



Floristic materials and critical notes on genus *Orobanchе* L. sect. *Orobanchе* subsect. *Glandulosae* (Beck) Teryokhin in Bulgaria

Kiril Stoyanov

Department Botany - Agricultural University of Plovdiv

Department Botany, Agricultural University
12 Mendeleev Str., 4000 Plovdiv,
BULGARIA,
tel. +359 32 654332
e-mail: orobanche@abv.bg
www.botanica.hit.bg

New collected material of genus *Orobanchе* L. sect. *Orobanchе* subsect. *Glandulosae* (Beck) Teryokhin. and both specimens existing in Bulgarian herbaria and data published before are revised and used for creation of maps. One subspecies (*O. alba* ssp. *xanthostigma*) and two forms (*O. alba* f. *lutescens* and f. *rubiginosa*) are reported as new taxa in the flora of Bulgaria. The chorological data about the known species and intraspecific taxa are reconsidered. The known host plants are discussed comparing both herbar data and literature reviewed.

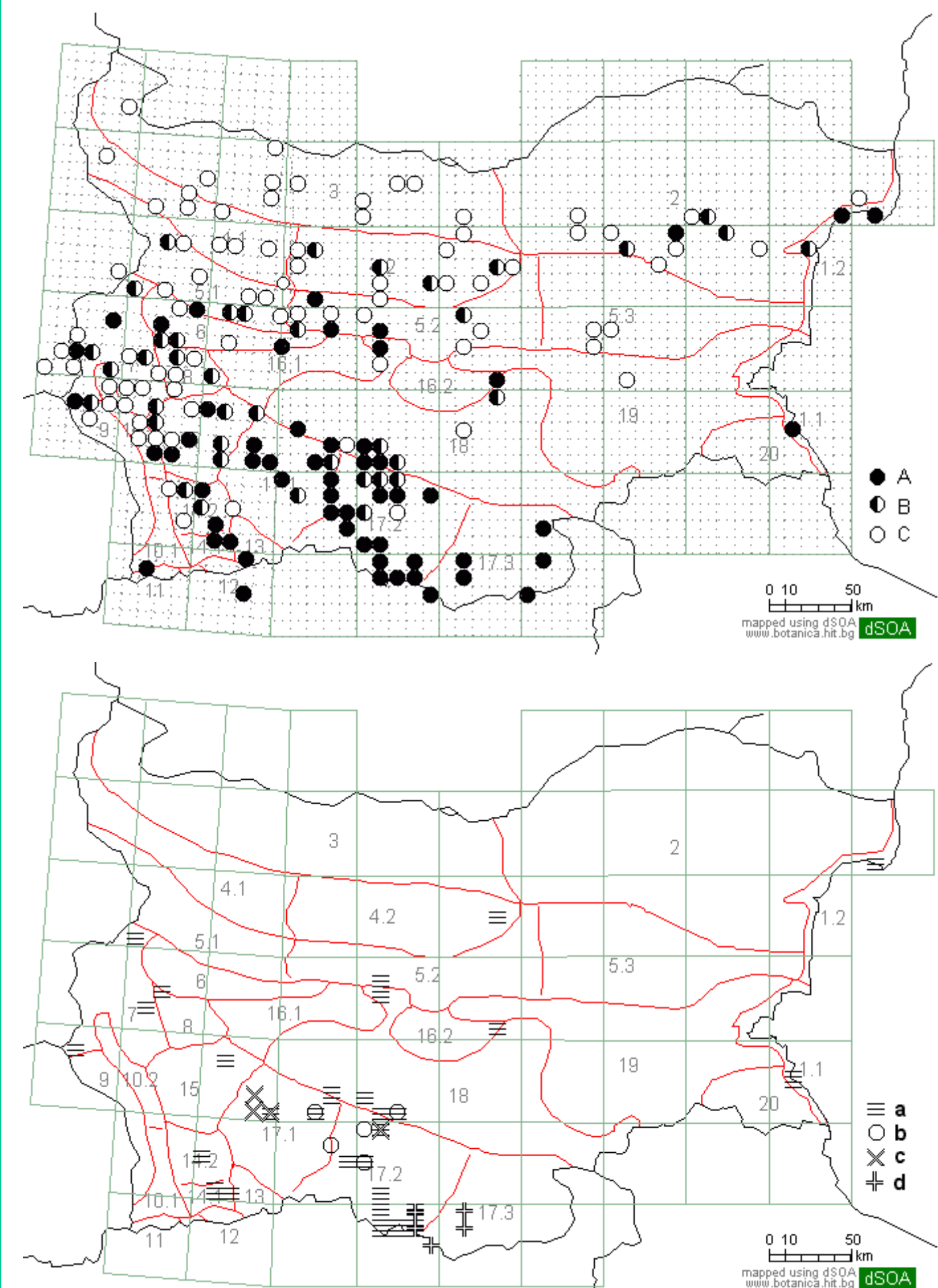


Fig. 1. Horological data of *O. alba*: A - new data, B - confirmed data, C - data from literature; Host plants: a - *Thymus*, b - *Acinos*, c - *Origanum*, d - *Satureja*

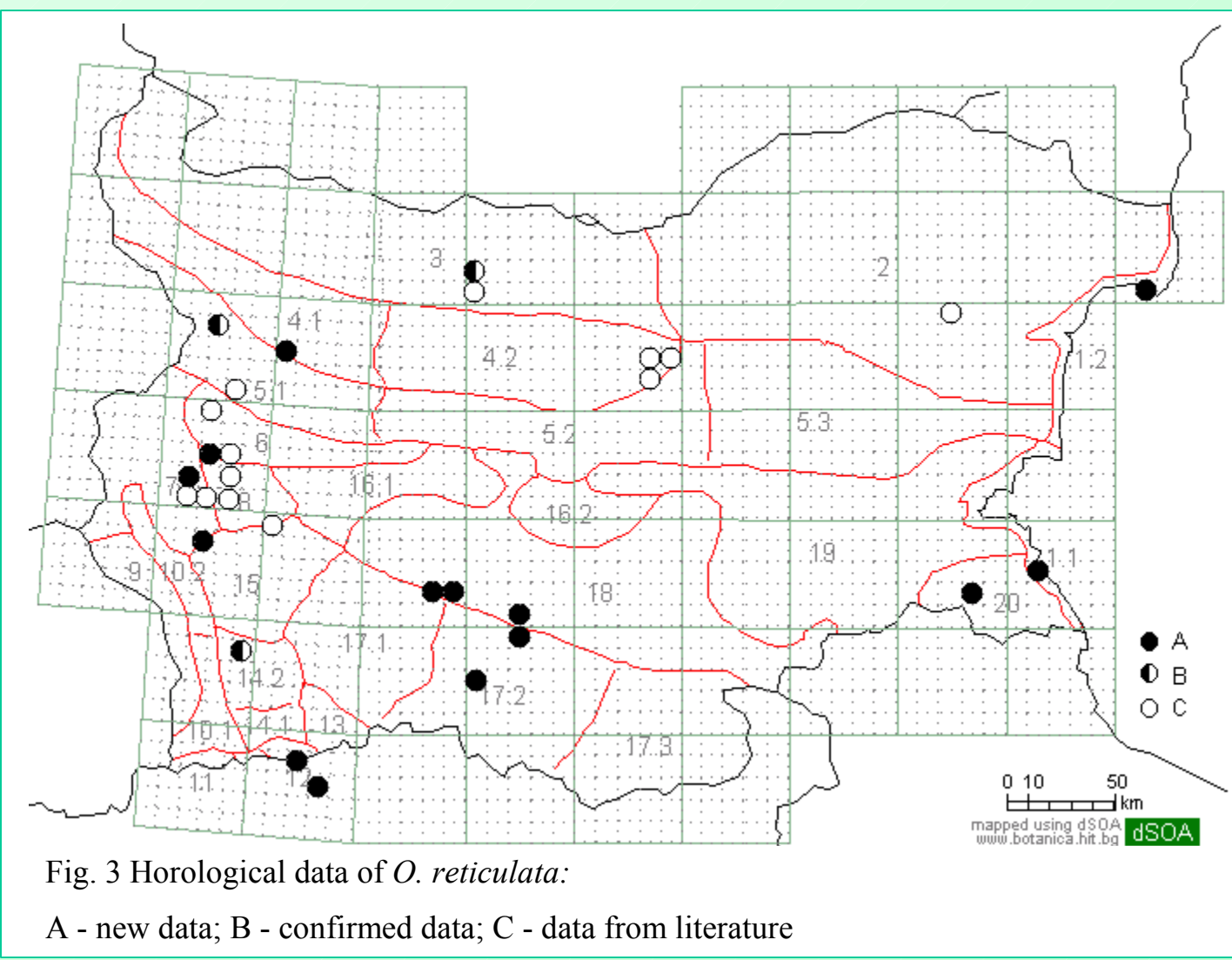


Fig. 3 Horological data of *O. reticulata*:

A - new data; B - confirmed data; C - data from literature

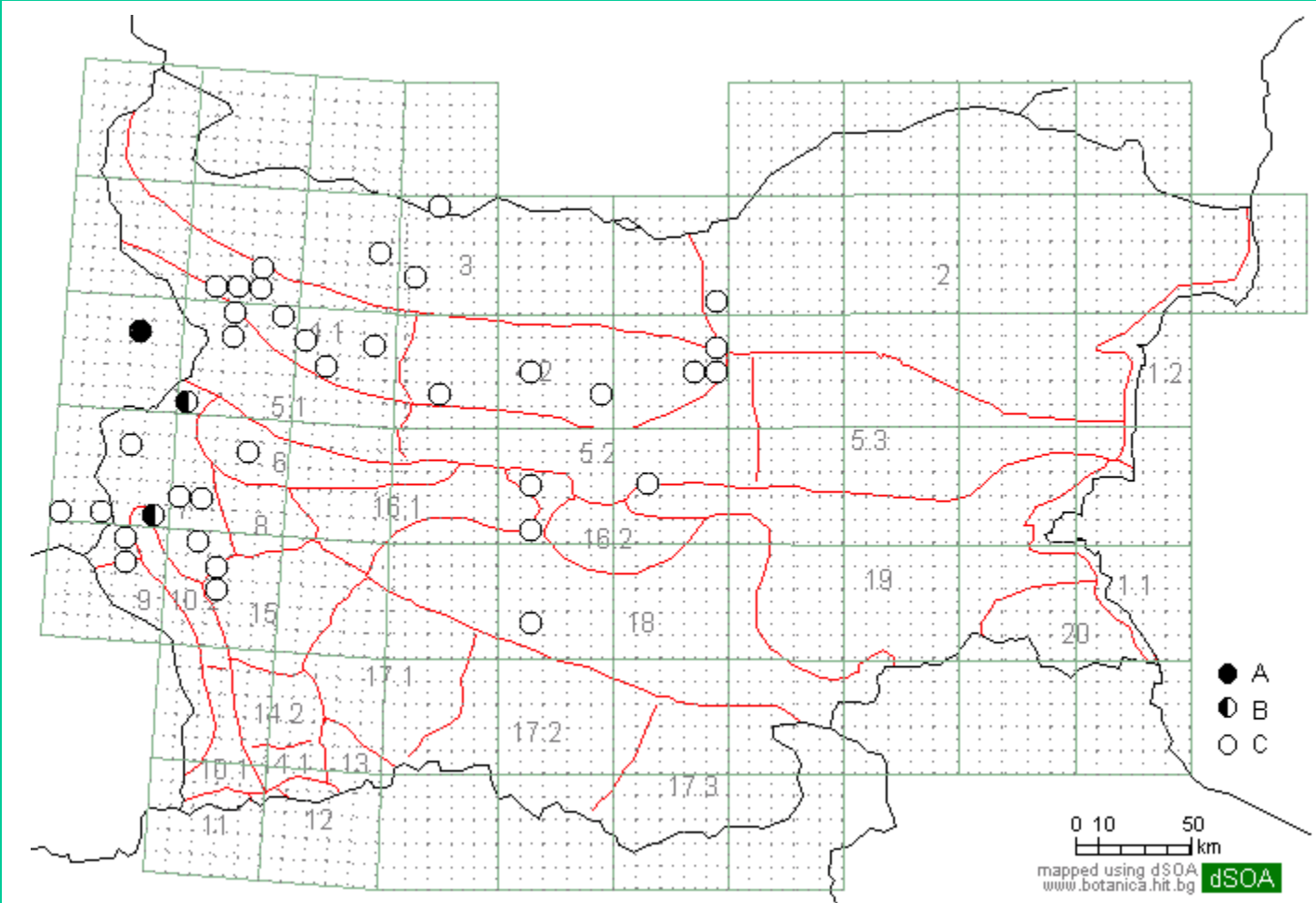


Fig. 5. Horological data of *O. serbica*:

A - new data; B - confirmed data; C - data from literature

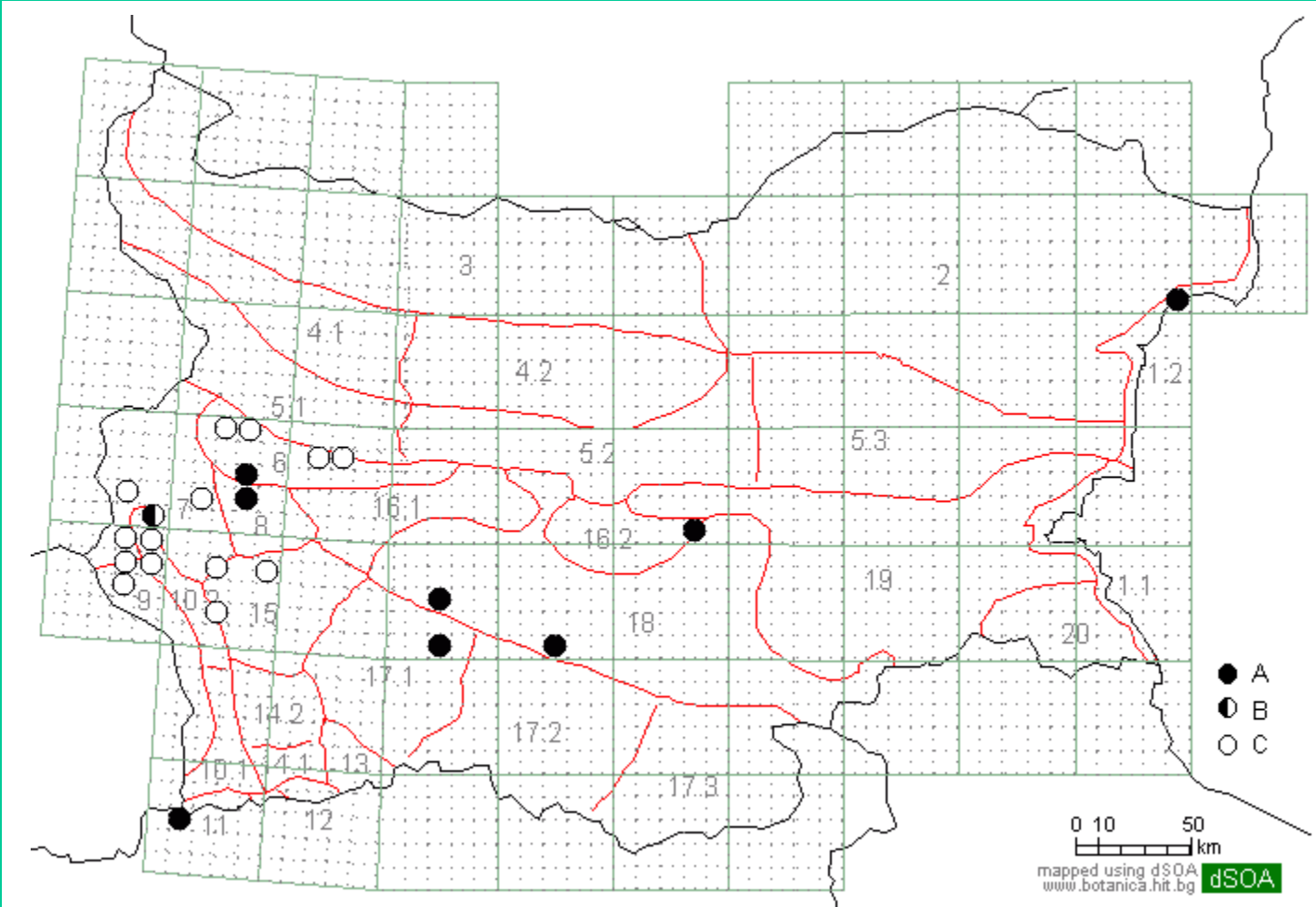


Fig. 6. Horological data of *O. panicii*:

A - new data; B - confirmed data; C - data from literature

Флористични материали и критични бележки от род *Orobanchе* L. sect. *Orobanchе* subsect. *Glandulosae* (Beck) Teryokhin в България

Кирил Стоянов

Катедра Ботаника - Аграрен университет - Пловдив

В българската флора са известни четири вида от subsect. *Glandulosae* – *O. alba* Steph., *O. reticulata* Wallr., *O. panicii* Beck и *O. serbica* Beck & Petrovič. *Orobanchе alba* е полиморфен вид, който не е напълно проучен в България. Целта на изследването е да ревизира и представи известните хорологични данни за представителите от тази подсекция, както и да анализира информацията за техните гостоприемници.

In the Bulgarian flora are known four species of genus *Orobanchе* L. sect. *Orobanchе* subsect. *Glandulosae* (Beck) Teryokhin – *O. alba* Steph., *O. reticulata* Wallr., *O. panicii* Beck and *O. serbica* Beck & Petrovič. *Orobanchе alba* is a polymorphic species wich is not fully examined in Bulgaria. The aim of this study is to revise and represent the known horological data about the members of subsect. *Glandulosae* in Bulgaria as well as to analyze the information about their host plants.

Orobanchе alba Steph.

New and unpublished data (fig. 1) for Southern Black Sea coast, Belasitsa, Slavyanka, Mesta Valley, Southern Pirin and Eastern Rhodopes. The confirmed data covers 16 regions. The hosts of this species are exclusive from *Lamiaceae* - *Acinos suaveolens*, *Origanum vulgare*, *Satureja* spp., and *Thymus* spp.

O. alba var. *alba* f. *alba*. Covers the area of the species. Known hosts - *Thymus*, *Acinos* and *Satureja*.

O. alba var. *alba* f. *campanulata* Beck. Not confirmed by herbar sheets and is indicated for Sofia region, Vitosha and Sredna-gora.

O. alba var. *alba* f. *capitata* Beck (fig. 2-a). New data for Northern Black Sea region, Northeast Bulgaria, Eastern Balkan Foothill region, Western and Central Stara-Planina, Belasitsa, Slavyanka, Western and Central Rhodopes and Thracian plain. Confirmed for 3 regions. Host plants: *Thymus* and *Acinos*.

O. alba var. *alba* f. *communis* Beck (fig. 2-b). New data for Struma valley (south), Western Foothill region, Western and Central Rhodopes. Confirmed for Stara-planina and Thracian plain. Hosts *Thymus* and *Acinos*.



Orobanchе reticulata Wallr.

New and unpublished data (fig. 3): Black Sea coast, Slavyanka, Thracian plain. Confirmed for Danube plain, Western Stara-planina, Sofia region, Znepole region, Northern Pirin, Rila, Western and Central Rhodopes, Tracian plain and Strandja. Indicated without confirmation for Northeast Bulgaria, Balkan Foothill region and Vitosha. The herbar sheets and the own collections confirm the hosts *Achillea pectinata*, *Cirsium* spp. and *Cnicus benedictus*.

O. reticulata subsp. *reticulata* (fig. 4-a). Confirmed for Black Sea coast, Western Stara-planina, Sofia region, Znepole region, Vitosha, Slavyanka, Northern Pirin, Rila, Western and Central Rhodopes, Tracian plain and Strandja. Indicated as widespread.

O. reticulata subsp. *pallidiflora* (Wimm. et Grab.) Beck (fig. 4-b). New data for Tracian plain. Confirmed for Danube plain. Indicated without confirmation for Northeast Bulgaria, Balkan Foothill region, Znepole region and Vitosha. The key in "Flora Republicae Popularis Bulgaricae" leads incorrectly to *O. alba* instead of this subspecies.

Orobanchе serbica Beck & Petrovič

This species is confirmed only from two localities of Znepole region – Chepan Mountain over Dragoman and Zemen Mountain on altitudes between 600 and 1000 m. One herbar sheet is revised by Delipavlov as *O. serbica* but it tally to the description of *O. minor* Sutt. Probably the other indicated localities are based on incorrectly identified specimens of *O. alba* or *O. minor*. This unconfirmed data is from Notheast Bulgaria, Danube plain, Balkan Foothill region, Western Stara-planina, Sofia region, Vitosha, West Frontier Mountains, Rila, Thracian plain, Tundja hilly plain. This species is endemic for the Balkan Peninsula, with a little known localities. Figures in the European list of the rare, endangered and endemic plants with the category "rare". The only confirmed host plant for this species is *Artemisia alba*. The unproved hosts *Genista*, *Chamaecytisus*, *Alchemilla* are indicated, probably on the basis of incorrectly determined *O. minor* Sutt. and *O. crenata* Forssk., or by the plants in neighbourhood.



Orobanchе panicii Beck

New and unpublished data for Western Rhodopes and Tracian plain. Confirmed for Northern Black Sea coast, Sofia region, Znepole region, Vitosha, Belasitsa. Indicated without confirmation for West Frontier Mountains, Struma Valley, Rila and Strandja. One herbar sheet (in SOA) has a twig of *Euonymus*. The other sheets in Bulgarian herbaria have not data about the host plant. The own collections confirm the host *Cephalaria*. One plant was found near the roots of *Pistacia terebinthus*.

The new material used in this study is collected during 2002-2005 in different places of the country. An examination of specimens maintained in the Bulgarian herbaria – SOM, SOA, SO is carried out. Using this data as well the data from some minor collections (Nature Science Museum - Plovdiv, Institute of Plant Genetic Resources - Sadovo and Natural Science Section of Burgas Museum) further maps in UTM (MGRS) grid are created using dSOA computer program.



O. alba var. *alba* f. *lactea* Beck (fig. 2-c). Confirmed for Sofia region and indicated for Balkan Foothill region (eastern part). Host plants: only *Thymus*.

O. alba var. *alba* f. *longibracteata* Beck (fig. 2-d). New and unpublished data for Northeast Bulgaria, Znepole region, Southern Pirin, Western Rhodopes and Tracian plain. Confirmed for 2 regions. Not confirmed for Stara-planina and Sofia region. Host plants: only *Thymus*.

O. alba var. *alba* f. *lutescens* (Boreau) Beck (fig. 2-e). New for Bulgaria: Vitosha, Central Rhodopes. Host plants: *Satureja*, *Thymus*.

O. alba var. *alba* f. *maxima* Beck (fig. 2-f). New data: South Black Sea coast, Vitosha, Southern Pirin, Tracian plain. Confirmed for Balkan Foothill region (east), Znepole region, Western and Central Rhodopes. Indicated for 3 regions without confirmation. Host plants: *Acinos* and *Thymus*.

O. alba var. *alba* f. *rubiginosa* (Dietrich) Beck (fig. 2-g). New for Bulgaria: Central Stara-planina, Central and Eastern Rhodopes, Tracian plain. Host plants: *Acinos*, *Satureja* and *Thymus*. The Bulgarian keys determine incorrectly this form as *O. rapum-genistae* or *O. panicii*.

O. alba var. *alba* f. *rubra* (Hook.) Beck (fig. 2-h). New and unpublished data: Black Sea coast, Western and Central Stara-planina, Southern Pirin, Western Rhodopes. Indicated for the whole country but lack data for 14 subregions. This taxon is too often identified incorrectly as *O. purpurea* Jacq. (because of confusion with *O. purpurea* Hook., nom amb.) or as *O. gracilis* Sm. (because of the corolla color). Host plant: *Thymus*.

O. alba var. *bidentata* Beck (fig. 2-i). New data: Central Stara-planina, Vitosha, West Frontier mountains, Northern Pirin, Western and Central Rhodopes. Indicated without confirmation for Sredna-gora. Host plants: *Thymus*, *Acinos*, *Origanum*.

O. alba subsp. *xanthostigma* Rätzel & Uhlich (fig. 2-j). New for Bulgaria: Western and Central Rhodopes. The Bulgarian keys determine incorrectly this subspecies as *O. rapum-genistae*, *O. panicii* or *O. amethystea*. Host plant: *Origanum vulgare*.



Identification key of *Orobanchе* subsect. *Glandulosae*

- 1^o. Stigma brightly yellow and remains yellow after the bloom
2^o. Corolla 18-26 mm long, often with straight part of the dorsal line. Filaments inserted on 2-2.5 mm up of the corolla base. Upper lip lobes bent outwards. Stigma often with red aureole... *O. panicii*
- 2^o. Corolla 17-19 mm long, with uniformly curved dorsal line. Filaments inserted on 3-5 mm up of the corolla base. Upper lip lobes not bent outwards. Stigma without red aureole... *O. serbica*
- 1^o. Stigma red, purple or whitish, sometimes yellow but in this case darken after bloom and host plant of
3^o. Calyx parts with 1-3 nerves, in siccio light brown. Corolla rose-reddish or yellowish with slightly incised upper lip. Filaments inserted under 3mm of the corolla base, with dense glandular hairs in the upper half. Host plants of *Lamiaceae* ...
a¹. Calyx parts 8-20 mm long, usually entire, sometimes bidentate, usually equal with the corolla tube. Corolla with stright part in the dorsal line. Stigma red or purple, rarely yellow or white subsp. *alba*
b¹. Calyx parts monodentate, var. *alba*
c¹. Stigma red, purple or pink
d¹. Bracts vastly longer than the corolla f.
longibracteata
d². Bracts not longer than the corolla
e¹. Corolla 25-30 mm long f. *maxima*
e². Corolla shorter than 20 mm
f¹. Spike rotundate or ovate, compact, with no many flowers f. *capitata*
f². Spike elongated, cylindrical, usually with many flowers
g¹. Corolla pale yellow or white
h¹. Corolla white f. *lactea*
h². Corolla pale yellow... f. *alba*
g². Corolla pink or purple to red
i¹. Spike dense, elongated ovate, short, with a little flowers. Stem thin f.
communis
i². Spike ± lax, cylindrical, elongated with many flowers. Stem thick
j¹. Corolla short, long almost as wide f. *campanulata*
j². Corolla 1.5-2 times longer as wide ... f. *rubra*
e² Stigma yellow or white
k¹. Whole plant yellow as the stigma f. *lutescens*
k². Corolla reddish or red, coloured as the type. f. *rubiginosa*
b². Calyx parts bidentate. Teeth often dissimilar. Bracts equal to the corolla var. *bidentata*
a². Calyx parts 7-10 mm, entire, equal to the half of the corolla tube. Corolla with uniformly curved dorsal line. Stigma brightly yellow... subsp. *xanthostigma*
incised upper lip. Filaments inserted 2-4 mm of the corolla base; in the upper half with diluted glandular
h¹. m¹. Upper lip intense violet or purple subsp. *reticulata*
m². Upper lip white or pale-yellowish subsp. *pallidiflora*

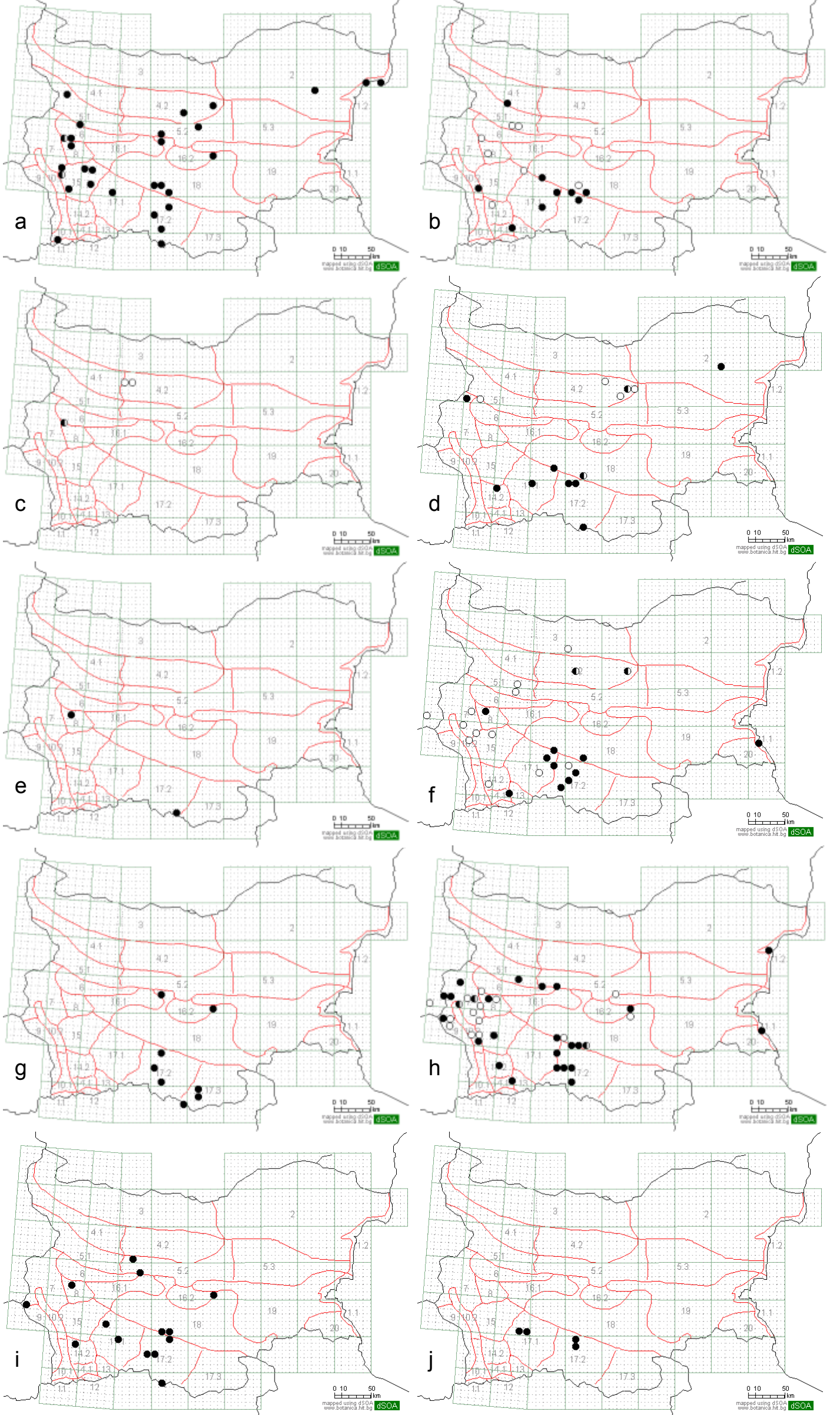


Fig. 2. Intraspecific taxa of *Orobanchе alba*:

a - f. *capitata*; b - f. *communis*; c - f. *lactea*; d - f. *longibracteata*; e - f. *lutescens*; f - f. *maxima*; g - f. *rubiginosa*; h - f. *rubra*; i - var. *bidentata*; j - subsp. *xanthostigma*

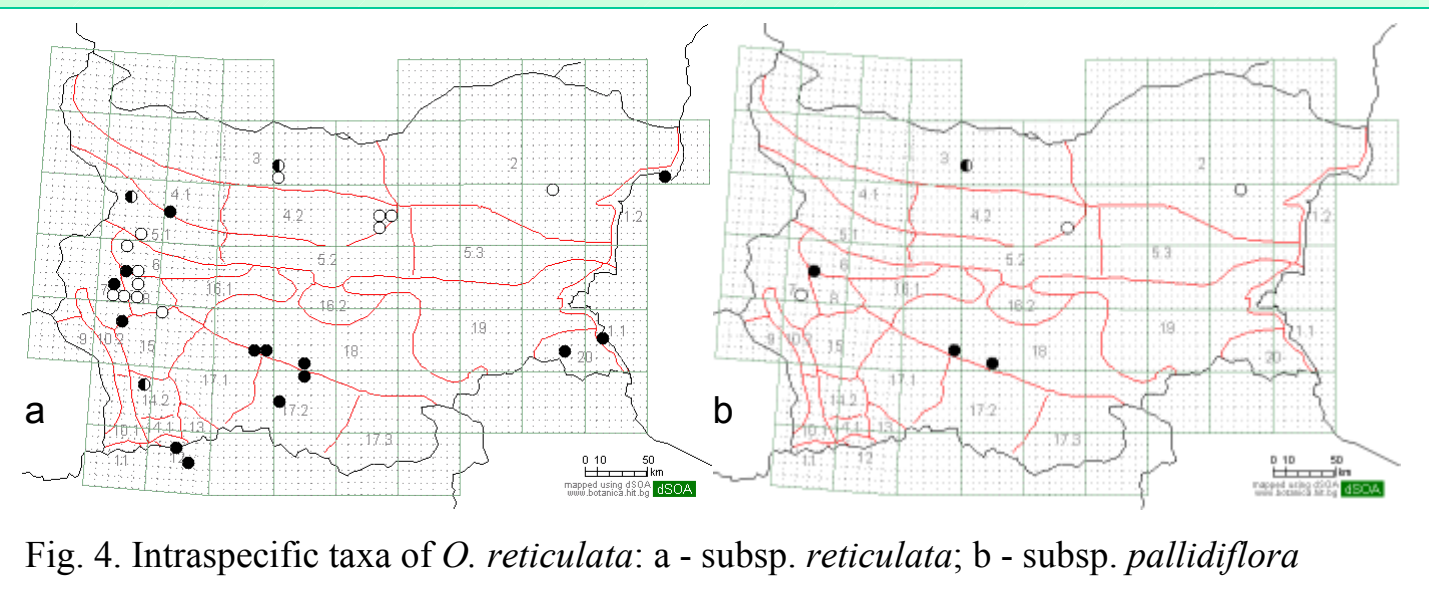


Fig. 4. Intraspecific taxa of *O. reticulata*: a - subsp. *reticulata*; b - subsp. *pallidiflora*

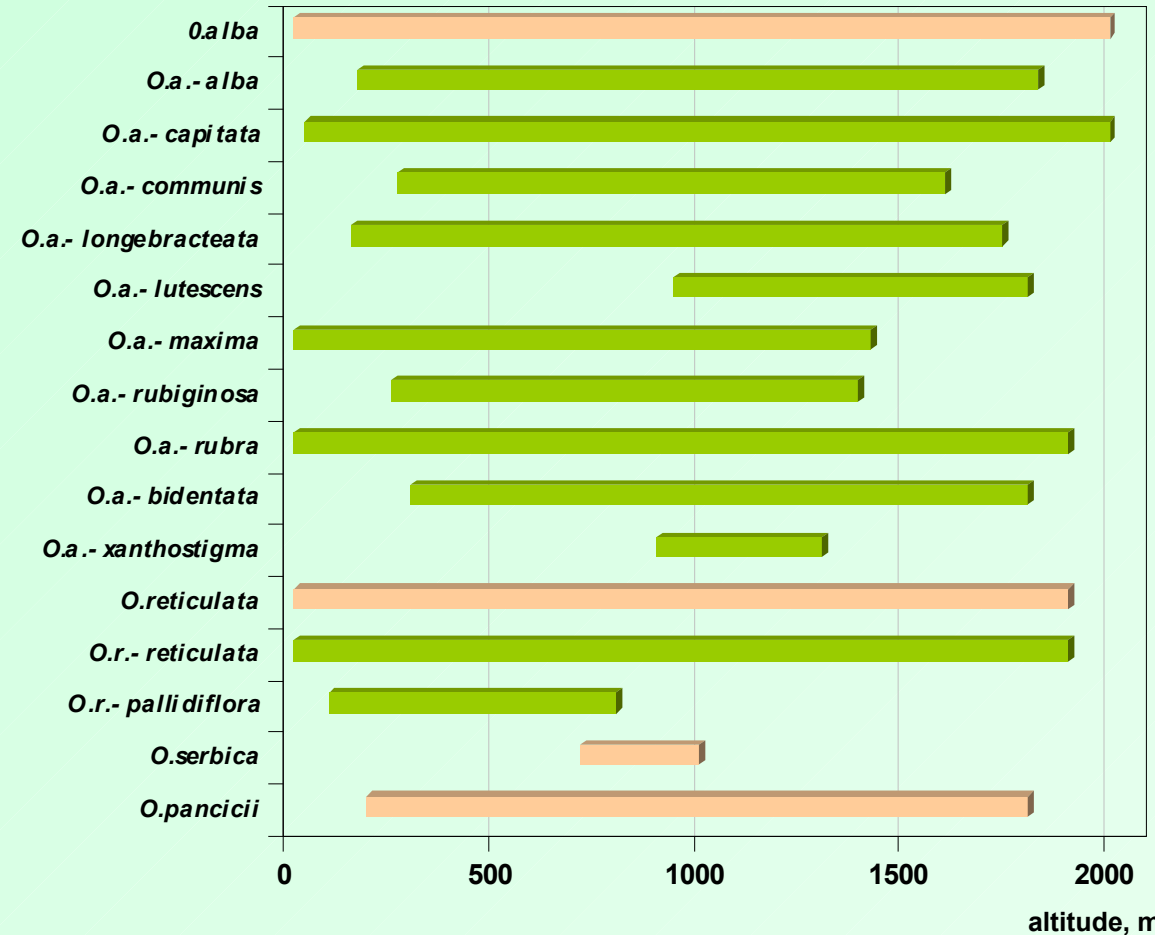


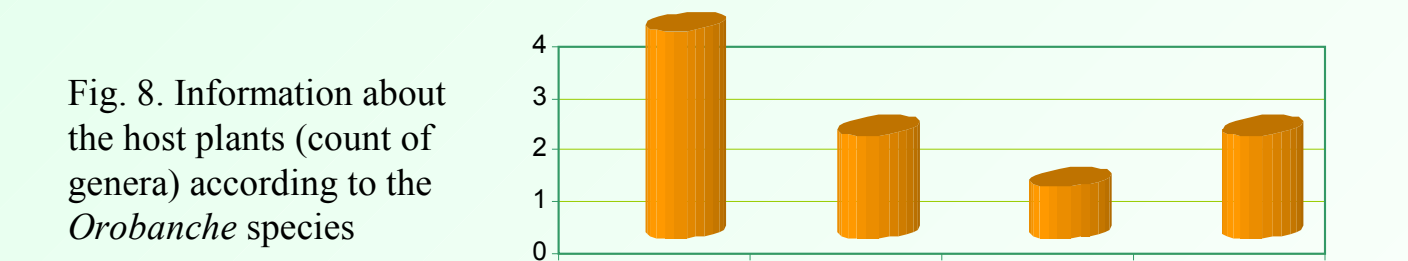
Fig. 7. Vertical distribution of the species and intraspecific taxa

The vertical distribution of the discussed taxa is displayed in fig. 7.

The presented intraspecific diversity of the polymorphic species *O. alba* and *O. reticulata*. shows that the hue of stigma is not a reliable criteria to identify the species of this section in Bulgaria.

The information for *O. alba* have to be reconsidered as inexplicit. Although it is found to be distributed in the whole country according to floras and keys, practically are missing records or herbar sheets from some regions. *Orobanchе alba* f. *rubiginosa*, f. *lutescens* and subsp. *xanthostigma* are new taxa for the country. The new data add 3 regions (5 subregions) to the distribution area of *O. alba*. The taxa of *O. alba* ssp. *alba* are revised. One of the known forms - f. *campanulata* is not confirmed by herbar material. Four regions (5 subregions) are added to the distribution area of *O. reticulata*, and the data about subsp. *pallidiflora* is specified to 2 regions. *Orobanchе serbica* has more limited distribution area than the indicated in the literature. It is found only in two isolated localities of Znepole region. Two regions are added to the distribution area of *O. panicii*.

The information obtained in the study shows a clear specificity according to the host plants (fig. 8). *Orobanchе alba* parasitizes only *Lamiaceae*, *O. reticulata* – only *Asteraceae*. An obligate monophagous parasite is the endemic *O. serbica* which parasitizes only *Artemisia alba*. The information about the host of *O. panicii* is not clear and needs research in future.



Orobanchе serbica е с по-ограничено разпространение, в сравнение с посочваното в литературата. Откритан е само на две изолирани места в Знеполския район. Два района са добавени към ареала на *O. panicii*. Известните гостоприемници са обсъдени при сравняване на хербарни и литературни данни. Информацията получена в това изследване показва ясна специфичност на видовете към гостоприемниците. *Orobanchе alba* паразитира само по *Lamiaceae*, *O. reticulata* – само по *Asteraceae*. Като obligaten монофагов паразит се проявява ендемичният *O. serbica*, който паразитира само по *Artemisia alba*. Данните за гостоприемниците на *O. panicii* не са ясни и се нуждаят от бъдещи изследвания.