

Report on *Ooctonus* (Hymenoptera: Mymaridae) of Finland, with additional new records from some other European countries

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2574 specimens of the fairyfly genus *Ooctonus* Haliday, 1833 (Hymenoptera: Chalcidoidea: Mymaridae) from Finland were examined and identified to species, an annotated list of which is given. These were mainly collected by M. Koponen and V. Vikberg while some earlier ones by W. Hellén; the bulk of them are deposited in Zoological Museum, Finnish Museum of Natural History, University of Helsinki, Finland, and a few are in V. Vikberg's private collection. Most specimens were determined by M. Koponen and V. Vikberg while some also by S. V. Triapitsyn in 2016 and 2017. *Ooctonus novickyi* Soyka, 1950 is newly recorded from Finland, and its previously unknown male is described and illustrated; an updated key to the males of the European species of *Ooctonus* is provided. Now all six known European species are found in Finland; we also include new distributional records of five of them from some other European countries.

Key words. Hymenoptera, Chalcidoidea, Mymaridae, *Ooctonus*, biodiversity, Finland, Europe.

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Introduction

Ooctonus Haliday, 1833 is one of the few large genera of Mymaridae (Hymenoptera: Chalcidoidea) whose world fauna is relatively well known (Triapitsyn 2010; Huber et al. 2010; Huber 2012, 2013). Triapitsyn (2010) revised the Palearctic *Ooctonus* and provided a key to both sexes of its six valid European species, excluding the male of *Ooctonus novickyi* Soyka, 1950 which was then unknown. The genus is particularly common in northern Europe (Triapitsyn 2010).

In Finland, Hellén (1968, 1971, 1974) reported four species of *Ooctonus* and Vikberg (1982) an additional species. Wolter Hellén's specimens are deposited in the insect collection of Zoological Museum, Finnish Museum of Natural History, University of Helsinki, Helsinki, Finland. We have examined them recently and found his identifications to be mostly correct.

More recent extensive, systematic collections of Finnish fairyflies have been made mainly by M. Koponen and V. Vikberg since 1970s, primarily by sweeping. As the result, more than 2000 specimens of *Ooctonus*, sorted initially only to genus, had become available by the time Triapitsyn's (2010) revision was published. Then the collectors themselves identified most of their specimens to species using the key in Triapitsyn (2010), while some were also determined to species by S. V. Triapitsyn in 2016 and 2017. Their annotated synopsis is given below along with an updated key to the males of the European species of *Ooctonus* which now includes the previous unknown male

of *O. novickyi*. The latter is described and illustrated herein; it is a new record for the Finnish fauna of Mymaridae, which now includes all six known European species of the genus.

Hosts of *Ooctonus* species in Finland are unknown, but elsewhere some members of this genus are known as egg parasitoids of Aphrophoridae and Cicadellidae (Hemiptera) (Triapitsyn 2010; Huber 2012).

The following acronyms are used to designate depositories of specimens examined: FMNH = Zoological Museum, Finnish Museum of Natural History, University of Helsinki, Helsinki, Finland; UCRC = Entomology Research Museum, University of California, Riverside, California, USA; VVCT = private collection of Veli Vikberg, Turenki, Finland; ZMUC = Zoological Museum, Natural History Museum of Denmark, University of Copenhagen, Copenhagen, Denmark.

Specimens collected by M. Koponen were mounted air-dried on points or cards, and labeled; these have been all donated to FMNH. Specimens collected by V. Vikberg are deposited in VVCT; these were mostly point-mounted (air-dried) but some are stored, also air-dried but unmounted, on paper layers in plastic Petri dishes. For the massive material from Finland, detailed label data are omitted for brevity except for the newly recorded *O. novickyi*; for the five other taxa, which were previously known from the country, only their distribution in the different biological provinces of Finland (Heikinheimo & Raatikainen 1971) is indicated.

Using this opportunity, we also list some recently identified (by M. Koponen and S. V. Triapitsyn) specimens of five species of *Ooctonus* from some other European countries from several museum collections, including those in FMNH collected by M. Koponen. Those representing new country records are marked by an asterisk (*).

Distribution maps for all species are provided as Maps 1–6. Dot colours on the maps represent the year of the latest record in a 10x10 km² square: white < 1901 or year unknown; red 1901–1974; green 1975–1999; blue > 1999.

Annotated list of species of *Ooctonus* Haliday, 1833 in Finland

Ooctonus hemipterus Haliday, 1833 (Figs 1–2)

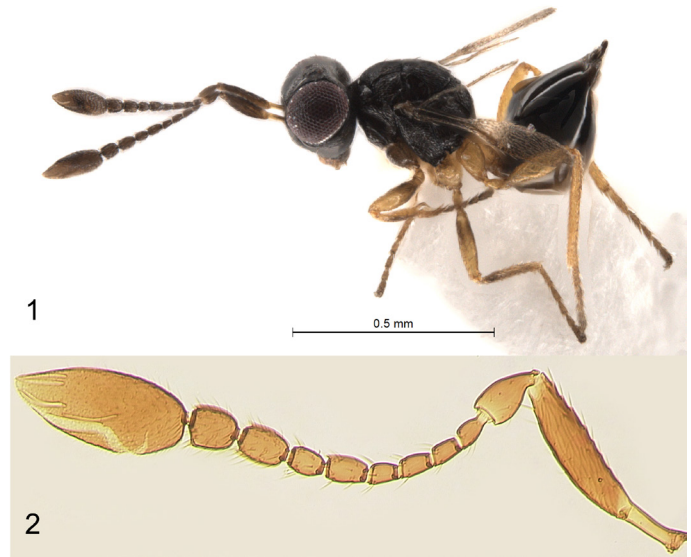
Hellén 1968, 1971, 1974; Triapitsyn 2010; Huber 2012; Fusu 2013

Finland (1640 ♂♂ 130 ♀♀, Map 1): *Al* (Eckerö, Hammarland, Kökar, Lemland, Mariehamn, Vårdö), *Ab* (Dragsfjärd, Lohja, Salo, Uusikaupunki), *N* (Helsinki, Hyvinkää, Kirkkonummi, Nurmijärvi, Porvoo mlk. Tammissaari, Tuusula), *Ka* (Hamina, Michikkälä, Virolahti), *St* (Kihniö, Mouhijärvi, Rauma, Vammala), *Ta* (Janakkala, Lammi, Loppi, Ruovesi), *Sa* (Lappeenranta, Joutseno, Luumäki, Mikkeli, Pertunmaa, Rantasalmi, Ristiina, Savitaipale, Savonlinna, Taipalsaari, Valkeala), *Kl* (Parikkala), *Oa* (Kurikka), *Tb* (Hankasalmi, Karstula, Keuruu, Rautalampi, Vesanto, Viitasaari), *Sb* (Maaninka, Nilsä, Pieksämäki), *Kb* (Joensuu, Kitee, Liperi, Tohmajärvi), *Om*: Alahärmä, Alajärvi, Haapavesi, Pietarsaari, Vimpeli), *Oba* (Kiiminki, Vaala), *Obb* (Rovaniemen mlk.), *Ks* (Taivalkoski), *Lkoc* (Kittilä), *Lkor* (Sodankylä), *Li* (Inari).

Distribution: Holarctic (Triapitsyn 2010; Huber 2012).

New extralimital records: ***Denmark** (ZMUC, det. S. V. Triapitsyn): Hovedstaden: Allerød, 21.5.1956, O. Bakkendorf, 1 ♀. Dyrehaven (Jægersborg Dyrehave, Zealand Island): 28.7.1929, O. Bakkendorf, 1 ♀; Fortunens Indelukke, 4.9.1959, O. Bakkendorf, 1 ♂. Gentofte, Berstorff [Palace], 20.10.1926, J. P. Kryger, 1 ♀. Holte, 4.10.1953, O. Bakkendorf, 1 ♀. Tisvilde, 7.10.1923, J. P. Kryger, 1 ♀. Midtjylland: Grenå, 5.10.1997, T. Munk, 1 ♂. Sjælland: Liselund, 23.8.1925, O. Bakkendorf, 1 ♀. Syddanmark, Rømø, 24.9.2000, T. Munk, 1 ♂.

Specimens collected by M. Koponen (FMNH) unless indicated otherwise: ***Estonia**: Läänemaa (Haapsalu r.): Karuse, 29.5.1990, 1 ♀; Vormsi, Borby, 9.8.2002, 1 ♂. Saaremaa: Kaali, 30.5.1990, 1 ♀, Küpassaare, 30.5.1990, 2 ♂. **Portugal**:



Figs 1–2. *Ooctonus hemipterus* Haliday, 1833 (brachypterous female from Laurinmäki, Janakkala, Finland, collected 2.11.2013): **Fig. 1** – habitus; **Fig. 2** – antenna. Photos by S. V. Triapitsyn.

Madeira, Boca da Corrida (1200 m), 10.12.1991, 5 ♂; Camara de Lobos (Estreito, Levada do Norte, 550 m), 12.12.1994, 1 ♂; Funchal (Old Monte Gardens, 550 m), 6.11.1996, 1 ♂; Levada dos Tornos between EN102 and Romeiros (600 m), 15.12.1994, 4 ♂ 1 ♀. **Russia**: Leningradskaya oblast, Vaganovo, 60°05'24.5"N 31°02'08.3"E, 25 m, 15–30.6.2016, A. Knyshev, 1 ♂ 5 ♀ (UCRC, det. S. V. Triapitsyn). Moskovskaya oblast: Noginskiy rayon, Fryazevo, 22.7.2002, S. V. Triapitsyn, 1 ♂ (UCRC). Pushkinskiy rayon, Pushkino, Mamontovka, 15–25.7.2001, E. Ya. Shuvakhina, 1 ♀ (UCRC). ***Spain**: Andalusia, Fuengirola (Los Pacos), 25.3.2012, 1 ♂.

Remarks: On very rare occasions, F5 of the female antenna in *O. hemipterus* bears an multiporous plate sensillum either on both antennae (Figs 1–2), like in the two brachypterous specimens from Laurinmäki, Janakkala, Finland, or just on one antenna, like in the brachypterous specimen from Rotarypuisto, Turenki, Janakkala, all collected by V. Vikberg. That is an interesting addition to the diagnosis of *O. hemipterus* given in Triapitsyn (2010).

According to the collections and personal observations of the third author, *O. hemipterus* is by far the most frequent species of *Ooctonus* in Janakkala and Turenki in Tavastia Proper Region. In Turenki there are localities (Vapari, Rälssitie and Rotarypuisto) which are small parks where grass is cut during summer, and *O. hemipterus* (particularly males) are numerous there from July to very late autumn until snow cover. Similarly, the specimens from Laurinmäki were swept in November at a road ramp where grass and herbs had been cut during summer. Both brachypterous females and a macropterous male of *O. hemipterus* were collected in Rotarypuisto as early as 12.3.2014 when temperature in the afternoon was about 10°C.

***Ooctonus insignis* Haliday, 1833**

Hellén 1974, 1976; Triapitsyn 2010; Fusu 2013.

Finland (69 ♂♂ 39 ♀♀, Map 2): *Ab* (Dragsfjärd, Lohja), *N* (Espoo, Helsinki, Hyvinkää, Nurmijärvi, Sipoo, Vantaa), *Ta* (Hauho?, Janakkala, Jämsä), *Ka* (Ylämaa), *St* (Nakkila), *Sa* (Hirvensalmi, Mikkeli, Mäntyharju, Ristiina, Taipalsaari), *Tb* (Keuruu), *Om* (Haapavesi, Lappajärvi).

Distribution: Palaearctic (Triapitsyn 2010; Huber 2012).

New extralimital records: ***Denmark:** Hovedstaden, Ryget, 24.8.1924, O. Bakkendorf, 1 ♂ 1 ♀ (ZMUC, det. S. V. Triapitsyn). ***Estonia:** Läänemaa, Vormsi, forest meadows by stream Vae, 7.8.2002, M. Koponen, 2 ♀ (FMNH, det. M. Koponen). **Russia:** Moskovskaya oblast, Pushkinskiy rayon, Pushkino, Mamontovka, 15–25.7.2001, E. Ya. Shuvakhina, 1 ♀ (UCRC).

***Ooctonus notatus* Walker, 1846**

Triapitsyn 2010; Huber 2012; Fusu 2013.

Ooctonus heterotomus Foerster, 1847: Hellén 1974, 1976.

Finland (297 ♂♂ 315 ♀♀, Map 3): *Al* (Eckerö, Finström, Hammarland, Jomala, Lemland, Mariehamn), *Ab* (Dragsfjärd, Lohja, Perniö, Suomensjärvi, Tammisaari? Turku, Uusikaupunki, Vihti, Västanfjärd), *N* (Espoo, Hanko, Helsinki, Hyvinkää, Inkoo, Lapinjärvi, Nurmijärvi, Porvoon mlk. Pyhtää, Sipoo, Siuntio, Tammisaari, Vantaa), *Ka* (Ylämaa), *St* (Kokemäki,



Fig. 3. *Ooctonus novickyi* Soyka, 1950 habitus of female from Nurmijärvi, Finland, collected by M. Koponen 17.9.1987. Specimen <http://id.luomus.fi/GL.6254>. Photo by Pekka Malinen, Finnish Museum of Natural History.

Nakkila), *Ta* (Forssa, Hämeenlinna, Janakkala, Korpilahti, Jämsä, Kärkölä, Lahti, Lammi, Loppi, Nastola), *Sa*: (Hirvensalmi, Joutseno?, Mikkeli, Mäntyharju, Pertunmaa, Puumala, Rantasalmi, Ristiina, Savitaipale, Taipalsaari), *Kl* (Parikkala), *Oa* (Ilmajoki, Töysä), *Tb* (Konnevesi, Rautalampi, Äänekoski), *Sb* (Maaninka), *Kb* (Liperi), *Om* (Alahärmä, Alajärvi, Pyhäntä, Veteli), *Ok* (Rautjärvi, Vaala), *Oba* (Ii, Pudasjärvi, Utajärvi, Vaala), *Obb* (Kemi, Simo, Ylitornio), *Lkoc* (Kittilä), *Lkor* (So-dankylä).

Distribution: Holarctic (Triapitsyn 2010; Huber 2012).

New extralimital records: **Austria:** Tyrol, Höllental, Schwarzau, 20.8.1960, B. Petersen, 1 ♂ (ZMUC, det. S. V. Triapitsyn). **Denmark** (ZMUC, det. S. V. Triapitsyn): Hovedstaden: Dyrehaven (Jægersborg Dyrehave, Zealand Island), 26.12.1928, O. Bakkendorf (emerged 25.4.1929 from unknown eggs on *Phalaris arundinacea* [as *Baldingera arundinacea*, “in copula”]), 1 ♂ 1 ♀ (identified by O. Bakkendorf as *O. heterotomus*). Ryget, 30.8.1925, J. P. Kryger, 1 ♀. Nordjylland: Kielstrup, 7.8.1986, T. Munk, 1 ♂. Krogens Mølle, 57°21'N 10°19'E, 11–13.8.1986, T. Munk, 1 ♂ 1 ♀. Sjælland: Liselund, 7.8.1924, O. Bakkendorf, 2 ♂. ***Estonia:** Läänemaa, Vormsi, Borrby, 9.8.2002, M. Koponen, 1 ♀ (FMNH); forest meadows by stream Vae, 7.8.2002, M. Koponen, 1 ♂ (FMNH). Väike-Tjuka, 8.8.2002, M. Koponen, 1 ♂ 1 ♀ (FMNH). Saaremaa: Tagamõisa, 12.6.1996, M. Koponen, 1 ♀ (FMNH). **Ireland:** County Kildare, Ballynafagh Lake (near Ballynafagh and Prosperous), 53°18'20"N 6°46'58"W, 87 m, 26.8.2015, S. V. Triapitsyn, 1 ♂ (UCRC). **Poland:** Podlaskie, Białowieża, 9.7.1988, M. Koponen, 1 ♀ (FMNH). **United Kingdom:** England, Hampshire County, Hollom Down, 51°06'52.5"N 1°37'02.3"W, 86 m, 30.8.2014, S. V. Triapitsyn, 1 ♀ (UCRC).

***Ooctonus novickyi* Soyka, 1950 (Figs 3–8) (new species record for Finland)**

Triapitsyn 2010.

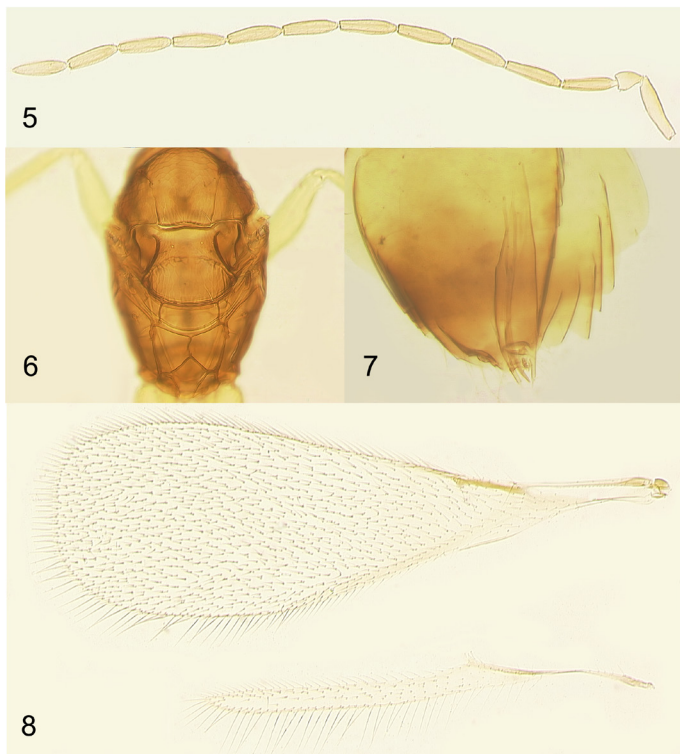
Finland (1 ♂ 10 ♀♀, Map 4) (all specimens collected by M. Koponen, FMNH, unless indicated otherwise): *N*: Helsinki (Viikki, 6681:3390), 28.9.1982, 1 ♀, (Viikki, 6681:3391), 27.9.1984, 2 ♀, edge of sugar beet field (det. M. Koponen 2015). Nurmijärvi (Kaanaanmetsä, 6704:3381), 17.9.1987, 1 ♀, forest grasses (Fig. 3, specimen identifier <http://id.luomus.fi/GL.6254>), (Myllykoski, 6706:3382), 30.8.1987, 1 ♀ (det. M. Koponen 2015). *Ta*: Janakkala (road 131, 6754:3368), 18.9.2009, V. Vikberg, 1 ♂ (VVCT) (Figs 4–8, specimen identifier <http://id.luomus.fi/GL.8175>); (Konttilan kartano, 6757:3373), 8.10.2006, V. Vikberg, 1 ♀ (VVCT); (Kalpalinna, 6759:3370), 13.8.1997, V. Vikberg, 1 ♀ (VVCT), (det. V. Vikberg 2016); (Rotarypuisto, 6758:3372), 25.9.2018, 1 ♀, 11.10.2018, 1 ♀, V. Vikberg (VVCT) (det. V. Vikberg 2018). *Sa*: Mikkeli (Kivilahdentie 6, 6839:3506), 7.8.2016, 1 ♀ (det. M. Koponen 2016).

Distribution: Palearctic (Triapitsyn 2010).

Description: Male (previously unknown, Figs 4–8). Body length of the air-dried, point-mounted specimen (Fig. 4) prior to slide-mounting 1.12 mm (head length 0.23 mm). Head, mesosoma and apical third or so of gaster dark brown; petiole and remainder of gaster light brown; pedicel and scape light brown to brown, flagellum brown; legs light brown. Similar to female as redescribed in detail by Triapitsyn (2010) except for normal sexually dimorphic features of antenna (Fig. 5) and genitalia (Fig. 7). Scape minus radicle 4.4 times as long as



Fig. 4. *Ooctonus novickyi* Soyka, 1950 male from Janakkala, Finland, collected by V. Vikberg 18.9.2009. Specimen <http://id.luomus.fi/GL.8175>. Photo by Pekka Malinen, Finnish Museum of Natural History.



Figs 5–8. *Ooctonus novickyi* Soyka, 1950 (male from Janakkala, Finland, collected by V. Vikberg 18.9.2009): **Fig. 5** – antenna; **Fig. 6** – mesosoma; **Fig. 7** – genitalia; **Fig. 8** – fore and hind wings. Photos by S. V. Triapitsyn.

wide. Fore wing 3.1 times as long as wide, truncate apically; hind wing 17.5 times as long as wide.

Remarks: The body length of both females of *O. novickyi* from Janakkala is 1.18 mm; their gaster is mostly pale brownish yellow.

Ooctonus sublaevis Foerster, 1847

Triapitsyn 2010; Fusu 2013.

Ooctonus dovrensis Solem & Sveum, 1980: Vikberg 1982, Silfverberg 1986, synonymized by Triapitsyn (2010).

Finland (43 ♂♂ 53 ♀♀, Map 5): *Al* (Eckerö, Jomala, Lemland, Mariehamn), *Ab* (Lohja, Perniö, Uusikaupunki, Vihti), *N* (Espoo, Hanko, Hyvinkää, Nurmijärvi, Sipoo, Siuntio), *St* (Karkku, Nakkila), *Ta* (Heinolan mlk. Janakkala, Lahti, Lammi, Loppi, Sääksmäki), *Sa* (Juva, Mikkeli, Punkaharju, Ristiina, Suomenniemi, Taipalsaari), *Kl* (Parikkala, Uukuniemi), *Tb* (Rautalampi), *Kb* (Kitee, Tohmajärvi), *Lkoc* (Kolari), *Lkor* (Kemijärvi).

Distribution: Palearctic (Triapitsyn 2010; Huber 2012).

New extralimital records: ***Denmark** (ZMUC, det. S. V. Triapitsyn): Hovedstaden: Tisvilde, 7.10.1923, J. P. Kryger, 1 ♂. Sjælland, Liselund, 10.8.1924, O. Bakkendorf, 1 ♀. ***Estonia**: Saaremaa, Kaali, 30.5.1990, M. Koponen, 1 ♀ (FMNH). **Poland**: Podlaskie, Białowieża, 3.9.2007, M. Koponen, 1 ♂ (FMNH). **Russia**: Moskovskaya oblast, Noginskiy rayon, Fryazevo, 22.7.2002, S. V. Triapitsyn, 1 ♂ (UCRC, det. S. V. Triapitsyn). **United Kingdom**: England, Hampshire County: Awbridge, Beechwood Estate, 51°01'18"N 1°32'27"W, 52 m, 30.8.2014, S. V. Triapitsyn, 1 ♂ (UCRC).

Ooctonus vulgatus Haliday, 1833

Hellén 1967, 1968, 1971, 1974; Triapitsyn 2010; Fusu 2013

Finland (16 ♂♂ 66 ♀♀, Map 6): *Al?* (Eckerö?, Finström?), *Ab* (Dragsfjärd, Lohja?, Perniö, Uusikaupunki), *N* (Espoo, Helsinki, Nurmijärvi, Tammisaari), *Ka* (Ylämaa), *Ta* (Janakkala, Lammi?), *Sa* (Joutseno?, Mikkeli, Mäntyharju, Pertunmaa, Punkaharju?, Ristiina, Taipalsaari?), *Kl?* (Parikkala?), *Tb* (Keuruu), *Kb* (Tohmajärvi), *Om* (Pyhäntä).

Distribution: Holarctic and Australasian: New Zealand (apparently unintentionally introduced there) (Triapitsyn 2010; Huber et al. 2010).

New extralimital records: **Denmark** (ZMUC, det. S. V. Triapitsyn): Hovedstaden: Ryget, 30.8.1925, J. P. Kryger, 1 ♀. Tisvilde, 7.10.1923, J. P. Kryger, 2 ♀. Midtjylland: Samsø Island,

Vejrø (7 km E of Samsø), 22.8.1997, T. Munk, 1 ♀. Sillerup (12 km SW of Silkeborg), 25.8.1986, T. Munk, 1 ♀. Sjælland: Liselund, 7.8.1924, O. Bakkendorf, 1 ♀. *Estonia, Vormsi: Väike-Tjuka, 8.8.2002, M. Koponen, 1 ♀ (FMNH). Greece: Peloponnese, 5 km S of Monemvasia, 27.11.1983, G. Christensen, 2 ♂ (ZMUC). Russia: Karachay-Cherkessia, Dombay, 19.7.2003, E. Khomchenko, 1 ♂ (UCRC, det. S. V. Triapitsyn). Stavropol'skiy kray: Mikhaylovskoye ("Aviator farm near Stavropol' airport), 19.10.2002, E. Khomchenko, 1 ♀ (UCRC, det. S. V. Triapitsyn). Spain: Canary Islands, Tenerife, Aguanansa, 12.12.1997, M. Koponen, 2 ♂ 76 ♀ (FMNH). United Kingdom: England, Hampshire County: Hollom Down, 51°06'52.5"N 1°37'02.3"W, 86 m, 30.8.2014, S. V. Triapitsyn, 1 ♀ (UCRC).

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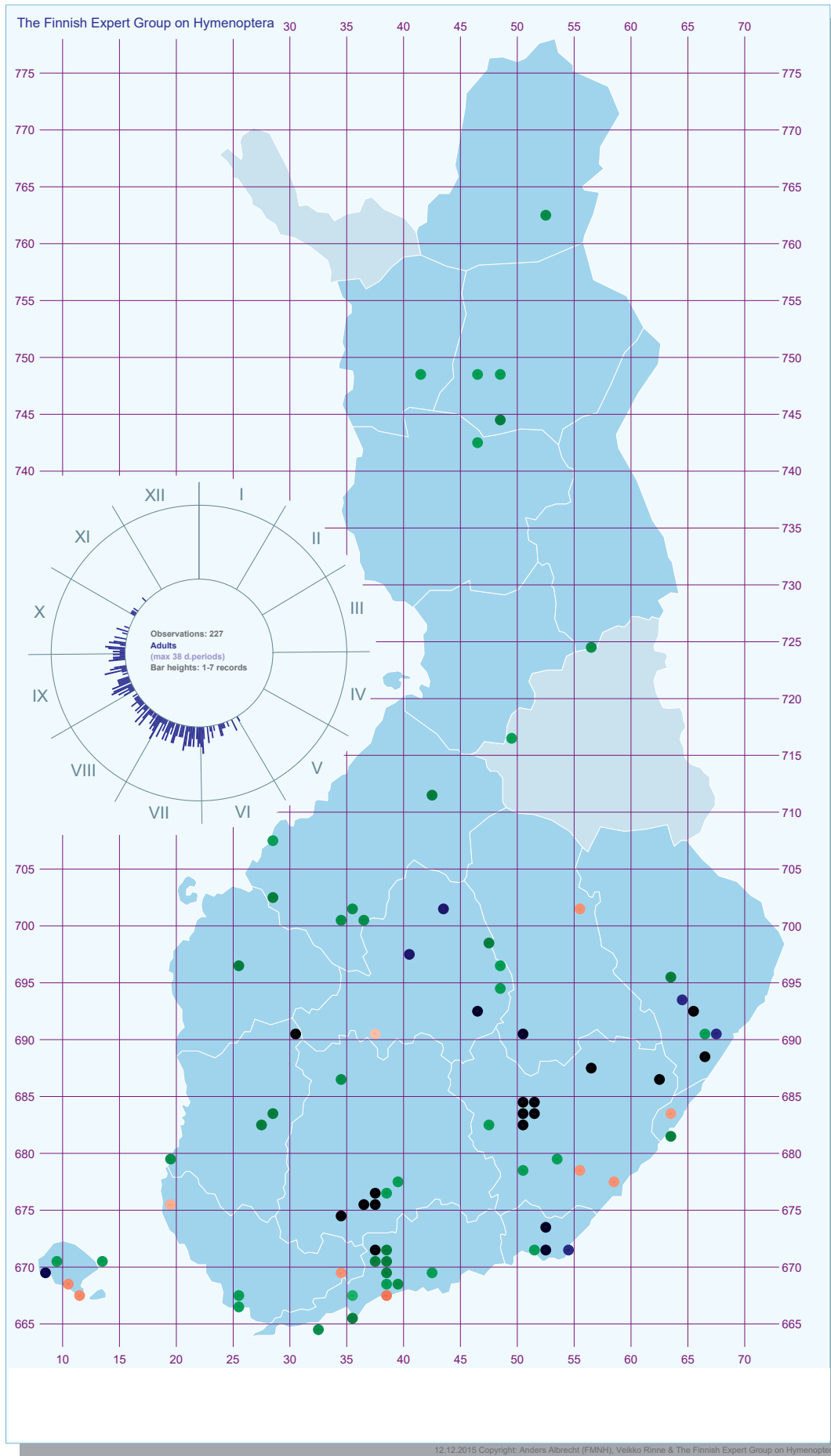
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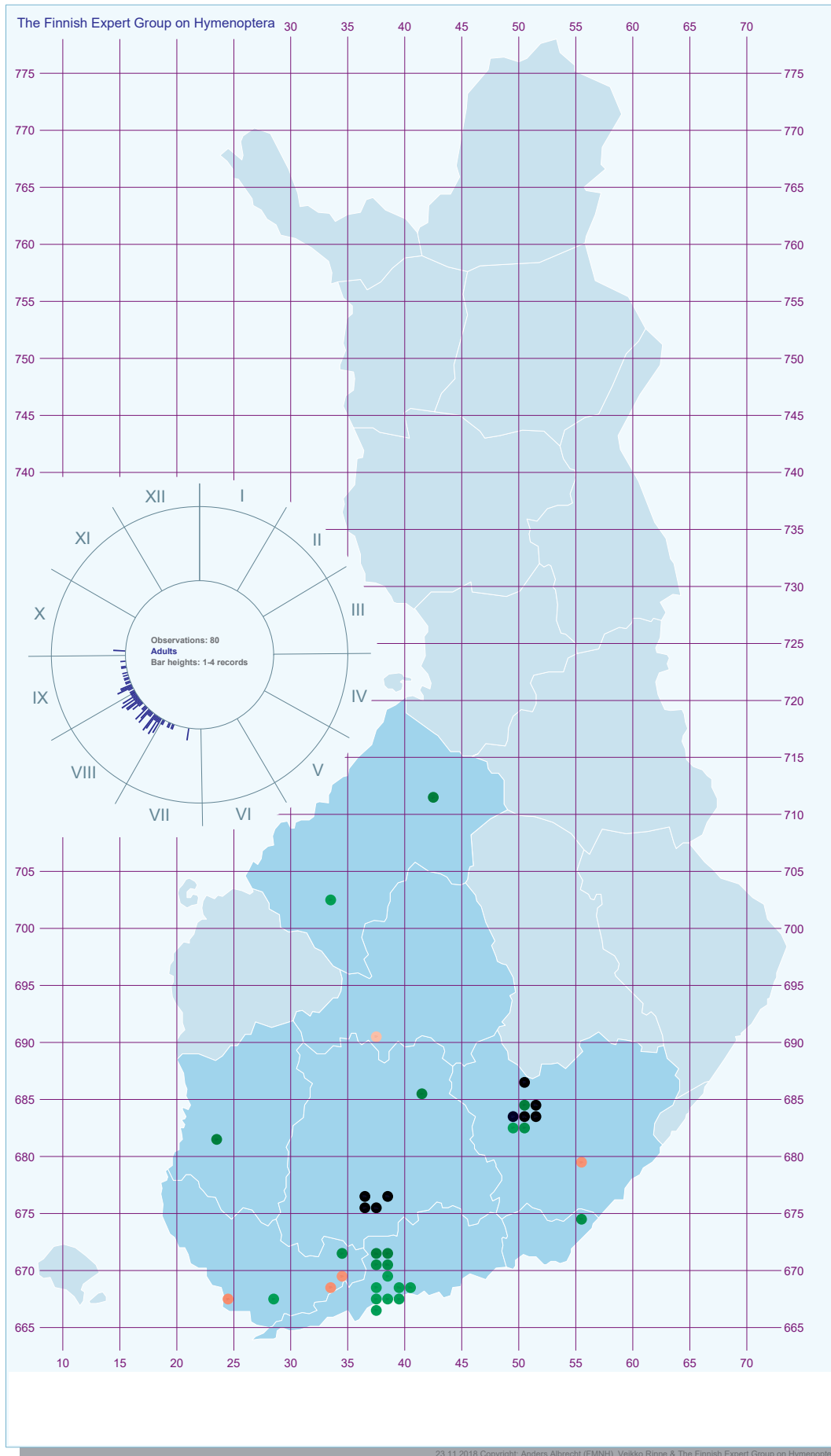


Key to males of the European species of *Ooctonus*, modified from Triapitsyn (2010)

- 1 Metanotum and propodeum with reticulate sculpture; fore wing markedly rounded apically*O. hemipterus* Haliday, 1833
– Metanotum and propodeum without reticulate sculpture; fore wing usually at least slightly truncate (occasionally just slightly rounded) apically2
- 2(1) Frenum of scutellum mostly smooth except for weak sculpture at lateral borders and sometimes also at anterior margin*O. vulgatus* Haliday, 1833
– Frenum of scutellum entirely with reticulate sculpture3
- 3(2) Body length usually more than 1.3 mm*O. insignis* Haliday, 1833
– Body length usually less than 1.2 mm4
- 4(3) Propodeum with a large median areole extending to or almost to anterior margin of propodeum, thus median carina very short or absent*O. notatus* Walker, 1846
– Propodeum either with a distinct median carina extending to anterior margin of propodeum or with median carina incomplete, not extending to anterior margin of propodeum or almost absent or, sometimes, median areole incomplete anteriorly and median carina absent5
- 5(4) Propodeum with a distinct median carina extending to anterior margin of propodeum and shorter than median areole (Fig. 6)*O. novickyi* Soyka, 1950
– Propodeum with median carina usually longer than or sometimes subequal in length to median areole, or, often, median carina incomplete, not extending to anterior margin of propodeum or almost absent or, sometimes, median areole incomplete anteriorly and median carina absent*O. sublaevis* Foerster, 1847

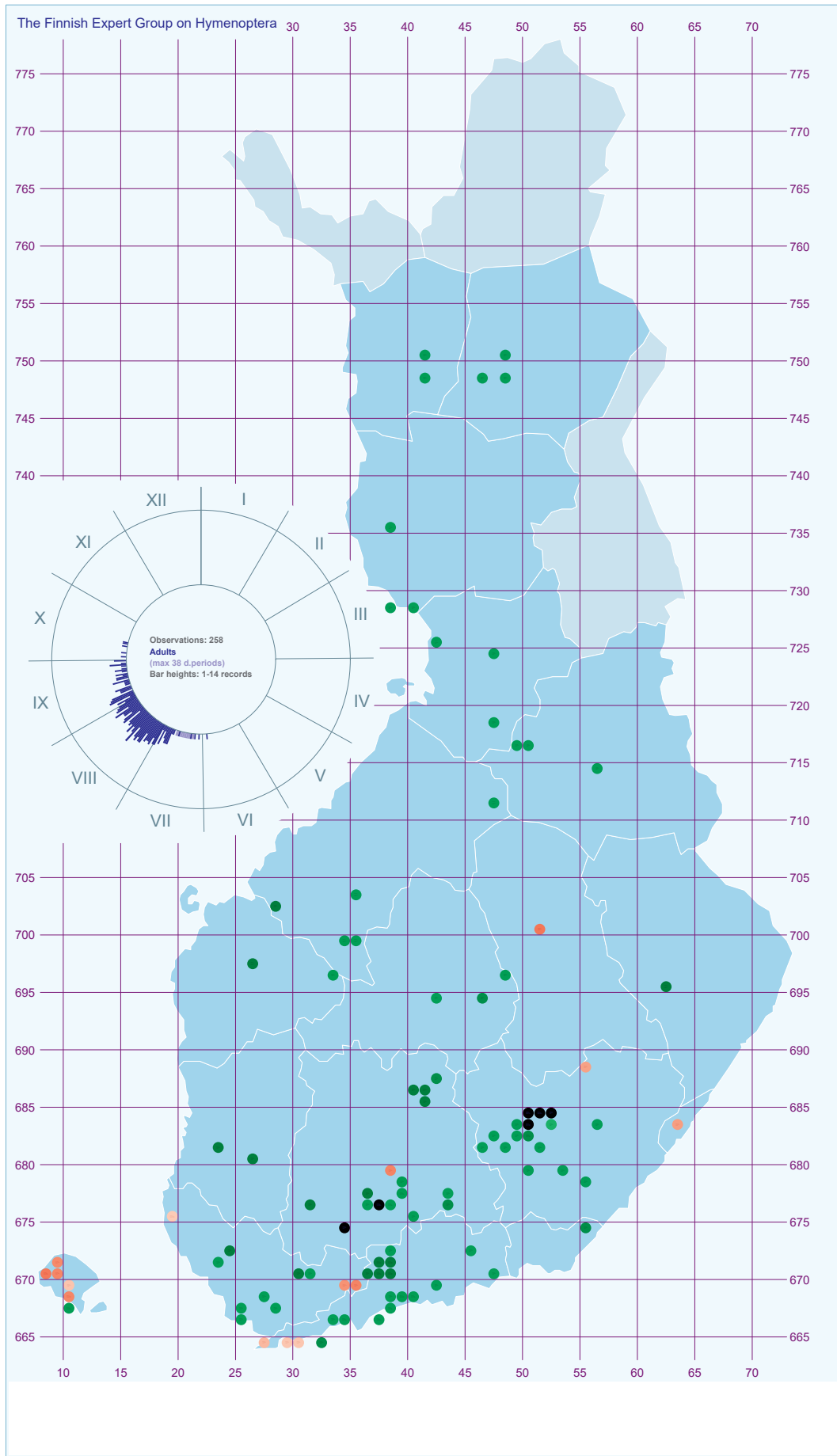


Map 1: Distribution of *Ooctonus hemipterus* Haliday, 1833 in Finland.

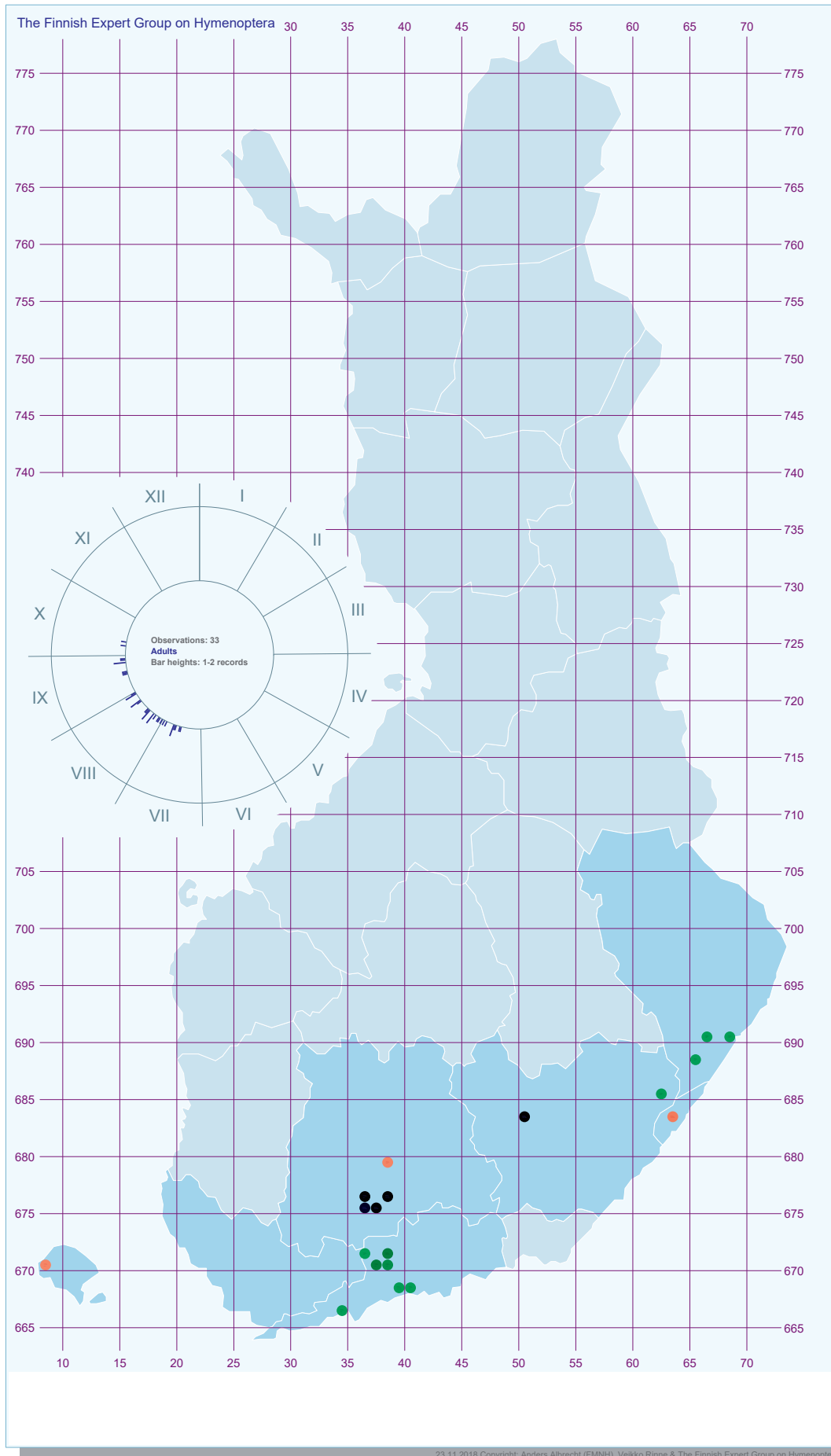


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Map 2: Distribution of *Ooctonus insignis* Haliday, 1833 in Finland.

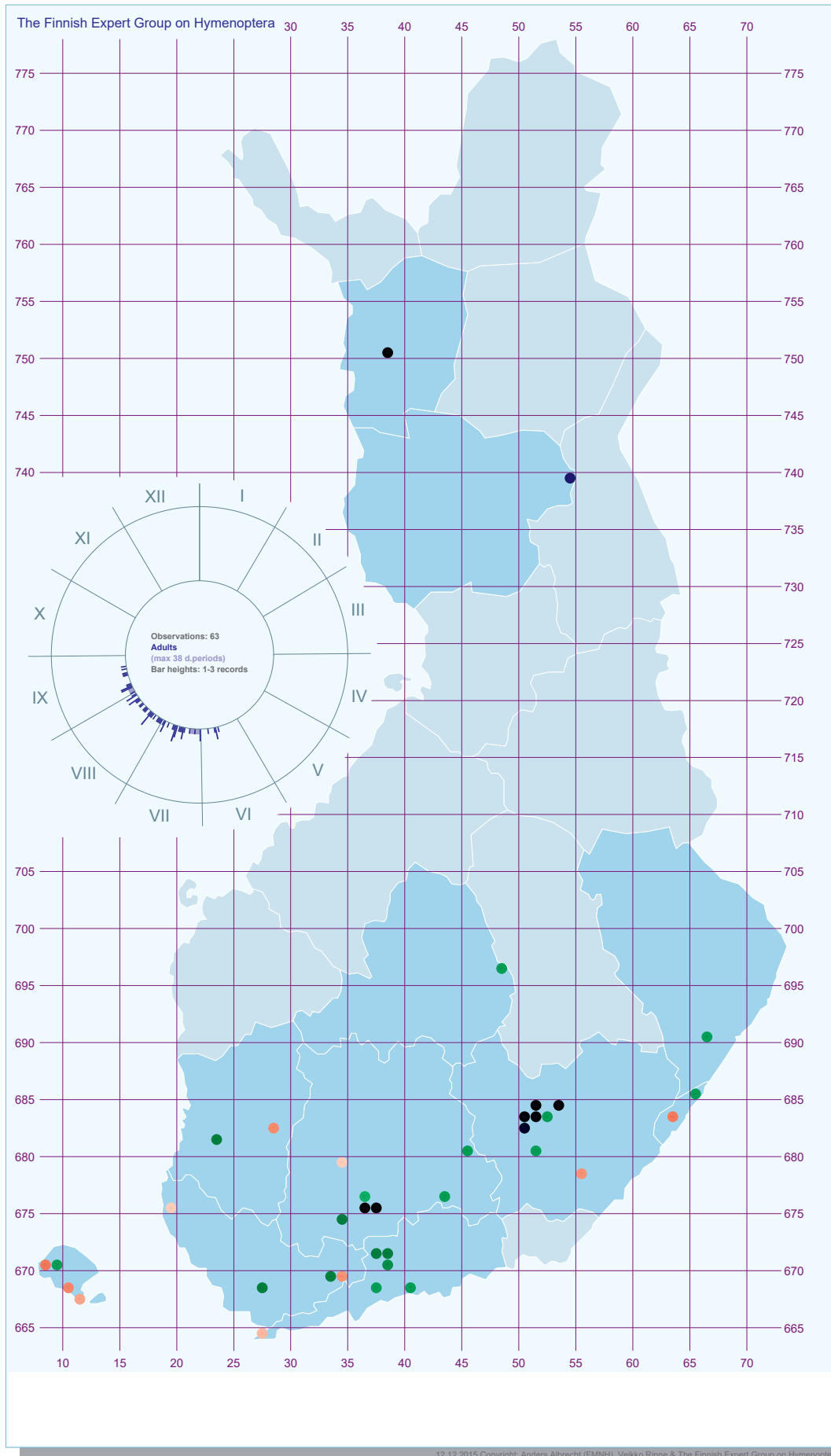


Map 3: Distribution of *Ooctonus notatus* Walker, 1846 in Finland.

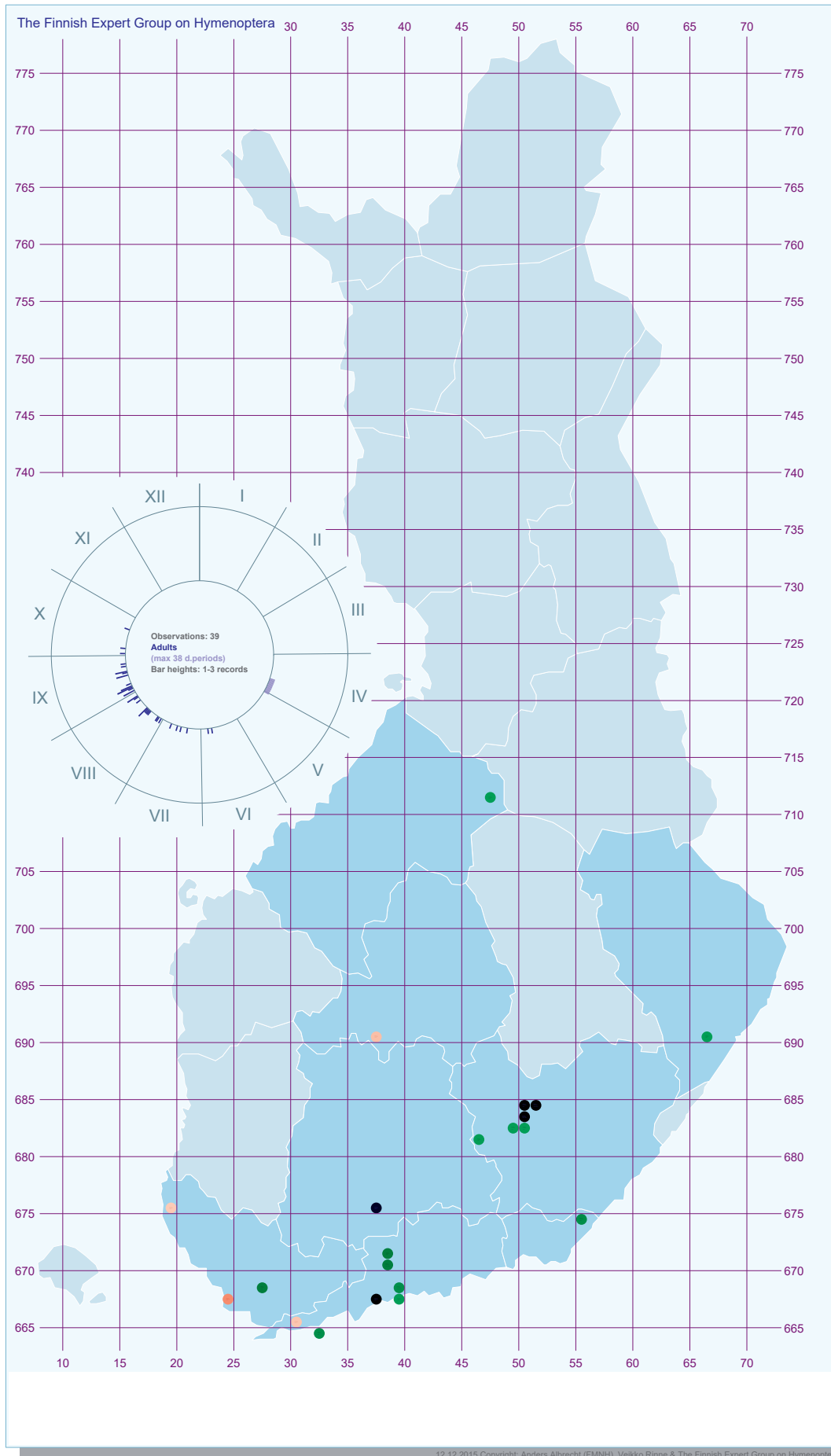


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Map 4: Distribution of *Ooctonus novickyi* Soyka, 1950 in Finland.



Map 5: Distribution of *Ooctonus sublaevis* Foerster, 1847 in Finland.



Map 6: Distribution of *Ooctonus vulgatus* Haliday, 1833 in Finland.