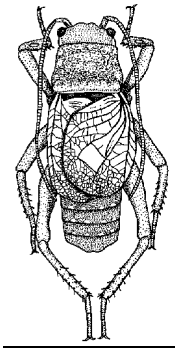

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REVIEW OF THE PALAEARCTIC SPECIES OF *CLERUCHUS* ENOCK (HYMENOPTERA: MYMARIDAE)

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The Palaearctic species of the fairyfly wasp genus *Cleruchus* Enock, 1909 (Hymenoptera: Mymaridae) are reviewed, and a key to both sexes is given. Three new taxa are described: *C. kivach* **sp. n.** (Karelia, Russia), *C. nikaknet* **sp. n.** (Italy), and *C. taktochno* **sp. n.** (Belgium). Also described and illustrated is the previously unknown male of *C. petr* Triapitsyn, 2002 (Far East of Russia). *Cleruchus bakkendorfi* Debauche, 1948, **syn. n.** is synonymized under *C. pluteus* Enock, 1909, the type species of the genus, for which a lectotype is designated. *Cleruchus terebrator* (Ogloblin, 1959) and *C. vagatus* (Ogloblin, 1959), both from Argentina, are transferred to *Platystethynium* Ogloblin, 1946 as, respectively, *P. terebrator* (Ogloblin), **comb. n.** and *P. vagatus* (Ogloblin), **comb. n.** *Cleruchus terebrator* Viggiani, 1970, **stat. rev.** (Switzerland) is re-established as the proper name since its replacement name *C. europaensis* Özdikmen, 2011, **syn. n.** became unnecessary.

KEY WORDS: Hymenoptera, Mymaridae, *Cleruchus*, taxonomy, Palaearctic region.

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Приведен обзор палеарктических ос-мимарид рода *Cleruchus* Enock, 1909 (Hymenoptera: Mymaridae). Дана определительная таблица для самцов и самок.

Описаны три новых вида: *C. kivach* **sp. n.** (Россия: Карелия), *C. nikaknet* **sp. n.** (Италия) и *C. taktochno* **sp. n.** (Бельгия). Описан ранее неизвестный самец *C. petr* Triapitsyn, 2002 с Дальнего Востока России. *Cleruchus bakkendorfi* Debauche, 1948, **syn. n.** сведен в синонимы к типовому виду рода *C. pluteus* Enock, 1909, для которого обозначен лектотип. Два вида из Аргентины, *C. terebrator* (Ogloblin, 1959) и *C. vagatus* (Ogloblin, 1959), перенесены в род *Platystethynium* Ogloblin, 1946, вследствие чего установлены новые комбинации: *P. terebrator* (Ogloblin), **comb. n.** и *P. vagatus* (Ogloblin), **comb. n.** Установлено, что замещающее название *Cleruchus europaensis* Özdikmen, 2011, **syn. n.**, предложенное для *C. terebrator* Viggiani, 1970, **stat. rev.** (Швейцария), является излишним.

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INTRODUCTION

A rather poorly known cosmopolitan fairyfly genus *Cleruchus* Enock, 1909 (Hymenoptera: Mymaridae) is not very commonly collected in the Palaearctic region, yet a number of species have been described to date (Enock, 1909; Debauche, 1948; Bakkendorf, 1964; Novicky, 1965; Triapitsyn, 2002; Triapitsyn & Moraal, 2008). Its three little known species described by Novicky (1965) from Europe were recently reviewed by Triapitsyn *et al.* (2013).

Several species of *Cleruchus* were collected from leaf litter and soil samples (Ferrière, 1952; Bakkendorf, 1964; Novicky, 1965; Viggiani, 1970). Some species were collected emerging from tubules of bracket fungi in both Europe and North America (Triapitsyn & Moraal, 2008), while some others were swept with a net in mixed, mostly deciduous, forests and in forest openings in Belgium (Debauche, 1948) and also in similar habitats in Poland (Novicky, 1965). Besides sweeping, collecting on windows of an electric train car (Novicky, 1965), and rearing from bracket fungi, specimens of *Cleruchus* can also be captured in Malaise, yellow pan, and flight interception traps as well as by extracting from soil and leaf litter using Berlese funnels and various sifting methods.

The generic diagnoses of *Cleruchus* were given by Enock (1909), Debauche (1948), Schauff (1984), and Pricop (2011) but their definitions are too narrow to encompass properly its worldwide diversity (Triapitsyn, 2002; Triapitsyn & Moraal, 2008) although they are more or less appropriate for the Palaearctic species. In the entire Palaearctic region, both sexes of *Cleruchus* can be identified using the generic key in Triapitsyn & Huber (2000); in Europe, females of this genus can also be recognized using the key by Pricop (2013). Most of the European species of *Cleruchus* were first keyed by Novicky (1965) whose key, however, had some mistakes and was incomplete. That key was later expanded by Trjapitzin (1978); both are now outdated. Unlike some other genera of Mymaridae, males of *Cleruchus* are quite diagnostic.

MATERIAL AND METHODS

Compared to some other, more common fairyfly genera, availability of the recently collected, well-preserved and properly curated specimens of the Palaearctic *Cleruchus* for this study was quite limited. Most historical specimens in the scientific collections were mounted on microscopic slides of variable quality which unfortunately often is quite poor.

The following acronyms are used to designate depositories of specimens:

BMNH – The Natural History Museum, London, England, UK

CUPC – Department of Zoology, Faculty of Science, Charles University, Prague, Czech Republic

CVV – Private collection of Veli Vikberg, Turenki, Finland

DEZA – Dipartimento di Entomologia e Zoologia Agraria "Filippo Silvestri", Università degli Studi di Napoli "Federico II", Portici, Napoli, Italy

EMEC – Essig Museum of Entomology, University of California, Berkeley, California, USA

FMNH – Zoological Museum, Finnish Museum of Natural History, University of Helsinki, Helsinki, Finland

ISNB – Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium

MHNG – Muséum d'histoire naturelle de la Ville de Genève, Geneva, Switzerland

MZNA – Department of Zoology and Ecology, Faculty of Sciences, University of Navarra, Pamplona, Navarre, Spain

NHMW – Naturhistorisches Museum Wien, Vienna, Austria

RMNH – National Museum of Natural History (Nationaal Natuurhistorisch Museum Naturalis), Leiden, Netherlands

UCDC – The R.M. Bohart Museum of Entomology, University of California, Davis, California, USA

UCRC – Entomology Research Museum, University of California, Riverside, California, USA

ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia

Collecting and preservation methods of material from Primorskii krai (the Maritime Territory) of Russia were described by Triapitsyn & Berezovskiy (2001). Selected specimens were slide-mounted in Canada balsam, examined under a Zeiss Axioskop 2 plus compound microscope using Nomarski differential interference contrast optics, and photographed using the Auto-Montage® system; the photographs were then retouched where necessary using Adobe Photoshop®.

All measurements (as length or length: width for the wings) are given in micrometers (μm) unless stated otherwise. Terms for morphological features follow Gibson (1997). Abbreviations used are: F = funicle segment of the female antenna or flagellomere of the male antenna; mps = multiporous plate sensillum or sensilla on the antennal flagellar segments (= longitudinal sensillum or sensilla or sensory ridge(s) of authors).

TAXONOMY

Genus *Cleruchus* Enock, 1909

Cleruchus Enock, 1909: 453. Type species: *Cleruchus pluteus* Enock, 1909, by monotypy.
Eucleruchus Ogloblin, 1940: 600-601. Type species: *Eucleruchus neivai* Ogloblin, 1940, by original designation. Synonymized under *Cleruchus* by Luft Albarracin *et al.*, 2009: 3.
Cleruchus Enock: Debauche, 1948: 142-145 (diagnosis, key to species in Belgium); Kryger, 1950: 50-51 (diagnosis, comments); Ferrière, 1952: 43 (comments); Annecke & Doutt, 1961: 20 (comments); Novicky, 1965: 56-60 (discussion, key to European species); Viggiani, 1973: 270-271 (male genitalia); Viggiani, 1974: 86-88 (comments, synonymy); Trjapitzin, 1978: 531-532 (key to the European species); Schauff, 1984: 43-44 (genus definition, remarks); Noyes & Valentine, 1989: 31 (diagnosis); Yoshimoto, 1990: 55-56 (diagnosis, discussion, list of species in the New World); Triapitsyn & Huber, 2000: 613 (remarks); Donev & Huber, 2002: 117-119 (comments); Triapitsyn, 2002: 2-3 (list of synonyms, comments, key to species in the Russian Far East); Viggiani, 2005: 64 (male genitalia); Lin *et al.*, 2007: 29-30 (diagnosis, list of Australian species); Triapitsyn & Moraal, 2008: 62-63 (comments, key to the *pieloui* species group); Pricop, 2011: 25-26 (diagnosis); Triapitsyn & Proshchalykin, 2012: 207 (catalog); Pricop, 2013: 75 (key); Triapitsyn *et al.*, 2013: 6-8 (comments); Manickavasagam & Palanivel, 2013: 81 (distribution).
Stenopteromymar Ferrière, 1952: 41-42. Type species: *Stenopteromymar biciliatus* Ferrière, 1952, by monotypy. Synonymized under *Cleruchus* by Viggiani, 1974: 87-88.
Stenopteromymar Ferrière: Annecke & Doutt, 1961: 26 (comments); Trjapitzin, 1978: 532 (list); Viggiani, 1974: 87 (comments).
Douttiella Annecke, 1961: 71-72. Type species: *Douttiella depressa* Annecke, 1961, by original designation. Synonymized under *Cleruchus* by Noyes & Valentine, 1989: 31.
Paracleruchus Yoshimoto, 1971: 1079. Type species: *Paracleruchus pieloui* Yoshimoto, 1971, by original designation. Synonymized under *Cleruchus* by Viggiani, 1974: 87-88.
Haplochaeta Noyes & Valentine, 1989: 35-36. Type species: *Haplochaeta mandibularis* Noyes & Valentine, 1989, by original designation. Synonymized under *Cleruchus* by Lin *et al.*, 2007: 29.

DIAGNOSIS. Both sexes of *Cleruchus* s. str.: body usually more or less dorsoventrally flattened; femora often swollen, at least slightly; fore wing in macropterous individuals parallel or almost parallel-sided (brachypterous or apterous individuals are not uncommon in some species), venation short, disc usually with a few rows of setae; head variable in shape and degree of flatness; toruli at or below lower level of eye; ocelli, when present, in a very obtuse triangle delimited anteriorly by a fine sulcus; mandible 2-dentate; pronotum mediolongitudinally divided; scutellum with a distinct frenum; metanotum usually inconspicuous; propodeum without carinae; petiole short, much wider than long; protibial spur bifurcate, tarsi 4-segmented. Female antenna with a 6-segmented funicle and an entire clava; ovipositor of variable length but usually notably shorter than gaster. Male antenna with flagellum 9-, 10-, or 11-segmented.

Cleruchus belongs to the informal *Cleruchus* group of genera (Donev & Huber, 2002; Lin *et al.*, 2007) which needs to be revised using a combination of morpholo-

gical, molecular, and biological evidence. Species with a 2-segmented clava of the female antenna that have been classified in *Cleruchus*, such as for instance *C. mandibularis* (Noyes & Valentine, 1989) which also has a different, greater number of the mandibular teeth, may not belong in the genus but that remains to be investigated thoroughly and will be reported elsewhere (I have examined the following specimen of *C. mandibularis*: **New Zealand,** North Island, Waihi, 37°28'07''S 175°51'4''E, 9-14.II 2006 (B. Brown) [1 ♀, UCRC]). Meanwhile, the status of two other such species, described by Ogloblin (1959) from Argentina as *Platypatasson terebrator* Ogloblin, 1959 and *P. vagatus* Ogloblin, 1959, needs to be clarified right away because there has been much confusion about them that has also impacted the European species *C. terebrator* Viggiani, 1970 (Viggiani, 1970; Özdikmen, 2011). When Schauff (1984) synonymized the genus *Platypatasson* Ogloblin, 1946 under *Cleruchus*, these two species found themselves in the latter by an implied transfer only because no formal combination was proposed. Again, later when Donev & Huber (2002) removed *Platypatasson* from the synonymy under *Cleruchus* and synonymized it instead under *Platystethynium* Ogloblin, 1946, *P. terebrator* and *P. vagatus* automatically became members of the latter by an implied transfer (no formal combination was proposed but that is not required). However, more recently Luft Albarracin *et al.* (2009) erroneously listed them under *Cleruchus* as, respectively, *C. terebrator* (Ogloblin) and *C. vagatus* (Ogloblin), and it is this way that they are now listed in the Universal Chalcidoidea Database (Noyes, 2013). Here I am correcting their proper placement, at least for the time being, by formally transferring them from *Cleruchus* back to *Platystethynium* as, respectively, *P. terebrator* (Ogloblin) **comb. n.** and *P. vagatus* (Ogloblin) **comb. n.**: after examining their holotypes during a visit to Museo de La Plata, La Plata, Buenos Aires, Argentina (MLPA), where they are deposited, I definitely do not consider them to be members of *Cleruchus* which is more narrowly defined here. Indeed, even though the number of antennal claval segments in females of Mymaridae is not always a good genus-level character, these species also have other, more significant, morphological features of generic value to render them being different from those of *Cleruchus* even if it were treated in a broad sense. They are also not congeneric with *C. mandibularis* and the related unnamed species from Australia which, according to Lin *et al.* (2007), at most could belong to a species group or a subgenus within *Cleruchus* s. l. which corresponds to the synonymized genus *Haplochaeta*.

Because some species of *Cleruchus* may have macropterous, brachypterous, and apterous individuals, and males are often difficult to associate with conspecific females, there is always a danger of describing the same species more than once when specimens do not come from the same rearing or collecting event. Using appropriate molecular methods with freshly collected and properly preserved specimens could be particularly beneficial for their recognition and matching of one sex with the other.

DISTRIBUTION. Cosmopolitan.

BIOLOGY. Hosts of *Cleruchus* are poorly known; the few available extralimital host records were listed by Huber (1986) and Lin *et al.* (2007), these among other

insect families mentioned below also included Cleridae (Coleoptera) and Tettigoniidae (Orthoptera), respectively. That of Cleridae was based on the listing of *Callimerus arcufer* Chapin, 1919 (as *C. arufer* [sic]) as the host of a *Cleruchus* sp. in Johor, Malaysia by Subba Rao & Hayat (1983). However, I could not find any published records of a confirmed *Cleruchus* species from eggs of Tettigoniidae. In the *Cleruchus* group of genera, host records from eggs of Orthoptera are known only for the species of *Platystethynium*: Tettigoniidae for *P. onomarchicidum* Ogloblin, 1946 and "locustid eggs" for *P. fransseni* (Ogloblin, 1946) (Ogloblin, 1946). As reasonably noted by Donev & Huber (2002), the latter record was almost certainly also of a katydid (Tettigoniidae) rather than of a grasshopper (Acrididae) host as stated by Schauff (1984). Thus, host associations of *Cleruchus* most likely are limited to certain Coleoptera as shown by the following scarce records.

A *Cleruchus* sp. was reared in Florida, USA, from eggs of the citrus weevil *Artipus floridanus* Horn, 1876 (Coleoptera: Curculionidae) (Schauff, 1987). *Cleruchus pieloui* (Yoshimoto, 1971), *C. polypori* Triapitsyn & Moraal, 2008, and *C. puchus* Triapitsyn, 2008 were reared from the bracket fungi (Polyporales: Fomitopsidaceae) and are apparently (*C. puchus* evidently) associated with Ciidae (Coleoptera) (Triapitsyn & Moraal, 2008). A species quite similar to *C. polypori* was also reared from the bracket fungi in Karelia (Russia) (Triapitsyn *et al.*, 2011); it is described here as *C. kivach* sp. n. Other potential hosts of *Cleruchus* species were discussed by Novicky (1965); among them was the earlier reported association of *C. pluteus* Enock, 1909 with eggs of an unidentified beetle in leaf-rolls of Rhynchitidae (Coleoptera) in Denmark (Bakkendorf, 1934; Kryger, 1950).

Key to the Palaearctic species of *Cleruchus*

1. Female (antenna with flagellum 7-segmented, consisting of a 6-segmented funicle and an entire clava) …… 2
– Male (antenna with flagellum filiform, 9-, 10-, or 11-segmented) ……..... 21
2(1) Apterous or strongly brachypterous (all wing stubs, if present, with membrane strongly reduced, at most extending a little beyond apex of venation) ……... 3
– Macropterous or slightly to moderately brachypterous (fore wing disc, even if somewhat reduced, extending far beyond apex of venation) ..…… 8
3(2) Most funicle segments either a little wider than long or at most as long as wide (except a few may be a little longer than wide) …….. 4
– Most funicle segments clearly longer as wide (except a few may be about as long as wide) ……... 5
4(3) Ocelli absent; ovipositor about 0.7x length of metatibia ……. ***C. szelenyi***
– Ocelli present; ovipositor 1.3x length of metatibia …… ***Cleruchus* sp. 1**
5(3) Ocelli absent; F2-F6 each with 1 mps ……... 6
– Ocelli present; at most sometimes F5 and F6 each with 1 mps ……. 7
6(5) Body length (of dry-mounted specimens) at least 0.5 mm; body relatively more elongate; funicle segments relatively longer and clava at least 3.7x as long as wide …….. ***C. polypori*** (part)

– Body length (of dry-mounted specimens) at most 0.46 mm; body relatively less elongate; funicle segments relatively shorter and clava at most 2.9x as long as wide ..... ***C. kivach* sp. n.** (part)
7(5) Ovipositor 0.6-0.65x length of metatibia ..... ***C. janetscheki*** (part)
– Ovipositor 1.3-1.4x length of metatibia ..... ***C. terebrator***
8(2) Ocelli absent 9
– Ocelli present 12
9(8) F2 and F3 each with 1 mps 10
– F2 and F3 without mps 11
10(9) Body length (of dry-mounted specimens) at least 0.5 mm; body relatively more elongate; funicle segments relatively longer and clava at least 3.7x as long as wide ..... ***C. polypori*** (part)
– Body length (of dry-mounted specimens) at most 0.46 mm; body relatively less elongate; funicle segments relatively shorter and clava at most 2.9x as long as wide ..... ***C. kivach* sp. n.** (part)
11(9) Clava just a little longer than combined length of F4-F6; fore wing very narrow, with disc reduced (but extending far beyond apex of venation), and with a few discal and most marginal setae short except for 2 or 4 very long marginal setae at wing's apex ..... ***C. biciliatus***
– Clava as long as combined length of F2-F6; fore wing normal (not reduced, with many marginal setae) ..... ***Cleruchus* sp. 2**
12(8) Admarginal row of discal setae along posterior margin of fore wing absent (Figs 16, 21) or incomplete (at most a few setae behind and just beyond stigmal vein and also at wing's apex, Fig. 24) 13
– Admarginal row of discal setae along posterior margin of fore wing present and complete 16
13(12). Fore wing with dorsal setae on marginal vein relatively very long (Fig. 24) ..... ***C. mikhail***
– Fore wing with dorsal setae on marginal vein relatively short 14
14(13) Fore wing with discal setae of the median row relatively long (Fig. 21) ..... ***C. megatrichus***
– Fore wing with discal setae of the median row relatively short 15
15(14) Body length (slide-mounted specimens) at most 0.78 mm; fore wing at least 12.0x as long as wide ..... ***C. leptosoma***
– Body length (slide-mounted specimen) 1.12 mm; fore wing 10.2x as long as wide ..... ***Cleruchus* sp. 3**
16(12) F3 and F4 each with 1 mps 17
– F3 and F4 without mps 19
17(16) F1 wider than long (Fig. 2) ..... ***C. detritus***
– F1 longer than wide 18
18(17) F1 notably shorter than F6; F2 with 1 mps, at least on one antenna ..... ***C. petr***
– F1 almost as long as F6; F2 without mps ..... ***C. nikaknet* sp. n.**

19(16) Clava notably lighter than funicle; F1 clearly longer than wide ……
..……. ***C. janetscheki*** (part)
– Clava concolorous with funicle; F1 either about as long as wide or at most slightly longer than wide …….. 20
20(19) Collected in northern Europe during summer (male antenna 12-segmented) ..
……... ***C. pluteus***
– Collected in northern Europe during spring (male antenna 13-segmented) …….
..…… ***C. taktochno* sp. n.**
21(1) Apterous or strongly brachypterous (all wing stubs, if present, with membrane strongly reduced, at most extending a little beyond apex of venation) ……. 22
– Macropterous or slightly to moderately brachypterous (fore wing disc, even if somewhat reduced, extending far beyond apex of venation) …… 26
22(21) Ocelli present …….. 23
– Ocelli absent …… 24
23(22) Antenna with flagellum 9-segmented and F1-F6 wider than long (Fig. 49) …
…… ***C. raignieri***
– Antenna with flagellum 10-segmented and F1-F6 at least a little longer than wide
..…….. ***C. janetscheki***
24(22) Antenna with flagellum 9-segmented …….. ***C. szelenyi***
– Antenna with flagellum 11-segmented …… 25
25(24) F1 relatively smaller and subglobular (about as long as wide) …….
…… ***C. polypori***
– F1 relatively larger and a little longer than wide (Fig. 11) …… ***C. kivach* sp. n.**
26(21) Antenna with flagellum 9-segmented …….. ***Cleruchus* sp. 4**
– Antenna with flagellum 10- or 11-segmented ……. 27
27(26) Antenna with flagellum 10-segmented ..…… 28
– Antenna with flagellum 11-segmented ……29
28(27) F1 about as long as wide (Figs 37, 44) …….. ***C. pluteus***
– F1 clearly longer than wide (Fig. 28) …….. ***C. petr***
29(27) Fore wing with discal setae of the median row relatively long (as in Fig. 21)
……..… ***C. megatrichus***
– Fore wing with discal setae of the median row relatively short …….. 30
30(29) Fore wing with dorsal setae on marginal vein very long (as in Fig. 24) …….
……. ***C. mikhail***
– Fore wing with dorsal setae on marginal vein short (Fig. 55) …….
…… ***C. taktochno* sp. n.**

Synopsis of species (in alphabetical order)

Cleruchus biciliatus (Ferrière, 1952)

Stenopteromymar biciliatus Ferrière, 1952: 42-43. Two ?syntype females [either lost or not returned from a loan – the "type" mentioned by Ferrière (1952) could not be found in MHNG (Bernhard Merz, personal communication) where it was deposited according to

the original description, which was based on the two females examined later by Schauff (1984) who indicated that these were syntypes from MHNG; these are also absent in BMNH (Suzanne Ryder, personal communication)], not examined. Type locality: Arcine [village], at the foot of Vuache [mountain or hill] (Montagne de Vuache, village d'Arcine), Haute-Savoie [as d'Arcine, Vuache, Savoie in the original description], France.

Cleruchus biciliatus (Ferrière): Viggiani, 1974: 87 (taxonomic comments, illustrations, additional record of a female from France); Yoshimoto, 1990: 56 (distribution); Huber, 2013: 67 (mentioned).

Stenopteromymar biciliatus Ferrière: Trjapitzin, 1978: 532 (short diagnosis, distribution).

DIAGNOSIS. According to Ferrière (1952) and Viggiani (1974), female of *C. biciliatus* (body length is about 0.5 mm) has small eyes and lacks ocelli; all funicle segments are at least a little longer than wide (F1 the shortest) and apparently lack mps, clava is just a little longer than the combined length of F4-F6; pronotum and propodeum are large, mesoscutum and scutellum are short; wings are reduced, particularly the hind wing, fore wing is very narrow, with a few discal and most marginal setae short except for 2 or 4 very long marginal setae at wing's apex; hind wing has no setae and extends at most to the apex of mesosoma; ovipositor is short and not exserted beyond the gastral apex. The male is unknown.

Cleruchus biciliatus is somewhat similar to *C. szelenyi* Novicky, 1965 (both species lack ocelli) but female antenna of the latter species, which is apterous, has the clava a little longer than the combined length of F3-F6 (Triapitsyn *et al.*, 2013).

DISTRIBUTION. France (Viggiani, 1974), and Canada (Yoshimoto, 1990). The listing of this species from Switzerland (Noyes, 2013) is incorrect.

HOSTS. Unknown.

***Cleruchus detritus* Bakkendorf, 1964**

Figs 1–6

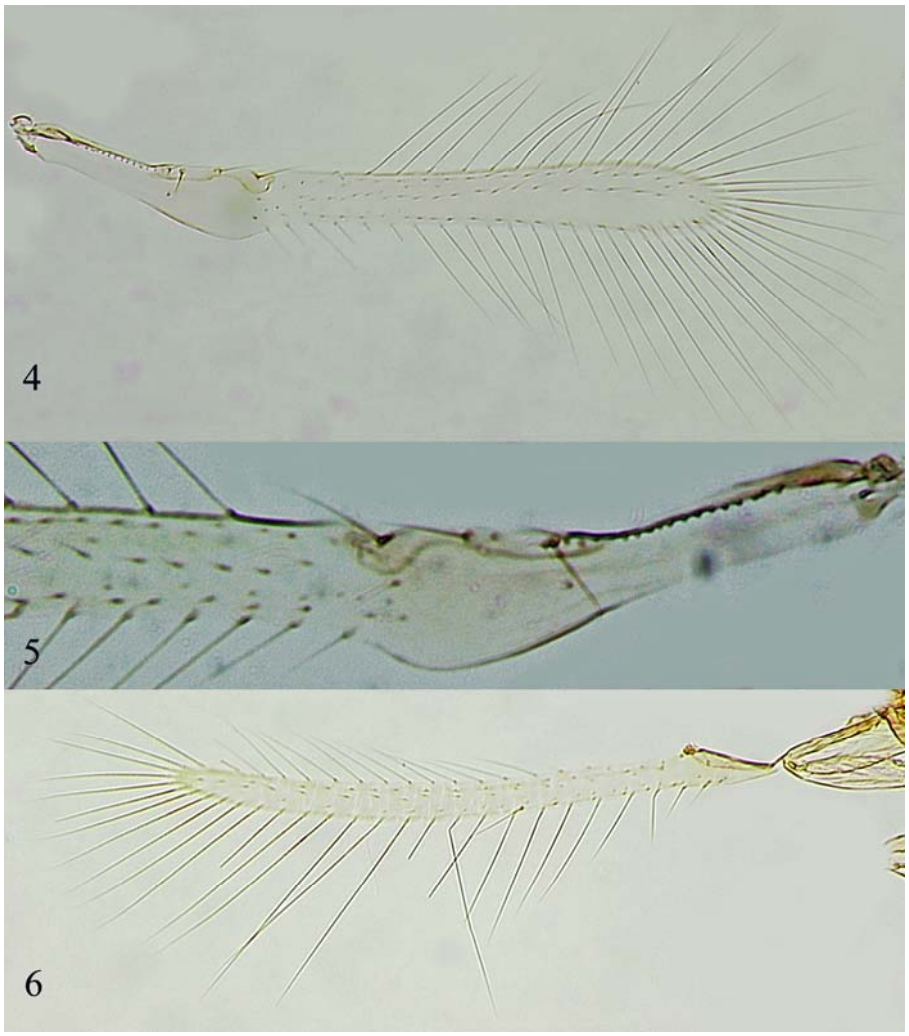
Cleruchus detritus Bakkendorf, 1964: 4–6 (in part, winged "form" only, also in the key). Type locality: Chancy, Geneva, Switzerland.

Cleruchus detritus Bakkendorf: Novicky, 1965: 60 (mentioned in footnote, as "f.[orma] *alata*"); Triapitsyn, 2002: 8 (winged female mentioned); Triapitsyn *et al.*, 2013: 12, 14 (type information, lectotype designation, comments).

TYPE MATERIAL EXAMINED. Lectotype female [MHNG], designated by Triapitsyn *et al.* (2013), on slide (Fig. 1) labeled: 1. "Mymaridae: *Cleruchus detritus* Bkdf. Type. 2 [in pencil]"; 2. "Genève Chancy 23.V.61 lavage de terre Besuchet 2 [in pencil]"; 3. [red] "*Cleruchus detritus* Bakkendorf LECTOTYPE ♀ (macropterous) Des. by S. V. Triapitsyn 2012"; 4. [pink] "*Cleruchus detritus* Bakkendorf PARALECTOTYPE ♀ (apterous) Des. by S. V. Triapitsyn 2012 (= *C. szelenyi* Novicky Det. S. T. 2012)". The lectotype is mounted under the same coverslip with an intact apterous paralectotype of *C. detritus* which belongs to *C. szelenyi* (Triapitsyn *et al.*, 2013). The macropterous lectotype is poorly mounted (not cleared), with head plus both antennae, one fore wing, and the apical half or so

of one hind wing detached from the body, which is mounted dorsoventrally and lacking tibia and tarsus of one hind leg. Also a macropterous paralectotype female on another slide [MHNG], mounted under the same coverslip with the two apterous

Figs 1-3. *Cleruchus detritus*, female (lectotype). 1) Slide, 2) head and antennae, 3) mesosoma and metasoma.



Figs 4-6. *Cleruchus detritus*, female (lectotype). 4) Fore wing, 5) fore wing venation, 6) hind wing.

female paralectotypes of *C. detritus* which belong to *C. szelenyi*, with the same original label data as the lectotype except lacking "Type" on the first label and labeled "1." in pencil on both original labels; the head plus one antenna and another antenna are detached from the poorly mounted body.

REDESCRIPTION. FEMALE (lectotype and paralectotype). Body length 0.45 mm (Bakkendorf, 1964). Color of body and appendages as described by Bakkendorf (1964); that of the slide-mounted specimens as follows: body and flagellum brown;

scape, pedicel, and legs yellowish. Head as wide as mesosoma. Eye with at least 7 or 8 ommatidia visible in frontal view; ocelli present. Torulus below lower level of eye. Antenna (Fig. 2) with scape (minus a short radicle) almost smooth, 3.1-3.4x as long as wide; pedicel 1.5-1.6x as long as wide, much longer than F1; F1 the shortest funicle segment, transverse, about 1.5x as wide as long; F2-F5 longer than wide and more or less subequal in length (F5 slightly longer), F6 about as long as wide and as long as F4, F3-F6 wider than F1 and F2 and each with 1 mps (F2 with a mps in the paralectotype but not completely evident on one antenna in the lectotype although apparently present on the other antenna); clava a little shorter than combined length of F3-F6 in the lectotype but subequal to slightly longer in the smaller paralectotype, 2.9-3.1x as long as wide, with 6 mps. Mesosoma (Fig. 3) as long as metasoma (Fig. 3). Pronotum short; midlobe of mesoscutum apparently with 2 pairs of setae. Macropterous. Fore wing (Fig. 4) 9.85x as long as wide in the lectotype (apparently somewhat narrower in the paralectotype), marginal vein with both macrochaetae moderately long (Fig. 5); disc slightly infumate throughout, with 3 complete rows of setae (2 of them admarginal); the longest marginal seta 3.5-4.3x greatest width of wing. Hind wing (Fig. 6) 21.7x as long as wide; disc infuscate as described by Bakkendorf (1964), with 3 irregular rows of setae; longest marginal seta 7.0x greatest width of wing. Petiole hardly visible in the uncleared specimens; ovipositor 0.85x length of metatibia and occupying about 0.5 length of gaster, exserted beyond its apex by about 0.25x own length.

Measurements of the lectotype: Mesosoma: 197; gaster: 194; ovipositor: 122. Antenna: radicle: 9; rest of scape: 94; pedicel: 42; F1: 12; F2: 24; F3: 24; F4: 25; F5: 27; F6: 25; clava: 103. Fore wing: 473:48; longest marginal seta: 166. Hind wing: 455:21; longest marginal seta: 148.

MALE. Unknown.

DIAGNOSIS. The female of *C. detritus* has mps on F2-F6 of the antenna, with rather short and wide funicle segments (Fig. 2). The female antenna of *C. brevipennis* Ogloblin, 1940 from Argentina also has mps on F2-F6 (Ogloblin, 1940) but these funicle segments are relatively longer and narrower in *C. brevipennis* than in *C. detritus*.

DISTRIBUTION. Switzerland (Bakkendorf, 1964 [as a winged "form" of *C. detritus*]).

HOSTS. Unknown.

COMMENTS. The entire syntype series of *C. detritus* was examined (Triapitsyn *et al.*, 2013); it was determined that the two "forms" of *C. detritus* (Bakkendorf, 1964) represent two different species: the apterous one is identical to *C. szelenyi* whereas the macropterous "form" is a good species considered to be the true *C. detritus* for which a lectotype was designated.

I have examined the following specimens of *C. brevipennis*, which previously has been known only from the single holotype female (Ogloblin, 1940): **Argentina:** Formosa, Estancia Guaycolec (25 km N of Formosa), 25°59'S 58°12'W, 185 m, 26.II-10.III 1999 (S. L. Heydon, J. Ledford) [1 ♀, UCDC]. Misiones, Parque Nacional Iguazú, 25.68°S 54.45°W, 200 m, 2-7.XII 2003 (B. V. Brown, G. Kung) [1 ♀, UCRC].

***Cleruchus janetscheki* Novicky, 1965**
Fig. 22

Cleruchus janetscheki Novicky, 1965: 59 (in key). Holotype female [DEZA], examined (Triapitsyn *et al.*, 2013). Type locality: 2040 m, summit of Kanisfluh [massif], Vorarlberg, Austria.
Cleruchus longicornis Viggiani, 1970: 137–138 (junior primary homonym of *C. longicornis* Ogloblin 1955: 499–502). Holotype female [MHNG], examined (Triapitsyn *et al.*, 2013). Type locality: Fondra, Comune di Isola di Fondra (Isola di Fondra Municipality), Bergamo Prov., Lombardy, Italy.
Cleruchus subterraneus Viggiani, 1974: 88 (nom. n. pro *C. longicornis* Viggiani, 1970 nec *C. longicornis* Ogloblin, 1955). Synonymized under *C. janetscheki* by Triapitsyn *et al.*, 2013: 8.
Cleruchus janetscheki Novicky: Trjapitzin, 1978: 531 (key, distribution); Vidal, 2001: 61 (list); Triapitsyn *et al.*, 2013: 8-10 (redescription, illustrations, distribution).
Cleruchus longicornis Viggiani: Viggiani & Jesu, 1988: 1022 (distribution).
Cleruchus subterraneus Viggiani: Triapitsyn, 2002: 5, 8 (compared with the species from the Russian Far East); Viggiani, 2005: 63–64 (illustration of male genitalia, short diagnosis, distribution).

DIAGNOSIS. *Cleruchus janetscheki*, as redescribed and illustrated by Triapitsyn *et al.* (2013), can have macropterous (responsible for dispersal), strongly brachypterous, and apterous females and almost apterous males; the only fully winged individual known is the holotype of *C. subterraneus* (fore wing, Fig. 22), which is a large female (body length 960 μm) whereas the brachypterous and apterous females are smaller (body length 560-750 μm). The ocelli are present in both sexes although Novicky (1965) incorrectly stated that they were absent in the female. Female of this species can also be recognized by the combination of ovipositor 0.6-0.65x metatibia length and funicle segments of the antenna all longer than wide; clava is lighter than funicle. The male antenna is 12-segmented, F1 without mps (Triapitsyn *et al.*, 2013).

DISTRIBUTION. Austria, Italy (Viggiani, 1970; Viggiani & Jesu, 1988) [as *C. longicornis*], and Switzerland (Viggiani, 2005 [as *C. subterraneus*]). Vidal (2001) listed *C. janetscheki* from Germany but that needs confirmation: it is not clear on what material this listing was based on.

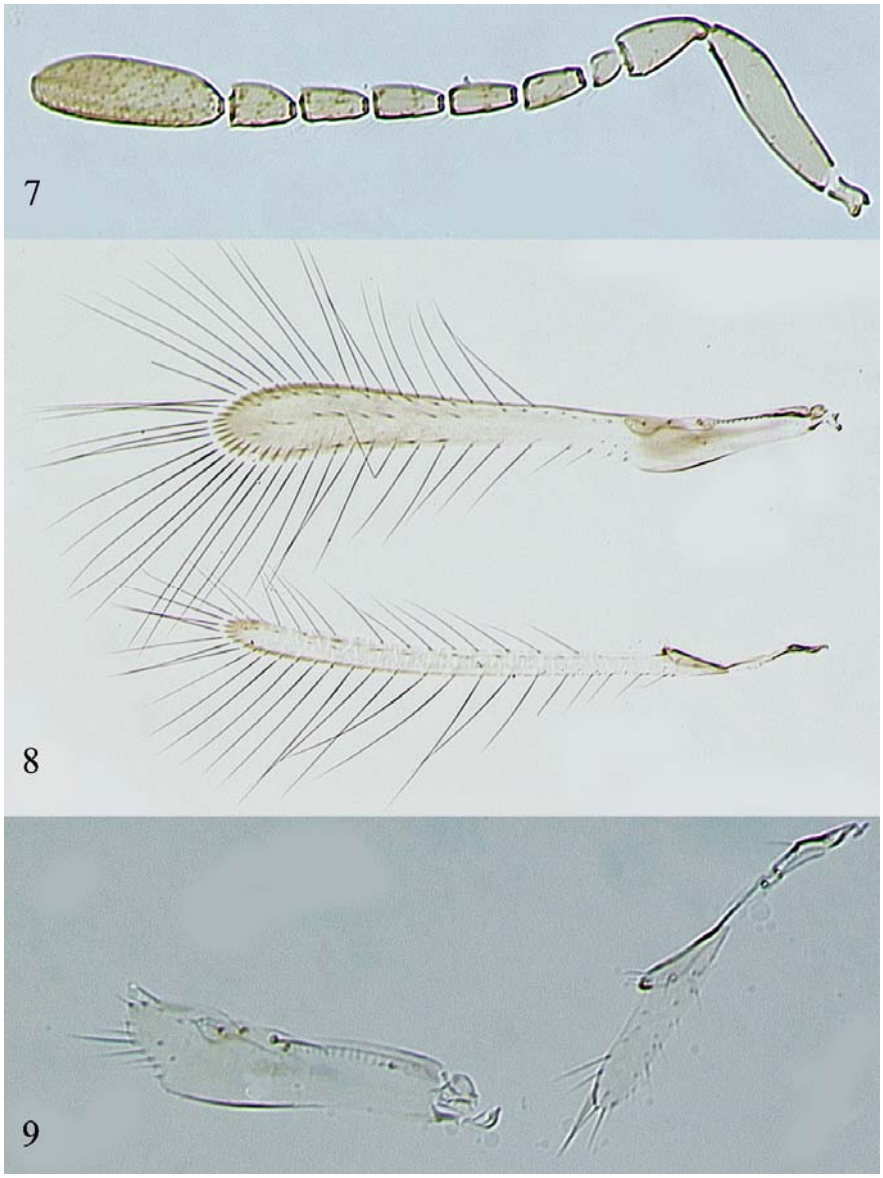
HOSTS. Unknown.

***Cleruchus kivach* Triapitsyn, sp. n.**
Figs 7–12

Cleruchus sp.: Triapitsyn *et al.*, 2011: 9 (taxonomic notes, diagnosis), 10 (illustrations); Vikberg & Martikainen, 2011: 30 (brief information on specimens).

TYPE MATERIAL. Holotype female (macropterous) on slide [UCRC]: **Russia:** Republic of Karelia, Kondopozhskiy District, Kivach [Nature Reserve], 21.V 1998

(P. Martikainen), from *Trametes ochracea* and *Bjerkandera adusta* on *Populus tremula* [UCRC ENT 245608]. The holotype is in good condition, almost complete (lacking both fore legs and one middle leg), dissected under 3 coverslips (the body



Figs 7-9. *Cleruchus kivach* sp. n., female (lectotype). 7) Antenna (holotype), 8) pair of wings (holotype, macropterous), 9) pair of wings (paratype, brachypterous).

is mounted dorsoventrally). Paratypes: same data as the holotype [48 brachypterous females, 31 macropterous females, and 20 almost apterous males: CVV and FMNH (40, 25, 13, respectively), UCRC (7, 5, 6, respectively; among them 2, 3, 3, respectively, on slides and remainder on points), ZIN (1, 1, 1, respectively; all on slides).

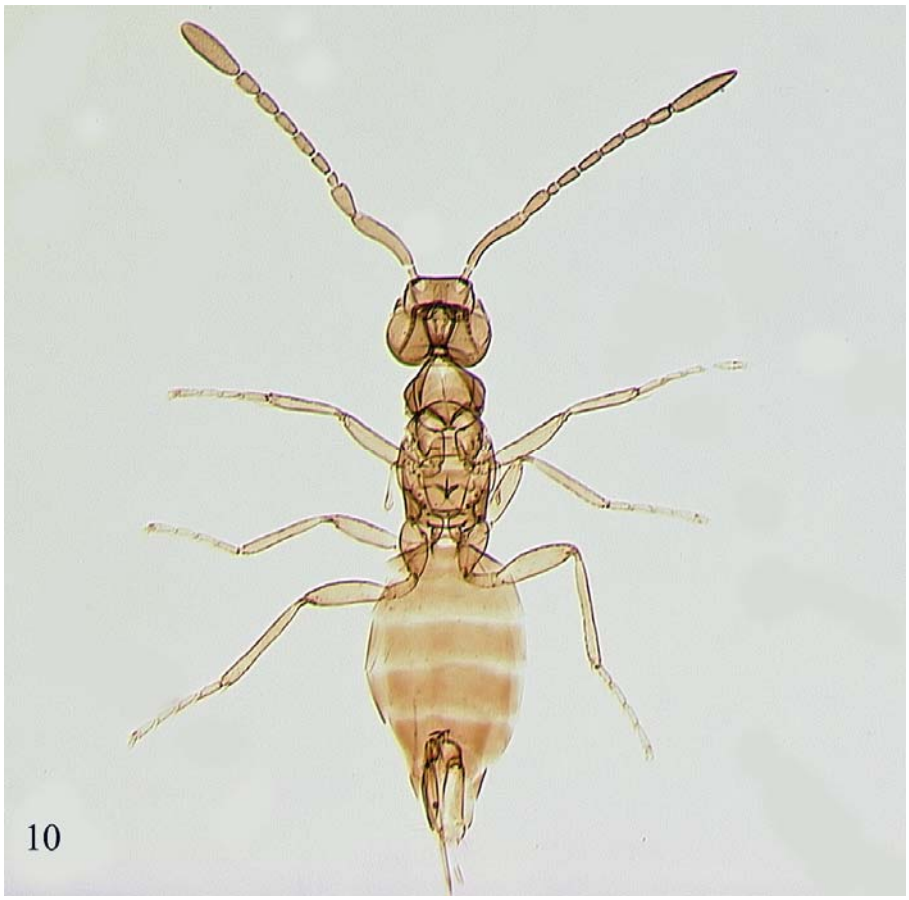
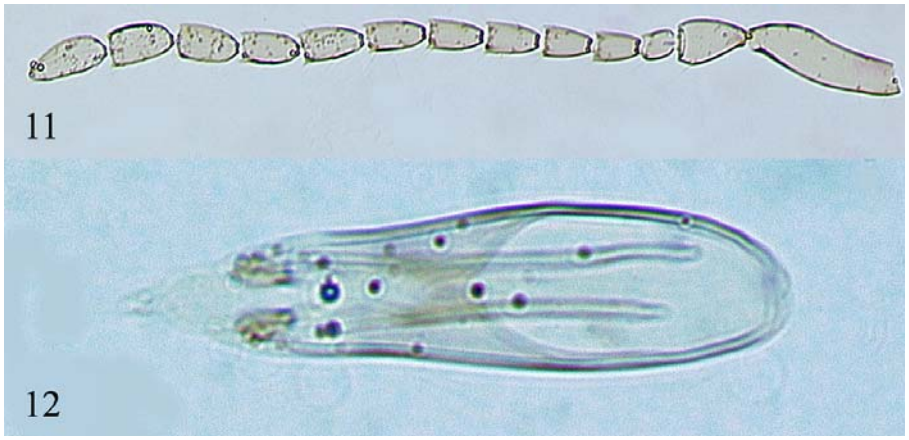


Fig. 10. *Cleruchus kivach* sp. n., female (paratype). Habitus (strongly brachypterous).

DESCRIPTION. FEMALE (holotype and paratypes in UCRC and ZIN). Body length of air-dried, point-mounted, shriveled paratypes 0.4-0.46 mm; of slide-mounted specimens 0.52-0.69 mm. Body brown to dark brown, with most of gaster almost black (except basally), appendages pale brown to brown. Ocelli absent. Antenna (Fig. 7) with scape smooth, 3.4-4.0x as long as wide (measured without radicle); pedicel much longer than F1; F1 shorter than following funicle segments and without mps; F2-F5 cylindrical or subcylindrical, F6 a little wider; F2-F6 about equal in length, each with 1 mps; clava a little shorter than combined length of F4-F6,



Figs 11, 12. *Cleruchus kivach* sp. n., male (paratype). 11) Antenna, 12) genitalia.

2.7-2.9x as long as wide, with 6 mps. Mesosoma (Fig. 10) a little shorter than metasoma. In brachypterous individuals, wings moderately (Fig. 9) to greatly (Fig. 10) reduced, with fore wing and hind wing blades either extending to just past apex of venation and with marginal setae few (Fig. 9), or wings reduced to short stubs practically without membrane (Fig. 10). Fore wing in fully winged individuals (Fig. 8) 7.7-8.8x as long as wide, with venation typical of the genus, both macrochaetae short and weak; disc strongly infuscate throughout (with brown), with one subapical, incomplete, median row of 4 to 9 setae and two more or less complete rows of setae along margins; longest marginal seta 3.0-3.4x greatest width of wing. Hind wing (Fig. 8) in macropterous individuals narrow, 19-22x as long as wide; longest marginal seta about 6.5x greatest width of wing; disc infuscate throughout. Gaster (Fig. 10) elongate; ovipositor occupying 0.35-0.6 its length, 1.3-1.4x length of metatibia, notably exserted beyond gastral apex (by about 0.33x own length).

Measurements of the holotype: Body: 590; head: 118; mesosoma: 215; gaster: 270; ovipositor: 188. Antenna: radicle: 15; rest of scape: 91; pedicel: 42; F1: 15; F2: 30; F3: 30; F4: 30; F5: 30; F6: 30; clava: 90. Fore wing: 445:58; longest marginal seta: 173. Hind wing: 439:21; longest marginal seta: 136.

MALE. Body length of air-dried, point-mounted, shriveled specimens 0.4-0.43 mm; of slide-mounted specimens 0.55-0.59 mm. Similar to female except for the normal sexually dimorphic characters such as 13-segmented antenna (Fig. 11) and genitalia (Fig. 12) and the following. Antenna with F1 notably shorter than following flagellomeres, without mps. Almost apterous (strongly brachypterous, only short stubs remain of the wings).

DIAGNOSIS. Triapitsyn *et al.* (2011) compared this species (as *Cleruchus* sp.) with *C. polypori*, known from the Netherlands (Triapitsyn & Moraal, 2008), and at that time abstained from its description as a new taxon. Although indeed these two species are quite similar, a combination of several minor morphological differences between them is yet consistent, allowing for their easy separation and thus justifying a new species description. Their habitats, and also the host trees and the polypore fungi, are also very different.

Both sexes of *C. kivach* have more or less elongate, brown bodies and lack ocelli. Its females are either fully winged or brachypterous, while males are strongly brachypterous (almost apterous). The species differs from *C. polypori* by its relatively smaller, less elongate body in both sexes; the funicle segments of the female antenna are relatively shorter, and F1 of the male antenna is relatively larger and more elongate than in the type series of *C. polypori*, as indicated in the key. *Cleruchus kivach*, which belongs to the *pieloui* species group as defined by Triapitsyn & Moraal (2008), is also similar to *C. pieloui* from New Brunswick, Canada, in which the clava of the female antenna is notably longer than the combined length of F4-F6 (Yoshimoto, 1971; Triapitsyn & Moraal, 2008).

HOSTS. Unknown, but Vikberg & Martikainen (2011) provided a list of several species of Ciidae (Coleoptera) which could be the likely hosts of this species.

ETYMOLOGY. The species name is a noun in apposition referring to its type locality.

Cleruchus leptosoma Debauche, 1948

Figs 13–18

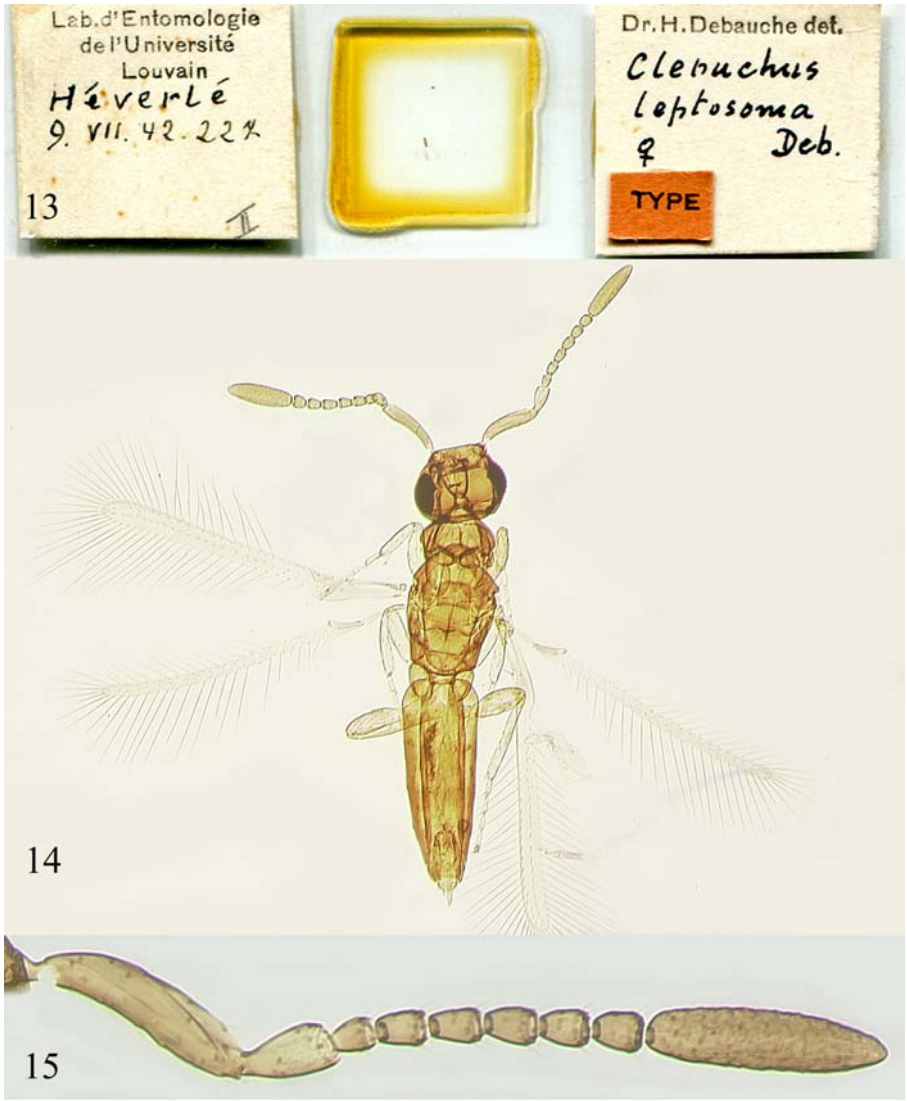
Cleruchus leptosoma Debauche, 1948: 144 (key, female only), 151–153 (in part, female only), Planche XV (illustrations, in part – female only). Type locality: Heverlee (as Héverlé in the original description), Leuven, Flemish Brabant, Belgium.

Cleruchus leptosoma Debauche: Boțoc, 1964: 83–84 (taxonomic comments, measurements, distribution, illustrations of female); Novicky, 1965: 60 (key, female only); Viggiani, 1970: 138 (mentioned); Trjapitzin, 1978: 531 (key – female only, distribution); Triapitsyn & Moraal, 2008: 65 (mentioned); Pricop, 2009: 125 (list).

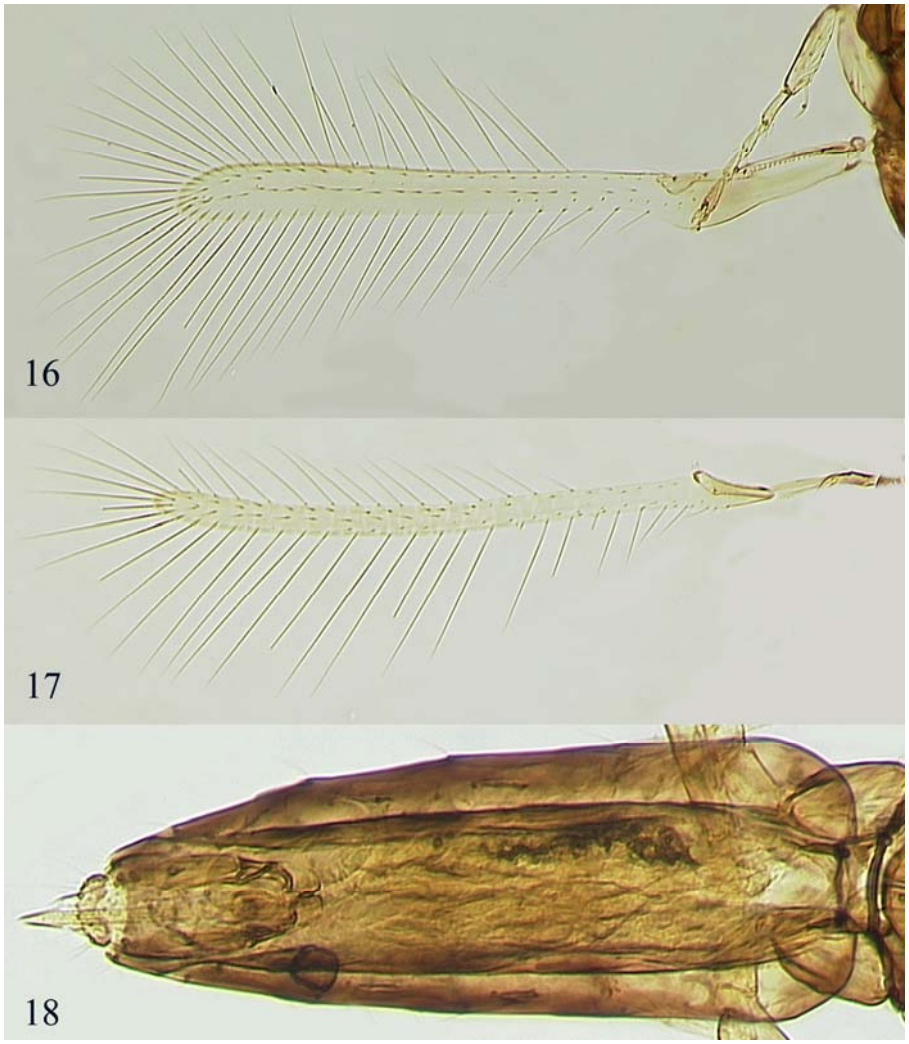
TYPE MATERIAL EXAMINED. Holotype (Fig. 14) female [ISNB] on slide (Fig. 13) labeled: 1. "Dr. H. Debauche det. *Cleruchus leptosoma* Deb. 1943 ♀ TYPE [on red rectangle glued onto the label]"; 2. "Lab. d'Entomologie de l'Université Louvain Héverlé 9.VII.42. 227. II [in pencil]". The holotype is complete, uncleared, mounted dorsoventrally. The species was described (Debauche, 1948) from 4 females and 2 males, all from the type locality. Paratypes (all on slides) [ISNB]: 1 male (the allotype), same data as the holotype except for "ALLO TYPE" on the red label (it is actually *C. pluteus*); two other paratypes, a female and a male, the same collection date as the holotype, both presumably collected by H. R. Debauche, with the same label but not marked as paratypes (the male is actually *C. pluteus*); also 1 female collected 14.viii.1942 (also labeled as: "C/iv-47 245") and not marked as a paratype. Another female paratype collected on 10.vii.1942 by A. Raignier (Debauche, 1948) was not examined.

REDESCRIPTION. FEMALE (holotype and paratypes). Body color as described by Debauche (1948); in the slide-mounted specimens, body and antenna mostly brown, legs yellowish to light brown. Body strongly flattened (Debauche, 1948), its length 0.627-0.78 mm (slide-mounted specimens). Head slightly wider than mesosoma; eye normal; vertex and face smooth, ocelli present; toruli well below lower

level of eyes. Antenna (Fig. 15) with scape almost smooth; scape minus small radicle 3.9-4.1x as long as wide. Pedicel about 2.1x as long as wide, much longer than F1; all funicle segments without mps, rather short and at least a little longer than wide except F6 about as long as wide, subequal in length except F1 somewhat shorter and F2, F3, or F4 sometimes slightly longer; clava slightly longer than



Figs 13-15. *Cleruchus leptosoma*, female (holotype). 13) Slide, 14) habitus, 15) antenna.



Figs 16-18. *Cleruchus leptosoma*, female (holotype). 16) Fore wing, 17) hind wing, 18) metasoma.

combined length of F3-F6, about 3.4x as long as wide, with 6 mps. Mesosoma smooth. Pronotum large. Mesoscutum wider than long, its midlobe with 1 pair of adnotaular setae. Scutellum including frenum rather long. Metanotum more or less conspicuous, quite long. Propodeum very long, longer than mesoscutum. Macropterous. Fore wing (Fig. 16) 12.0-12.4x as long as wide, venation typical for the genus, both macrochaetae moderately short; disc slightly infuscate, with 2 complete rows of setae (one median row and the other along anterior margin) and one short,

incomplete, inconspicuous row of a few very short, weak setae just below base of median row of setae, admarginal row of discal setae along posterior margin of wing absent; the longest marginal seta 4.2-4.3x greatest width of wing. Hind wing (Fig. 17) very long (slightly longer than fore wing), 20-23x as long as wide; disc infuscate, with 1 complete and 2 irregular, incomplete rows of setae; longest marginal seta 6.3-6.4x greatest width of wing. Petiole conspicuous, (Fig. 18) about 3.8x as wide as long; gaster (Fig. 18) longer than mesosoma; ovipositor 0.8-0.9x length of metatibia and occupying 0.27-0.3 length of gaster, barely exserted beyond its apex.

Measurements of the holotype: Body: 780; head: 130; mesosoma: 277; petiole: 12; gaster: 375; ovipositor: 124. Antenna: radicle: 12; rest of scape: 106; pedicel: 44; F1: 19; F2: 21; F3: 24 (22); F4: 23 (24); F5: 21; F6: 22; clava: 113. Fore wing: 539 (555):45; longest marginal seta: 193. Hind wing: 554:24; longest marginal seta: 154.

MALE. Unknown, even though described by Debauche (1948), but both male paratypes (including the allotype) were misidentified by him: they are quite small (body length 0.449-0.541 mm) and actually represent the typical males (with a 10-segmented flagellum of the antenna) of *C. pluteus*.

DIAGNOSIS. The female of *C. leptosoma* has an elongate body with a particularly long gaster (Figs 14, 18). It is very similar to *C. pluteus*, some females of which also have a very long gaster and thus can be easily confused with *C. leptosoma*, but the latter species lacks a row of admarginal discal setae along the posterior margin of the quite narrow (12.0-12.4x as long as wide) fore wing whereas such row is always present in both sexes of *C. pluteus* whose fore wing is usually 8.3-9.6x as long as wide in females. Other distinguishing characters of *C. leptosoma* indicated by Debauche (1948) are not really helpful for its separation from *C. pluteus*.

DISTRIBUTION. Belgium, and Romania (Boţoc, 1964).

HOSTS. Unknown.

***Cleruchus megatrichus* Novicky, 1965**

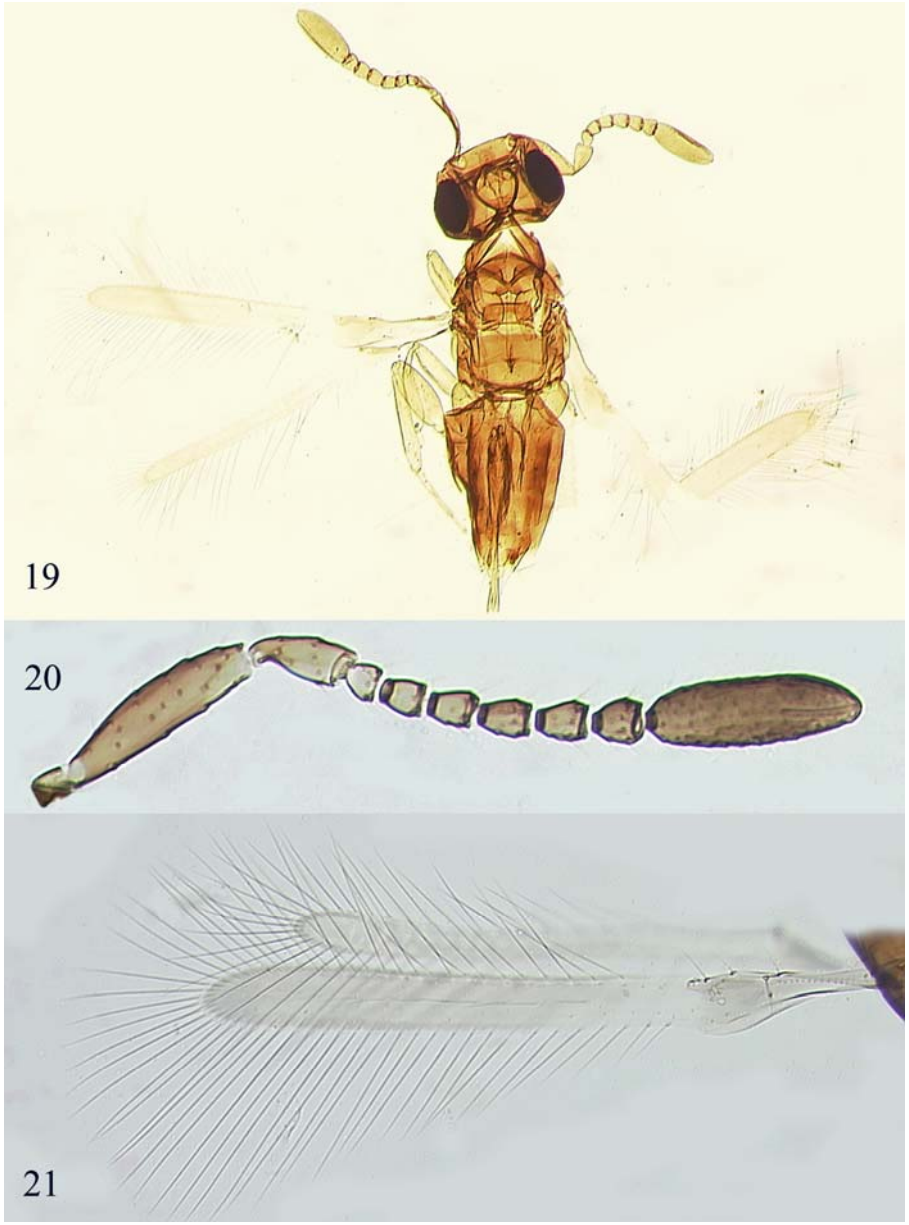
Figs 19–21

Cleruchus megatrichus Novicky, 1965: 59–60 (in key). Lectotype female [DEZA] (examined), designated by Triapitsyn *et al.*, 2013: 10. Type locality (of the lectotype): forest at Mienia, Mińsk Mazowiecki, Mińsk Co., Masovian Voivodeship, Poland.

Cleruchus megatrichus Novicky: Trjapitzin, 1978: 531–532 (key, distribution); Triapitsyn *et al.*, 2013: 10-12 (information on type series, redescription, illustrations, distribution).

Cleruchus sp.: Baquero & Jordana, 2002: 80 (as *Cleruchus* sp. 1 most similar to *C. megatrichus*, specimens from Navarre, Spain), 88 (illustration of a fore wing), 91 (illustration of a female antenna, funicle erroneously drawn as being 7-segmented).

MATERIAL EXAMINED. **Poland:** Masovian Voivodeship, Mińsk Co.: 1 ♀ [NHMW] on slide labeled: 1. "Mienia (Minsk-Mazowiecki, Prov. Warschau) 2.VIII.42."; 2. "*Cleruchus* ♀ *caudatulus* [a manuscript name] Type Novicky [?dem. – illegible] Soyka"; 3. [red] "Type"; 4. [Walter Soyka's slide number] "1158". This



Figs 19-21. *Cleruchus megatrichus*, female (19 – Mienia, Poland; 20, 21 – Acedo, Navarre, Spain). 19) Habitus, 20) antenna, 21) pair of wings.

non-type female (Fig. 19), which is mounted dorsoventrally and almost complete, was collected by S. Novicky in 1942. It has the same label data as the lectotype but was not included by Novicky (1965) in the syntype series of *C. megatrichus* because only one female was mentioned in the original description, and that female (the lectotype) remained in his collection; he probably forgot that he had donated another one to W. Soyka. **Spain:** Navarre, Acedo, 42°39'59.5''N 2°14'58.5''W, 534 m, 2.IX 1997 (E. Baquero), grass under *Quercus* sp. [1 ♀, MZNA].

DIAGNOSIS. Both sexes of *C. megatrichus*, as redescribed and illustrated by Triapitsyn *et al.* (2013), have dark brown bodies and the fore wing (Fig. 21) with dense marginal setae in the apical half and long discal setae of the median row; an admarginal row of discal setae along posterior margin of the fore wing is absent. Females usually have a rather compact antennal funicle (Fig. 19) (less so in the specimen from Spain, Fig. 20) and a relatively long ovipositor (1.6-1.7x length of metatibia) exserted beyond the gastral apex by 0.21-0.25x its own length (Fig. 19). The male antenna is 13-segmented (Novicky, 1965), F1 about as long as wide, with 1 mps (Triapitsyn *et al.*, 2013).

DISTRIBUTION**.** Poland, and Spain [new record]. The species is also known from a beech (*Fagus* sp.) forest in Sorogain, Navarre, Spain (Baquero & Jordana, 2002 [as *Cleruchus* sp. 1]).

HOSTS. Unknown.

Cleruchus mikhail Triapitsyn, 2002

Figs 23, 24

Cleruchus mikhail Triapitsyn, 2002: 3–5. Holotype female [ZIN], examined along with the paratypes in UCRC (see Triapitsyn, 2002). Type locality: Gornotayozhnoye, Primorskii krai, Russia.

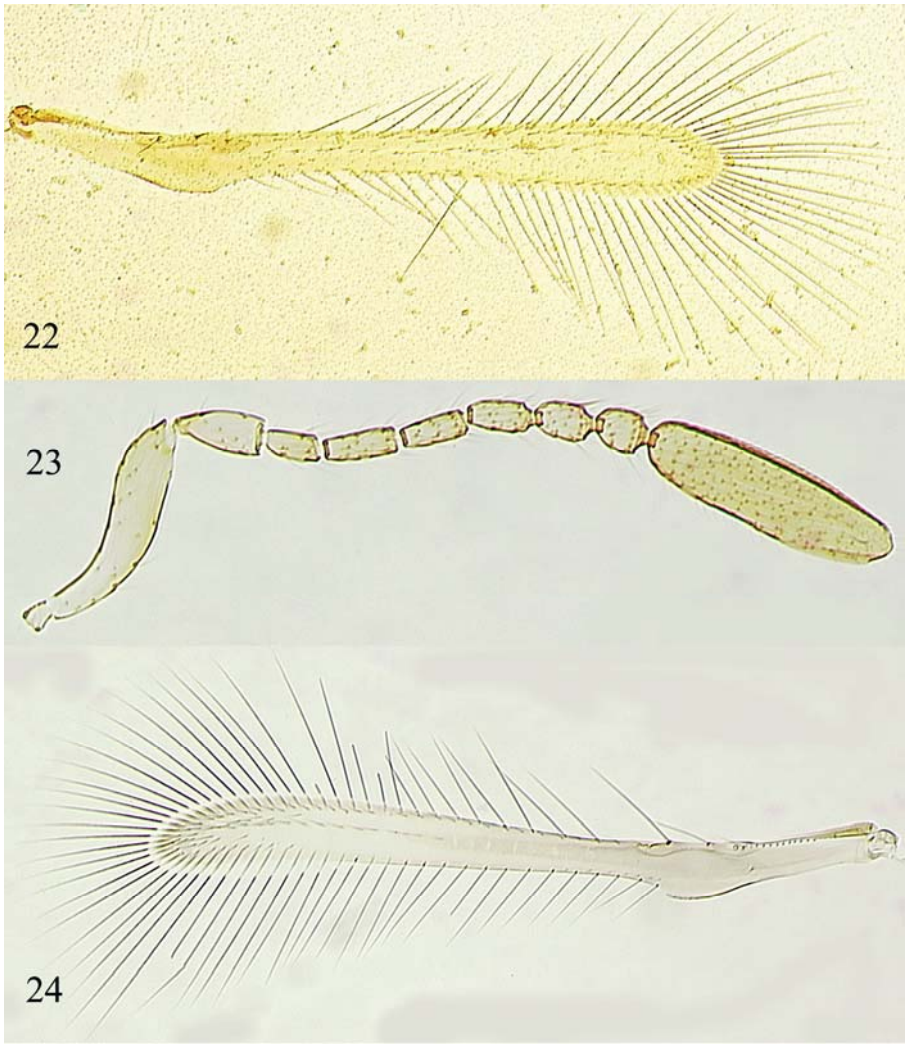
Cleruchus mikhail Triapitsyn: Triapitsyn & Moraal, 2008: 65 (mentioned); Triapitsyn & Proshchalykin, 2012: 207 (catalog).

MATERIAL EXAMINED. **Russia:** Primorskii krai, Ussuriyskiy rayon, Gornotayozhnoye, 1-5.VIII 2003 (M. V. Michailovskaya) [1 ♂, UCRC].

DIAGNOSIS. *Cleruchus mikhail*, as described and illustrated in detail by Triapitsyn (2002), is characterized by the unique combination of the following features: in both sexes, ocelli present, fore wing with dorsal setae on marginal vein very long and its disc rather setose at apex, with median row of setae incomplete (only in the apical part) and admarginal row of discal setae along posterior margin incomplete (only a few setae behind and just beyond stigmal vein and also at apex); female antenna (Fig. 23) with F1-F4 notably longer than wide and all funicle segments without mps; female fore wing (Fig. 24) 11.0-12.0x as long as wide and hind wing about 19x as long as wide; ovipositor short, about 0.8x length of metatibia, occupying about 0.5 length of gaster and not or just barely projecting beyond its apex; male antenna 13-segmented, with all flagellar segments notably longer than wide and F1 almost as long as other flagellomeres; male fore wing 9.0-9.3x as long as wide and hind wing about 15x as long as wide.

DISTRIBUTION. Russia (Primorskii krai) (Triapitsyn, 2002).

HOSTS. Unknown.

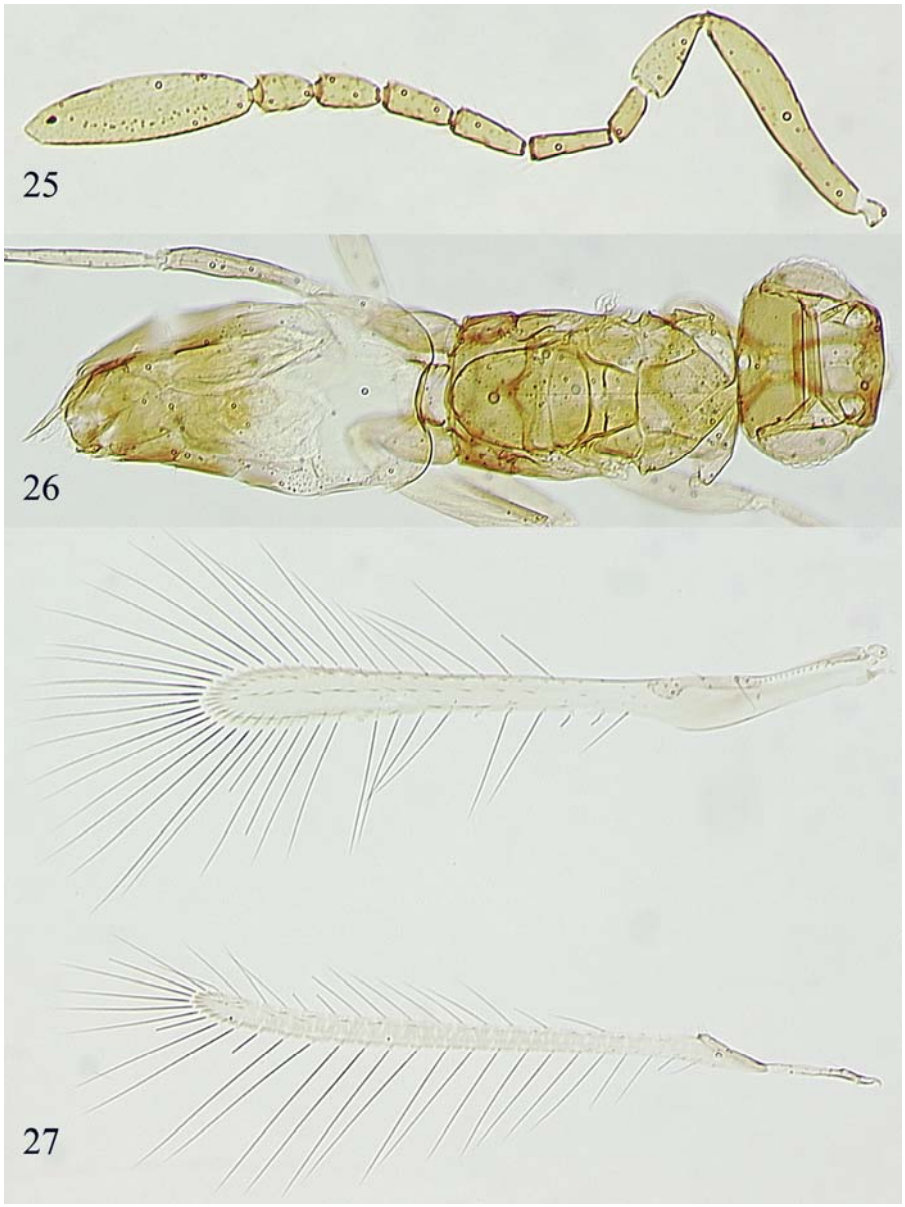


Figs 22-24. *Cleruchus* spp., females. 22) *C. janetscheki* (holotype of *C. subterraneus*), fore wing, 23) *C. mikhail* (paratype), antenna, 24) *C. mikhail* (paratype), fore wing.

***Cleruchus nikaknet* Triapitsyn, sp. n.**
Figs 25–27

TYPE MATERIAL. Holotype female [UCRC] on slide labeled: 1. "ITALY: Lazio, Roma Province, Bosco di Manziana, 42°07.392'N, 12°07.314'E, 400 m, 9.VI.2003, M. Bologna, J. Munro, A. Owen, J. D. Pinto Sweep., *Quercus carris* forest UCR PEET 03-100S"; 2. "Mounted at UCR/ERM by V.V. Berezovskiy 2011

in Canada balsam"; 3. "Det. by S. V. Triapitsyn 2011"; 4. (red) "*Cleruchus nikaknet* Triapitsyn HOLOTYPE ♀ "; 5. (database label) "Univ. Calif. Riverside Ent. Res.



Figs 25-27. *Cleruchus nikaknet* sp. n., female (holotype). 25) Antenna, 26) body, 27) pair of wings.

Museum UCRC ENT 154131". Paratype: **Italy**: Campania, Caserta Prov., SE end of Lago del Matese, 41°24.411'N 14°24.200'E, 1050 m, 7.vi.2003 (M. Bologna, J. Munro, A. Owen, J. D. Pinto), screen sweeping, *Salix*, pasture, etc., PEET03-027C [1 ♀ on slide, UCRC].

DESCRIPTION. FEMALE (holotype and paratype). Body length of the paratype 0.726 mm (critically point-dried before slide-mounting) or 0.75 mm (slide-mounted). Head brown or dark brown, mesosoma pale to light brown or brown, gaster pale or pale-yellowish (anterior half or so) to light brown or brown (posterior half or so; antenna brown (pedicel and scape slightly lighter in the paratype), legs mostly pale or yellowish brown except coxae slightly darker. Head a little wider than mesosoma; eye normal; vertex smooth, ocelli present; toruli at about lower level of eye. Antenna (Fig. 25) with scape faintly longitudinally striate; scape minus small radicle 5.8-6.4x as long as wide. Pedicel about 2.1x as long as wide, longer than F1; all funicle segments longer than wide, F1 cylindrical and almost as long as F6, F2 the longest funicle segment, F3-F6 each with 1 mps; clava shorter than combined length of F3-F6, 3.5-4.3x as long as wide, with 6 mps. Mesosoma (Fig. 26) smooth. Pronotum rather short. Mesoscutum wider than long, its midlobe with 2 pairs of setae. Scutellum slightly shorter than mesoscutum. Metanotum short, inconspicuous. Propodeum about as long as mesoscutum. Macropterous. Fore wing (Fig. 27) 12.0-12.4x as long as wide, venation (Fig.) typical for the genus, both macrochaetae very short; disc infuscate, with 1 complete median row of setae in addition to admarginal rows of setae; the longest marginal seta 4.1-4.4x greatest width of wing. Hind wing (Fig. 27) very long, 22.0-24.5x as long as wide; disc infuscate, with 1 complete row of setae along anterior margin; longest marginal seta 5.9-7.2x greatest width of wing. Petiole conspicuous, about 3.0 x as wide as long; gaster (Fig. 26) longer than mesosoma; ovipositor about 0.5x length of metatibia and occupying a little more than 0.2 length of gaster, exserted beyond its apex by 0.15-0.3x own length.

Measurements of the holotype: Body: 462 (critically point-dried before slide-mounting) or 603 (slide-mounted); head: 110; mesosoma: 215; petiole: 15; gaster: 276; ovipositor: 94. Antenna: radicle: 12; rest of scape: 139; pedicel: 50; F1: 29; F2: 45; F3: 42; F4: 39; F5: 34; F6: 30; clava: 127. Fore wing: 508:41; longest marginal seta: 182. Hind wing: 515:21; longest marginal seta: 152.

MALE. Unknown.

DIAGNOSIS. The macropterous female of this new species is defined by the following unique combination of features: antenna with all funicle segments notably longer than wide and F3-F6 each with 1 mps; and ovipositor very short, about 0.5x length of metatibia. The somewhat similar macropterous female of *C. janetscheki* lacks mps on F3 and F4.

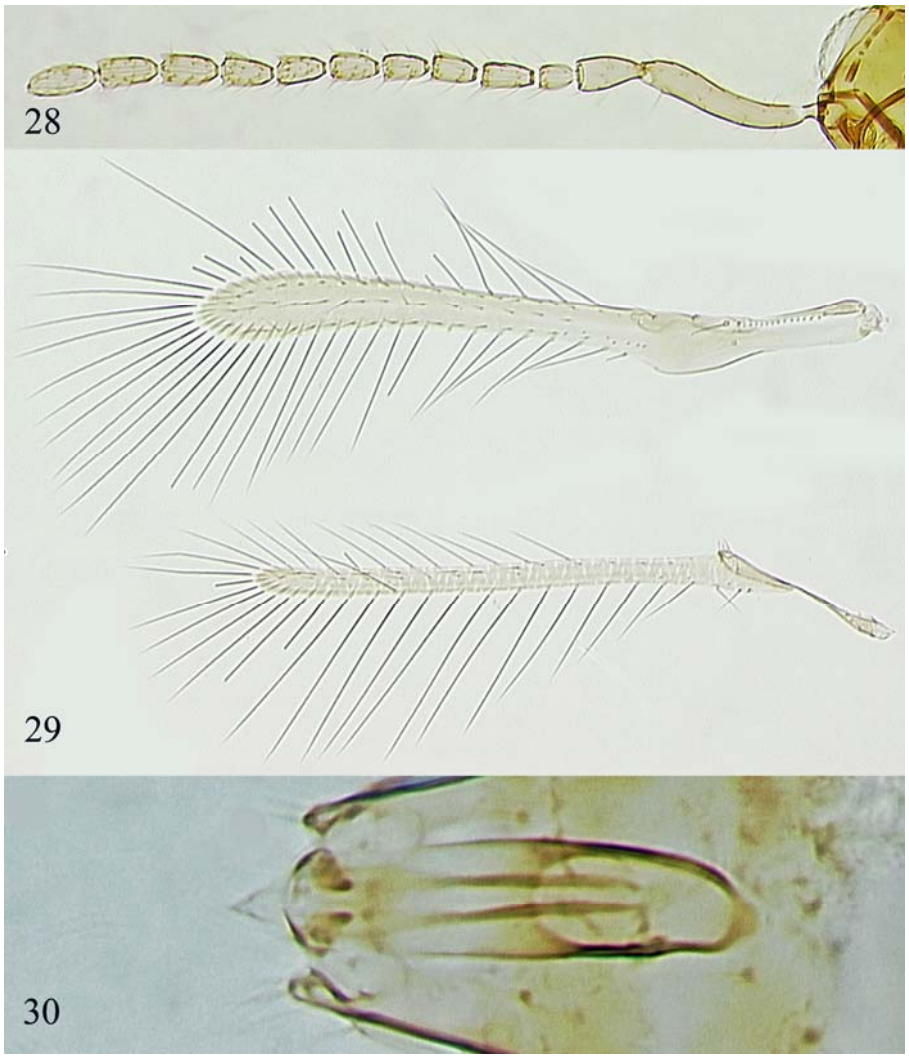
HOSTS. Unknown.

ETYMOLOGY. The species name is a noun in apposition; "nikak net" stands for "absolutely not" in Russian.

***Cleruchus petr* Triapitsyn, 2002**
Figs 28–30

Cleruchus petr Triapitsyn, 2002: 3 (key), 6–8. Holotype female [ZIN], examined along with the paratypes in UCRC (see Triapitsyn, 2002). Type locality: Gornotayozhnoye, Primorskii krai, Russia.

Cleruchus petr Triapitsyn: Triapitsyn & Moraal, 2008: 65 (mentioned); Triapitsyn & Proshchalykin, 2012: 207 (catalog).



Figs 28-30. *Cleruchus petr*, male (Gornotayozhnoye, Primorskii krai, Russia). 28) Antenna, 29) pair of wings, 30) genitalia.

MATERIAL EXAMINED. **Russia:** Primorskii krai, Ussuriysk district, Gornotayozhnoye, 24-30.VII 2003 (M. V. Michailovskaya) [1 ♂, UCRC].

DESCRIPTION. MALE (previously unknown). Body length 0.446 mm (critical point dried, point-mounted specimen prior to being slide-mounted) or 0.591 mm (same specimen, slide-mounted). Similar to female as described by Triapitsyn (2002) except for the normal sexually dimorphic characters and the following. Color of body and appendages brown except base of gaster lighter. Antenna (Fig. 28) 12-segmented, with scape minus short radicle 5.8x as long as wide; all flagellomeres clearly longer than wide and with mps, among them F1 the shortest and F8-F10 the longest. Fore wing (Fig. 29) 10.3x as long as wide, with disc strongly infuscate; hind wing (Fig. 29) about 21x as long as wide, with disc notably infuscate. Genitalia (Fig. 30) typical for the genus (Viggiani, 2005).

DIAGNOSIS. Female of *C. petr*, as described and illustrated in detail by Triapitsyn (2002), is characterized by the unique combination of the following features: antenna with F1 short and F2-F5 notably longer than wide, F2-F6 each with a mps (F2 on at least one antenna), and clava a little shorter than combined length of F3-F6; ovipositor very short, about 0.6x length of metatibia, occupying less than 0.5 length of gaster and not projecting beyond its apex. In both sexes, ocelli present, fore wing (Fig. 29) with disc strongly infuscate, dorsal setae on marginal vein short. Male antenna (Fig. 28) 12-segmented.

DISTRIBUTION. Russia (Primorskii krai, Sakhalin) (Triapitsyn, 2002).

HOSTS. Unknown.

Cleruchus pluteus Enock, 1909

Figs 31–46

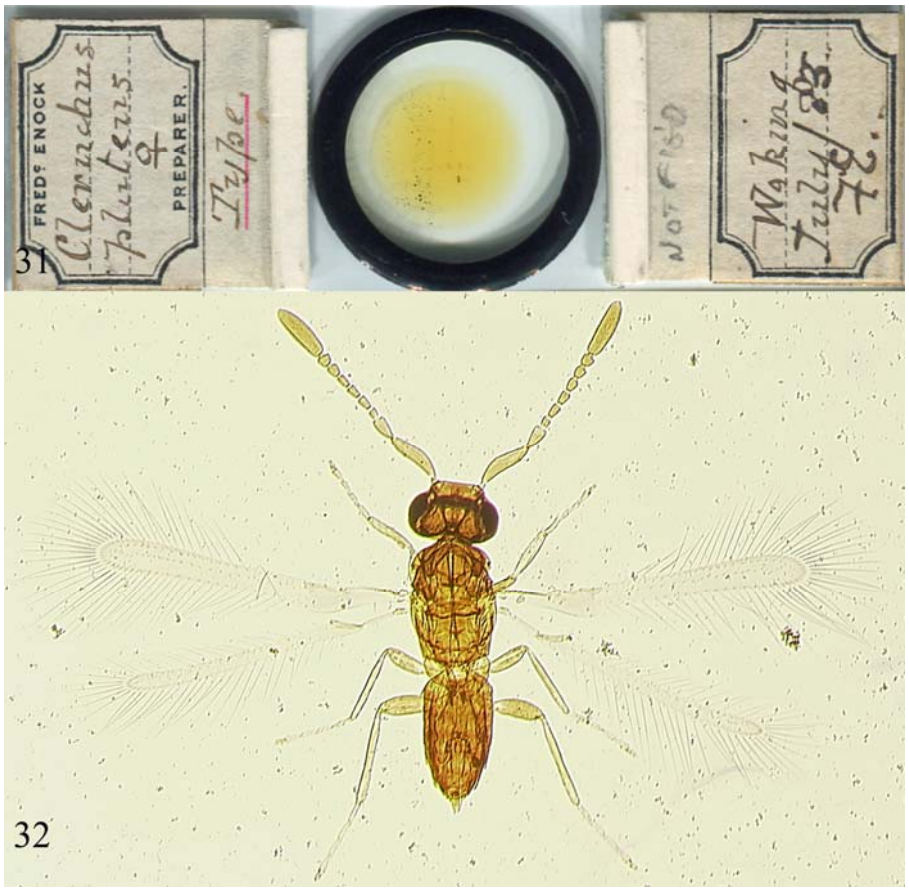
Cleruchus pluteus Enock, 1909: 453-454, Plate XII (photographs). Type locality (of the lectotype designated here): Woking, Surrey Co., England, UK.

Cleruchus pluteus Enock: Bakkendorf, 1934: 58-61 (in part, "summer generation" only – biology, comments on possible host associations, illustrations, distribution), 132 (mentioned); Debauche, 1948: 144 (in part – comments on biology, key – female), 147-149 (in part – redescription [female only], distribution, comments), Planche XV (illustrations [in part, female only]); Kryger, 1950: 50-51 (reprint of the original description, distribution, illustration of female only, comments – in part); Ferrière, 1952: 43 (mentioned); Boţoc, 1964: 81, 83 (taxonomic comments, measurements, distribution), 84 (illustrations); Novicky, 1965: 57-58 (important comments, in part); Viggiani, 1973: 271 (illustration of male genitalia); Trjapitzin, 1978: 530 (illustrations, in part), 531 (key – female [in part], distribution); Vikberg, 1982: 142 (record from Finland); Schauff, 1984: 44 (syntypes mentioned); Donev, 1990: 69 (distribution); Triapitsyn, 2002: 8 (mentioned); Pricop, 2010: 73 (distribution, taxonomic notes, illustrations); Pricop, 2013: 74 (illustration); Triapitsyn *et al.*, 2013: 14 (records of S. Novicky's specimens from Poland, in part).

Cleruchus bakkendorfi Debauche, 1948: 144-145 (key), 149-151, Planche XV (illustrations). Type locality: Rochers de Dave (or Rochers de [or du] Néviau) [as Rochers du Néviaux in the original description], Dave, Namur, Namur Province, Wallonia, Belgium. **Syn. n.**

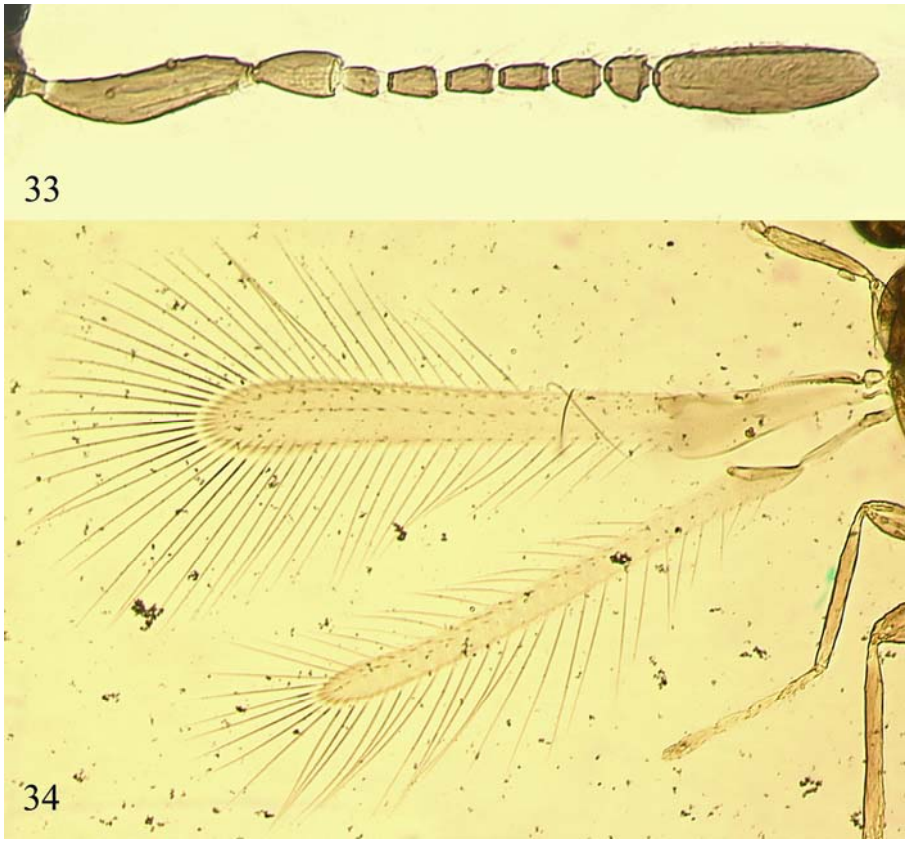
Cleruchus leptosoma Debauche (misidentifications): Debauche, 1948: 145 (key, male only), 153 (in part, male only), Planche XV (in part, illustration of male antenna only); Novicky, 1965: 59 (key, male only); Trjapitzin, 1978: 532 (key, male only).

Cleruchus bakkendorfi Debauche: Bakkendorf, 1964: 6 (key, compared with *C. detritus*); Novicky, 1965: 58 (comments), 59-60 (key); Viggiani, 1973: 271 (illustration of male genitalia); Trjapitzin, 1978: 530 (illustration), 531-532 (key, distribution); Viggiani, 1989: 144 (illustration of male genitalia); Triapitsyn, 2002: 8 (mentioned).



Figs 31, 32. *Cleruchus pluteus*, female (lectotype). 31) Slide, 32) habitus.

TYPE MATERIAL EXAMINED. Lectotype female (Fig. 32) of *C. pluteus* [BMNH], here designated to avoid any possible confusion regarding the status of the type specimens of this taxon or its identity, on slide (Fig. 31) prepared in the typical F. Enock's style (Enock, 1959) and labeled: 1. "FRED^{c} ENOCK PREPARER. *Cleruchus pluteus* ♀ Type [underlined in red ink]"; 2. "NOT FIG'D [apparently (illegible), in pencil] Woking July/85. FE." (i.e., this specimen was collected in July

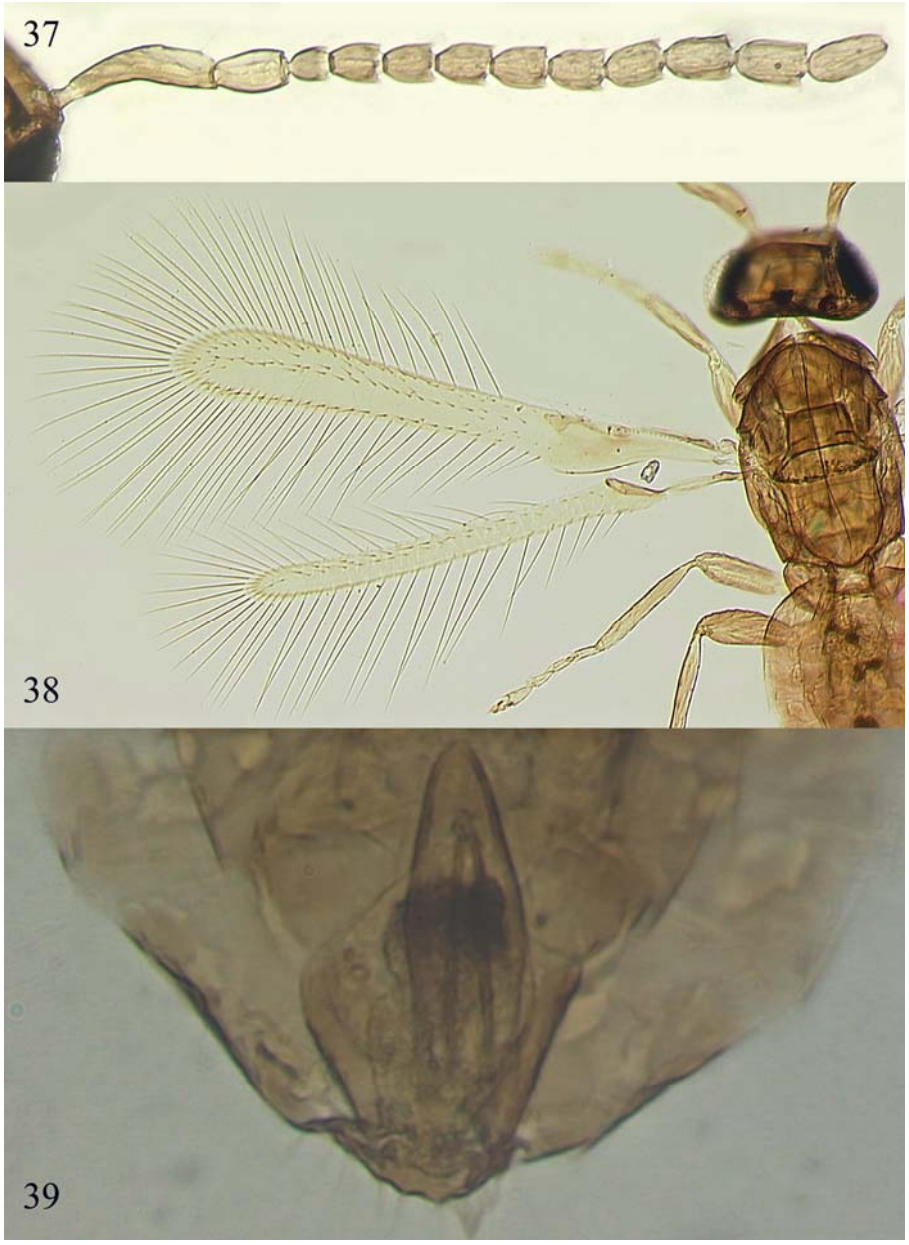


Figs 33, 34. *Cleruchus pluteus*, female (lectotype). 33) Antenna, 34) pair of wings.

1885 by Frederick Enock); 3. [red] "*Cleruchus pluteus* Enock LECTOTYPE ♀ Designated by S. V. Triapitsyn 2012" (added on the underside of the slide). The specimen (Fig. 32) is poorly cleared because, according to Enock (1959), only turpentine was used by his uncle F. Enock for clearing, but otherwise it is in perfect condition, beautifully spread out and complete. As all F. Enock's slides of fairyflies are, it is better observed under a compound microscope upside down to better see the dorsal side of the specimen. The photograph of the pair of wings (Enock's (1909) Figure 10, Plate XII) was undoubtedly taken from this specimen despite what is apparently written in pencil to the contrary on the lectotype slide whereas the photograph of the entire female (Enock's (1909) Figure 7, Plate XII) was taken from another original syntype which is now missing from the BMNH (Natalie Dale-Skey Papilloud, personal communication); thus it is likely that there were two slide-mounted females from Woking on which F. Enock based his description. It is now impossible to figure out from which specimen the photograph of the female antenna

Figs 35, 36. *Cleruchus pluteus*, male (paralectotype). 35) Slide, 36) habitus.

was taken (Enock's (1909) Figure 9, Plate XII). Paralectotypes: 1 ♀ [BMNH] on card labeled: 1. "Burnham Beeches, 28.5.08 C. Waterhouse. 1908-178."; 2. [hand-written in India ink] "*Cleruchus*"; 3. "1919-185"; 4. [pink] "*Cleruchus pluteus* Enock PARALECTOTYPE ♀ Designated by S. V. Triapitsyn 2012". The specimen is in fair condition, complete; the collection locality is in Buckinghamshire Co., England, UK. Also 1 ♂ (Fig. 36) [BMNH] on slide (Fig. 35) labeled: 1. "FRED^{c} ENOCK PREPARER. *Cleruchus pluteus* ♂"; 2. "PLATE XII Fig 6. [in pencil] Loughton July/97. F.E." (this specimen was collected in July 1897 by Frederick Enock (Enock, 1909), the collection locality is in the Epping Forest district of Essex Co., England, UK); 3. [pink] "*Cleruchus pluteus* Enock PARALECTOTYPE ♂ Designated by S. V. Triapitsyn 2012" (added on the underside of the slide). The specimen (Fig. 36) is complete, in perfect condition although poorly cleared; F8 and F9 of the right antenna are partially fused as also seen in Enock's (1909) Figure



Figs 37-39. *Cleruchus pluteus*, male (paralectotype). 37) Antenna, 38) pair of wings, 38) genitalia.

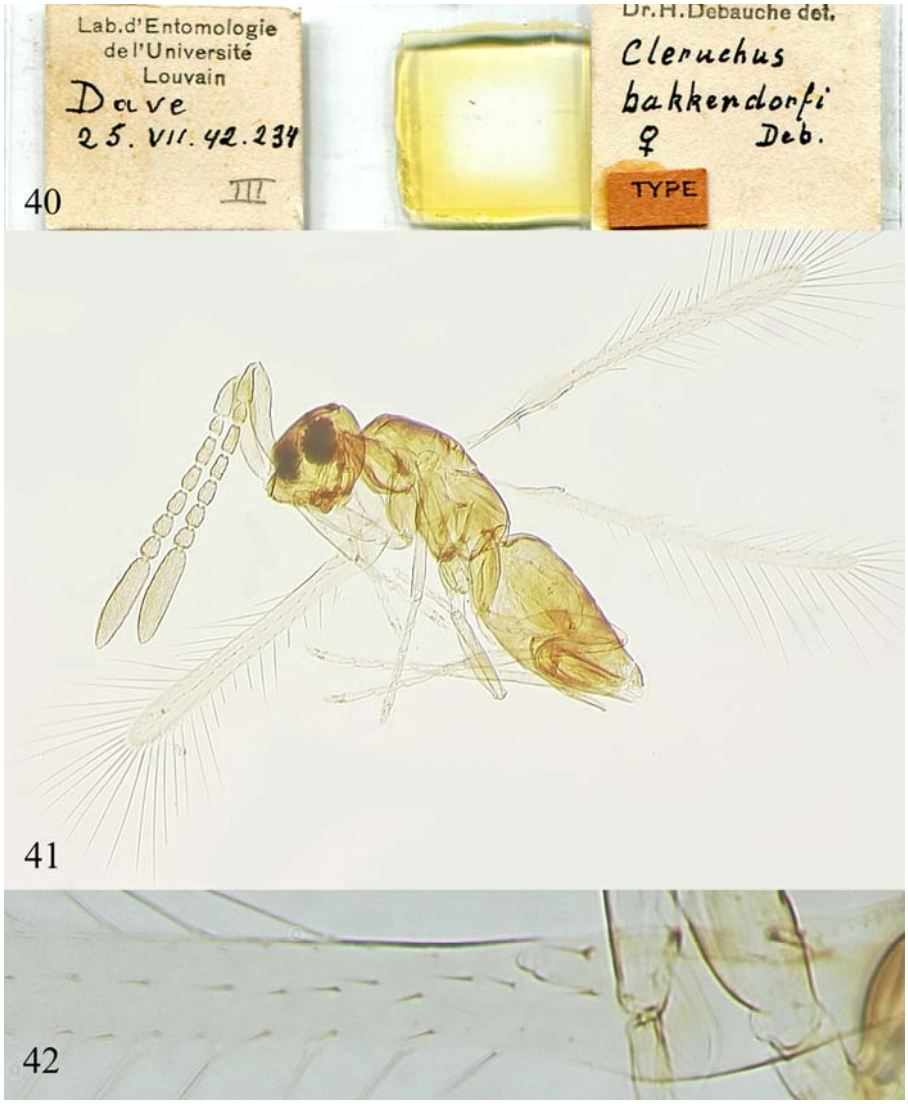
8, Plate XII; the photograph of the entire male (Enock's (1909) Figure 6, Plate XII) was also taken from this specimen. The male paralectotype is clearly conspecific with both females of the type series.

Holotype (Fig. 41) female of *C. bakkendorfi* [ISNB] on slide (Fig. 40): 1. "Dr. H. Debauche det. *Cleruchus bakkendorfi* Deb. 1943 ♀ TYPE [on red rectangle glued onto the label]"; 2. "Lab. d'Entomologie de l'Université Louvain Dave 25.VII.42. 234. III [in pencil]". The holotype is almost complete (missing the apical part of one hind wing), uncleared, mounted laterally. Paratype (the allotype male, Fig. 43) [ISNB] on slide, same data as the holotype except for "ALLO TYPE" on the red label.

MATERIAL EXAMINED. **Belgium:** Flemish Brabant, Leuven: Egenhoven, 4.IX 1941 (H. R. Debauche) [1 ♀, ISNB]. Heverlee: 9.VII 1942 (H. R. Debauche) [1 ♀, 3 ♂, ISNB] (two of these males are paratypes of *C. leptosoma*, including the allotype); 22.VII 1942 (H. R. Debauche) [1 ♀, ISNB]. Tervuren, Bois des Capucins, 20.VI 1942 (H. R. Debauche) [1 ♀, ISNB]. **Czech Republic:** Ústí nad Labem, České Švýcarsko National Park, Zadní Jetřichovice, 50°53'56.346''N 14°21'28. 925''E, 18.VII 2007 (J. Macek) [1 ♀, CUPC]. **Germany:** North Rhine-Westphalia, Leverkusen, Opladen, Imbach (M. Boness): 17.VI 1960 [1 ♀, NHMW]; 27.VI 1960 [1 ♀, NHMW]. **Greece:** Central Macedonia, Lake Kerkini, Kerkini Marsh, 41°13'32.8''N 23°05'04.2''E, 45 m, 25.IV-1.V 2007 (G. Ramel) [1 ♀, UCRC]. **Italy:** Campania, Caserta Prov., SE end of Lago del Matese, 41°24.411'N 14° 24.800'E, 1050 m, 8.VI 2003 (M. Bologna, J. Munro, A. Owen, J. D. Pinto) [1 ♀, UCRC]. **Netherlands:** Limburg, Valkenburg, St. Ignatius College, on window (W. Soyka): 25.VII 1931 [3 ♀, NHMW]; 28.VI 1932 [2 ♀, EMEC, NHMW]; VI 1932 [4 ♀, NHMW]. **UK:** England, Hampshire Co., New Forest, Brockenhurst, 8.VII 1909 (C. O. Waterhouse) [1 ♀, BMNH].

REDESCRIPTION. FEMALE (lectotype, Fig. 32). Body mostly dark brown, appendages brown. Head slightly wider than mesosoma. Eye normal; vertex smooth, ocelli present. Face smooth. Antenna (Fig. 33) with scape almost smooth; radicle very small; remainder of scape 3.9x as long as wide. Pedicel 1.8x as long as wide, much longer than F1; all funicle segments without mps, rather short and at least a little longer than wide except F6 about as long as wide; clava just slightly longer than combined length of F3-F6, 3.3-3.4x as long as wide, apparently with 6 mps. Mesosoma mostly smooth. Mesoscutum wider than long. Scutellum a little shorter than mesoscutum, placoid sensilla close to anterior margin of scutellum. Metanotum narrow, strap-like and inconspicuous. Propodeum almost as long as mesoscutum. Macropterous. Fore wing (Fig. 34) 8.3x as long as wide, venation with an abruptly angulate stigmal vein; both macrochaetae rather short; disc infuscate, with 1 complete, submedian row of setae (a little closer to anterior margin) and a row of setae along each margin; marginal setae 54-56 in number, particularly dense at apex, the longest 3.0x greatest width of wing. Hind wing (Fig. 34) about 18x as long as wide; disc infuscate, with 2 rows of setae along anterior margin; longest marginal seta 5.2x greatest width of wing. Gaster a little longer than mesosoma; ovipositor 0.8x length of metatibia and occupying about 0.5 length of gaster, barely exserted beyond its apex.

Measurements of the lectotype: Body: 602 [of the dry-mounted paralectotype 480]; head: 123; mesosoma: 234; petiole: 18; gaster: 248; ovipositor: 133. Antenna: radicle: 14; rest of scape: 106; pedicel: 40; F1: 21; F2: 25; F3: 24; F4: 24; F5: 24; F6: 22; clava: 114. Fore wing: 554:67; longest marginal seta: 200. Hind wing: 551:30; longest marginal seta: 157.



Figs 40-42. *Cleruchus pluteus*, female (holotype of *C. bakkendorfi*). 40) Slide, 41) habitus, 42) fore wing venation.

MALE (paralectotype, Fig. 36). Body length 0.624 mm. Similar to female except for the normal sexually dimorphic features and the following. Antenna (Fig. 37) 12-segmented, with flagellar segments rather short, particularly F1 about as long as wide, and all with mps. Mesosoma about as long as gaster. Fore wing (Fig. 38) 7.6x as long as wide, the longest marginal seta 2.7x greatest width of wing; hind wing (Fig. 38) about 15x as long as wide. Genitalia as in Fig. 39.

VARIATION (holotype female and allotype male of *C. bakkendorfi*, paratype males of *C. leptosoma*, and non-type specimens, all slide-mounted except when indicated otherwise). Body length 0.475-0.756 mm (female) and 0.449-0.541 mm (male). Body length of female from Lago del Matese, Italy (dry-mounted, critical point dried specimen prior to slide-mounting) 0.512 mm; its body brown except scutellum mostly light brown (frenum pale brown), scape and pedicel light brown and flagellum brown, legs yellowish-brown.

Both sexes: hind wing sometimes with only 1 more or less complete row of setae.

Female: antenna with scape minus radicle 3.4-3.7 x as long as wide; F1 often about as long as wide; clava definitely with 6 mps, often as long as combined length of F3-F6; fore wing 8.9-9.6x as long as wide except notably narrower in the holotype of *C. bakkendorfi* (Fig. 41) as indicated below under "Comments", longest marginal seta 3.0-3.8x greatest width of wing (except 4.4x in the holotype of *C. bakkendorfi*); hind wing 17-19x as long as wide, longest marginal seta 5.4-6.0x greatest width of wing; ovipositor 0.7-1.0x length of metatibia and occupying 0.3-0.5 length of gaster.

Male: length of antenna 0.380-0.427 mm; fore wing 8.8-9.5x as long as wide except notably narrower in the allotype of *C. bakkendorfi* (Fig. 43) as indicated below under "Comments".

DIAGNOSIS. Both sexes of *C. pluteus* can be recognized by the fore wing with a characteristic venation: usually with an abruptly angulate (Fig. 38), but sometimes an elongately angulate stigmal vein (Figs 42, 45, 46) and chaetotaxy (Fig. 38), as well as usually a short gaster which is at most a little longer than mesosoma in small specimens, but may be notably longer than mesosoma in large specimens. Female antenna (Figs 33, 41) with all funicle segments shorter than pedicel and lacking mps, and clava about as long as or just slightly longer than combined length of F3-F6; male antenna (Figs 37, 44) with flagellum 10-segmented and flagellomeres short.

DISTRIBUTION**.** Belgium (Debauche, 1948 [female only, in part; also as *C. bakkendorfi*]), Bulgaria (Donev, 1990), Czech Republic [new record], Denmark (Bakkendorf, 1934 ["summer generation" only; Kryger, 1950 [in part]), Finland (Vikberg, 1982), Germany (Ulrich, 1999; Vidal, 2001); Greece [new record], Italy [new record], Netherlands [new record], Poland (Novicky, 1965 [in part, also as *C.* ?*bakkendorfi*]; Triapitsyn *et al.*, 2013 [in part]), Romania (Boţoc, 1964; Pricop, 2010), UK (England). The record of a male of *C. pluteus* from a beech (*Fagus sylvatica*) forest in Germany by Ulrich (1999: 240) needs confirmation because it was collected in the first half of June and thus could rather belong to either *C. taktochno* sp. n. or *C. polypori*.

Figs 43-45. *Cleruchus pluteus*, male (allotype of *C. bakkendorfi*). 43) Habitus, 44) antenna, 45) fore wing venation.

HOSTS. Unknown although it was found in Denmark (Bakkendorf, 1934; Kryger, 1950) as a common inhabitant of rolled leaves of alder and birch with "*Rhynchites betulae*" and also of hazel with "*Rhynchites alni*". They both likely were *Byctiscus betulae* (Linnaeus, 1758) if all the rolls were made of several leaves but also could be both *B. betulae* and *Deporaus betulae* (Linnaeus, 1758) (Coleoptera:

Rhynchitidae [now commonly placed in the Attelabidae, subfamily Rhynchitinae]) if some of the rolls were made of just one leaf like in the latter species which makes a conical roll (Andrei A. Legalov, personal communication). However, Bakkendorf (1934) quite confidently considered the "summer generation" of *C. pluteus* to be a parasitoid of some other beetle eggs deposited in the rolls. Novicky (1965) mentioned that he had studied the material of O. Bakkendorf partly reared from the leaves rolled by *D. betulae*.

Fig. 46. *Cleruchus pluteus*, female (Valkenburg, Netherlands). Fore wing venation (marginal and stigmal veins outlined).

Here it is important to point out, for better understanding of the very ambiguous host associations of *C. pluteus* as reported by Bakkendorf (1934) and Kryger (1950), that in northern Europe both *Byctiscus betulae* and *Deporaus betulae* are univoltine: their overwintering stages are adult beetles and pupae; in the spring, approximately in April or May, while there are young leaves and when the beetles switch host plants, females make leaf rolls and lay eggs inside them; beetles of the new generation emerge closer to fall along with the ones from the overwintered pupae of the previous generation (Andrei A. Legalov, personal communication).

COMMENTS. Until now, none of taxonomists on *Cleruchus* after F. Enock and possibly C. O. Waterhouse, unfortunately, seemed to have a chance to examine the type series of *C. pluteus*.

As first noted by Novicky (1965), Enock (1909: 453) clearly miscalculated the number of antennal segments of the male *C. pluteus* as "13-jointed" whereas the flagellum is definitely 10-segmented (and thus the antenna is 12-segmented) in the male paralectotype (Fig. 36) photographed by him (his plate XII, figs 6 and 8). Thus it corresponds to the males of the "summer generation" of *C. pluteus* in Denmark illustrated by Bakkendorf (1934: 60) which also have short, 12-segmented antennae; in Belgium these were referred to by Debauche (1948) as his *C. bakkendorfi* and also as the misidentified males of *C. leptosoma*. The allotype male of *C. bakkendorfi* (Fig. 43) and the allotype and paratype males of *C. leptosoma* also have 12-segmented antennae (Debauche, 1948) and are identical in all other regards to the paralectotype male of *C. pluteus* (Fig. 36) except for the narrower fore wing in the allotype of *C. bakkendorfi* but that is by no means a stable character in *Cleruchus* in which brachyptery is common. While the holotype and paratype females of *C. leptosoma* represent a good species that seems to be in many aspects related to *C. pluteus* (see

diagnosis of the latter), the holotype female of *C. bakkendorfi* (Fig. 41), like its male allotype, is in my opinion conspecific with *C. pluteus*, hence the synonymy. One of their distinguishing features, an apparently relatively more elongate stigmal vein of the fore wing (Fig. 42) in the former (although both wings of the holotype are rather poorly mounted, Fig. 41) compared to a relatively more abrupt stigmal vein in the lectotype of the latter species (Fig. 38), seems to be subject of an intra-specific variability within *C. pluteus*, sometimes even in the same specimen (Fig. 46) among the series of eight clearly conspecific females from Valkenburg, the Netherlands, collected by W. Soyka on windows. Also, both the slide-mounted holotype female (body length 0.492 mm) and the allotype male (body length 0.504 mm) of *C. bakkendorfi* are quite small and possibly display the initial stages of brachyptery which might very well affect both the shape of the apex of venation and of the fore wings which are notably narrower than in other, fully winged individuals of *C. pluteus* (8.3-9.6x as long as wide in females and 7.6-9.5x as long as wide in males): the fore wing of the female holotype of *C. bakkendorfi* is 11.2x as long as wide and that of the male allotype is 12.0x as long as wide. Other differences between the females of *C. pluteus* and *C. bakkendorfi* indicated by Debauche (1948), such as proportions of the antennal segments, are simply not true: for instance, in the holotype of the latter (Fig. 41), the clava is exactly as long as the combined length of four preceding segments (i.e., F3-F6).

Novicky (1965) mentioned that he had to leave his Polish material of the *C. pluteus* - *C. bakkendorfi* group [taxonomically] untreated along with O. Bakkendorf's material [of *C. pluteus sensu* Bakkendorf] from Denmark sent to him by the collector; thus S. Novicky considered his review and keys incomplete in this regard; they are indeed very confusing. Because *C. bakkendorfi* is treated here as a junior synonym of *C. pluteus* for the above reasons, most of this confusion is now irrelevant. However, another aspect of the confusion regarding the "spring generation" of *C. pluteus* in northern Europe (Bakkendorf, 1934; Debauche, 1948; Novicky, 1965), males of which have 13-segmented antennae, still remained to be unresolved. While according to Bakkendorf (1934) females of both "generations" of *C. pluteus* in Denmark were pretty much the same, flagellum of the antennae of the "spring generation" males is relatively longer than that of the males of the "summer generation", as illustrated by him (p. 60, figs 77 and 76, respectively) and 11-segmented vs. 10-segmented. Although, unfortunately, his specimens have not been available for my study, I have examined a number of specimens on microscopic slides from the ISNB collection collected in Belgium during spring and early June and identified by H. R. Debauche and G. Mathot as *C. pluteus*, some of which Debauche (1948) correctly referred to being the same as the "spring generation" of Bakkendorf (1934) because the males had relatively longer, 13-segmented antennae (the flagellum is 11-segmented, Fig. 53). These, along with several other, apparently conspecific males collected in Poland during May and early June by S. Novicky and listed by Triapitsyn *et al.* (2013) under *C. pluteus*, are considered to belong to a separate taxon which is described here as *C. taktochno* sp. n. (see diagnosis and comments under the latter species).

Cleruchus polypori Triapitsyn et Moraal, 2008

Cleruchus polypori Triapitsyn & Moraal, 2008: 3 (key), 64–65, 67 (mentioned). Holotype female [RMNH], examined (see Triapitsyn & Moraal, 2008). Type locality: Dassenberg (52°13'35.38''N 5°51'0.44''E), Gelderland, Netherlands.

Cleruchus polypori Triapitsyn & Moraal: Triapitsyn *et al.*, 2011: 9 (mentioned).

TYPE MATERIAL EXAMINED. Paratypes [UCRC]: 2 females, 2 males on slides and 26 females, 11 males on points; see Triapitsyn & Moraal (2008) for the detailed data. The species was described from 38 females and 18 males, all from the type locality.

DIAGNOSIS**.** Both sexes of *C. polypori*, as described and illustrated in detail by Triapitsyn & Moraal (2008), have elongate, brown bodies and lack ocelli. Its females are mostly macropterous, rarely brachypterous or apterous, while males are apterous. Its female can be distinguished from female of the Nearctic species *C. pieloui*, which has a similarly elongate body and also lacks ocelli, in having F2-F6 more elongate (the clava is notably shorter than F4-F6 combined) whereas F2-F6 of the female antenna of *C. pieloui* are relatively shorter (the clava is notably longer than F4-F6 combined), both its sexes are apterous (Yoshimoto, 1971). From even more similar *C. kivach* sp. n., *C. polypori* differs by the characters indicated in the key. The elongate body of *C. polypori* is also somewhat similar to that of *C. leptosoma* (Fig. 14), but the latter species has the ocelli, and also funicle segments of its female antenna are more compact (Fig. 15).

DISTRIBUTION. Netherlands.

HOSTS. Unknown for sure, but according to Triapitsyn & Moraal (2008) most of the fruiting bodies of the polypore fungus host of *C. polypori*, *Fomes fomentarius* on *Fagus sylvatica* trees, were infested with *Cis castaneus* (Herbst, 1793) [as *C. nitidus* (Fabricius, 1792)], *C. fusciclavis* Nyholm, 1953 [as *C. castaneus* Mellié, 1849], and *Ennearthron cornutum* (Gyllenhal, 1827) (Coleoptera: Ciidae). Thus, these beetles are the likely hosts of this species. The current names for *C. castaneus* (Herbst) and *C. fusciclavis*, which have a complicated nomenclatural history, are given following Jelínek (2007).

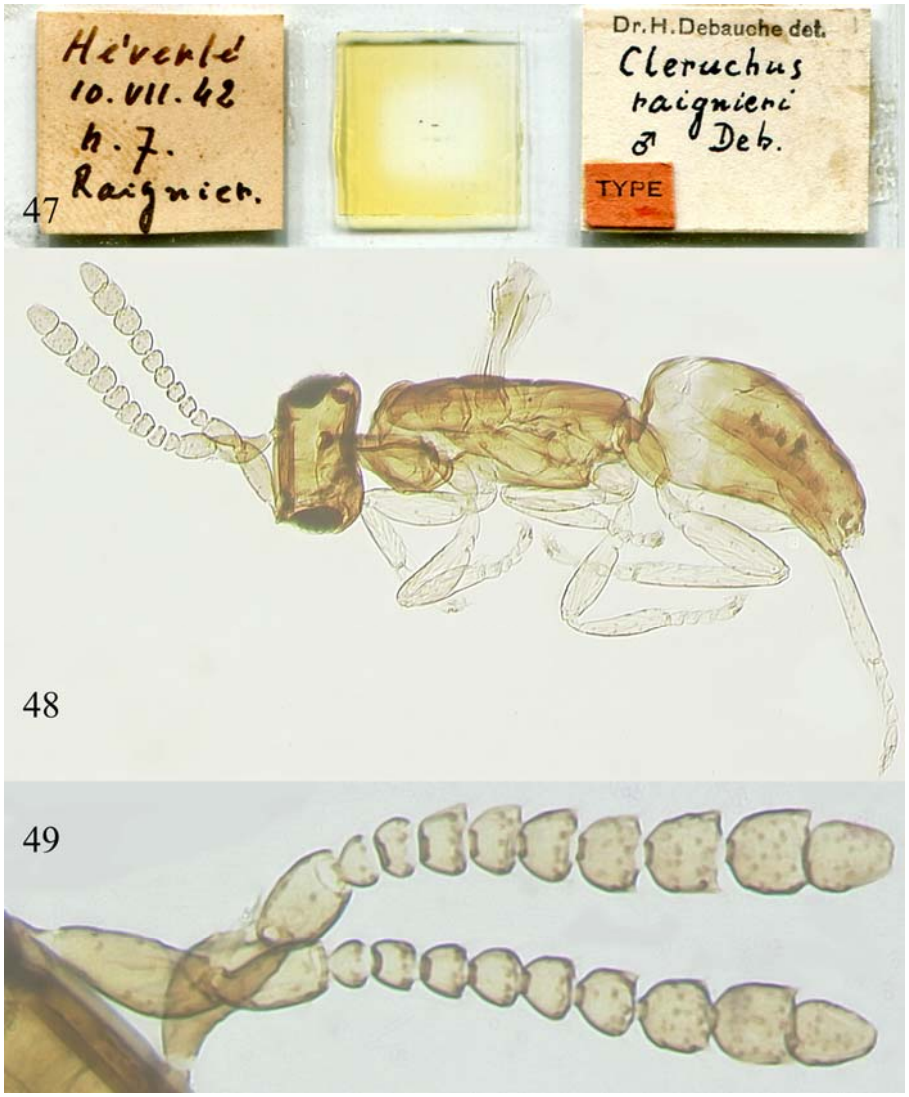
Cleruchus raignieri Debauche, 1948

Figs 47–49

Cleruchus raignieri Debauche, 1948: 145–147 (key), Planche XV (illustrations). Type locality: Heverlee (as Héverlé in the original description), Leuven, Flemish Brabant, Belgium.

Cleruchus raignieri Debauche: Novicky, 1965: 56 (mentioned), 58 (key); Trjapitzin, 1978: 532 (key, distribution).

TYPE MATERIAL EXAMINED. Holotype (Fig. 48) male [ISNB] on slide (Fig. 47) labeled: 1. "Dr. H. Debauche det. *Cleruchus raignieri* Deb. 1943 ♂ TYPE [on red rectangle glued onto the label]"; 2. "Héverlé 10.VII.42 n. 7. Raignier". The holotype is complete, uncleared, mounted laterally except the head dorsally.



Figs 47-49. *Cleruchus raignieri*, male (holotype). 47) Slide, 48) habitus, 49) antennae.

REDESCRIPTION. FEMALE. Unknown.

MALE (holotype). Body (Fig. 48) brown or dark brown except base of gaster light brown, antenna brown, legs yellowish except metacoxa brownish. Eye normal; ocelli present. Antenna (Fig. 49) short (length 0.267 mm), with flagellum 9-segmented and compact; scape short, scape plus small radicle about 2.5x as long as wide; pedicel much longer than F1; F1-F6 wider than long, F7 and F8 about as long as wide, F9 a

little longer than wide, F8 the broadest funicle segment; mps on F3 (0 or 1), F4 (0 or 1), F5 (0 or 1), F6 (1 or 2), F7 (2), F8 (2), and F9 (2). Mesosoma as long as metasoma. Strongly brachypterous: stumps of all four wings (Fig. 48) with membrane only behind reduced venation and with only a few shortened setae. Tarsal segments very short.

Measurements of the holotype: Body: 498; head: 77; mesosoma: 221; gaster: 218; genitalia: 96. Antenna: scape (including radicle): 64; pedicel: 34; F1: 10; F2: 10 (12); F3: 12 (13); F4: 15; F5: 15; F6: 18; F7: 21 (22); F8: 24; F9: 27.

DIAGNOSIS. The male of *C. raignieri* is strongly brachypterous (Fig. 48); the ocelli are present. It is easily distinguishable from males of all other known Palaearctic species of *Cleruchus* by its characteristic 11-segmented antenna (Fig. 49) with very short flagellar segments (F1-F6 are transverse).

DISTRIBUTION. Belgium.

HOSTS. Unknown. Debauche (1948) supposed that his *C. raignieri* might inhabit galleries of ipine bark beetles (Coleoptera: Curculionidae: Scolytinae: Ipini) but that was merely a guess.

***Cleruchus szelenyi* Novicky, 1965**

Fig. 50

Cleruchus sp.: Nowicki, 1940: 646 (mentioned as a brachypterous new species).

Cleruchus detritus Bakkendorf, 1964: 4–6 (in part, apterous "form" only).

Cleruchus szelényi [sic] Novicky, 1965: 58, 60 (in key). Lectotype female [DEZA] (examined), designated by Triapitsyn *et al.*, 2013: 12. Type locality: Svábhegy [hill], Budapest, Hungary (according to the original description and also to Nowicki, 1940: 646 [as *Cleruchus* sp.]) but on the labels on the syntypes probably the correct locality is indicated – Köhegy, Pomáz, Pest Co., Hungary (Triapitsyn *et al.*, 2013).

Cleruchus detritus Bakkendorf: Novicky, 1965: 59 (footnote, as "forma *aptera*", compared with *C. janetscheki*); Trjapitzin, 1978: 531 (in part, apterous [as strongly brachypterous] females only; key, distribution).

Cleruchus szelenyi Novicky: Trjapitzin, 1978: 531–532 (key, distribution); Triapitsyn *et al.*, 2013: 12-14 (information on type series, redescription, illustrations, distribution).

DIAGNOSIS. Both sexes of *C. szelenyi*, as redescribed and illustrated by Triapitsyn *et al.* (2013), have elongate, brown bodies, are apterous (Fig. 50), and lack ocelli; compound eyes are present, each with about 5-7 distinct ommatidia (Novicky (1965) incorrectly stated that they are rudimentary, with indistinct ommatidia). Female antenna (Fig. 50) has a short funicle, with F2-F5 usually more or less about as long as wide but occasionally F2 and F3 clearly longer than wide (Triapitsyn *et al.*, 2013). The male antenna is 11-segmented (Novicky, 1965); F1-F4 are short (not longer than wide), compact, at least F1 without mps (Triapitsyn *et al.*, 2013).

DISTRIBUTION. Hungary, and Switzerland (Bakkendorf, 1964 [as an apterous "form" of *C. detritus*]).

HOSTS. Unknown.

Fig. 50. *Cleruchus szelenyi*, female (paralectotype of *C. detritus*). Habitus.

Cleruchus taktochno **Triapitsyn, sp. n.**
Figs 51–58

Cleruchus pluteus Enock (misidentifications): Bakkendorf, 1934: 60 (in part, "spring generation" only – illustration of male antenna, comments); Debauche, 1948: 144-145 (key, in part), 147-149 (redescription of female [in part], description of male, distribution, comments, in part), Planche XV (illustrations, in part – male antenna only); Kryger, 1950: 51 (in part, illustration of male antenna, comments); Novicky, 1965: 57-58 (important comments, in part), 59 (key – male [as "*Cl. pluteus* Debauche"]), 60 (key – female [as "*Cl. pluteus* Deb.[auche]"]); Mathot, 1969: 2 (distribution); Trjapitzin, 1978: 530 (illustration of male antenna), 531 (key, distribution, female – in part), 532 (key – male); Triapitsyn *et al.*, 2013: 14 (records of S. Novicky's specimens from Poland, in part – see "Material examined" below).

TYPE MATERIAL. Holotype (Fig. 52) male [ISNB] on slide (Fig. 51) labeled originally: 1. "Dr. H. Debauche det. *Cleruchus pluteus* ♂ Enock 1909"; 2. "Héverlé 1.VI.41. n° 140". The type locality is Heverlee, Leuven, Flemish Brabant, Belgium. The holotype (Fig. 52) is in good condition, almost complete (missing one hind wing), mounted dorsoventrally; it was collected on 1.vi.1941 apparently by H. R. Debauche himself. A male, rather than a female, has been chosen to be the holotype of this

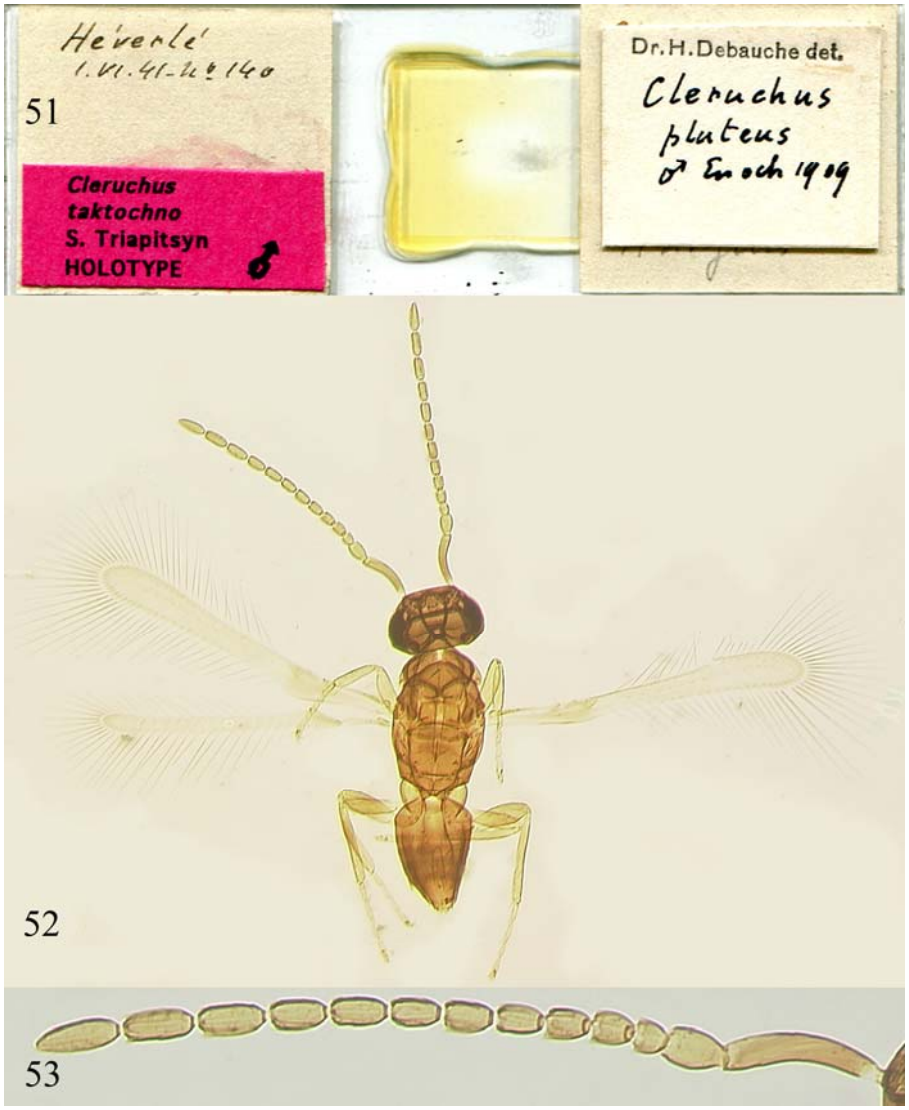
species because it provides better diagnostic features for its separation from *C. pluteus*. Paratypes [all on slides, ISNB]: **Belgium:** Brussels, Forêt de Soignes (Sonian Forest), 17.V 1964, clairière (P. Dessart) [2 ♂]. Flemish Brabant, Leuven: Forêt de Meerdael (Meerdaalbos), 26.IV 1942 (H. R. Debauche) [1 ♂]. Heverlee, 1.VI 1941 (H. R. Debauche) [3 ♀, 11 ♂]. Hainaut, Gerpinnes, Forêt de Loverval, 7.IV 1942 (H. R. Debauche) [1 ♂]. Liège, Hockai, 23.V 1951 (A. Collart) [2 ♂].

MATERIAL EXAMINED. **Poland:** Masovian Voivodeship: Warsaw, Wilanów, Natolin [park and palace, mentioned by Novicky (1965) as "Schloß Natolin bei Wilanów"], 22.V 1941 (S. Novicky) [1 ♀, 1 ♂ on slides, NHMW] (labeled by W. Soyka under his unpublished manuscript name). Warsaw West Co., Gmina Leszno, Wilków, 9.V 1937 (S. Novicky) [1 ♂ on slide, DEZA]. Unfortunately, all antennae of the males are now incomplete so we don't know how many segments they had but according to Novicky (1965: 57), the males collected during spring in these locations had 13-segmented antennae. Also possibly 1 ♀ [DEZA]: Warsaw, Wawer, "Reservat" [i.e., wood reserve], 1.VI 1941 (S. Novicky). Poor condition of these specimens does not allow for their inclusion in the paratype series of this new species.

DESCRIPTION. MALE (holotype and paratypes). Body length (slide-mounted specimens) 0.475-0.64 mm. Body (Fig. 54) mostly dark brown, antenna brown, legs light brown to brown. Head a little wider than mesosoma. Eye normal; vertex with a faint sculpture, ocelli present. Antenna (Fig. 53) 13-segmented (length 0.437-0.56 mm); scape minus very short radicle 3.7-4.8x as long as wide; all flagellar segments with mps and longer than wide except F1 rarely (in a few small specimens) about as long as wide. Mesosoma at least a little longer than gaster, mostly smooth. Pronotum short. Midlobe of mesoscutum with 1 pair of setae. Placoid sensilla close to anterior margin of scutellum. Metanotum narrow and inconspicuous. Macropterous. Fore wing (Fig. 55) 7.3-10.0x as long as wide, venation with an abruptly angulate stigmal vein; both macrochaetae short; disc infuscate, with 1 complete, submedian (a little closer to anterior margin) row of setae and a row of setae along each margin; the longest marginal seta 2.8-3.6x greatest width of wing. Hind wing (Fig. 55) 15-19x as long as wide; disc infuscate, with 1 complete and 1 incomplete rows of setae along anterior margin; longest marginal seta 4.5-5.6x greatest width of wing. Petiole very short, inconspicuous. Genitalia as in Fig. 56.

Measurements of the holotype: Body: 517; head: 102; mesosoma: 233; petiole: 9; gaster: 182; genitalia: 108. Antenna: radicle: 9; rest of scape: 82; pedicel: 32; F1: 16; F2: 21; F3: 21; F4: 24; F5: 24; F6: 26; F7: 30; F8: 29; F9: 33; F10: 36; F11: 45. Fore wing: 497:55; longest marginal seta: 203. Hind wing: 464:26; longest marginal seta: 133.

FEMALE (paratypes). Similar to male except for the normal sexually dimorphic features and the following. Body length (slide-mounted specimens) 0.51-0.633 mm. Body (Fig. 57) mostly dark brown, antenna brown, legs light brown. Antenna (Fig. 58) with scape faintly longitudinally striate; scape minus small radicle 4.0-4.1x as long as wide. Pedicel 1.8-1.9x as long as wide, much longer than F1; all funicle segments without mps, rather short and at least a little longer than wide except F1

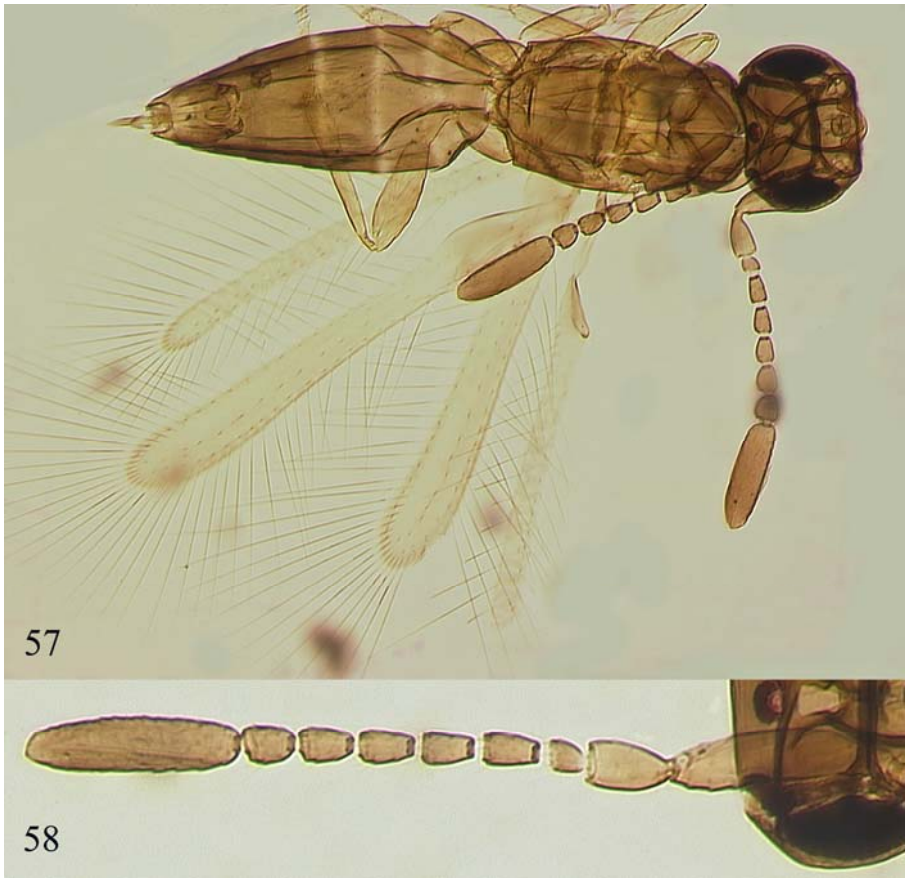


Figs 51-53. *Cleruchus taktochno* sp. n., male (holotype). 51) Slide, 52) habitus, 53) antenna.

(sometimes) and F6 about as long as wide, F1 the shortest funicle segment and F2-F6 more or less subequal in length; clava as long as or slightly shorter than combined length of F3-F6, 3.3-3.5x as long as wide, with 6 mps. Midlobe of mesoscutum with 2 pairs of setae. Macropterous. Fore wing (Fig. 57) 9.3-10.0x as long as wide; disc infuscate, with 1 complete, submedian row of setae (a little closer to anterior margin) and a row of setae along each margin; the longest marginal seta 4.0-4.2x greatest

Figs 54-56. *Cleruchus taktochno* sp. n., male. 54) Body (holotype), 55) pair of wings (holotype), 56) genitalia (paratype, Heverlee, Belgium).

width of wing. Hind wing 17-19x as long as wide; disc infuscate, with 1 complete and 1 incomplete rows of setae along anterior margin; longest marginal seta 5.0-5.3x greatest width of wing. Gaster a little longer than mesosoma in smaller specimens but notably longer than mesosoma in the largest specimen; ovipositor 0.8-0.9x length of metatibia and occupying 0.3-0.4 length of gaster, exserted slightly beyond its apex.



Figs 57, 58. *Cleruchus taktochno* sp. n., female (paratype). 57) Habitus, 58) antenna.

DIAGNOSIS. Males, even the smallest ones, of *C. taktochno* can be recognized by a 13-segmented antenna (length 0.437-0.56 mm) with flagellar segments rather long (Fig. 53) whereas the male antenna of *C. pluteus* (length 0.380-0.427 mm) is 12-segmented and its flagellar segments are rather short (Figs 37, 44). Otherwise males and particularly females of *C. taktochno* [= the "spring generation" of "*C. pluteus*" of Bakkendorf (1934) and the misidentified males of *C. pluteus* of Debauche (1948)] appear to be almost identical to those of Bakkendorf's "summer generation" of *C. pluteus* [= the real *C. pluteus*] that can be collected during and after late June in northern Europe (and likely earlier in central and southern Europe). Their respective body lengths are also comparable (only slide-mounted specimens were measured): 0.475-0.756 mm and 0.449-0.624 mm, respectively, and 0.51-0.633 mm and 0.475-0.64 mm, respectively.

DISTRIBUTION. Belgium (Debauche, 1948 [in part, as *C. pluteus*]; Mathot, 1969 [as *C. pluteus*]), Denmark (Bakkendorf, 1934 [in part, as "spring generation" of *C. pluteus*]; Kryger, 1950, in part [as *C. pluteus* males collected in spring]), and Poland (Novicky, 1965 [in part, as "*C. pluteus* Debauche"]; Triapitsyn *et al.*, 2013 [in part, as *C. pluteus*]).

HOSTS. Unknown.

ETYMOLOGY. The species name is a noun in apposition; "tak tochno" stands for "exactly that" in Russian.

COMMENTS. O. Bakkendorf, who was a very careful and astute researcher, could not know at that time that it would be very unlikely in Mymaridae (and from the modern genetics point of view highly improbable if not impossible, although perhaps anything could be possible in Nature) for the same species to have two generations with different, stable number of the antennal segments in males even if they parasitize different hosts at different times. Both Debauche (1948) and Novicky (1965) were of opinion that the males with the different number of antennal segments might belong to two separate species, with which I agree. Most likely these two species parasitize different, univoltine coleopteran hosts. Indeed, O. Bakkendorf collected in Denmark, and later also H. R. Debauche in Belgium and S. Novicky in Poland, their "spring generation" "*C. pluteus*" males with 13-segmented antennae only by sweeping but never by rearing from the rhynchitid beetle rolls of tree leaves. Then two scenarios have to be considered. The first one would assume that the males of the "spring generation", which was misidentified by Debauche (1948) as *C. pluteus*, could be not conspecific with females of the presumably real *C. pluteus* collected at the same time and locality and thus represent an undescribed species (for instance, in the case that these were winged males of a species with apterous or brachypterous females that are very difficult to collect by sweeping). However, in all other known European species of *Cleruchus* it is the opposite: when the male sex is apterous or strongly brachypterous the conspecific females can be represented by apterous, strongly brachypterous, and macropterous individuals (Novicky, 1965; Triapitsyn & Moraal, 2008; Triapitsyn *et al.*, 2011, 2013). The males of the "spring generation" cannot possibly be the unknown males of *C. leptosoma* because all of them have a characteristic admarginal row of setae at the fore wing posterior margin which is lacking in the females of the type series of the latter species, all of which were collected in Belgium during July or August. The second, by far more likely possibility is that both sexes of the two aforementioned "generations" of "*C. pluteus*" of Bakkendorf (1934) in northern Europe represent two separate macropterous cryptic species females of which are practically indistinguishable morphologically from those of the real *C. pluteus* (= "summer generation" of authors) but males can be easily separated by the relative length and number of antennal flagellar segments. Indeed, both sexes of this species were collected simultaneously in different localities in northern Europe by O. Bakkendorf, H. R. Debauche, and S. Novicky. Thus the logical conclusion, beyond the reasonable doubt, has to be that both sexes of the "spring generation" of "*C. pluteus*" of authors almost certainly belong to an undescribed macropterous species of *Cleruchus* needing a new scientific name. Of course, the best way to resolve this problem would be collecting fresh specimens of both sexes of the two "generations" described

by Bakkendorf (1934) and then using molecular techniques to establish their likely conspecificity or otherwise. That, however, is currently not feasible so that I rely on the aforementioned rationale as justification for describing *C. taktochno* as a new taxon.

It is still unclear if *C. pluteus* and *C. taktochno* can overlap in June in northern Europe; it is only known that *C. taktochno* was collected in the quite distant past as late as in early June and apparently *C. pluteus* was collected since late June although mostly from late July (Bakkendorf, 1934).

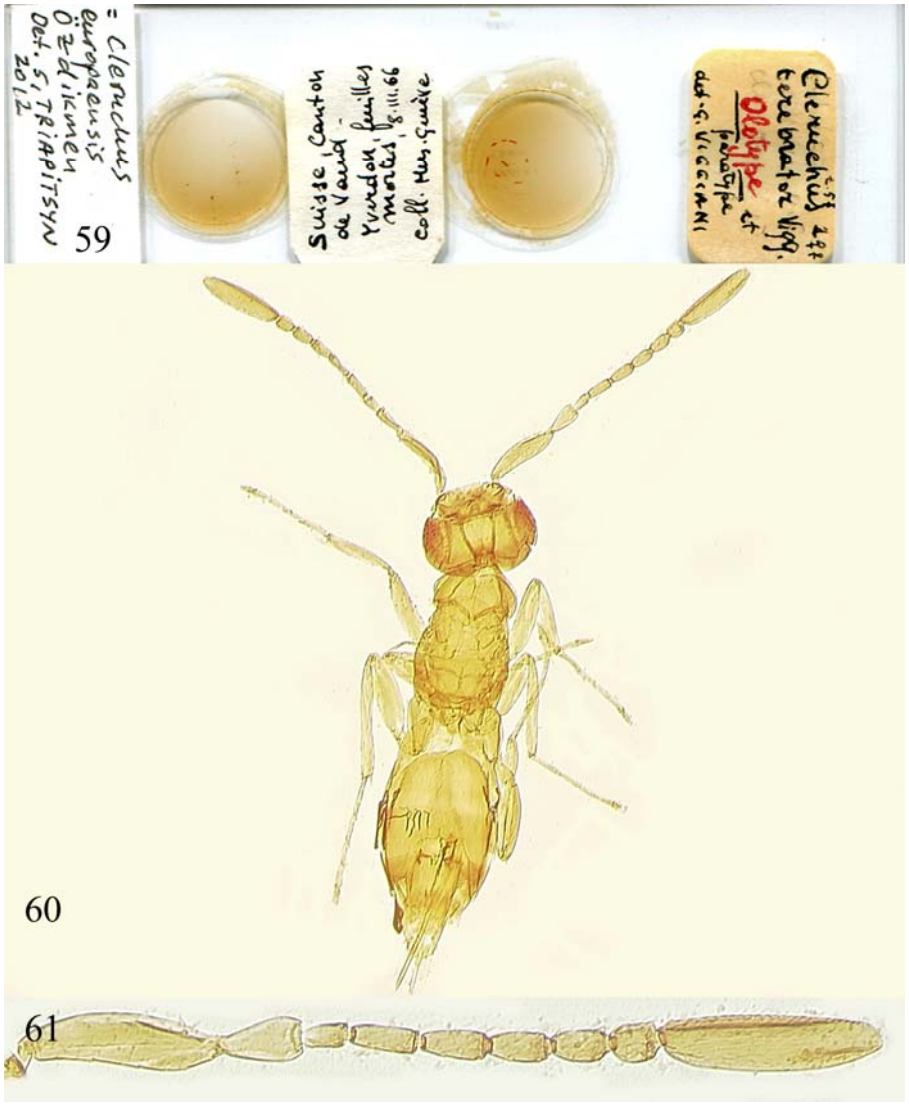
***Cleruchus terebrator* Viggiani, 1970, stat. rev.**
Figs 59–61

Cleruchus terebrator Viggiani, 1970: 138 (illustration), 139. Type locality: Yverdon-les-Bains (as Yverdon in the original description), Vaud, Switzerland. **Stat. rev.** The replacement name *C. europaensis* Özdikmen, 2011 (Özdikmen, 2011: 839–840) became unnecessary after the transfer of *C. terebrator* (Ogloblin, 1959) (Ogloblin, 1959: 71–74, described originally as *Platypatasson terebrator*), back to *Platystethynium* as proposed here, see above.
Cleruchus terebrator Viggiani: Trjapitzin, 1978: 531 (key, distribution).
Cleruchus europaensis Özdikmen, 2011: 839–840, nom. n. pro *C. terebratus* Viggiani, 1970 nec *C. terebrator* (Ogloblin, 1959). **Syn. n.**
Cleruchus europaensis Özdikmen: Triapitsyn *et al.*, 2013: 9 (mentioned).

TYPE MATERIAL EXAMINED. Holotype (Fig. 60) and one paratype females [MHNG] mounted under different coverslips on the same slide (Fig. 59) labeled: 1. "t. 57 2 ♀ *Cleruchus terebrator* Vigg. Olotype [in red, underlined in black] et paratype det. G. VIGGIANI"; 2. "Suisse, Canton de Vaud – Yverdon, feuilles mortes, 8.III.66 coll. Mus. Genève". The holotype, obviously marked as such in red ink by an interrupted line on the coverslip, is in fair condition although uncleared, complete, and mounted dorsoventrally; the paratype is dissected into several parts (G. Viggiani's drawing of the metasoma (his fig. 8, p. 138) illustrating the original description was taken from this specimen). The mounting medium (Hoyer's) is darkened a little (Fig. 59) but that does not prevent the specimens to be visible well enough; they have not been remounted in Canada balsam also because of the risk of losing body parts in the process. The species was described from 5 females, all collected from dead leaves (the other 3 females are paratypes, which have not been examined; although depository of these paratypes was not indicated in the original description, it was likely MHNG, but now their whereabouts are unknown).

REDESCRIPTION. FEMALE (holotype and paratype). Body (Fig. 60) and funicle of antenna brown; pedicel, scape, clava and legs light brown. Head a little wider than mesosoma. Vertex large, trapezoidal, with a faint sculpture in the middle; eye with many ommatidia; ocelli present. Face small, torulus well below lower level of eye. Antenna (Fig. 61) with scape faintly longitudinally striate; radicle small; remainder of scape 3.4-4.0x as long as wide. Pedicel 1.7-1.8x as long as wide, longer than F1. F1 the shortest funicle segment; F2 the longest, following funicle

segments gradually slightly shorter then the preceding one; F6 the broadest funicle segment, slightly longer than F1; funicle segments apparently without mps although possibly F6 with 1 mps (it may be not visible in the uncleared specimens); clava slightly shorter than combined length of F3-F6, 3.6-4.1x as long as wide, with 6 mps. Mesosoma smooth. Pronotum large; mesoscutum short, midlobe of mesoscutum apparently with 2 pairs of setae; scutellum small; propodeum rather long. Almost



Figs 59-61. *Cleruchus terebrator*, female (holotype). 59) Slide, 60) habitus, 61) antenna.

apterous (very strongly brachypterous) [according to Viggiani (1970), wing stumps, which are now not readily visible in the uncleared slide-mounted specimens, are a little shorter then propodeum length]. Gaster notably longer than mesosoma; ovipositor 1.3-1.4x length of metatibia and occupying slightly less than 0.5 length of gaster, exserted beyond its apex by 0.19-0.23x own length.

Measurements of the holotype: Body: 770; head: 148; mesosoma: 258; gaster: 400; ovipositor: 252. Antenna: radicle: 12; rest of scape: 121; pedicel: 49; F1: 27; F2: 41; F3: 39; F4: 37; F5: 36; F6: 30; clava: 136.

MALE. Unknown.

DIAGNOSIS. The almost apterous (very strongly brachypterous) females of *C. terebrator* differ from the apterous and strongly brachypterous females of *C. janetscheki* by the ovipositor 1.3-1.4x length of metatibia (0.6-0.65x length of metatibia in the latter species). Otherwise they are quite similar.

I disagree with the opinion of Viggiani (1970) that *C. terebrator* appears to be related to the macropterous species *C. megatrichus* because the proportions of funicle segments of their female antennae are completely different (relatively much shorter and compact in the latter species). *Cleruchus terebrator* is clearly more closely related to *C. janetscheki* with which it shares many similar morphological features and also the habitat. Intraspecific variability, particularly regarding the ovipositor length, needs to be further studied within *C. janetscheki* to better understand the limits of these two taxa; there is even a chance that they eventually might be found conspecific.

DISTRIBUTION. Switzerland.

HOSTS. Unknown.

***Cleruchus* sp. 1**

Fig. 62

MATERIAL EXAMINED. **Switzerland:** Ticino (Tessin), Mendrisio District, Besazio, 5.VI 1969 (C. Besuchet, I. Löbl) [1 ♀, DEZA].

DIAGNOSIS. FEMALE (Fig. 62). Body length 0.775 mm. Head notably wider than mesosoma; eye normal, with many ommatidia; ocelli present. Antenna with scape minus radicle 3.2x as long as wide; pedicel 1.6x as long as wide, longer than F1; all funicle segments short and without mps except F6 apparently with 1 mps; F1, F2, F5, and F6 a little wider than long, F3 and F4 about as wide as long, F6 the widest funicle segment; clava 2.3x as long as wide, as long as combined length of F2-F6. Pronotum large. Apterous. Gaster longer than mesosoma; ovipositor 1.3x length of metatibia and occupying 0.6 length of gaster, exserted beyond its apex by 0.17x own length.

This apterous female stands out among the known Palaearctic species of *Cleruchus* by its antenna with very short funicle segments and a large clava which is as long as the combined length of F2-F6. However, I am reluctant to describe a new species from this single, poorly cleared slide-mounted specimen also because potentially, although not necessarily, it very well may turn out to be a yet unknown

female of *C. raignieri* (as also noted by G. Viggiani on the slide who identified it in 1976 as "*Cleruchus* nr. *raignieri* Deb.").

DISTRIBUTION. Switzerland.

HOSTS. Unknown.

Fig. 62. *Cleruchus* sp. 1, female (Besazio, Switzerland). Habitus.

***Cleruchus* sp. 2**

Figs 63–65

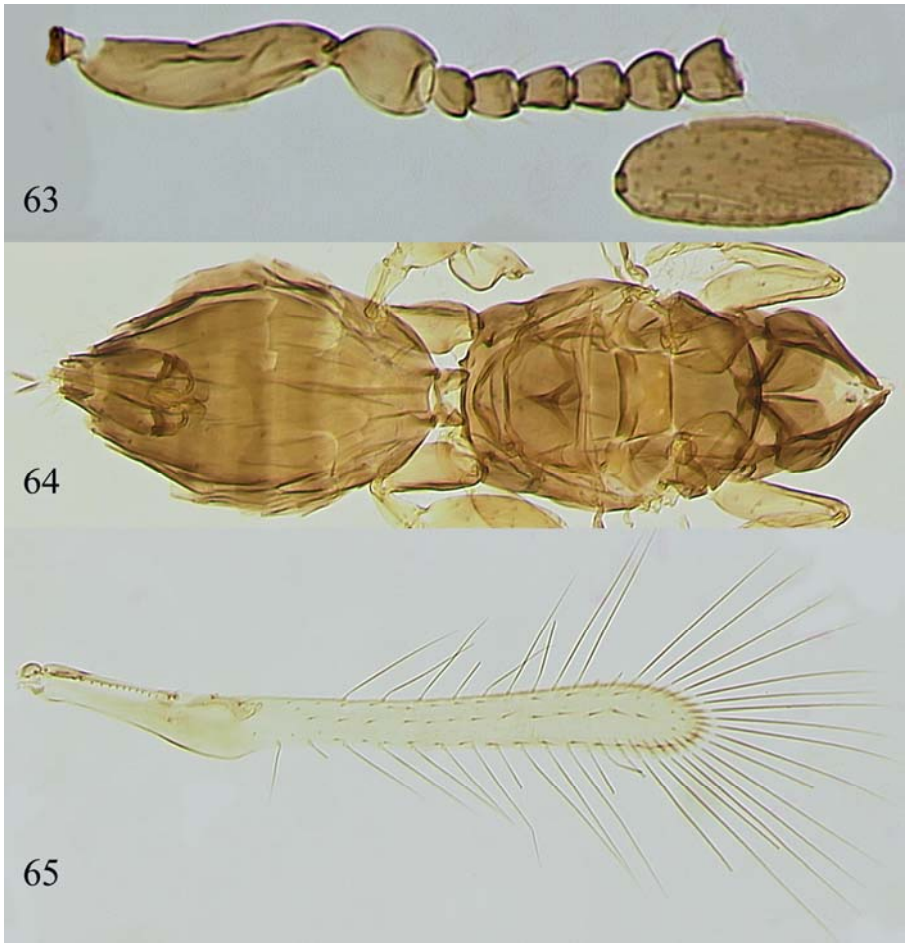
Cleruchus sp.: Triapitsyn *et al.*, 2013: 7 (mentioned as an unidentified, incomplete female of a species different from *C. pluteus*).

MATERIAL EXAMINED. **Poland:** Masovian Voivodeship, Grójec Co., Wólka Turowska, 27.VI 1935 (S. Novicky) [1 ♀, DEZA]. This slide-mounted specimen, which was remounted from the original, deteriorated "micro-slide" of S. Novicky (Triapitsyn *et al.*, 2013), lacks F6 and clava of one antenna, apical part of one fore wing blade, one hind wing, and a few leg segments.

DIAGNOSIS. FEMALE. Body length 0.64 mm. Body brown to dark brown, antenna brown, legs light brown. Head about as wide as mesosoma; eye normal, with many ommatidia; ocelli apparently absent. Antenna (Fig. 63) with scape faintly longitudinally striate; scape minus small radicle 3.3x as long as wide; pedicel 1.3x as long as wide, much longer than F1; all funicle segments without mps, very short (about as long as wide or at most slightly longer than wide), F6 the widest funicle segment; clava 2.5x as long as wide, as long as combined length of F2-F6, with 6 mps. Pronotum large, midlobe of mesoscutum with 2 pairs of setae. Macropterous. Fore wing (Fig. 65) 9.7x as long as wide, venation with an abruptly angulate stigmal

vein; both macrochaetae short; disc infuscate, with 1 complete, median row of setae and a row of setae along each margin; the longest marginal seta 3.8x greatest width of wing. Hind wing 17x as long as wide; disc infuscate, with 1 complete and 1 incomplete rows of setae along anterior margin. Petiole 2.2x as wide as long. Gaster (Fig. 64) shorter than mesosoma (Fig. 64); ovipositor (its apical part seems to be broken off) occupying a little less than 0.4 length of gaster.

This female has a very similar antennal funicle to that of *C. szelenyi*, of which it could very well be a macropterous individual (it also lacks ocelli). But even if it were a different, undescribed species (it does not fit any other described Palaearctic



Figs 63-65. *Cleruchus* sp. 2, female (Wólka Turowska, Poland). 63) Antenna, 64) mesosoma and metasoma, 65) fore wing.

species of *Cleruchus*), I would be reluctant to describe a new taxon from a single, incomplete specimen.

DISTRIBUTION. Poland.

HOSTS. Unknown.

***Cleruchus* sp. 3**

Figs 66–69

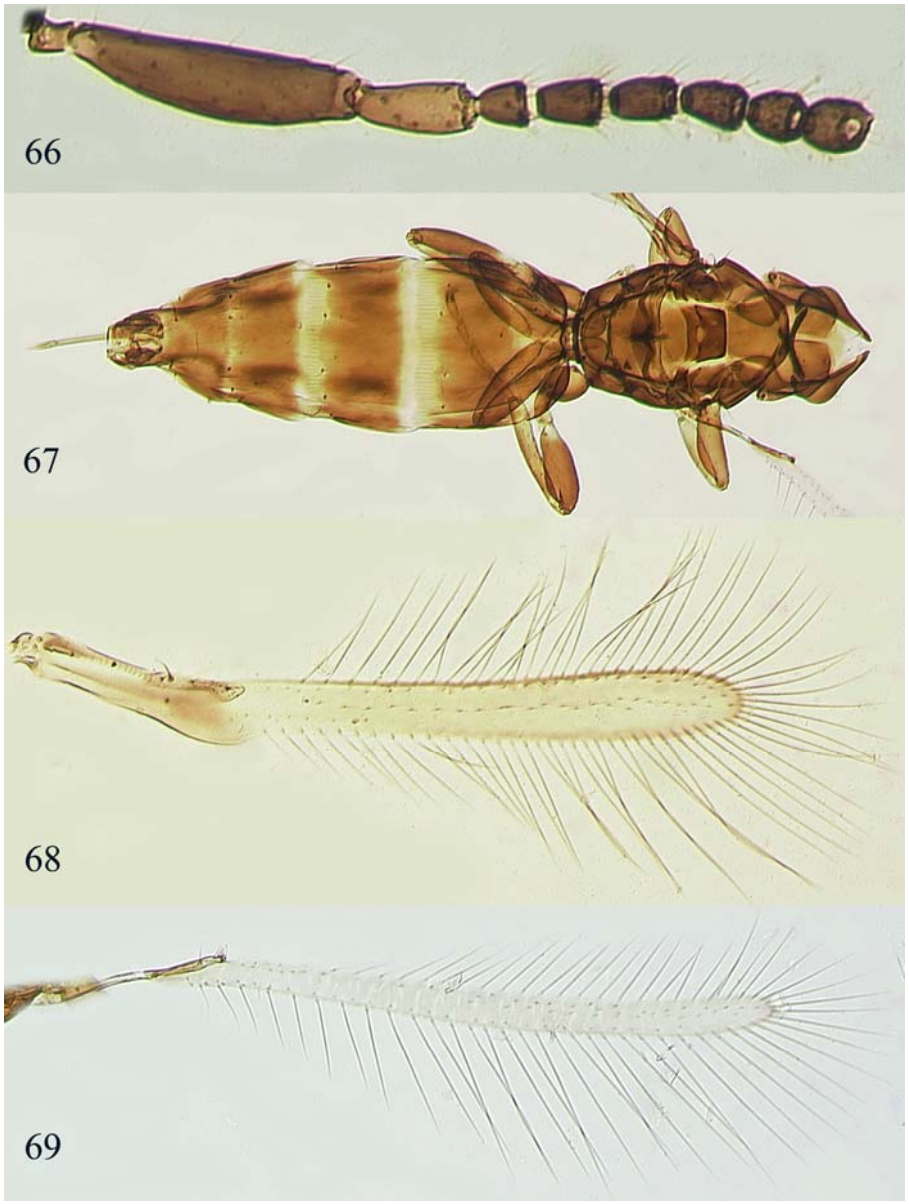
MATERIAL EXAMINED**. Spain:** Zaragoza, Pina de Ebro, 41°29'19.7''N 0°31'37.0''W, 159 m, 10.IX 1991 (J. Blasco-Zumeta) [1 ♀, MZNA]. The slide-mounted specimen lacks one antenna and clava of the other antenna.

DIAGNOSIS. FEMALE. Body length 1.12 mm. Body and antenna mostly dark brown except pedicel brown, legs brown to dark brown; body probably strongly flattened. Head a little wider than mesosoma; eye normal; vertex and face smooth, ocelli present; toruli well below lower level of eyes. Antenna (Fig. 66) with scape almost smooth; scape minus short radicle 4.1x as long as wide; pedicel 2.1x as long as wide, much longer than F1; all funicle segments without mps, rather short and at least a little longer than wide, subequal in length except F1 a little shorter, F6 the widest funicle segment. Mesosoma (Fig. 67) smooth; pronotum very large; mesoscutum much wider than long, its midlobe with 2 pairs of setae; scutellum including frenum rather long; metanotum conspicuous, very long; propodeum almost as long as mesoscutum. Macropterous. Fore wing (Fig. 68) 10.2x as long as wide, both macrochaetae very short; disc notably infuscate, with 2 complete rows of setae (one median row and the other along anterior margin) and one short, incomplete, inconspicuous row of a few very short, weak setae just below base of median row of setae, admarginal row of discal setae along posterior margin of wing absent; the longest marginal seta 3.5x greatest width of wing. Hind wing (Fig. 69) very long (slightly longer than fore wing), 21x as long as wide; disc infuscate, with 2 complete and 1 irregular, incomplete rows of setae; longest marginal seta 5.3x greatest width of wing. Petiole conspicuous, 4.5x as wide as long; gaster (Fig. 67) much longer than mesosoma and with conspicuous longitudinal striations on terga (these are also present in some other species of *Cleruchus* and better observed in well-cleared specimens); ovipositor about 1.0x length of metatibia and occupying about 0.13 length of gaster, exserted beyond its apex by almost 0.6x own length (although that may be due to the way the specimen is slide-mounted).

This interesting specimen could be a very large female of *C. leptosoma* because it has a very elongate body and an almost identical antennal funicle, and it also lacks a row of discal setae along the posterior margin of the fore wing. However, it also might be an undescribed species because of such a great difference between them in body size: the slide-mounted females of the type series of *C. leptosoma* are at most 0.78 mm long. The fore wing of *Cleruchus* sp. 3 (Fig. 68) is a little wider than that of *C. leptosoma* (at least 12.0x as long as wide in the latter) but that is not a reliable distinguishing character in this genus. Anyway, I would be reluctant to describe a new species from a single, incomplete specimen.

DISTRIBUTION. Spain.

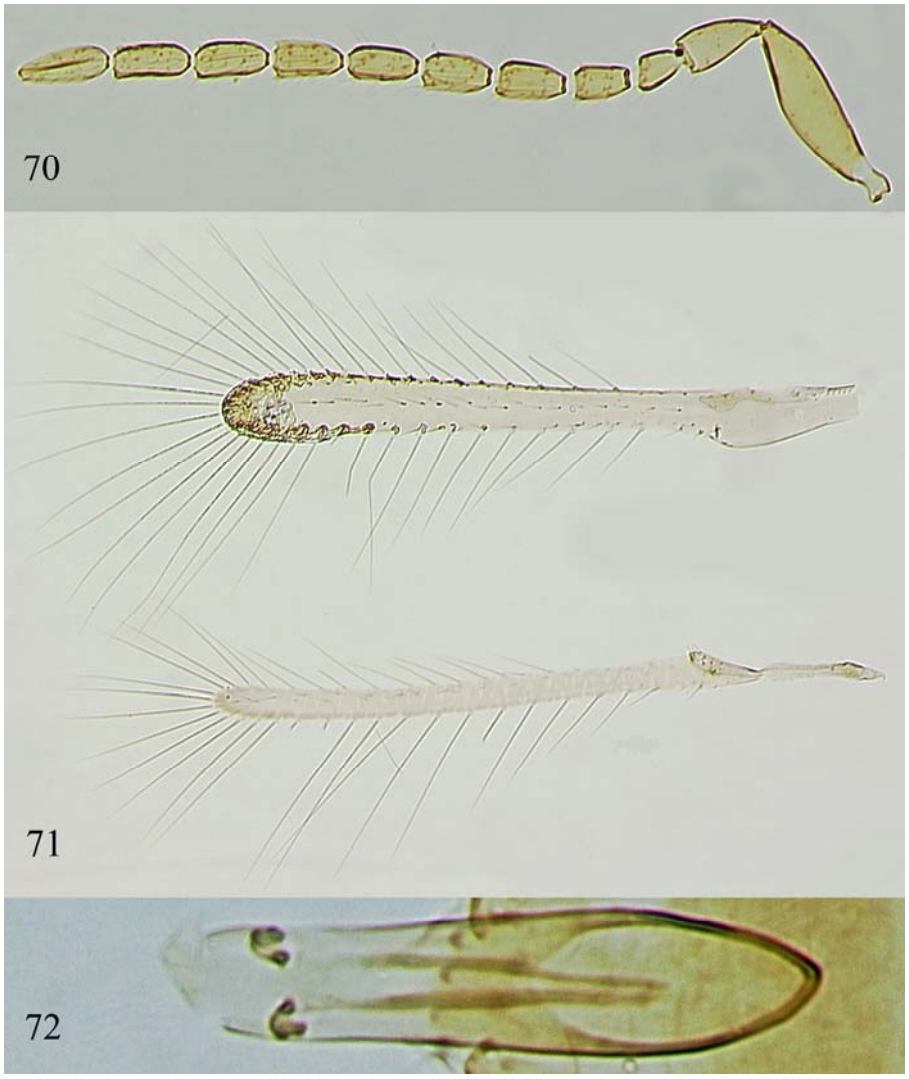
HOSTS. Unknown.



Figs 66-69. *Cleruchus* sp. 3, female (Pina de Ebro, Zaragoza, Spain). 66) Antenna, 67) mesosoma and metasoma, 68) fore wing, 69) hind wing.

***Cleruchus* sp. 4**
Figs 70–72

MATERIAL EXAMINED. **Russia:** Moskovskaya oblast', Noginskiy rayon, Fryazevo, 22.VII 2002 (S. V. Triapitsyn) [1 ♂, UCRC].



Figs 70-72. *Cleruchus* sp. 4, male (Fryazevo, Moskovskaya oblast', Russia). 70) Antenna, 71) pair of wings, 72) genitalia.

DIAGNOSIS. MALE. Body length 0.7 mm. Body mostly dark brown except base of gaster a little lighter, antenna brown, legs light brown. Head slightly wider than mesosoma; eye normal; vertex smooth, ocelli present. Antenna (Fig. 70) 11-segmented; scape smooth, 3.4x as long as wide (minus a short radicle); all flagellar segments with mps and longer than wide (F1 the shortest). Mesosoma shorter than gaster; pronotum rather short; midlobe of mesoscutum with 1 pair of setae. Macropterous. Fore wing (Fig. 71) 10.1x as long as wide, both macrochaetae short; disc notably infuscate, with 1 complete, median row of setae and a row of setae along each margin; the longest marginal seta 3.7x greatest width of wing. Hind wing (Fig. 71) about 21x as long as wide; disc infuscate, with 1 complete and 1 incomplete rows of setae along anterior margin; longest marginal seta 6.8x greatest width of wing. Petiole conspicuous, about 2x as wide as long. Genitalia as in Fig. 72.

Although this slide-mounted specimen undoubtedly represents a previously unknown species, I am reluctant to describe it as a new taxon from a single male. The only other known European species of *Cleruchus* with 11-segmented male antennae, *C. raignieri* and *C. szelenyi*, both have much shorter flagellar segments.

DISTRIBUTION. Russia (Moskovskaya oblast').

HOSTS. Unknown.

COMMENTS. A male specimen without wings and with almost identical antennae to those of *Cleruchus* sp. 4 from Russia, but unfortunately lacking any label data (supposedly collected in Belgium), is found in the H. R. Debauche collection at the ISNB.

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