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THE GENUS *VOLUCELLA* GEOFFROY, 1764 (DIPTERA: SYRPHIDAE) ON THE BALKAN PENINSULA

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ABSTRACT: Species of the genus *Volucella* Geoffray, 1764 occurring on the Balkan Peninsula are analyzed in the present paper. Altogether 327 specimens (144 males, 183 females), deposited in the collection of the Department of Biology and Ecology, University of Novi Sad, were examined and five species were recorded: *V. bombylans* (Linnaeus, 1758), *V. zonaria* (Poda, 1761), *V. inanis* (Linnaeus, 1758), *V. pellucens* (Linnaeus, 1758), and *V. inflata* (Fabricius, 1794). All investigated species of this genus are widely distributed, except *V. inflata*, which has been registered only at a few localities. Species data are supplemented with records and distribution.

KEY WORDS: Syrphidae, *Volucella*, Balkan Peninsula.

INTRODUCTION

The genus *Volucella* is comprised of large, broad-bodied hover flies that resemble bumblebees and wasps. Of 19 species registered in the Palearctic, six occur in Europe (PECK, 1988). Five of the six European species of *Volucella* are treated by VAN DER GOOT (1981). The sixth species, *V. elegans* Loew, has been recorded only in Southern Europe (SPEIGHT, 2004). *Volucella* species occur in a wide variety of forests, including scrub woodland and hedgerows, while *V. zonaria* is associated with urban areas - gardens. The larvae live in the nests of bumblebees and social wasps, where they are mainly detritivores, but *V. inanis* is a larval predator. An exception is *V. inflata*, whose larvae have been found in a sap run on *Quercus* (ROTHERAY, 1993, 1999).

The aim of the present paper is to complete faunal data, on the genus *Volucella* on the Balkan Peninsula by assembling all literature data and results of studying the collection deposited at the Department of Biology and Ecology, University of Novi Sad, Novi Sad.

MATERIAL AND METHODS

The examined insect material (327 specimens – 144 males, 183 females) from the collection of the Department of Biology and Ecology, University of Novi Sad, was collected by Branka Božičić, Dragana Dević, Nataša Dožić, Ljiljana Ercegovac, Gorana Gardinovački, Slobodan Glumac, Predrag Jakšić, Vesna Milankov, Marica Milidragović, Snežana Pešić, Jasmina Prodana, Snežana Radenković, Predrag Radišić, Dragan Radnović, Dragana Radović, Smiljka Šimić, and Ante Vujić. Determination was based on morphological characteristics of adults (presence or absence of long hairs, color of hairs and abdomen) mentioned in the key of STUBBS & FALK (1983). For each species, diagnostic features, biology, range, and published and new distribution data are given. The locality records are supplemented by UTM designation (marked on maps of Serbia, Figs. 1-5). Data on biology and range are after SPEIGHT (2004).

RESULTS, DISCUSSION AND CONCLUSIONS

Analysis of the collected material and the review of the previosly published data have resulted in recognition of five *Volucella* species on the Balkan Peninsula.

Volucella species on the Balkan peninsula

Diagnosis. Volucella species are large hover flies, with face protruded downwards and densly feathered arista. Cell R1 in the wing is closed before the wing border.

1. *Volucella bombylans* (Linnaeus, 1758)

Diagnosis. Very large, longhaired flies (body length 12-15 mm; wing length 10-14 mm). Body covered with long, dense hairs, that make these flies look like bumblebees. Scutellum without bristles at hind margin. Several color forms are recognized.

Biology. It occurs in most types of deciduous forests and humid *Pinus* forests, on the edges of fens and raised bogs, along hedges in farmland, and in evergreen oak forests (*Quercus ilex)* in Southern Europe. Adults fly from May to August, plus September at high altitudes. They visit a wide range of flowers, including many different composites and umbellifers and trees in bloom. Larvae are detritivores or larval predators in nests of bumblebees (SPEIGHT, 2004).

Range. From northern Fennoscandia south to Iberia; from Ireland eastwards through Central and Southern Europe into Russia and the Caucasus and on to the Pacific coast and Japan; in North America from Alaska to Newfoundland and south to California and Georgia (SPEIGHT, 2004).

Published data. Slovenia: LAMBECK, 1968. *Croatia***:** FRAUENFELD, 1860; LANGHOFFER, 1919. *Bosnia and Herzegovina:* STROBL, 1898, 1900 (as *V. bombylans* var. *bombylans*, *V. bombylans* var. *bombylans* form. *alpina*, *V. bombylans* var. *mystacea* = var. *plumata*), STROBL, 1902 (as *V. bombylans* var. *bombylans*, *V. bombylans* var. *mystacea*); GLUMAC, 1955b (as *V. bombylans* var. *plumata*). *Serbia:* STROBL, 1902 (as *V. bombylans* var. *bombylans*, *V. bombylans* var. *mystacea*); GLUMAC, 1955a, 1959 (as *V. bombylans* var. *bombylans*); KULA, 1985; ŠIMIĆ & VUJIĆ, 1987; VUJIĆ & GLUMAC, 1994; VUJIĆ & ŠIMIĆ, 1994; ŠIMIĆ & VUJIĆ, 1996; VUJIĆ *et al*., 1998a. *Montenegro:* COE, 1960; GLUMAC, 1955b (as *V. bombylans* var. *bombylans*, *V. bombylans* var. *plumata*); ŠIMIĆ, 1987.

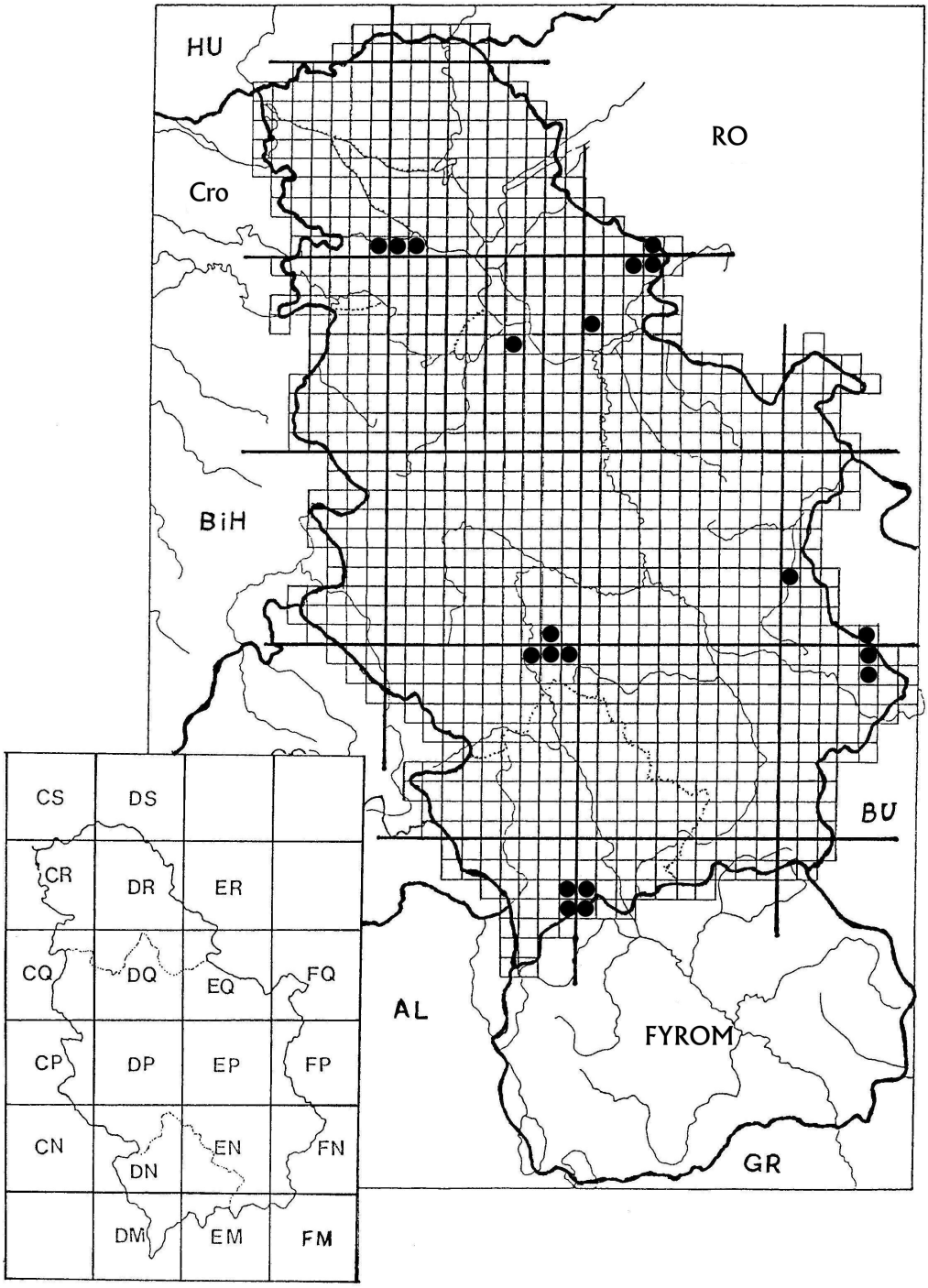

Fig. 1. Distribution of *Volucella bombylans* (Linnaeus, 1758) in Serbia

Macedonia: GLUMAC, 1968 (as *V. bombylans* f. typ., *V. bombylans* var. *plumata*); KRPAČ *et al*., 2001. *Bulgaria:* DRENSKY, 1934 (as *V. bombilans*, *V. terestriformis* Drensky, 1934); BANKOWSKA, 1967.

New data. Slovenia: Bohinjska Bistrica VM12 (500 m), 14.06.1988. 4♂♂, 1♀, leg. Vujić, Radnović; Savica VM02 (1219 m), 14.06.1988. 1♂, leg. Radnović; Jesenice (Mežakla) VM24 (600 m), 18.06.1988. 1♂, leg. Radnović, 1♀, leg. Vujić; Logarska dolina VM74 (1000 m), 01.07.1989. 1♀, leg. Vujić; Pokljuka VM13 (1500 m), 02.07.1989. 1♂, leg. Vujić; *Bosnia and Herzegovina:* Grmeč WK94 (700-800 m), 29.05.1990. 1♀, leg. Vujić; *Serbia:* Fruška gora - Glavica DR00 (300 m), 30.05.1998. 1♀, leg. Vujić; Deliblatski pesak 13.05.1996. 1♂, leg. Vujić; Vršačke planine 13.06.1997. 1♂, leg. Vujić; Vršac - Gudurica ER30, 08.06.1983. 1♀, leg. Vujić; Vršac - Široko bilo EQ29, 06.04.1989. 1♂, leg. Radnović; Kopaonik - Radošice DN79 (600 m), 17.06.1986. 1♂, leg. Šimić; Kopaonik - Samokovska reka - smrča DN89 (1500 m), 05.07.1986. 1♂, leg. Vujić, 1♀, leg. Radišić; Kopaonik - Duboka reka DN89 (1500 m), 06.07.1986. 1♂, leg. Radnović; Kopaonik - Žljeb DN89 (1700 m), 21.06.1987. 1♂, leg. Vujić; Kopaonik - Radmanovo DN99, 21.06.1987. 1♂, leg. Vujić; Kopaonik - Gobeljska reka DP80 (800 m), 24.06.1987. 1♂, leg. Vujić; Kopaonik - Jasle Čukara DN89 (1400 m), 28.05.1994. 1♂, leg. Vujić, 01.08.1997. 1♂, leg. Vujić; Stara planina - Pilj FP40, 25.06.1987. 1♂, 1♀, leg. Vujić; Stara planina - Planinica FN38 (900 m), 27.06.1987. 2♂♂, 1♀, leg. Vujić; Stara planina – Dojkinci, Arbinje FN49, 26.06.1987. 1♂, leg. Vujić; Stara planina - Dojkinačka reka FN48 (600-1000 m), 29.05.1988. 1♂, leg. Ercegovac; Stara planina - Žarkova čuka FP03, 11.07.1991. 1♀, leg. Vujić; Stara planina - Živadinov dol FP03, 12.07.1991. 2♂♂, leg. Vujić; Stara planina - Sliv Topolske reke FP03, 11.07.1991. 5♂♂, 4♀♀, leg. Vujić; Stara planina - Babin zub FP03, 19.07.1991. 1♂, 2♀♀, leg. Vujić; 20.07.1991. 1♂, leg. Vujić; Šar planina - Durov potok EM06 (2000 m), 18.07.1986. 1♂, leg. Božičić; Šar planina – Brezovica - Molika DM97 (900 m), 19.07.1986. 1♀, leg. Božičić; Šar planina - Durlov potok EM07, 04.08.1991. 2♂♂, 5♀♀, leg. Vujić; Šar planina - Durlov potok DM96 (2000 m), 11.07.1996. 1♂, leg. Radišić, 1♀, leg. Radenković; Šar planina - Beli kamen - Potoci EM07, 21.07.1995. 1♀, leg. Dožić; Šar planina - Ćop potok EM07, 12.07.1996. 1♀, leg. Radenković; Šar planina - Muržica EM07, 12.07.1996. 1♂, leg. Radenković, 1♀, leg. Vujić. *Montenegro*: Prokletije – nr. Ljubokuća DN00, 27.07.1994. 1♂, leg. Vujić; Durmitor - Međed CN47 (2000 m), 25.07.1991. 1♂, 3♀♀, leg. Jakšić. *Macedonia*: Oteševo DL93, 17.06.1990. 2♂♂, leg. Vujić; Baba EL14 (500 m), 17.06.1990. 1♂, leg. Radnović; S. Mogočegarska r. DM97, 11.07.1998. 1♀, leg. Vujić.

2. *Volucella inanis* (Linnaeus, 1758)

Diagnosis. Large, short-haired flies (body length 15-16 mm; wing length 13-15 mm). Mesoscutum blackish and scutellum yellow. Abdomen black and yellow. Tergites 2-4 dull, yellow, with dark bands at the hind margin of tergites 2-3, and often 4. Sternite 2 yellow.

Biology. This species occurs in open areas in various types of deciduous forests. Adults visit flowers of yellow composites; umbellifers and *Achillea, Allium, Buddleja, Cirsium, Epilobium, Eupatorium, Hedera, Knautia, Mentha, Sambucus, Scabiosa, Solidago, Thymus,* and *Valeriana.* It flies from the beginning of July to the end of September. The 1st and 2nd instars are parasitic in wasps' nests, on larvae of *Vespula germanica* and *V.vulgaris*, while the 3rd instar is more parasitoid (SPEIGHT, 2004).

Range. From southern Fennoscandia south to Spain and the Mediterranean, north Africa and Asia Minor; from Britain eastwards through Central and Southern Europe into Turkey and European parts of Russia and through Siberia to the Pacific; Afghanistan, Mongolia, China. This

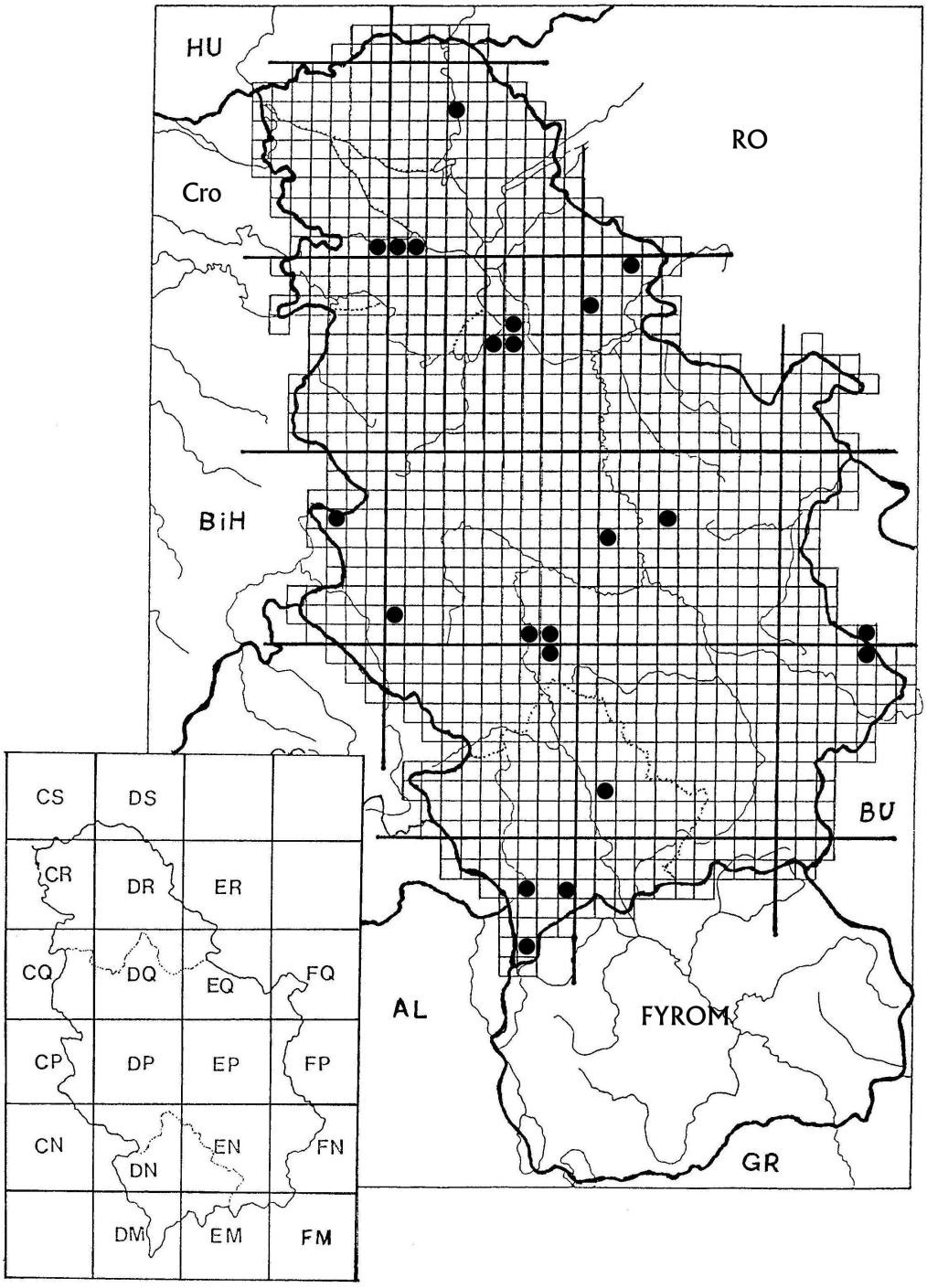

Fig. 2. Distribution of *Volucella inanis* (Linnaeus, 1758) in Serbia

species is strongly migrant (SPEIGHT, 2004).

Published data. Slovenia: COE, 1960; LAMBECK, 1968. *Croatia:* LANGHOFFER, 1919. *Bosnia and Herzegovina*: STROBL, 1898, 1900; GLUMAC, 1955b. *Serbia*: GLUMAC, 1955a; GLUMAC, 1959; ŠIMIĆ & VUJIĆ, 1987; VUJIĆ & GLUMAC, 1994; VUJIĆ & ŠIMIĆ, 1994; ŠIMIĆ & VUJIĆ, 1996. *Montenegro*: GLUMAC, 1956b; ŠIMIĆ, 1987. *Macedonia*: GLUMAC, 1968; KRPAČ *et al*., 2001. *Bulgaria*: DRENSKY, 1934. *Greece*: VUJIĆ *et al*., 2000.

New data. Croatia: Slavonski brod BR61 (300 m), 21.08.1985. 1♀, leg. Božičić; *Serbia*: Vršac - Široko bilo EQ29 (300 m), 22.07.1983. 7♂♂, 1♀, leg. Vujić; Vršac - Brana, 13.07.1988. 1♂, leg. Vujić; N. Potisje- Ada DR37 (90 m), 10.07.1985. 1♀, leg. Šimić; Kučaj - Papratno EP46 (500 m), 27.07.1986. 1♂, leg. Radnović; Kučaj - Crnica EP46 (400 m), 21.07.1986. 1♀, leg. Radnović; Grmija EN12 (700 m), 16.08.1983. 1♀, leg. Vujić; Juhor - Kolare EP15 (300 m), 08.07.1984. 1♂, leg. Radišić; Kratovo - Kokin Brod DP01 (600 m), 12.08.1982. 1♀, leg. Božičić; Kopaonik - Treska DN89 (1500 m), 17.07.1985. 1♂, leg. Vujić; Kopaonik - Veliki do DN89 (1700 m), 17.08.1985. 1♀, leg. Radnović; Kopaonik -Samokovska reka - B. DP70 (800 m), 19.07.1985. 2♂♂, leg. Vujić, 03.08.1987. 1♂, leg. Vujić; Kopaonik - Samokovska reka - smrča DN89 (1500 m), 20.07.1985. 1♂, leg. Vujić; Kopaonik - Pajino preslo DN89 (1700 m), 06.07.1986. 1♀, leg. Radišić; Kopaonik - Karamanski potok DN89 (1700 m), 07.07.1986. 1♀, leg. Radnović; Kopaonik - Gobeljska reka DP80 (800 m), 04.08.1987. 1♂, leg. Vujić; Kopaonik - Lisinska reka, 25.07.2001. 1♂, 1♀, leg. Šimić; Stara planina - Arbinje FN49 (1500 m), 11.08.1987. 1♀, leg. Vujić; Stara planina - Topli do - Pilj FP40 (1200 m), 11.08.1987. 1♀, leg. Vujić; Šar planina – Prizren - Bistrica DM77, 10.07.1985. 1♀, leg. Jakšić; Šar planina – Brezovica - Molika DM97 (900 m), 19.07.1986. 1♂, leg. Božičić; Šar planina – Restelica - Jelak DM74 (1700 m), 25.07.1986. 1♀, leg. Vujić; *Montenegro*: Skadar - Vilusi CN03, 27.08.1982. 1♀, leg. Šimić.

3. *Volucella inflata* (Fabricius, 1794)

Diagnosis. Large, short-haired flies (body length 12-15 mm; wing length 11-13 mm). Mesoscutum black with orange lateral margins. Scutellum orange with whitish hairs on the apex. Abdomen black except for dark orange spots on tergite 2.

Biology. This species occurs in deciduous forests with overmature trees, including alluvial softwood and hardwood forests and thermophilous *Quercus*. Adults visit flowers of umbellifers and *Cornus, Crataegus, Euonymus, Frangula, Ligustrum, Rubus, Sambucus,* and *Viburnum.* It flies from May to July. Larvae of *V. inflata* are inhabitants of insect-workings in which sap and insect faeces/tree humus provide a sub-aqueous mix (SPEIGHT, 2004).

Range. From Sweden and Northern Germany south to the Pyrenees and northern Spain; from Britain eastwards through Central Europe into European parts of Russia and into the Caucasus; the former Yugoslavia; Bulgaria. This fly is now very local over much of its European range (SPEIGHT, 2004).

Published data. Croatia: LANGHOFFER, 1919. *Bosnia and Herzegovina*: STROBL, 1898, 1900. *Serbia*: GLUMAC, 1955a; GLUMAC, 1959; KULA, 1985; VUJIĆ & GLUMAC, 1994; VUJIĆ & ŠIMIĆ, 1994; VUJIĆ *et al*., 1998b. *Macedonia*: GLUMAC, 1968. *Bulgaria*: DRENSKY, 1934. *Greece*: VUJIĆ *et al*., 2000.

New data. Serbia: Vojvodina - Morović CQ58 (100 m), 13.05.1982. 2♂♂, leg. Šimić; Juhor

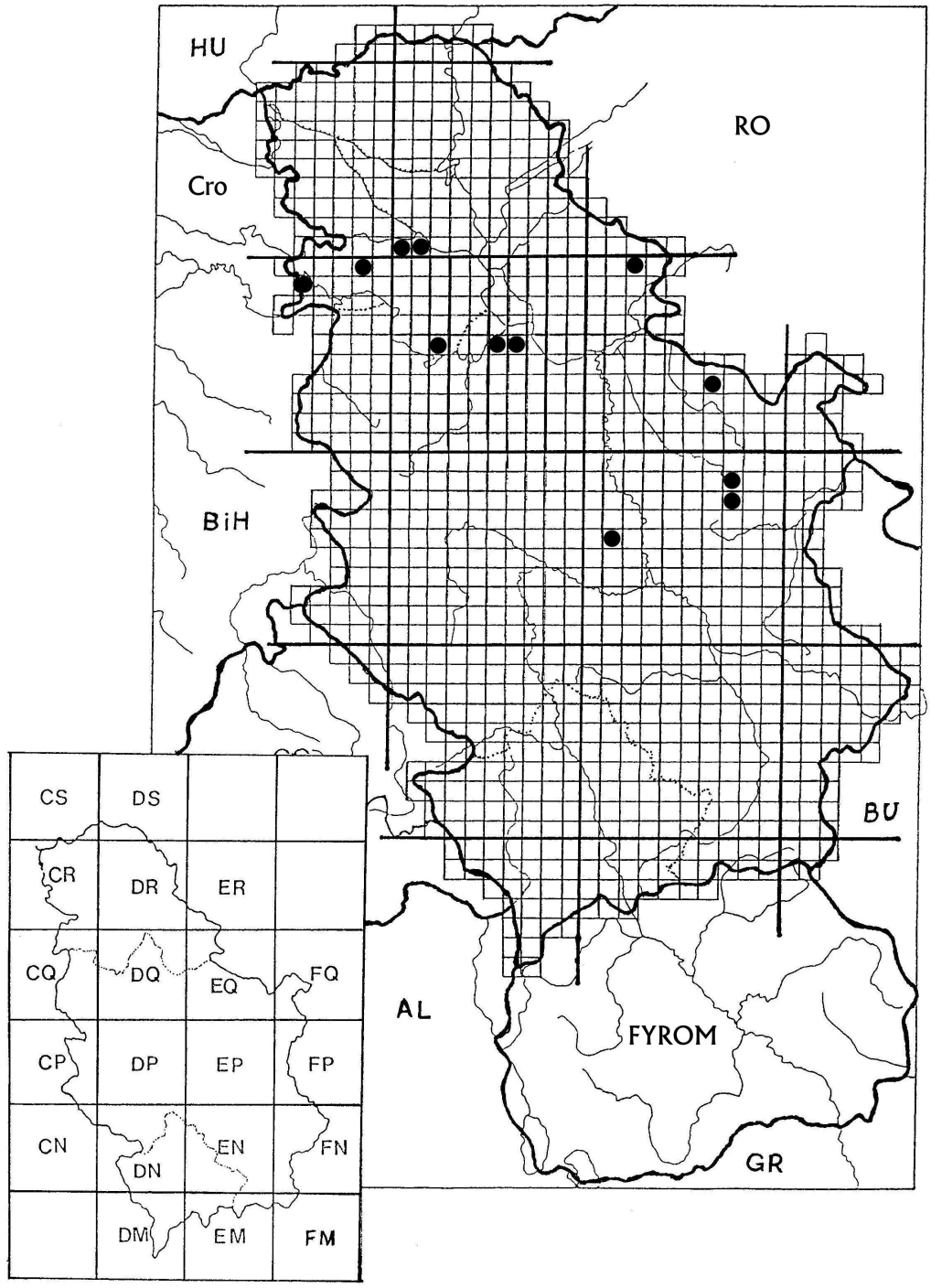

Fig. 3. Distribution of *Volucella inflata* (Fabricius, 1794) in Serbia

EP15 (300 m), 06.07.1984. 2♀♀, leg. Radišić; Dubašnica - Dubašnica Lunga EP78, 6.06.1993. 1♂, leg. Radišić; Kučaj, Beljavina EP77, 6.06.1993. 1♀, leg. Radnović.

4. *Volucella pellucens* (Linnaeus, 1758)

Diagnosis. Very large, short-haired flies (body length 13-17 mm; wing length 10-16 mm). Mesoscutum black with brownish lateral margins. Scutellum brownish with black hairs on the apex. Abdomen black, except for white or light yellow spots on tergite 2.

Biology. This species occurs in deciduous forests; in stands of mesophilous *Fagus,* as well as acidophilous and thermophilous *Quercus*; and in scrub and hedgerows. Adults visit the flowers of a wide range of low-growing plants, bushes and trees. It flies from May to October. Larvae are scavengers/larval predators in nests of wasps (*Vespula*) (SPEIGHT, 2004).

Range. From Fennoscandia south to Iberia; from Ireland eastwards through Eurasia to Japan; India and Malaya in the Oriental region; the Caucasus (SPEIGHT, 2004).

Published data. Slovenia: COE, 1960; LAMBECK, 1968. *Croatia*: LANGHOFFER, 1919. *Bosnia and Herzegovina*: STROBL, 1989, 1900; GLUMAC, 1955b. *Serbia*: GLUMAC, 1955a; GLUMAC, 1959; KULA, 1985; ŠIMIĆ & VUJIĆ, 1987; VUJIĆ & GLUMAC, 1994; VUJIĆ & ŠIMIĆ, 1994; ŠIMIĆ & VUJIĆ, 1996; VUJIĆ *et al*., 1998b. *Montenegro*: GLUMAC, 1956b; ŠIMIĆ, 1987. *Macedonia*: GLUMAC, 1968; KRPAČ *et al*., 2001. *Bulgaria*: DRENSKY, 1934; BANKOWSKA, 1967. *Greece*: VUJIĆ *et al*., 2000.

New data. Slovenia: Bled - Bohinj VM23 (500 m), 14.06.1988. 2♂♂, leg. Vujić; Savinja VM73 (700 m), 16.06.1988. 1♂, leg. Radnović; Savinja VM74 (900 m), 16.06.1988. 1♀, leg. Radnović; Kamniška bistrica VM63 (1000 m), 16.06.1988. 1♂, leg. Vujić, 30.06.1989. 1♂, leg. Vujić; Logarska dolina VM73 (1000 m), 17.06.1988. 1♂, leg. Vujić; Jesenice VM24 (600 m), 18.06.1988. 1♂, leg. Radnović; Matkov kot VM64 (1400 m), 01.07.1989. 1♂, leg. Vujić. *Croatia*: Plitvička jezera WK46 (600 m), 22.07.1986. 2♀♀, leg. Šimić. *Bosnia and Herzegovina*: Konjuh CQ00 (600-900 m), 25.06.1989. 1♀, leg. Vujić, 30.07.1989. 1♂, leg. Radović; Jahorina CP04 (1500 m), 26.06.1989. 1♀, leg. Vujić, 31.07.1989. 1♀, leg. Radović. *Serbia*: Vojvodina: Vršac - Široko bilo EQ29 (300 m), 22.07.1983. 1♀, leg. Vujić; Vršac - Lisičja glava EQ29 (400 m), 08.07.1988. 2♀♀, leg. Vujić; Fruška gora - Glavica DR00 (300 m), 20.05.1989. 1♂, leg. Vujić; Fruška gora, 10.08.1996. 1♀, leg. Radenković; Vlasinsko jezero, 01.-05.08.1991. 1♀, leg. Vujić; Tara – Mitrovac - Perućac CP76, 14.07.1985. 2♀♀, leg. Radnović; Tara – Mitrovac - Šuma CP76, 17.07.1985. 2♀♀, leg. Radnović; Tara – Mitrovac - Zborište CP76, 18.07.1985. 1♂, leg. Radnović; Tara - Gorušica CP76 (1000 m), 12.07.1985. 2♀♀, leg. Radnović; Tara - Vučjak CP76 (1000 m), 13.07.1985. 1♂, 1♀, leg. Radnović; Tara - Kozja stena CP76 (1000 m), 20.07.1985. 4♀♀, leg. Radnović; Goč - Dobre vode DP82 (900 m), 08.-11.08.1983. 1♀, leg. Vujić; Kučaj - Papratno - Buk.S. EP46, 4♀♀, leg. Radnović; Kučaj - Sisevac -potok EP46 (450 m), 21.07.1986. 1♀, leg. Radnović; Kučaj - Crnica EP46 (400 m), 21.07.1986. 1♀, leg. Radnović, 23.07.1986. 1♂, leg. Radnović; Svrljig - Beloinje EP90 (450 m), 12.07.1989. 2♀♀, leg. Milankov; Suva planina EN98 (700 m), 16.07.1989. 1♂, leg. Radnović; Stara planina - Topli do - Pilj FP40 (1200 m), 25.06.1987. 2♂♂, leg. Vujić; Stara planina - Spomenik FN39 (600 m), 28.05.1987. 1♂, leg. Šimić; Stara planina - Arbinje FN49 (1500 m), 26.06.1987. 1♂, leg. Vujić, 11.08.1987. 1♀, leg. Vujić; Stara planina - Planinica FN38 (900 m), 27.06.1987. leg. Vujić; Stara planina - Crni vrh FP20 (600 m), 31.05.1988. 1♀, leg. Ercegovac; Stara planina - Sliv Topolske reke FP03, 17.07.1991. 1♀, leg. Vujić; Juhor EP15, 06.07.1984. 2♀♀, leg. Radišić; Šupljice - Kokin brod DP01 (600 m), 11.08.1982. 1♀, leg. Božičić; Kopaonik - Samokovska reka DP70 (800 m), 19.07.1985. 7♂♂, leg.

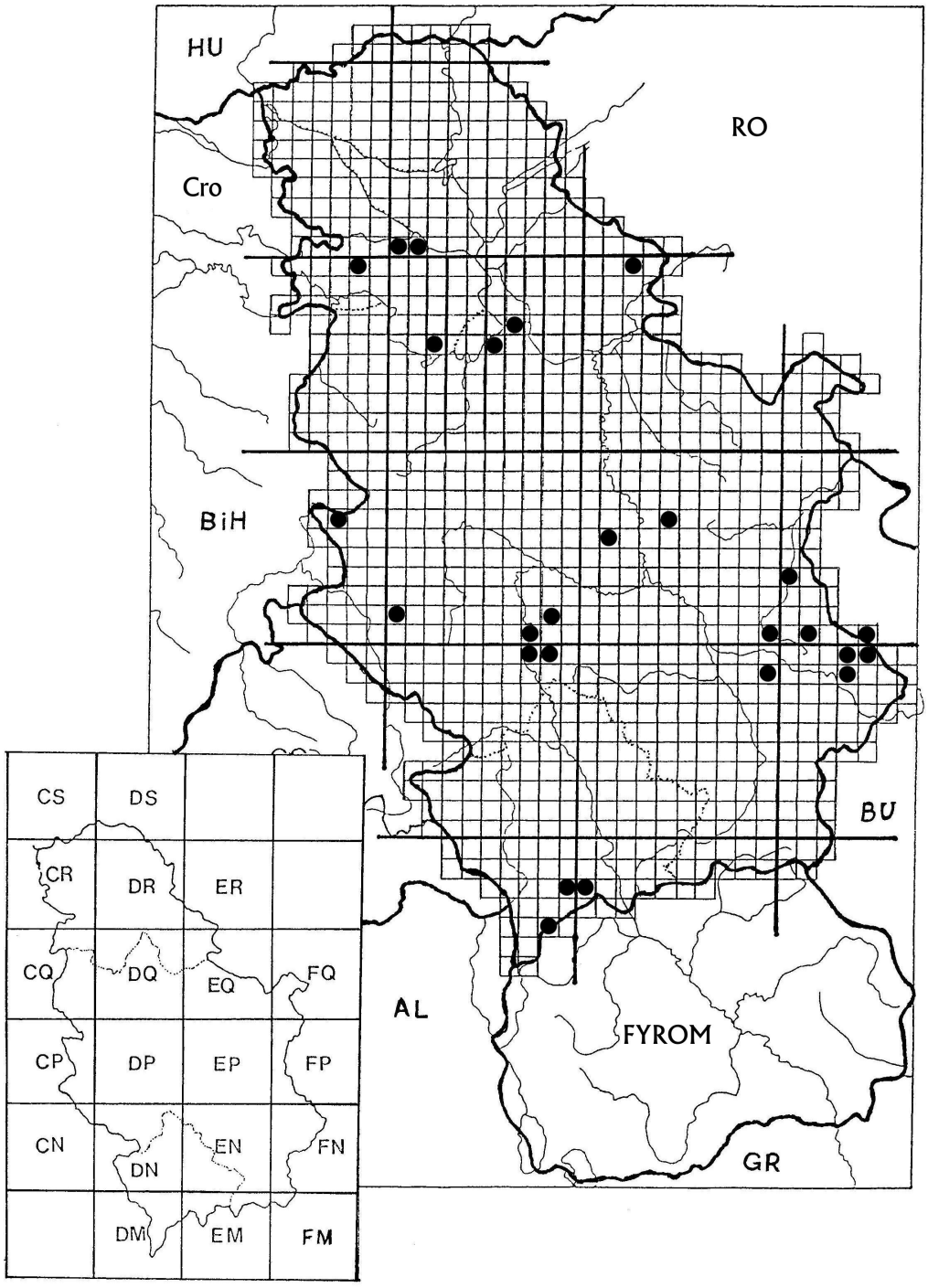

Fig. 4. Distribution of *Volucella pellucens* (Linnaeus, 1758) in Serbia

Vujić; 14.07.1998, 1♂, 1♀, leg. Šimić; 13.07.1998, 3♂♂, leg. Radenković, 1♀, leg. Šimić 1♂, 2♀♀, leg. Vujić; Kopaonik - Samokovska reka DN89 (1500 m), 16.06.1986. 1♀, leg. Vujić, 05.07.1986. 4♂♂, 1♀, leg. Vujić, 03.08.1987. 1♀, leg. Vujić; Kopaonik - Samokovska reka-B DP70 (800 m), 05.07.1986. 1♂, 4♀♀, leg. Radnović, 01.08.1997. 1♀, leg. Vujić; Kopaonik - Samokovska reka - S DN89 (1500 m), 05.07.1986. 2♂♂, 1♀, leg. Vujić; Kopaonik - Samokovska reka DN89 (1500 m), 14.08.1997. 3♂♂, leg. Dević, 1♀, leg. Prodana, 1♀, leg. Milidragović; Kopaonik – Treska - Bukva DN89 (1500 m), 17.07.1985. 1♀, leg. Vujić; Kopaonik - Bukva - Smrča DN89, 17.07.1985. 2♀♀, leg. Vujić; Kopaonik - Lisinska reka DN89 (1200 m), 18.08.1985. 1♀, leg. Radišić, 25.07.2001. 1♂, 2♀♀, leg. Šimić; Kopaonik - Jasle- Čukara DN89 (1400 m), 04.07.1986. 1♂, 1♀, leg. Vujić; Kopaonik - Karamanski potok DN89 (1700 m), 07.07.1986. 1♀, leg. Radnović; Kopaonik - Bačište DN89 (1600 m), 04.07.1986. 1♀, leg. Radišić; Kopaonik - Paljestička reka DN79 (700 m), 23.06.1987. 1♂, 1♀, leg. Vujić; Kopaonik - Gobeljska reka DP80 (800 m), 24.06.1987. 1♂, leg. Vujić, 04.08.1987. 1♀, leg. Vujić; Kopaonik - Jankove bare DN89 (1400 m), 02.08.1987. 1♀, leg. Vujić; Kopaonik - Marine vode DN89 (1700 m), 04.08.1987. 1♂, leg. Vujić; Kopaonik - Velika reka DN89 (1300 m), 04.08.1987. 1♀, leg. Vujić; Kopaonik - Čajetinska česma DN79, 31.07.2001. 1♀, leg. Šimić; Šar planina - Lešnica - Popova Šapka DM85, 27.07.1986. 2♂♂, 2♀♀, leg. Vujić, Božičić; Šar planina - Brezovica DM97 (900 m), 19.07.1986. 1♀, leg. Božičić, 05.08.1991. 2♀♀, leg. Vujić; Šar planina - Mužica EM07, 27.07.1995. 1♀, leg. Dožić. *Montenegro*: Prokletije - ka Volušnici DN00, 29.07.1994. 3♂♂, 1♀, leg. Radenković; Prokletije - Krošnje DN00, 28.07.1994. 1♂, leg. Radnović; Skadar - Ljutica 11.07.1983. 1♂, 1♀, leg. Šimić. *Bosnia and Herzegovina*: Tjentište CP10, 30.07.1983. 1♀, leg. Šimić. *Macedonia*: Bačije, 14.06.1975. 1♀, leg. Glumac; Pelister EL14, 23.07.1981. 1♀, leg. Šimić; Kožuf - Visoka čuka FL17 (1300 m), 15.07.1990. 1♀, leg. Gardinovački; Kožuf - Obronci čiči Kaja (1000 m) 17.07.1990. 1♀, leg. Jakšić; Kožuf - Konsko FL15 (600 m), 18.07.1990. 1♀, leg. Jakšić.

5. *Volucella zonaria* (Poda, 1761)

Diagnosis. One of the biggest, short-haired hover flies (body length 17-20 mm; wing length 16-18 mm). Mesoscutum and scutellum shiny, light brown in females, and dark brown in males. Abdomen yellow and black. Tergites shiny, yellow with dark band at hind margin of tergites 2 and 3. Sternite 2 black.

Biology. This species occurs in mesophilous *Fagus* and thermophilous *Quercus* forests, scrub, suburban gardens, and parks. Adults visit flowers of umbellifers and *Buddleja, Carduus, Eryngium campestre, Eupatorium, Hedera, Knautia, Ligustrum, Ranunculus, Rubus Sambucus, Scabiosa, Solidago,* and *Thymus.* It flies from the middle of June to November. Larvae are associated with *Vespa crabro* and *Vespula* species, acting as scavengers (and larval predators) in the nests of these wasps (SPEIGHT, 2004).

Range. From Poland south to the Mediterranean and North Africa; from Britain eastwards through Central and Southern Europe into Turkey and European parts of Russia and through Siberia to the Pacific; Iran; Mongolia. This species is strongly migratory (SPEIGHT, 2004).

Published data. Italy: STROBL, 1893. *Slovenia*: COE, 1960; STROBL, 1893. *Croatia*: FRANENFELD, 1860; STROBL, 1893; STROBL, 1902; LANGHOFFER, 1919; GLUMAC, 1956a; GLUMAC, 1956b; COE, 1960; LECLERCQ, 1961. *Bosnia and Herzegovina*: STROBL, 1898, 1900, 1902; GLUMAC, 1955b. *Serbia*: GLUMAC, 1955a; GLUMAC, 1955b; GLUMAC, 1959; KULA, 1985; ŠIMIĆ & VUJIĆ, 1987; VUJIĆ & GLUMAC, 1994; VUJIĆ & ŠIMIĆ, 1994; ŠIMIĆ & VUJIĆ, 1996. *Montenegro*: STROBL, 1902; GLUMAC, 1956b; ŠIMIĆ, 1987. *Macedonia*: COE, 1956; COE, 1960; GLUMAC, 1968; KRPAČ *et*

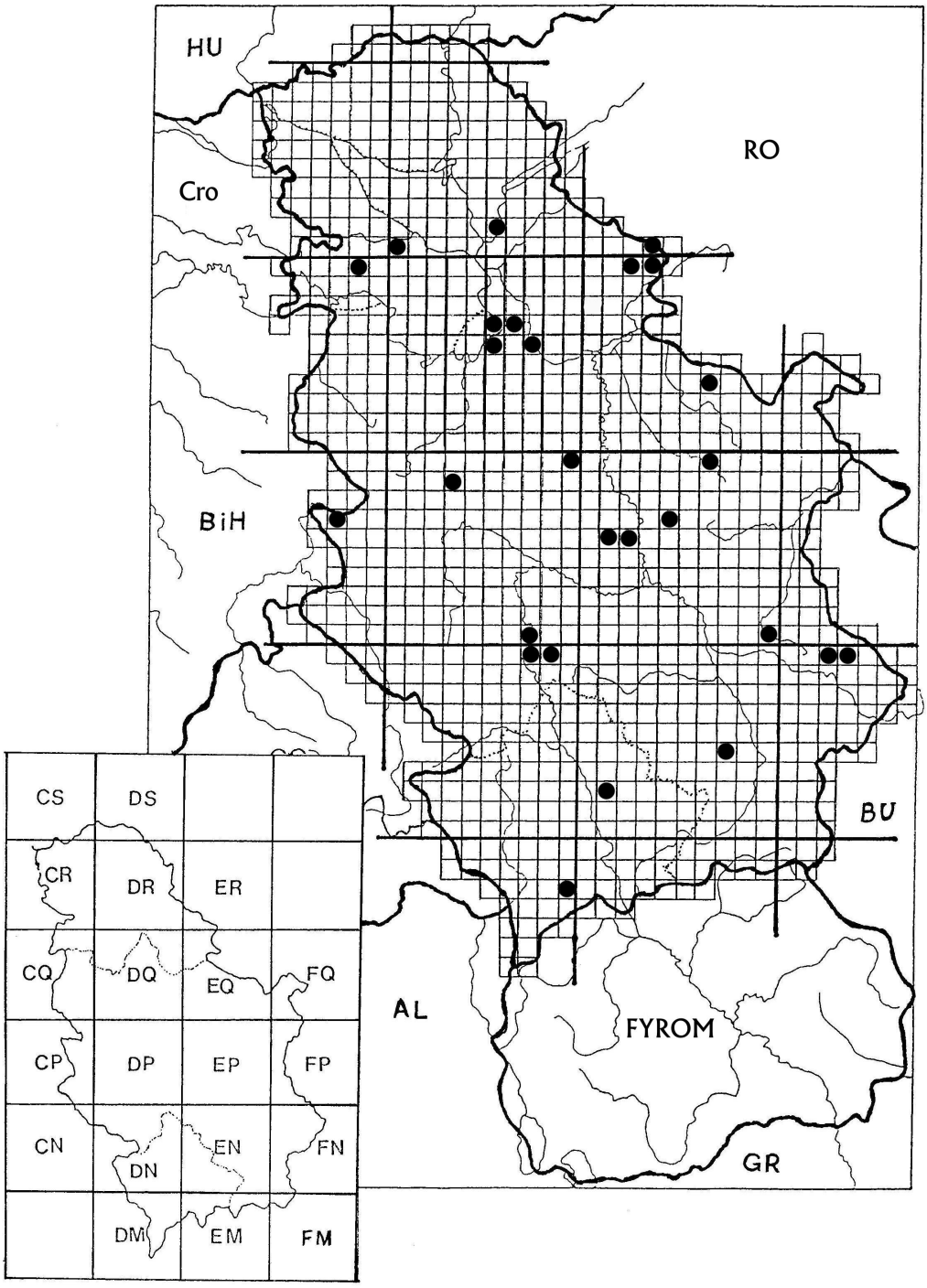

Fig. 5. Distribution of *Volucella zonaria* (Poda, 1761) in Serbia

al., 2001. *Bulgaria*: DRENSKY, 1934; BANKOWSKA, 1967. *Greece*: VUJIĆ *et al*., 2000.

New data. Serbia: Vršac - Karaula ER30 (100 m), 31.08.1983. 1♀, leg. Vujić; Vršac - Mesić-Fiseš EQ39 (100 m), 08.06.1994. 1♀, leg. Vujić; Potisje - Carska bara DR51 (90 m), 28.05.1985. 1♂, leg. Šimić; Rajac - Ozrem DP38, 07.08.2003. 2♀♀, leg. Šimić; Beljanica - Žagubica EP69, 15.07.1993. 1♀, leg. Radišić; Kučaj - Sisevac EP46 (450 m), 24.07.1986. 1♂, leg. Radnović; Kučaj - Papratno EP46 (500 m), 26.07.1986. 1♂, leg. Radnović, 27.07.1986. 1♀, leg. Radnović; Svrljig - Crni - zeleni vrh EP90 (1000 m), 11.07.1989. 1♀, leg. Vujić; Svrljig - Belonje EP90 (450 m), 12.07.1989. 1♀, leg. Radnović; Svrljig - Vrelo EP90 (450 m), 13.07.1989. 1♂, leg. Vujić A.; Stara planina - Spomenik FN39 (600 m), 26.06.1987. 1♀, leg. Vujić; Stara planina - Zavojsko jezero FN39, 13.07.1992. 1♂, 1♀, leg. Vujić, 22.07.1992. 1♂, 1♀, leg. Vujić; Stara planina - Temščica FN29, 18.07.1992. 1♂, 1♀, leg. Vujić; Suva planina EN98 (700 m), 16.07.1989. 2♀♀, leg. Radović; Kukavica EN74 (400 m), 18.07.1989. 1♀, leg. Radnović; Juhor – Kolare - Glavinci EP15 (300 m), 08.07.1984. 1♀, leg. Radišić, 13.07.1984. 1♀, leg. Radnović; Juhor - Bakarni studenac EP15, 09.07.1984. 1♂, leg. Radišić; Juhor -Dobre vode EP25, 10.07.1984. 1♂, leg. Radišić; Grmija EN12 (700 m), 29.05.1978. 1♀, leg. Vujić, 30.07.1979. 1♀, leg. Vujić, 16.08.1983. 2♀♀, leg. Vujić; Kragujevac – Science Faculty Building DP99, 10.06.1995. 2♂♂, 1♀, leg. Pešić; Kopaonik – Treska - Bukva DN89 (1500 m), 17.07.1985. 1♀, leg. Vujić; Kopaonik - Samokovska reka - Bukva DP70 (800 m), 19.07.1985. 2♂♂, leg. Vujić, 01.08.1997. 2♀♀, leg. Vujić; Kopaonik - Lisinska reka DN89 (1200 m), 27.07.2001. 1♂, leg. Šimić; Kopaonik - Čajetinska česma DN79, 28.07.2001. 3♂♂, leg. Šimić; Šar planina - Brezovica DM97, 05.08.1991. 3♂♂, 2♀♀, leg. Vujić; Šar planina – Mužica EM07, 27.07.1995. 1♂, 1♀, leg. Dožić; Šar planina, 07.1995. 2♂♂, leg. Dožić; *Montenegro*: Prokletije - ka Volušnici DN00, 29.07.1994. 1♂, 1♀, leg. Milankov; Skadar - Ljutica 11.07.1983. 1♂, leg. Šimić; Skadar - Briska CM66, 13.07.1983. 4♂♂, 1♀, leg. Šimić; Skadar – Virpazar - mak CM47 (300 m), 12.07.1983. 1♀, leg. Šimić; Skadar - Morača CM59 (200 m), 15.08.1981. 8♀♀, leg. Šimić; Zlatar - Drenova DP03, 17.07.1983. 1♂, 2♀♀, leg. Šimić; Skadar - Sutomore CM36, 18.07.1982. 1♂, leg. Vujić. *Macedonia*: Gevgelija FL25 (100 m), 13.06.1975. 2♀♀, leg. Glumac; Konjsko - Kožuf FL15 (500 m), 13.06.1975. 1♀, leg. Glumac; Bačije DM61, 14.06.1975. 1♂, 2♀♀, leg. Glumac; Kanjon Radike - Žirovnica DM61, 04.07.1984. 1♂, leg. Jakšić; Baba EL14 (500 m), 17.06.1990. 1♂, leg. Vujić; Kožuf - Konsko FL15 (600 m), 18.07.1990. 1♀, leg. Jakšić; Kožuf- Konska reka FL06, 17.07.1990. 1♀, leg. Gardinovački; Kožuf - Smrdljive vode FL06, 11.07.1990. 3♀♀, leg. Vujić, 13.07.1990. 1♀, leg. Vujić, 18.07.1990. 1♀, leg. Vujić; Kožuf – Asan - česma FL06 (1000 m), 12.07.1990. 1♀, leg. Radnović.

Altogether 327 specimens (144 males, 183 females), deposited in the collection of the Department of Biology and Ecology, University of Novi Sad, were examined and five species were recorded: *V. bombylans* (Linnaeus, 1758), *V. zonaria* (Poda, 1761), *V. inanis* (Linnaeus, 1758), *V. pellucens* (Linnaeus, 1758), and *V. inflata* (Fabricius, 1794). All registered species are widely distributed on the Balkan Peninsula, except *V. inflata*, which has been registered at few localities, although it has a wide range. According to SPEIGHT (2004), this fly is now very local over much of its European range. Larvae of *Volucella* species are manly detritivores or predators in nests of bumblebees and vasps, but larvae of *V. inflata* have been found in a sap run on *Quercus* caused by *Cossus cossus* (Lepidoptera, Cossidae). Specific larval development of this species can be the reason for its local distribution. Adults of all registered *Volucella* species on the Balkan Peninsula are on the wing from May to August, preferring forest habitats (100-2000 m), but some like *V. zonaria*, have also been found in urban sites.

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РОД *VOLUCELLA* GEOFFROY, 1764 (DIPTERA: SYRPHIDAE) НА БАЛКАНСКОМ ПОЛУОСТРВУ

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Департман за биолоију и екологију, Природно-математички факултет, Универзитет у Новом Саду, Трг Доситеја Обрадовића 2, 21000 Нови Сад, Србија и Црна Гора

У овом раду су анализиране врсте из рода *Volucella* Geoffray, 1764 на Балканском полуострву. Прегледом материјала (327 примерака), из збирке Департмана за биологију и екологију, Универзитета у Новом Саду установљено је присуство 5 врста овог рода: *V. bombylans* (Linnaeus, 1758), *V. zonaria* (Poda, 1761), *V. inanis* (Linnaeus, 1758), *V. pellucens* (Linnaeus, 1758) и *V. inflata* (Fabricius, 1794). Све регистроване врсте су широко распрострањене, изузев *V. inflata* која је забележена на свега неколико локалитета. Уз дијагностичке карактере за сваку врсту, податке о ареалу и биологији, дати су и нови налази за Балканско полуострво, а за подручје Србије и UTM карте распрострањења.

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