Clusiodes tuomikoskii, a druid fly (Diptera: Clusiidae) new to the European fauna found in Sweden

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The druid fly *Clusiodes tuomikoskii* Mamaev, 1974, previously only known from the type locality in Russian Far East, is reported from Europe for the first time. It was found in 2016 in Swedish Lapland, at a site with numerous beaver-felled aspens and birches. Characters for separating the species from related species are presented.

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The druid flies (Diptera: Clusiidae) is a family of small to medium sized, rather slender acalyptrate flies developing in moist, decaying wood. The larvae are supposed to feed by sucking microorganisms in biofilms in the decaying wood (Rotheray & Horsefield 2013). The different species are mostly not specialized on specific tree species and several of them can develop in conifers as well as various deciduous trees, although they often show some preference for certain tree species (Roháček 1995, Rotheray & Horsefield 2013) or certain habitats.

The family is highly diverse in tropical regions but is species-poor in Europe; 14 species are listed to occur in Europe according to Fauna Europaea. According to present taxonomy (Lonsdale et al. 2010) these species are distributed in four genera: *Clusia* (including *Paraclusia*) in subfamily Clusiinae and *Clusiodes*, *Hendelia* and *Heteromeringia* in subfamily Clusiodinae. Keys to the genera can be found in e.g. Sasakawa (1998) and Lonsdale et al. (2010) and European species can in most cases be determined using Stackelberg (1989). For the most species-rich genus, *Clusiodes*, Lonsdale & Marshall (2007) is recommended for determination.

Hedström (1995) presented a checklist with distribution records to Swedish Clusiidae comprising 11 species and one more species has been added since then (Bartsch 2010). Additional faunistic records from Sweden were presented by Nilsson (2009) after examination of material from the Swedish Malaise Trap Project. In neighboring countries 10 species are known from Norway (Greve 2005) and 12 species from Finland (Kahanpää 2014), including *Clusiodes microcerus* Stackelberg, 1955 which is not yet recorded in Sweden.

Druid flies are generally not easily found by sweep-netting. They should rather be searched for on mating sites such as pale, barkless logs where males may congregate and defend territories (Roháček 1995). Surveying activities during recent years, using window-traps on tree trunks and malaise traps at sites with an abundance of dead wood, have shown that several druid fly species are rather common and widely distributed in Sweden. Some species have, however, a more restricted distribution and four species are included in the national red list. Forest management methods leading to scarcity and decline of suitable developmental substrates has been as-

Figure 1. Male *Clusiodes tuomikoskii.* Elongated surstyli, wings lacking dark apical spot, dark legs and a dark thorax characterize the species. Size: 3.2 mm. Photo: Mikael Marberg.

Hane av *Clusiodes tuomikoskii.* Förlängda hangenitalier, vingar utan mörk spetsfläck, mörka ben samt mörk rygg karaktäriserar arten. Storlek: 3,2 mm.

Figure 2. Head of *Clusiodes tuomikoskii* from above. Photo: Mikael Marberg

Huvud av *Clusiodes tuomikoskii* sett ovanifrån.

sumed to be the reason for some species being rare or declining (e.g. Nilsson 2012). A high diversity of druid flies at the local scale may indicate habitats interesting for nature conservation and a high diversity of other saproxylic insects.

I here report the unexpected finding in Swedish Lapland of a druid fly new to the European fauna.

***Clusiodes tuomikoskii* Mamaev, 1974**

SWE: Åsele lappmark: Fredrika parish: Käringberget close to Lögdeälven, 64°4'48"N, 18°37'37"E; 14.vi-2.vii.2016; 1♂, leg. & coll. S. Hellqvist.

C. tuomikoskii was described from Kedrovaya Pad Nature Reserve in the province Primorsky Krai in southeasternmost Russia, close to the borders with China and North Korea and only a few kilometers from the Pacific Ocean. There seems to be no other published records of the species and the only specimens in the collections of the Zoological Museum of Moscow University are four paratypes from the type territory (Marina Krivosheina, *in litt*.). The distance between the two known sites of *C. tuomikoskii* is more than 6 000 km. Most probably the species could be found in several other sites in the Northern Palearctic, but as it is rather easily recognized and belongs to a fairly well-known family, it seems to be a truly rare species and not just overlooked.

The site

The Swedish specimen (Fig. 1 & 2) was captured in a malaise trap in a slope exposed to the south, close to the river Lögdeälven. Deciduous trees dominated on the slope but most of them, especially birches and aspens, had been felled by beavers. In close proximity to the trap there were several felled aspens of varying age. Five other druid fly species, viz. *Hendelia beckeri* Czerny, 1903, *Clusia flava* (Meigen, 1830), *Clusiodes apicalis* (Zetterstedt, 1848), *C. albimanus* (Meigen, 1830) and *C. ruficollis* (Meigen, 1830) as well as several other saproxylic Diptera, were collected at the same locality. The conditions for saproxylic insects at this particular site are very good for the time being, but the future is uncertain as the beavers have already felled most trees, including all large aspens.

Recognition

The species can be determined with the key to Old World *Clusiodes* by Lonsdale & Marshall (2007). *C. tuomikoskii* has a black scutum, lacking the whitish lateral stripes found in related species. The wings lack the dark spot at apex or along costa found in most other *Clusiodes*. Further, the male genitals are characteristic. To facilitate recognition a more thorough description, based on the Swedish male, is found below. When reference is made to related species that means *C. apicalis* and *C. freyi* Tuomikoski, 1933.

Head: Vertex anteriorly yellowish orange, posteriorly dark brown with diffuse transition. Three orbital bristles, the rearmost in the dark part of vertex. Occiput black, lunula and face yellow, gena broadly yellow below the eye, narrowly black along lower margin. Palpi yellow and antennae yellow but first flagellomere darkened on upper half. Lower margin of gena with three weak bristles, about half as long as vibrissa. Bristling as in related species but vibrissa and genal bristles weaker (thinner).

Thorax: Scutum completely dark (but there is a thin whitish line in the suture between notopleurum and anepisternum) with pale brownish dust, postpronotum dark brown, laterally subshining. No presutural and two well-developed postsutural dorsocentral bristles, in front of the anterior one a short and weak bristle less than half as long as the well-developed dorsocentrals. Pleura dark, with pale brownish dust, but anepisternum, anepimeron and rear, upper corner of katepisternum undusted. Bristling as in related species.

Legs: Fore and mid coxa yellow, hind coxa somewhat darker. All femora and tibiae dark with knees narrowly pale. Femora, especially profemur, broadly pale at base and below. Tarsi dark but metatarsus on hind leg yellowish. Fore and mid femur with rows of *av* and *pv* bristles as in related species.

Wing: Almost transparent with a pale brownish tinge. Veins brownish, media very thin. Otherwise as in related species.

Abdomen: Black, subshining as in related species. Male genitals with surstyli (Fig. 3) elongated, almost parallel-sided and 2.2 times as long as broad, on the inner side with a broad rhombic projection with rounded corners. Nota bene, the illustration in Lonsdale & Marshall (2007, fig. 41) is rather misleading as it shows a surstylus that seems to have been flattened by force.

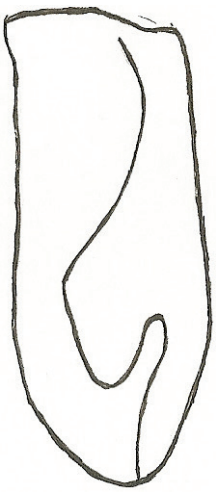

Figure 3. Surstylus of *Clusiodes tuomikoskii*, lateral view from the inner side, showing the characteristic shape of the inner projection. Hairs not shown. Redrawn from Mamaev (1974).

Surstylus av *Clusiodes tuomikoskii*, sedd från insidan. Det rombformade, inåtriktade bihanget är karaktäristiskt för arten. Behåring visas inte. Avritat från Mamaev (1974).

C. tuomikoskii shares the combination of elongated surstyli and no presutural dorsocentral bristles with *C. apicalis* and *C. freyi*. These species have, however, slightly broader surstyli with a more narrow, finger-like inner projection. Both species have also a yellowish white lateral stripe on thorax, covering postpronotum and notopleurum, paler legs, paler first flagellomere, paler sides of vertex and a dark spot apically on the wing. Further, males of *apicalis* have dark face and the lower margin of gena more broadly black while *freyi* has pale face and completely yellow gena. The dark legs gives *tuomikoskii* some resemblance with *C. pictipes* but that species have short surstyli, white lateral stripes on thorax and a dark apical wing spot. Females of *tuomikoskii* have not been studied but according to Mamaev (1974) they are similar to the males.

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Sammanfattning

Träflugan *Clusiodes tuomikoskii* Mamaev rapporteras för första gången från Europa. En hane av arten togs i en malaisefälla intill en bröt med bäverfällda aspar intill Lögdeälven i Käringbergets ekopark, Åsele lappmark. Arten är tidigare bara känd från typlokalen i ryska Fjärran Östern. Arten liknar mest *C. apicalis* och *C. freyi* och har i likhet med dessa hangenitalier med förlängda surstyli och avsaknad av dorsocentralborst på ryggsköldenframför suturen. *C. tuomikoskii* saknar dock mörk spetsfläck på vingarna och det vitaktiga sidoband på ryggsköldensom dessa arter har.