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New Data on the Distribution of *Camponotus fallax* (Nylander, 1856) in Belarus

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Abstract. New data on the distribution of *Camponotus fallax* (Nylander, 1856) in Belarus is given. New spots in Minsk, Mogilev and Vitebsk regions have been determined. A new assumption about the distribution of this species in Belarus is made.

Keywords: geographical distribution, ants, Hymenoptera, *Camponotus*, invertebrate biodiversity.

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Новые данные по распространению *Camponotus fallax* (Nylander, 1856) в Беларуси

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Аннотация. Приводятся сведения о новых находках *Camponotus fallax* (Nylander, 1856) на территории Беларуси. Были выявлены новые точки из Минской, Могилевской и Витебской областей. Высказано новое предположение о распространении данного вида в Беларуси.

Ключевые слова: географическое распространение, муравьи, Hymenoptera, *Camponotus*, биоразнообразие беспозвоночных животных.

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Introduction

Camponotus (*Myrmentoma*) *fallax* (Nylander, 1856) is widespread in Europe as well as in the northwestern part of Africa, the Caucasus, Transcaucasia, Asia Minor and northwestern Ka-

zakhstan [Radchenko, 2016]. This species was discovered by M.D. Ruzskiy in Western Siberia [Ruzskiy, 1946]. In Belarus, *C. fallax* was collected for the first time and then identified from the collections of E.I. Khotko (25.05.1972, village Lughi, Luninets district, Brest region) [Sinchuk, Blinov, 2018]. As a result of the research carried out from 1980 to 1986 (V.V. Blinov) and from 2012 to 2017 (A.V. Sinchuk) *C. fallax* was recorded in the territory of all the administrative regions of Belarus.

According to reports, the northern border of *C. fallax* distribution in Belarus goes along the border of hornbeam-oak-dark coniferous forests subzone (spruce-hornbeam oak forests), i.e. it is effective to use the geobotanical zoning of Belarus for this dendrobiont [Sinchuk, Blinov, 2018]. However, until now the northern range borders have not been well-determined due to the lack of data. Therefore, the objective of this work is to clarify the northern boarders of *C. fallax* in the Belarusian territory.

Material and methods

The material for the research was being collected in territory of Minsk, Mogilev and Vitebsk Regions of Belarus from 2018 to 2021. The collection of ants was created based on various approaches used in the fieldwork [Agosti et al., 2000]. The species was identified according to the corresponding identification tables [Arnol'di, Dlusskiy, 1978; Radchenko, 2016]. Typical specimens of ants were photographed (Fig. 1) with Optec SZ780 trinocular stereomicroscope and a Canon 1100d SLR camera installed on it. HeliconRemote software was used to get the images from the microscope. HeliconFocusLite was used to process some pictures and get a sharp resolution of specific objects.

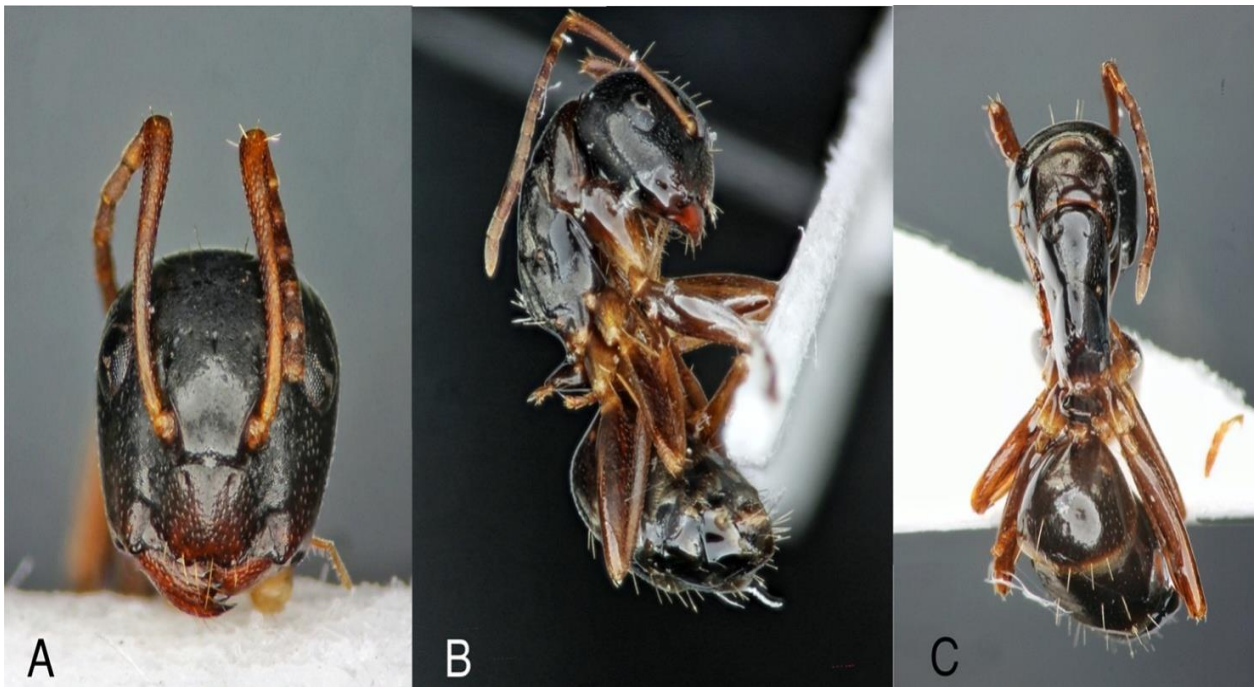

Fig. 1. The worker ant of *Camponotus fallax* (Nylander, 1856), found in the village Malaya Volovshchina (Minsk region, Belarus) in 2018 (photo by M.A. Logachev):
A – head; B – profile view; C – dorsal view
Рис. 1. Рабочий муравей *Camponotus fallax* (Nylander, 1856), найденный в селе Малая Воловщина (Минская область, Беларусь) в 2018 г. (фото М.А. Логачёва):
A – голова; B – вид в профиль; C – вид сверху

The color of the caught worker ant (see Fig. 1) ranges from dark-brown-red to black, the body is glossy. The color of the legs, antennae and mandibles are brighter. The anterior margin of the clypeus has a notch in the middle. Mandibles are wide with 5 distinct teeth. The body length is 4.5 mm.

The distribution map was built using the program RStudio [Sinchuk, Buga, 2016].

Results and discussion

As a result of the research carried out from 2018 and 2021, new points of *C. fallax* detection in Belarus were established.

Minsk region: 05.05.2018, village Malaya Volovshchina, 53°58'07.1" N 27°14'41.9" E, in a dry trunk, leg./det. M.A. Logachev; 11.07.2020, village Malaya Volovshchina, 53°57'46.4" N 27°15'08.7" E, in *Quercus robur,* leg./det. M.A. Logachev; 28.05.2021, Volozhyn district, near the village Rudnya, 53°58'20.0" N 26°42'03.6" E, in *Quercus robur*, leg. O.V. Sinchuk, det. N.V. Sinchuk; 10.06.2021, Minsk, 53°54'40.8" N 27°33'56.6" E, leg./det. M.A. Logachev; 11.06.2021, Borisov, near the shopping center "Corona", 54°14'06.3" N 28°30'23.1" E, in *Betula* sp., leg./det. N.V. Sinchuk; 11.06.2021, Borisov, M. Gorky St, 54°13'01.2" N 28°30'10.8" E, in *Populus* sp., leg./det. N.V. Sinchuk.

Mogilev region: 06.06.2021, town Krichev, Bolnichny lane, 53°44'17.6" N 31°42'23.3" E, in *Tilia* sp., leg. N.V. Sinchuk, det. O.V. Sinchuk.

Vitebsk region: 06.06.2021, Orsha, 54°30'18.1" N 30°25'00.3" E, in *Fraxinus excelsior*, leg./det. N.V. Sinchuk.

The northernmost distribution point of *C. fallax* has been discovered in the north-eastern Estonia [Keis et al., 2019]. It is very far from its actual range, the boundaries of which go near the hornbeam-oak-dark coniferous forests subzone (according to the geobotanical zoning of Belarus).

In Belarus, the northernmost point where these ants have been found so far is the vicinity of the village Kraytsy (Lepel district, Vitebsk region), as determined by V.V. Blinov on 18.06.1986 [Sinchuk, Blinov, 2018]. This village is located in the territory of the State Environmental Institution “Berezinsky Biosphere Reserve”.

According to the available data, colonies of *C. fallax* are most often recorded in the Brest and Gomel regions [Sinchuk, Blinov, 2018] (Fig. 2; see Table). At the same time, the data on the distribution of this species in the territory of other administrative regions is not sufficient to determine the exact location of the northern border. The assumption about the passage of the northern boundary of *C. fallax* distribution along the northern border of the hornbeam-oak-dark coniferous forests subzone (spruce-hornbeam oak forests) is based on the data available as of today [Radchenko, 2016] (Fig. 2; see Table). However, taking into account the fact that more northern *C. fallax* detection points are gradually established within the oak-dark coniferous forests subzone boundaries (according to the geobotanical zoning of Belarus), as well as considering the distribution boundaries mentioned in the scientific literature [Lebas et al., 2016; Radchenko, 2016], it is possible to say that the northern range border of *C. fallax* in Belarus passes through the territory of the Vitebsk region. The boundaries mainly coincide with the northern borders of the Oshmyany-Minsk and Orsha-Mogilev districts the oak-dark coniferous forests subzone (according to the geobotanical zoning of Belarus).

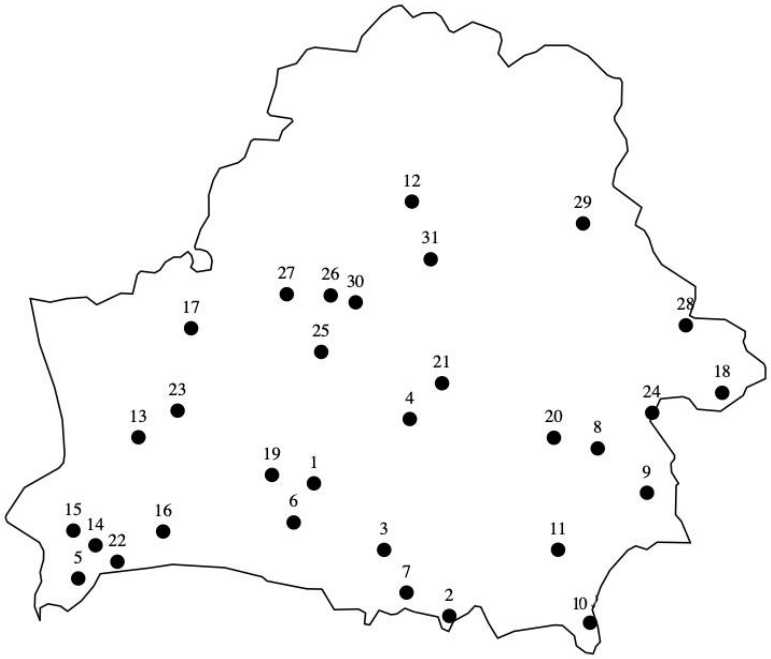

Fig. 2. Locations of detection of *Camponotus fallax* (Nylander, 1856) in Belarus (1980–2021): 1 – vil Lugi, 2 – vil Zasintsy, 3 – vil Khvoensk, 4 – Starye Dorogi, 5 – vil Zamshany, 6 – Luninets, 7 – vil Markovskoe, 8 – Buda-Koshelevo, vil Struki, 9 – Dobrush, vil Chistye luzhi, 10 – vil Krasnoe, 11 – vil Dubrovitsa,12 – vil Kraytsy, 13 – Ruzhany, 14 – vil Verkholesye, 15 – Zhabinka, vil Petrovichi, 16 – Drogichin, 17 – Berezovka, 18 – vil Belinkovichi, 19 – vil Lucino, 20 – Zhlobin, 21 – Osipovichi, 22 – vil Divin, 23 – Slonim, 24 – vil Polesie, 25 – vil Novaya Starina, 26 – vil Malaya Volovshchina, 27 – vil Rudnya, 28 – Krichev, 29 – Orsha, 30 – Minsk, 31 – Borisov

Рис. 2. Пункты обнаружения *Camponotus fallax* (Nylander, 1856) на территории Беларуси (1980–2021): 1 – д. Луги, 2 – д. Засинцы, 3 – д. Хвоенск, 4 – г. Старые Дороги, 5 – д. Замшаны, 6 – г. Лунинец, 7 – д. Марковское, 8 – г. Буда-Кошелево, д. Струки, 9 – г. Добруш, д. Чистые лужи, 10 – д. Красное, 11 – д. Дубровица, 12 – д. Крайцы, 13 – гп. Ружаны, 14 – д. Верхолесье, 15 – г. Жабинка, д. Петровичи, 16 – г. Дрогичин, 17 – г. Березовка, 18 – д. Белынковичи, 19 – аг. Люсино, 20 – г. Жлобин, 21 – г. Осиповичи, 22 – аг. Дивин, 23 – г. Слоним, 24 – д. Полесье, 25 – д. Новая Старина, 26 – д. Малая Воловщина, 27 – д. Рудня, 28 – г. Кричев, 29 – г. Орша, 30 – г. Минск, 31 – г. Борисов

All currently known collection points of *Camponotus fallax* (Nylander, 1856) in Belarus with an indication of the plant in which the nest is located (by [Sinchuk, Blinov, 2018] with additions)
Все известные на данный момент точки сбора *Camponotus fallax* (Nylander, 1856) на территории Беларуси с указанием растения, в котором устроено гнездо (по [Синчук, Блинов, 2018] с дополнениями)

Locations	Date	Collection point	Geographical coordinates	The plant in which the nest is located
1	*2*	*3*	*4*	*5*
1	25.05.1972	village Lugi, Luninets district, Brest region	–	*~Quercus robur*
2	28.07.1980	village Zasintsy, Yel′sk district, Gomel region	–	–
3	07.06.1981	village Khvoensk, Zhytkavichy district, Gomel region	–	*Quercus robur*
4	21.06.1981	town Staryye Dorogi, st. Moskovskaya, Minsk region	–	*Pinus silvestris*
5	15.06.1983	village Zamshany, Malorita district, Brest region	–	*Alnus glutinosa*

Continuation of the table
Продолжение таблицы

1	*2*	*3*	*4*	*5*
5	15.06.1983	village Zamshany, Malorita district, Brest region	–	*Quercus robur*
6	26.06.1983	town Luninets, Brest region	–	–
7	13.08.1983	village Markovskoe, Lyelchytsy district, Gomel region	–	*Quercus robur*
8	15.05.1984	village Struki, Buda-Kashalyova district, Gomel region	–	*Quercus robur*
8	16.05.1984	town Buda-Kashelevo, Gomel region	–	*Quercus robur*
9	20.05.1984	village Chistye Luzhi, Vetka district, Gomel region.	–	*Quercus robur*
9	26.09.2015	town Dobrush, st. Polevaya, 40, Gomel region	52°23'03.4" N 31°20'28.4" E	–
10	23.05.1984	village Krasnoe, Brahin district, Gomel region	–	*Quercus robur*
11	29.05.1984	village Dubrovitsa, Khoiniki district, Gomel region	–	*Quercus robur*
12	18.06.1986	village Kraytsy, Lyepyel district, Vitebsk region	–	–
13	04.07.1986	near the lake. Papernya, town Ruzhany, Pruzhany district, Brest region	–	*Quercus robur*
14	21.06.2012	village Verkholesye, st. Chkalova, Kobryn district, Brest region	52°04'55.3" N 24°18'10.4" E	Hedge of *Alnus glutinosa*
15	27.06.1986	village Petrovichi, Zhabinka district, Brest region	–	*Quercus robur*
15	06.06.2015	town Zhabinka, park, Brest region	52°11'34.6" N 24°01'29.7" E	*Acer platanoides*
15	08.08.2015	town Zhabinka, Brest region	52°12'10.6" N 24°01'12.2" E	*Quercus robur*
16	07.06.2015	town Drogichin, park named after M. Gorky, Brest region	52°11'09.1" N 25°09'03.3" E	*Fraxinus excelsior*
17	04.08.2015	town Berezovka, st. Lenina, 13, Brest region	53°42'57.7" N 25°30'06.3" E	–
18	10.06.2016	village Belinkovichi, Kastsyukovichy district, Mogilev region	53°13'48.4" N 32°09'45.0" E	*Populus* × *canadensis*
19	25.06.2016	stopping point of Yakub Kolas, village Lyusino, Hantsavichy district, Brest region	52°37'42.4" N 26°30'36.0" E	*Juglans regia*
20	27.06.2016	Zhlobin, st. Mezhdunarodnaya, Gomel region	52°53'29.5" N 30°03'05.7" E	–
21	09.07.2016	town Osipovichi, st. Leninskaya, 34, Mogilev region	53°18'07.2" N 28°38'55.7" E	–
22	31.07.2016	village Divin, st. Sovetskaya, Kobryn district, Brest region	51°57'30.4" N 24°34'37.1" E	*Juglans regia*
23	05.08.2016	town Slonim, st. M. Gorky, 23, Grodno region	53°05'44.9" N 25°19'55.9" E	*Juglans regia*
24	09.10.2016	village Polesye, Chachersk district, Gomel region	53°04'46.5" N 31°17'03.8" E	–

End of the table
Окончание таблицы

1	*2*	*3*	*4*	*5*
25	25.06.2017	village Novaya Starina, Uzda district, Minsk region	53°32'16.1" N 27°08'01.2" E	–
26	05.05.2018	village Malaya Volovshchina, Minsk region	53°58'07.1" N 27°14'41.9" E	–
26	11.07.2020	village Malaya Volovshchina, Minsk region	53°57'46.4" N 27°15'08.7" E	*Quercus robur*
27	28.05.2021	near the village Rudnya, Volozhyn district, Minsk region	53°58'20.0" N 26°42'03.6" E	*Quercus robur*
28	06.06.2021	town Krichev, Bolnichny lane, Mogilev region	53°44'17.6" N 31°42'23.3" E	*Tilia* sp.
29	06.06.2021	town Orsha, Vitebsk region	54°30'18.1" N 30°25'00.3" E	*Fraxinus excelsior*
30	10.06.2021	city Minsk, Minsk region	53°54'40.8" N 27°33'56.6" E	–
31	11.06.2021	town Borisov, near the shopping center "Corona", Minsk region	54°14'06.3" N 28°30'23.1" E	*Betula* sp.
31	11.06.2021	town Borisov, st. M. Gorky, Minsk region	54°13'01.2" N 28°30'10.8" E	*Populus* sp.

Note: locations of detection are numbered as shown in the Fig. 2.
Примечание: нумерация пунктов обнаружения соответствует таковой на рис. 2.

Conclusions

Based on the literary sources and author's newly obtained data, it has been preliminarily established that the *C. fallax* distribution boundaries coincide with the northern borders of the Oshmyany-Minsk and Orsha-Mogilev districts the oak-dark coniferous forests subzone (according to the geobotanical zoning of Belarus).

However, further studies can supplement this data with more findings in further northern points.

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