

***Leonurus intermedius*, species nova - with additional notes on some other *Leonurus* taxa**

Nový druh rodu *Leonurus*, *L. intermedius* - s doplňujícími poznámkami k jiným zástupcům rodu *Leonurus*

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Leonurus intermedius Holub from the *L. cardiaca* agg. (*Leonurus* L. sect. *Leonurus*) is described as a new species, taxonomically situated between *L. cardiaca* L. and *L. villosus* Dum.-d'Urv.; the type locality is in Central Bohemia. Its distribution in the Czech Republic is given on the basis of a revision of the material in the herbaria PR and PRC. The taxon evolved most probably by hybridogenesis between *L. cardiaca* and *L. villosus*; it is known mostly from this century, i.e. from the period after immigration of *L. villosus* to Central Europe. The kind of indumentum is the most important distinguishing character among the members of *L. cardiaca* agg.; a determination key for three Central European taxa of the aggregate is given. A list of localities of *L. intermedius* from the Czech Republic was compiled including 88 localities, arranged after the phytogeographical division of that area. A new variety is described in *L. cardiaca* L. - var. *hirtella* Holub. The closest relationship of this species seems to be to the Eurasian continental species *L. glaucescens* Bunge. Nomenclatural problems of *L. villosus* are mentioned but not finally solved. Finding of two herbarium sheets with plants of *L. japonicus* Houtt. from Bohemia is mentioned in an additional note (cultivated plants?).

Introduction

The group *Leonurus cardiaca* agg. is often accepted as taxonomically difficult, what follows from the fact that its species are considered to be rather variable, substantially polymorphic and with considerable overlap in variation ranges of single distinguishing characters. Though distinguishing the species within this group is still possible, it must be pointed out, that the group in Eurasia comprises a series of taxa, which replace themselves (with some geographical overlap in their distribution areas) in the West-East direction, from which some difficulties in distinguishing them may arise, especially in certain territories. Also in Central Europe the group is taxonomically not homogeneous (cf. Holub 1961). The present author was concerned with the taxonomic problems of this aggregate many years ago (l. c.; see also Holub et Mladý 1978). For the territory of Czechoslovakia of that period, the aggregate was divided by the present author into three informal taxa - A, B and C, classified as species and denominated by provisional designations, this with regard to some nomenclatural obscurities of that time. Recently

the present author prepared a text on the genus *Leonurus* for the flora work Flóra Slovenska (Holub et Kmeťová, Ms.), where three species are accepted within this taxonomic group; a nomenclaturally valid species name is missing for one of them. As the above mentioned manuscript for Flóra Slovenska is in print, it is necessary to describe validly the species in question. Its description is the main object of this communication; at once, its distribution, mostly in the Czech Republic is given, compiled according to the herbaria PR and PRC, the former of which contains many sheets collected mostly recently. Here, the relationships of the new taxon to other two members of the aggregate in Central Europe are also discussed; further their variation and additional data on the distribution of *L. villosus* in the Czech Republic and in Slovakia are attached. When studying herbarium material of this genus, two sheets of *L. japonicus* Houtt. collected in Bohemia were found; therefore some notice is also given to this species in the closing part of this communication.

Taxonomic problems within the *Leonurus cardiaca* agg.

Various investigators paid heed to the study of the *L. cardiaca* agg. Gusuleac (1915) should be mentioned here in the first place, as he correctly distinguished the importance of the indumentum character within this group, and used it for determination of two basic (marginal) types, designated later by Holub (1961) as taxa A and C, which in the present classification are named *L. cardiaca* L. s. s. and *L. villosus* Dum.-d'Urv. An intermediate type between these two species was not mentioned by Gusuleac; according to the present knowledge it was very rare and perhaps not represented in herbaria at that time. This intermediate type was taxonomically discerned by Holub (1961) as taxon B („*L. intermedius*“). In Flora Europaea, Ball (1972) accepted only one species in *Leonurus* from the taxonomic group in question for Europe - *L. cardiaca*, including further three species - *L. glaucescens* Bunge in Ledeb., *L. tataricus* L. and *L. villosus* Sprengel. In an additional note information about subsp. *villosus* (Desf. ex Sprengel) Hyl. and on our transitional type is given. All these included taxa (and also „*L. intermedius*“ are well distinguishable and deserve to be classified as separate species. Ball's compilation (l. c.) is not satisfactory, even though this author does suggest the problems of the whole group in his additional note. On the other hand, the earlier description of *Leonurus* in Flora SSSR (Kuprijanova 1954) distinguished a series of several species in the group in its West - East direction extended distribution area. Also new studies by the past Russian monographer of that genus Krestovskaja (1988a, b, 1989, 1990) accept (justifiably) a higher number of species in the Eurasiatic area of that group; two basic types among European members of the *L. cardiaca* agg. (in addition to *L. glaucescens* Bunge) are classified by her as separate species - *L. cardiaca* L. and *L. quinquelobatus* Gilib. (= *L. villosus* Dum.-d'Urv.; for a note on the nomenclature of this species see below).

Features of the calyx and the indumentum of various parts of plants are accepted as the main characters for classification and determination in the group *Leonurus* L. sect. *Leonurus*. The basic character for distinguishing taxa in the group *L. cardiaca* agg. belonging here is the indumentum of the whole plant, especially that of the stem, petioles of subtending leaves in the inflorescence and of the calyx. Further characters are rather auxilliary (see below). It may be confirmed that variation ranges of single characters may overlap each other, but the use of a whole set of distinguishing characters renders a sufficiently safe determination possible, especially when the main character - indumentum of certain parts of the plant - is respected. The indumentum (hairiness) as

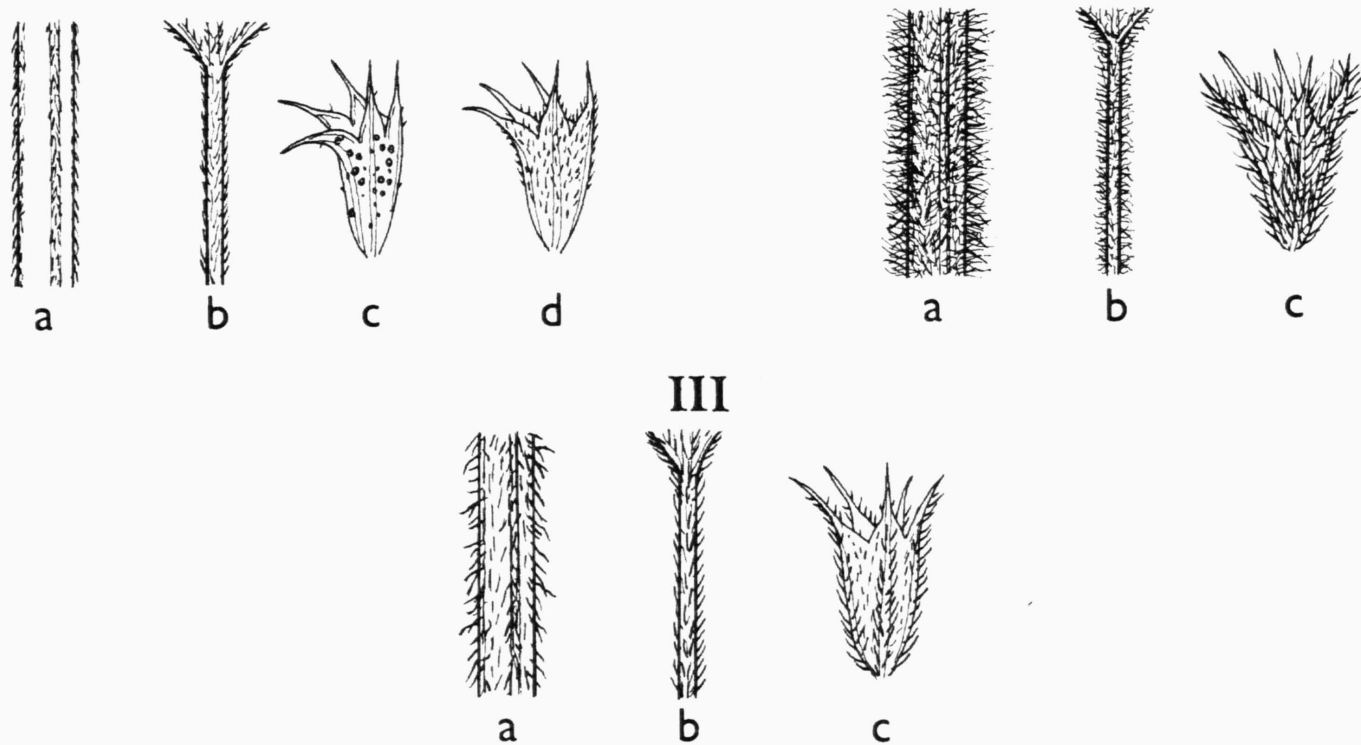


Fig. 1. - Diagnostic characters of species of the *Leonurus cardiaca* agg.: I. *L. cardiaca* L.; II. *L. villosus* Dum.-d'Urv.; III. *L. intermedius* Holub. - a: stem; b: petiole of leaves in the inflorescence; c: calyx. - I c: calyx of *L. cardiaca* L. var. *cardiaca*; I d: calyx of *L. cardiaca* L. var. *hirtella* Holub.

(Del. A. Skoumalová).

an important distinguishing character was used by Gams (1927) for the discrimination of taxa of this group, classified by him as varieties of one species. However, the synonymy given to single varieties by him is uncertain. The importance of the indumentum for distinguishing *L. cardiaca* and *L. villosus* was studied also by Rácz et Rácz-Kotilla (1963). Differences in the formation of this feature are both qualitative and quantitative. According to the qualitative character of the indumentum, Holub (1961; see also Holub et Mladý 1978) distinguished three taxa, whose differential diagnoses referring to the qualitative character of the indumentum are repeated here with certain modifications (see also Fig. 1):

A: The indumentum of the plant consists only of very short, at most 0.5 mm long, $\pm$ rigid, distinctly retrorse hairs appressed to the stem and confined there only to the angles (goniotrichous distribution of the indumentum - Fig. 1; I, a); the sides of the stem are glabrous or subglabrous. Petioles of the subtending leaves in the inflorescence have appressed hairs directed to the top of the petiole (Fig. 1; I, b). = *L. cardiaca* L.

B: The indumentum of plants consists of longer, 1-2 mm long hairs, which are somewhat soft, $\pm$ spreading, straight or bent, and of some shorter, at least partially half-appressed or arcuate hairs; the latter type occurs at stem angles (with a retrorse position) and then in petioles of subtending leaves in the inflorescence (these hairs are directed by their apices to the top of the petiole). The indumentum of the stem is not confined to its angles only, but longer spreading hairs occur rather abundantly also on stem sides. (Fig. 1; III, a, b). = *L. intermedius* Holub.

C: The indumentum of the plant consists only of one type of longer, 1-2 mm long, straight, spreading hairs, which cover - usually rather densely - the whole stem all around and especially very densely the petioles of subtending leaves in the inflorescence. (Fig. 1; II, a, b). = *L. villosus* Dum.-d'Urv.

The above mentioned types differ also by the quantitative character of their indumentum. Stems of plants of type A are nearly glabrous, the indumentum is confined only to the stem angles. Stems of plants belonging to type B are dispersely pubescent, and that of plants of type C are usually densely villous. Sometimes the usual character of the indumentum in the stem typical of the individual types may get near to one another, and then the best method for distinguishing these types, or for their correct taxonomic inclusion, respectively, is studying the indumentum on petioles of the upper stem leaves or of the subtending leaves in the inflorescence (see Fig. 1; I, b; II, b; III, b). To a certain extent the quantity of indumentum may be influenced by external conditions; on the other hand the presence of the qualitative type of indumentum is entirely independent of them. On the basis of quantity of the stem indumentum, it is possible to distinguish type A without any difficulties. Types B and C may stay in some cases - regarding the character in question - very close to one another and the shorter retrorse hairs usually typical of type B are then wrongly perceivable. Such plants may be, however, comparatively easily classified to the pertinent taxon according to the character of the indumentum on upper leaf petioles.

Further distinguishing characters used in the literature for dividing the taxonomic group *L. cardiaca* agg. are: the length of the calyx-tube, the indumentum of the calyx, the form and hairiness of leaves and the magnitude of nutlets. However, not all of these characters can be accepted as distinguishing ones in such a measure as it is mentioned sometimes in the literature. Substantially less important characters are then the height of the plant, the width of bracts, the length of corolla, the length of hairs on the upper lip of the corolla, as well as the form of stem leaves and of subtending leaves in the inflorescence. For distinguishing the two morphologically extreme (marginal) types of *L. cardiaca* agg.

represented in Central Europe (*L. cardiaca* and *L. villosus*), the following additional characters can be mentioned, too: *L. villosus* is usually more robust than *L. cardiaca*; individual parts of flowers are greater, nutlets usually longer (though the differences are not in such different size ranges as given in the literature); leaf blades are generally more divided, both by incisions and by more numerous dents in the margin. In *L. cardiaca*, upper leaves become simpler rather rapidly and subtending leaves in the inflorescence are trilobate and sometimes entire.

As regards classification of the above mentioned types A, B and C, the marginal types A and C are so different and morphologically remote to one another, that they can be justifiably taken as separate species. Their classification at the subspecies level was accepted by some authors (e.g. Hylander 1945; partially also Ball 1972). However, this was not based on any unclear circumscription and delimitation or morphological clear-cutness of the two types to one another, but stemmed rather from the existence of transitional or intermediate types, in which sometimes difficulties, associated with distinguishing certain marginal type (mostly the type C) from intermediate plants, may occur. In my opinion, it is necessary to classify all three taxa at the same taxonomic rank and with regard to the evolutionarily secondary character of intermediate plants; the rank accepted should be that of species. The difference between marginal types is not only morphological, but also primarily phytogeographical; type A is a Central European, and type C represents originally an East-European species.

All three Central European taxa of the *Leonurus cardiaca* agg. can be determined after the following determination key (cf. Fig. 1):

- 1a Stem hairy only at angles; hairs very short, $\pm$ rigid, at most 0.5 mm long, retrorsely appressed to the stem.
– Leaves to 1/3-1/2 divided, $\pm$ glabrous or dispersely shortly appressed hairy; subtending leaves in the inflorescence elliptic in outline; calyx glabrous or with very short appressed hairs, single longer hairs are missing on its surface *L. cardiaca*
- 1b Stem hairy all around; hairs longer, 1-2 mm long, straight, spreading. – Leaves to 1/2-2/3 divided, hairy to softly villous; subtending leaves in the inflorescence elongate rhombic in outline; calyx patent villous or shortly appressed hairy and then usually with single longer hairs situated at nerves 2
- 2a Stem villous; the indumentum monomorphous, consisting of 1-2 mm long spreading hairs; petioles of the inflorescence leaves with spreading hairs; calyx long spreading villous (its surface nearly invisible). – Leaves softly hairy to canescent villous *L. villosus*
- 2b Stem hairy or pubescent; the indumentum (often) dimorphous, hairs on stem sides 1-2 mm long, spreading, straight or undulate, those at angles shorter, somewhat retrorse or arcuate; petioles of the inflorescence leaves with $\pm$ appressed or arcuate hairs directed upwards; calyx shortly appressed hairy, usually with sparsely scattered longer hairs at nerves. – Leaves dispersely to densely hairy *L. intermedius*

The intermediate type B of the earlier classification (Holub 1961) overlaps distinctly the primary morphological hiatus between types A and C; it was designated by the present author with a provisional name „*L. intermedius*“. The presence of plants with intermediate characters between the two basic marginal types of this taxonomic aggregate is characteristic of regions, where the two basic types of this group occur together; their origin by means of hybridization is most probable or nearly certain. By the existence of these plants filling the gap of the primary morphological hiatus between *L. cardiaca* and *L. villosus*, the rather distinct difference between the two taxa is to some extent (though not fully) obliterated. However, the position of *L. intermedius* is not always quite

intermediate, though this taxon usually occupies, according to the character of most of its features, $\pm$ intermediate position between both basic members of the group; by the division of leaves and by the character of indumentum, it is often situated more closely to *L. villosus*. Analogically, among the not numerous vergent types (i.e. the types morphologically tending from *L. intermedius* to one of the two basic members of the group) those which are closer to *L. villosus* (verg. *villosoides*) seem to be more abundant than those more similar to *L. cardiaca* (verg. *cardiacoides*). The classification by Soó (1968: 92), following that by Gams (1927, see also above), included *L. intermedius* into *L. cardiaca* s.s. (sensu Soó!) and by this it was identified with the type (nominate) taxon of *L. cardiaca*, which approach is quite incorrect; on the contrary, an opposite solution - i.e. its inclusion into *L. villosus* - could rather be possible.

A description of the new species *L. intermedius* follows:

***Leonurus intermedius* Holub, species nova**

Planta perennis, 50-150 cm alta. Rhizoma breve, sublignosum. Caulis erectus, quadrangulus, viridis, rubescens vel subviolaceus, in parte superiore ramosus. Indumentum caulium dimorphum; pili in parte caulis inferiore 1-2 mm longi, recti vel undulati, vario modo a caule patentes, dispersi usque densi; in angulis caulium saepe pili breviores, retrorsi vel arcuati. Laminae foliorum palmato-partitae, utrinque disperse usque dense pilosae, supra vivide virides, subtus pallidiores et in nervibus prominentibus patenter pilosae. Folia inferiora rotundata, ad basin cordata, 5-partita, laciniae anguste triangulares, grosse inaequaliterque denticulatae. Folia superiora (folia verticillastos fulcrantia includentia) oblonge rhomboidea, ad basin cuneata, ad apicem tridentata; dens medius longissimus; laminae eorum breviter petiolatae, petioli 1,5-2 cm longi, cum pilis cursum ad apicem petioli dirigentibus, $\pm$ adpressis, vel arcuatis. Bractae subulatae, in margine ciliatae. Calyx conico-turbinatus, 6-9 mm longus, adpresse brevisetaceus, ad nervos cum pilis longioribus dispersis instructus, aliquando subglaber et cum glandulis sessilibus globularibus flavescentibusque ornatus; tubus calycis 4-6 mm longus; dentes calycini 2-3 mm longi, in apice subulate aristati. Corolla 10-14 mm longa; labium superius ellipticum in ambitu, extus longe albeduque villosum, pili 2-3 mm longi. Nuculae (1,9-) 2,0-2,5 (-2,6) mm longae, brunneae, argute trigonae, ad apicem truncatae pilosaeque. (Fig. 1; III., a, b, c).

Typus (holotypus): Herbarium Českoslovacum Nationalis Musei Pragae; no 325 148; „*Leonurus intermedius* Holub“. Habitat: Dolní Posázaví: Týnec n./Sáz.; Die 19.6.1969. Legit M. Lhotská. Rev. 1.3.1993 Josef Holub ut *Leonurus intermedius* Holub. No access. 10/1971; in collectione typorum herbarii PR sub no. 4686 asservatur.

Description: Perennials, 50-150 cm high. Rhizome subligneous. Stem straight, four-angled, green, reddish or purplish, branched in the upper part. The indumentum of the stem consists usually of two types of hairs; stem in its lower part long hairy all around, the hairs 1-2 mm long, straight to undulate, patulous in various directions, scattered to dense; at angles often shorter and retrorsely arcuate hairs. Leaves palmately divided, on both sides sparsely to densely hairy, vivid green in the upper side, paler and patulous hairy on the prominent nerves in the lower side. Lower leaves circular, cordate at the base, deeply 5-lobed, the lobes narrowly triangular, coarsely and unequally denticulate. Upper leaves (including those of the inflorescence) oblong rhombic, cuneate at the base, with three dents in their upper part; the middle dent is the longest one; their blades short petiolate; the petioles 1.5-2 cm long, their hairs directed to the apex of the petiole, $\pm$ appressed or arcuate. Bracts awl-shaped, ciliate in the margin. Calyx 6-9 mm long, appressed hairy, at nerves with some longer hairs, sometimes subglabrous and with yellowish sessile globular glands. Calyx tube 4-6 mm long, calyx dents 2-3 mm long, with awl-shaped aristate tips. Corolla 10-14 mm long, the upper lip elliptic in outline, outside long white villous, the hairs 2-3 mm long. Nutlets (1.9-) 2.0-2.5 (-2.6) mm long, brown, three-angled, truncate and hairy at the top.

Etymology: „*intermedius*“ - with regard to its intermediate position between two related species - *L. cardiaca* and *L. villosus*.

Nomenclature: No name does exist for this species. The species resulted most probably by hybridogenesis not a long time ago and all old names, the study of which was earlier considered as necessary to reveal whether one of them could not belong to the new species (Holub et Mladý 1978: 122), seem to refer mostly to *L. villosus* or even to species from other taxonomic groups (e.g. *L. condensatus* Hornem.).

For the present time, the total distribution area of the new species is quite insufficiently known. In addition to its occurrence in the Czech Republic (given in more detail below), the species is known in Slovakia (very rare), Transcarpathian Ukraine (rare, morphologically much tending to *L. villosus* !) and Germany (very rare, Westphalia); it is possible to adjoin here the occurrence in the central part of European Russia (northern surroundings of Moscow). Hybrids in *Leonurus* (probably between *L. cardiaca* and *L. villosus*) mentioned by Krestovskaja (1988a: 1745) without any more precise taxonomic and geographic data may perhaps also, at least partly, belong here. It cannot be excluded, that *L. intermedius* may be hidden also as some literature records of *L. villosus* (cf. e.g. Abromeit 1898: 674; his description recalls rather *L. intermedius* than *L. villosus*). According to the present knowledge, a further occurrence of *L. intermedius* can be expected with certainty in Austria and Poland. In Slovakia (Holub et Kmeřová, Ms.) *L. intermedius* is known only from 4 localities now (Kremnica, Liptovský Hrádok, Pustá Bela and Rakúsy), i. e. mostly from the basin - regions of the central part of the West Carpathians.

The occurrence in the Czech Republic is given by the following list of localities found after studying herbarium material of PR and PRC. The localities are arranged according to the new phytogeographical division of the Czech Republic (Skalický 1988) into districts and subdistricts. Texts of herbarium labels have been reduced and translated into Latin. The list includes 88 localities.

I. Thermophyticum (46 localities)

1. Podkruš. pán.: Záluží; 1958 Hulán; PR.
- 4a. Loun. střed.: Lahovice, occid. a pago; 1961 Vaidlová; PR.
- 4b. Lab. střed.: Litoměřice, urbi pars septentrionalis; 1974 Javůrková et Javůrek; PR.
6. Džbán: Kladno, acervus fodinae Engerth olim dictae; 1937 Šindelář; PRC. - Motyčín, ad villam merid. a pago; 1940 Souček PRC; 1940 Šourek; PR. - Kladno, Dubí, prope vicum Újezd pod Kladnem; 1939 Šindelář et Švejda; PRC.
8. Čes. kras: Dobřichovice; 1942 Barta; PRC (verg. *villosoides*). - Radotín; s. a., Hora; PRC.
9. Dol. Povlt.: Větrušice; 1989 Chrtěk et Chrtková; PR. - Žalov, 1939 Polívka; PR (verg. *villosoides*). - Podmořán; 1950, s. coll.; PR. - Praha 6, Baba; 1972 Kubíková; PR. - Podbaba, Baba; 1936, s. coll.; PR (verg. *villosoides*). - Praha, Troja, locis ruderalis; 1937 Deyl; PR (verg. *villosoides*). - Praha, Troja, via ad locum Lyon dictum; 1941 Vošoust; PR. - Praha, Troja, loco Hrachovka dicto, in ruderalis; 1947 Metzlová; PRC (verg. *villosoides*). - Praha, Na Vypichu; 1969 Hejný; PR. - Praha, Na Vidouli, locis ruderalis; 1940 et 1941 Domin; PRC; 1963 Pulchart; PRC. - Praha, Motol; 1942 Příhoda; PRC. - Praha, Motol, arenaria merid. a pago; 1942 Polívka; PR (verg. *villosoides* atque *L. villosus*).
- 10a. Jenšt. tab.: Praha 9, Klíčov, locis ruderalis; 1988 Chrtěk et Chrtková; PR. - Bříství, merid.-orient. a pago; 1978 Chrtěk et Chrtková; PR.
- 10b. Praž. kotl.: Královice, ad ecclesiam; s. a., s. coll.; PR.
- 11a. Všet. Pol.: Čelákovice, ad saepes; 1887 Polák; PRC (*L. intermedius* + *L. cardiaca*).
- 11b. Poděb. Pol.: Nymburk; 1941 Beneš; PRC. - Sadská, ad coemeterium; 1981 Chrtěk et Chrtková; PR. - Tatce, in pago; 1977 Chrtěk et Chrtková; PR. - Kolín, ad natatorium Tři Dvory dictum, orient. ab oppido; 1974 Nováková; PRC.
12. Dol. Pojiz.: Stará Boleslav, sept.-orient. ab oppidulo; 1962 Baloun; PR.
- 13a. Rožď. tab.: Rožďalovice, pagi pars septentrionalis; 1979 Chrtěk et Chrtková; PR. - Dymokury, ad ecclesiam; 1940 Duchoň; PR. - Oškobrh; 1940 Deyl; PR. - Chlumec nad Cidlinou, in silva Obora dicta; 1941 Deyl; PR.
- 14a. Bydž. pán.: Smidary, locis ruderalis; 1938 Deyl; PR. - Smidary, in silva Loučňohorský les dicta; 1966 Deyl; PR.
- 15b. Hrad. Pol.: Inter oppidulum Česká Skalice et pagum Spyta; 1956 Müllstein; PR. - Nové Město nad Metují, Krčín, in convalle rivi Metuje; 1968 et 1969 Krčan; PR (verg. *villosoides*).
- 17c. Milov.-valt. pah.: Locis ruderalis ad viam publicam inter oppidum Mikulov et pagum Sedlec; 1966 Chrtěk; PR.
- 18a. Dyj.-svr. úv.: Lanžhot, prata ruderalisata prope pagum; s. a., Husák; PR.
- 20b. Hustop. pah.: Sokolnice, in colle Stará hora dicto; 1922 J. Šmarda; PR.
- 21a. Han. pah.: Vyškov, in vico Nouzka, ad saepes; 1944 Skřivánek; PRC. - Vyškov, in pago Dědice, ad rivum Haná dictum; 1942 Skřivánek; PRC (verg. *cardiacoides*). - Distr. Prostějov, in pago Slatinice; 1940 Otruba;

- PRC. - Olomouc, planta in horto botanico inquilina; 1933 Laus; PRC et PR (verg. *villosoides*). - Olomouc, ad locum Hrad dictum; 1967 Dostál et Bolerájová; PR (verg. *cardiacoides*). - Distr. Přerov, ad marginem occidentalem silvae Žebračka dictae; 1942 V. Pospíšil; PRC.
- 21b. Hornomor. úv.: Distr. Olomouc, in pago Řepčín; 1941 Otruba; PRC. - In silva inter pagos Chropyně et Zářiči; 1965 Dostál; PR.
- II. Mesophyticum (42 localities)
- 24b. Sokol. pán.: Ostrov nad Ohří; 1952 Knobloch; PR.
- 30b. Rak. kotl.: Rakovník, ad rivulum Rakovnický potok in oppido; 1964 Mudrová; PR.
- 31a. Plz. pah.: Distr. Rokycany, in pago Břasy; 1915 Cejp; PRC. - Domažlice; 1975, s. coll.; PRC. - Distr. Domažlice, in pago Kout, ad saepes; 1944 Pulchart; PRC.
33. Křivokl.: Zdice; 1963 Hronešová; PR.
- 36a. Blat.: Bělčice, occid. a pago; 1971 Deyl; PR. - Blatná, ad pagum Blatenka; 1975 Deyl; PR. - Blatná, locis ruderatis sept. ab oppidulo; 1985 Deylová; PR. - Blatná, ad piscinam Pustý rybník dictam; 1972 Deyl; PR. - Blatná, ad coemeterium; 1973 Deyl; PR (verg. *villosoides*).
- 36b. Horaž.: Horažďovice, in pago Babín, locis ruderatis; 1982 Deylová; PR.
- 37b. Suš.-horaž. váp.: Horažďovice, prope fluvium Otava sub ruina arcis Prácheň; 1944 Dostál; PRC. - Hejtná; 1946 Vaněček; PR.
- 37c. Volyň. Předšum.: Inter oppidulum Vimperk et pagum Sudslavice; 1969 Deyl; PR.
- 37l. Českokrum. Předšum.: In convalle fluminis Vltava sept. a pago Opalice, prope locum Pozděraz dictum; 1940 Bafa; PRC (verg. *cardiacoides*).
38. Bud. pán.: Heřman; 1972 Hejný; PR. - Protivín, locis ruderatis; 1941 Semotán; PRC (verg. *cardiacoides*). - Svinětice, ad stationem viae ferreae; 1961 Hejný; PR. - Chvalešovice, in vico Bílá Hůrka; 1965, 1968 et 1972 Hejný; PR. - Divčice; 1968 et 1972 Hejný; PR. - Nákří; 1968 Hejný; PR. - Munice; 1968 Hejný; PR.
39. Třeboň. pán.: Soběslav; in ruderatis Solín dictis; 1944 Hojovec; PR. - Veselí nad Lužnicí, oppidi pars Mezimostí dicta, prope stationem viae ferreae; 1949 Kurka; PR.
41. Stř. Povlt.: Živohošť, in ruderatis prope vicum Nebřich; 1962 Lhotská; PR. - Kamenný Přívoz; 1969 Lhotská; PR. - Krhanice, loco Na rybníčkách dicto; 1961 Vernerová; PR. - Chrást nad Sázavou; 1962 Lhotská; PR. - Týnec nad Sázavou; 1969 Lhotská; PR (cf. holotypus).
- 42a. Sedlč.-mílev. pah.: Votice, in silva Bažantnice dicta ad stationem viae ferreae; 1956 Hostička; PR.
- 46a. Děč. Sněž.: Děčín, in vico Bělá; s. a., s. coll.; PR.
49. Frýdl. pah.: Frýdlant, ad saepes; 1946 Trapl; PRC. - Nové Město pod Smrkem; 1958 Jehlík; PR.
- 63f. Českotřebov. úv.: Ústí nad Orlicí; 1942, s. coll.; PRC.
- 64b. Jevan. ploš.: Mnichovice; 1901 Domin; PRC.
65. Kutnoh. pah.: Kouřim, Molitorov, ad viam sept. a vico; 1974 Chrtěk et Chrtková; PR. - Kutná Hora, in ruderatis; 1943 Vepřek; PRC.
67. Českomor. vrch.: Třešň, in vico Horní Pole, 680 m s.m.; 1958 Stuchlík; PR. - Telč, ad stationem viae ferreae Radkov; 1983 Chrtěk et Chrtková; PR. - Telč, in oppiduli parte meridio-occidentali, 520 m s.m.; 1943 Diener; PRC.
68. Mor. podh. Vysoč.: Bílovice prope urbem Brno; 1980 Deylová; PR.
- 71b. Drah. ploš.: Konice; 1940 J. Němec; PRC.
- 74a. Vidn.-osobl. pah.: Žulová, locis ruderatis in parte septentrionali pagi Skorošice; 1954 Heřmanská et Marvan; PRC.
78. B. Karp. les.: Nedašov; 1944 E. Mencl; PRC.
- 80a. Vset. kotl.: Distr. Vsetín, pagum Hošťálková, culta in horto; 1942 V. Pospíšil; PRC. - Vsetín, planta inquilina; 1943 V. Pospíšil; PRC.

III. Oreophyticum (no localities)

In the herbaria of Prague (PR, PRC) only few sheets of the new species *L. intermedius* have been found from other countries - from Germany (Westphalia, 1 sheet), Transcarpathian Ukraine (2-3 sheets) and 3 sheets from one locality in Central Russia. The survey of these localities follows:

Germania, Westphalia, Oberdorf prope Witten; 1895 Haber; PRC.

Ucraina Transcarpathica: Rachov; 1929 et 1934 Deyl; PR (verg. *villosoides* et *L. villosus*). - Rachov, ad rivum Borkutský potok prope fontem salsuginosum, 450 m s.m.; 1936 Pulchart; (+ *L. villosus*). - Kvasy, s. a., s. coll.

(= *M. Deyl*); PRC (verg. *villosoides*).

Rossia centralis, regio Mosquensis, pars septentrionalis; prope oppidum Jachroma; 1971 Vašák; PR (nos 341 646, 341 648, 341 649).

In addition to the above listed localities from the Czech Republic originating from PR and PRC, further data exist from the period of the last 20-30 years, as literature data, data in excursion notes and collections in further official herbaria as well as in various personal herbaria, which are not recorded here. In the above list only sheets determined and revised by the present author in the two greatest herbaria of the Czech Republic are included; all these sheets were provided with revision labels by him. All further data will be utilized later for preparing distribution maps of the members of the studied aggregate occurring in the Czech Republic. According to the present knowledge, the relation of the presence of the three species in the Czech Republic can be estimated as follows: *L. cardiaca*: 60-70 %; *L. intermedius*: 25-30 %; *L. villosus*: 5-10 %.

The publication of preliminary communications on the taxonomy of the aggregate (Holub 1961; Holub et Mladý 1978) and personal contact of the present author with persons interested in regional floristics have resulted in an increased collection of members of this aggregate in the Czech Republic in the the last 30 years. A greater number of sheets were collected, e. g. by Chrték et Chrtková, Deyl, Hejný, Lhotská etc. *L. intermedius* appeared in our herbaria as late as at the turn of the century, when also the first adventive

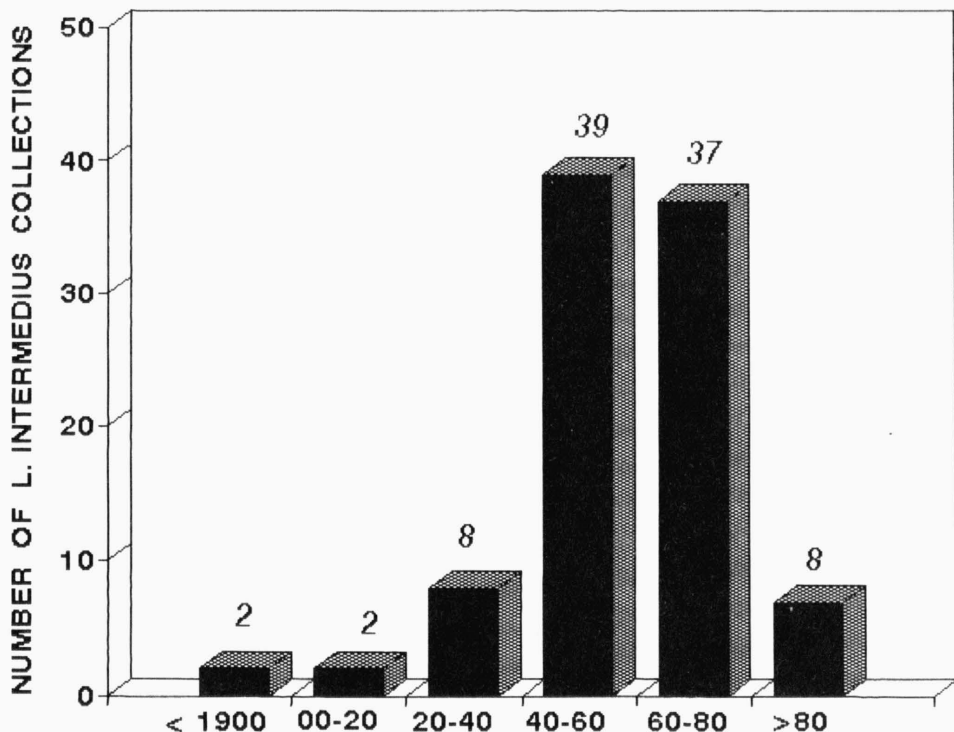


Fig. 2. - Chronological distribution of collections of *L. intermedius*. Number of records in a given period appears on top of each bar.

finds of *L. villosus* were reported from this country. It is interesting, that in the course of the past century, despite rather high collection activity, this taxon was not found nearly at all. The earliest collection of *L. intermedius* originates from the end of the 19th century (till to 1900 only two localities are known, and one of them may still be questionable - i.e. Polák 1887 including a mixture of 2 specimens of *L. cardiaca* and 1 specimen of *L. intermedius*; this situation could originate by an unwary work in the herbarium). The fact of chronologically bound and dependent occurrence of *L. intermedius* and *L. villosus* - together with the morphological intermediateness - can emphasize the opinion about the very probable origin of this taxon by interspecific hybridization after the (secondary) immigration of *L. villosus* into the territory of Central Europe.

It is interesting to study the chronological distribution of collections of *L. intermedius* in the Czech Republic (Fig. 2). Up to 1960 (before the publication of the communication Holub 1961 - i.e. for more than a hundred years) sheets from 51 localities were collected; after then, sheets from c. 40 localities were collected during the following thirty years.

The greatest part of collections (c. 90 sheets) were collected within the period 1930-1990, whereas only five sheets were gathered during 50 (-100) years preceding this period. It must be stressed that, in addition to the more numerous collection activity after the publication of the preliminary communication by Holub (1961), also the s.c. „floristic action“, i.e. a special undertaking by the Czech Botanical Society in the forties, gathered a rich herbarium material including also many sheets of *Leonurus*.

Variation of *L. intermedius* - unlike to that of its presumed parents - is not too extensive. As in analogical cases, it is possible to consider the s. c. vergent types, i. e. types morphologically closer to one or to the second one of the presumed parents; in this case verg. *villosoides* seems to be more frequent than verg. *cardiacoides*. For the area of the Czech Republic the relation of their presence is 9 : 4, in some other countries it is even higher. In sporadic cases it is difficult to classify the plants either to verg. *villosoides* of *L. intermedius* or to *L. villosus*. Analogical difficulties with classifying plants either to verg. *cardiacoides* or to *L. cardiaca* are very rare or nearly missing. Sometimes influences of introgressive hybridization cannot be excluded, especially in the localities, where *L. intermedius* occurs commonly with one of the presumed parents. However, there are many cases, where in a certain place or in a territory only *L. intermedius* occurs, without the presence of any one of the parents or only with *L. cardiaca*; in the latter case usually no closer morphological rapprochement to that species does occur. The occurrence of *L. intermedius* independent from that of its presumed parents follows also from the comparison of the number of its localities with the number of localities of *L. villosus* in the Czech Republic. Regarding the number of localities, *L. intermedius* is here c. four times more frequent than *L. villosus*. Altitudinal distribution of *L. intermedius* in the Czech Republic shows, that the species prevalently occurs in heights from 150 to 500 m a.s.l. This altitudinal range includes more than 90% of its localities in this country; its highest known occurrence at present is in the Bohemian - Moravian Uplands near the town Třešť - 680 m a.s.l.

Note: *Leonurus intermedius* is certainly a good example of the origin of a new taxon on the basis of an interspecific hybridization between a native species and a successful invader from other geographical areas. A new sexually reproducing taxon resulted from such a process as an evolutionary novelty. By studying such a taxon, it is possible to record „evolution in action“. The species under study represents a result of a rapid

evolution, being a stabilized hybridogeneous product originated by that process. It can be included as a further example among infrequent homoploid hybrid derivative species (in the sense of Abbott 1992) as all species of this taxonomic group are diploid and have the same chromosome number $2n = 18$. Analogical examples are known from *Helianthus* (cf. Abbott 1992), where three new species have originated from the same type of hybridisation between *Helianthus annuus* and *H. petiolaris*: *H. anomalus*, *H. deserticola*, and *H. paradoxus*. The latter species originated in Texas within the last 50 years. *L. intermedius* is a promising type to further evolutionary studies by using special modern methods (molecular and isozyme studies). Closing this note, it is useful to quote two thoughts by Abbott (1992): „Recent studies have confirmed that interspecific hybridization following plant invasions may sometimes lead to the rapid evolution of new plant taxa“. And „If recognized soon after their origin, further study of these new taxa can provide an understanding of the factors which influence their establishment and spread, and thus in certain cases the process which lead to successful speciation.“

Notes on other *Leonurus* species

1. *Leonurus cardiaca* L. s. str.

When studying the variation of this species, some difference was stated in the calyx indumentum; as the indumentum of the plant (including that of the calyx) is a very important diagnostic character in the genus *Leonurus* generally, the calyx indumentum was therefore studied in *L. cardiaca*. Normal plants of that species have calyces outside glabrous, green, only with dispersed yellowish globular glands (Fig. 1; I, c). The newly found different type has calyces with short appressed hairs, only 0.1-0.2 mm long; this indumentum gives to the calyx a certain gray-silky coloration. The new morphological type is classified as var. *hirtella* (Fig. 1; I, d); its differential diagnosis follows:

***Leonurus cardiaca* L. var. *hirtella* Holub, var. nova**

A plantis speciei typicis (cum calycibus glabris viridibusque) differt indumento calycis e pilis brevissimis (c. 0.1-0.2 mm longis) appressisque; indumentum calycis ideo canescenti-sericeum.

Typus: Herbarium Musei nation. Pragae; Buřina srdečník [=the Czech name of the species]; *Leonurus cardiaca*; okres Nymburk - obec Velenice - náves [Bohemia; distr. Nymburk; pagum Velenice]; 10.6.1961; leg. Naděje Krčíková; PR s. n.; no access. P 4 S 491/315; in collectione typorum herbarii PR sub no 4692 asservatur.

The following list of selected localities (compiled analogically as the list of localities of *L. intermedius* - see above) gives a certain picture of the occurrence of this taxon:

I. Thermophyticum (8 localities)

8. Čes. kras: Karlštejn, ad viam publicam in pago (Budňany); 1900, s. coll.; PRC.
9. Dol. Povlt.: Praha, Troja; 1920 Dostál, PR.
- 10b. Praž. kotl.: Praha, locis ruderalis, s. a., Tausch (= Tausch Fl. Bohem. Exsicc. no 1182); PRC.
- 11a. Všet. Pol.: Mělník, Brozánky, ad saepes; 1940 Mikuláš; PRC.
- 11b. Poděb. Pol.: Nymburk; s. a., Všetečka; PR.
- 13a. Rožď. tab.: Distr. Nymburk, in pago Velenice; 1961 Krčíková; PR (cf. holotypus). - Městec Králové, ad saepes; 1940 Duchoň; PRC.
14. Bydž. pán.: Smidary, ad stationem viae ferreae; 1938 Deyl; PR.

II. Mesophyticum (2 localities)

- 31a. Plz. pah.: Blovice, Hradiště; 1941, s. coll.; PR.
- 35b. Hořov. kotl.: Lochovice, ad rivum Litavka; 1943 Domin; PRC.

At present it is not clear whether a certain characteristic distribution pattern of this taxon exists; according to the above list of selected localities, it seems, that var. *hirtella* occurs more often in warmer regions and in lowlands (i.e. especially in the Thermophyticum); all localities given above refer to the territory of Bohemia only.

The total distribution area of *L. cardiaca* includes West, North, Central, South and East Europe, while in South Europe it is missing from southern parts of Spain and Italy, in East Europe it reaches at most to the lower Volga (whether is this not only an isolated occurrence there?), generally to the Dnieper and vicinity of Odessa, northwards to southern Fennoscandia and to the Baltic countries; over Roumania (here abundantly) and the Balkan Peninsula (here e.g. Bulgaria - vidi: Varna, 1897, Velenovský, PRC) the distribution area transgresses to northwestern Turkey, where it occurs mostly in its European part; its transgress to the northwestern part of Anatolia is very slight. The occurrence in North Africa (Algeria) may be of a secondary character. With certainty this species was introduced to North America (vidi e.g. from the New York State), where it occurs mostly in temperate regions of the USA and Canada. Also in the recent period this species is given (in a taxonomically broad circumscription) from some other regions, e.g. Rechinger (Flora Iranica 150/1982: 335) gives it still even from Iran. These data, given as subsp. *cardiaca*, were corrected by Rechinger himself (l.c., p. 337) according to the taxonomic interpretation of the aggregate used by Mill (1982) in Flora of Turkey; his own data of subsp. *cardiaca* were transferred by Rechinger to two other species - *L. glaucescens* Bunge (where the greater part of his data belong) and *L. villosus* (here only records from the Iranian Azerbaijan). The reply of the composite question raised by Holub (1961), what is the native distribution area of *L. cardiaca*, what is its phytogeographical character and where the centre of its origin and evolution should be situated, is from the viewpoint of its present distribution area not fully clear. Popov (1949: 227) believed, that *L. cardiaca* (in its broader taxonomic conception, i.e. incl. *L. villosus* and perhaps also further species) had spread in the Holocene as an anthropophytic plant from the Tian-Shan Mts. and the Altai Mts. over East Europe to Central Europe. It is impossible to agree with this opinion. *L. cardiaca* is the westernmost taxon of the whole broadly circumscribed aggregate divided in the temperate and warmer zones of Eurasia into a series of geographically vicariant species, whose distribution areas are situated from North China and Dahuria to Central Europe. *L. glaucescens* Bunge seems to be a very allied taxon covering an extensive distribution area from Poland to Central Siberia, Central Asia and Iran. *L. cardiaca* is an evolutionary descendant of that species, and it is necessary to consider its origin most probably in Central European region, perhaps in its southern or southeastern part; regarding the relation of its origin to biotope types, the species certainly evolved in places having been under a more long-term anthropic influence and damaged by Man activity, so that its occurrence in native or natural phytocoenoses is unknown (deuteroapophyte - Holub et Jirásek 1967: 106; Holub 1972: 10; = a species native in the given geographic area, occurring there, however, only in secondary types of habitats and biotopes).

2. *Leonurus villosus* Desf. ex Dum.-d'Urv.

Nomenclature of this species is still insufficiently solved and its problems could not be completely solved nor yet either in this communication. Only a selected survey of its synonymy is given here:

Leonurus villosus Desf. ex Dum.-d'Urv. Enum. Plant., 69, 1822 = Mém. Soc. Linn. Paris 1: 325, 1822 [n.v.];
 * Sprengel Syst. Veget. 2: 737, 1825.
 Syn.: *L. villosus* Desf. Tab. Ec. Bot., ed. 2, 73, 1815, nom. nudum; Desf. Catal. Plant. Hort. Reg. Paris, 395, 1829, nom. validum.
Cardiaca quinquelobata Gilib. Fl. Lithuan., 85, 1785, nom. inval. [n.v.].
Leonurus quinquelobatus (Gilib.) Gilib. in Usteri Delect. Opusc. Bot. 2: 321, 1793, nom. inval.
L. canescens Dum. Florula Belg., 46, 1827.
L. cardiaca L. subsp. *villosus* (Dum.-d'Urv.) Hyll., Uppsala Univ. Årskr. 1945/7: 273, 1945 [cum auct. „(Desf. ex Spreng.)”].

Soviet and Russian authors steadily have used the name *Leonurus quinquelobatus* Gilib. in (ex) Usteri 1793 for this species till to the present time. Krestovskaja (1988a: 1751) argued with those authors, who consider that name to be nomenclaturally invalid. According to her, the name proposed by Gilibert (1793) is valid and in accordance with the Code ICBN. However, it must be stressed here, that Gilibert in that publication (or the republishing author Usteri?) did not employ - in the same way as in his earlier as well as other works - consistently the binary Linnaean nomenclature. Therefore that work in the whole cannot be used as a source of valid names, and this also applies to the binomes created by Gilibert as in the case *Leonurus quinquelobatus*. Two new changes in the quotation of the publication place of this binomial have appeared recently. Mill (1982) in Flora of Turkey gave that name as *L. quinquelobatus* Gilib. Pl. Rar. Comment. Lithuan., 15, 1785. This publication is unknown and inaccessible to the present author; it is also not mentioned among Gilibert's works included in the basic bibliographical handbook Taxonomic literature (Stafleu et Cowan 1976). No closer explanation of this change was given by Mill. With regard to the general nomenclatural character of Gilibert's works (i.e. universal non-acceptance of binary Linnaean nomenclature, repeated always in his various works), it is therefore not certain, whether that name was really validly published in the given Gilibert's publication. Without revision and some explanatory comments it is not possible to take over that name and to use it as a correct one. The second change of the publication place appeared most recently in the Med-Checklist (3:292; Greuter et al. 1986); the name under question is used there (with some different orthography) provided by a quotation of another (and in this case a later) Gilibert's work - *L. quinquelobus* (!) Gilib. Hist. Pl. Europ. 2:104, 1806. The same evaluation uttered above on Mill's change is also valid for the change made in the Med-Checklist; to give an explanation and reasons for acceptance of this name is necessary.

The name *L. villosus* used here has likewise certain nomenclatural problems. For the first time, the name was used by Desfontaines in 1815 (see the list of synonyms above), but only as a nomen nudum. Its valid publication by Desfontaines is known to me from his work in 1829. Two authors who validated that invalid Desfontaine's name from 1815 earlier than Desfontaines himself are mentioned in the literature: Dumont-d'Urville in 1822 (n.v.) and Sprengel in 1825 (vidi) = Sprengel Syst. Veget. 2: 737, 1825; from the latter publication place this species epithet was taken over into the subspecies level by Hylander (1945) and by Ball (1982). The quotation by Dumont-d'Urville was revised and modified in the Med-Checklist 4 (Greuter et al. 1986) with the publication place „Mém. Soc. Linn. Paris 1: 325, 1822”.

Krestovskaja (1988a: 1751) mentioned a different type of *L. villosus* (sub *L. quinquelobatus*) from Caucasus - var. *caucasicus* Krestovskaja; a short appressed indumentum should be typical of this taxon. The plants corresponding to this type have

not been seen by the present author. Regarding the importance of the indumentum character within this aggregate generally and in this species especially, it seems to be necessary to revise critically the taxonomic evaluation, classification and importance of that taxon in future.

The total distribution of *L. villosus* includes North Europe (Fennoscandia - excluding its northern regions - and North Russia), West Europe (here only a rare and secondary occurrence), Central and East Europe (in Roumania especially in eastern regions of the country; in Bulgaria missing?), Turkey (only in northern and northeastern part of Anatolia), Caucasus and western Iran (mostly Azerbaijan). From East Europe its distribution transgresses to western part of West Siberia (but there only rarely); secondarily it occurs in Russian Far East and probably also elsewhere. Mill (1982) designated this species as an Euro-Siberian phytogeographical element; the centre of its geographic distribution seems to be situated in East Europe and in adjacent regions southwards from there (the Crimea, Caucasia). The area of native occurrence transgressed perhaps up to eastern Finland, in Central Europe to Poland, western Ukraine (incl. the Transcarpathian Ukraine), East Slovakia and Roumania. Further westwards only adventive localities and later some naturalized occurrences are known, originated in the second half of the 19th century and during the 20th century. In Central Europe data on its distribution occur more frequently from the period at the turn of century. In addition to its introduction into new regions by transport, a certain part in the increase of its distribution area has been played by its cultivation as a melliferous plant, at least in some regions. In the Czech Republic in the last period (most likely owing to the more intensive field research) several new localities were found in some regions (e.g. in South and Central Bohemia). Generally it can be said, that from the second half of the last century a substantial spread of the distribution area of this species westwards occurred; afterwards a formation of its extensive synanthropic part has followed. According to herbarium material of PR and PRC, *L. villosus* is known in the Czech Republic from the following localities. (The list of localities is arranged analogically as the list of localities of *L. intermedius*):

I. Thermophyticum (8 localities)

- 4b. Lab. střed.: Ústí nad Labem; 1899 Schubert; PR.
- 7c. Slán. tab.: Slaný, ad stationem viae ferreae; 1972 Jehlík; PR.
- 9. Dol. Povlt.: Praha, Motol, arenaria merid. a pago; 1942 Polívka; PRC.
- 10b. Praž. kotl.: Praha; 1926, s. coll.; PRC. - Praha, in horto botanico; 1890 Willkomm; PRC. - Praha, collis Bohdalec, declivia meridionalia; 1971 Lhotská; PR.
- 11b. Poděb. Pol.: Velenka; 1963 Chrtěk et Chrtková; PR.
- 21b. Hornomor. úv.: Kojetín, ad viam ferream versus Chropyně; 1970 Reitmayerová; PR.

II. Mesophyticum (11 localities)

- 37b. Suš.-horaž. váp.: Inter pagos Radomyšl et Malá Tuřňa; 1971 Deyl; PR.
- 38. Bud. pán.: Heřmaň; 1968 Hejný; PR. - Drahenice; 1967, 1968 et 1972 Hejný; PR. - Skočice; 1968 Hejný; PR. - Čičenice; 1968 Hejný; PR.
- 41. Stř. Povlt.: Chrást nad Sázavou; 1958 et 1969 Lhotská; PR. - Pecerady; 1969 Lhotská; PR.
- 47. Šluk. pah.: Krásná Lípa; 1957 Marschner; PR.
- 64a. Průh. ploš.: Klánovice, ad stationem viae ferreae; 1939 Dostál et Jirásek; PRC.
- 65. Kutnoh. pah.: Kouřim, inter vicus Bošice et Svojšíce; 1977 Chrtěk et Chrtková; PR.
- 67. Českomor. vrch.: Telč, culta in horto; 1943 Diener; PRC.

III. Oreophyticum (no localities)

An old collection exists also, approximately from the half of the past century, collected by Sekera in Bohemia (without any geographic localization of the collection; a cultivated plant ?).

The occurrence in Slovakia is confined to its eastern part, wherein the species transgresses from the Transcarpathian Ukraine. In the compilation for Flóra Slovenska (Holub et Kmeřová, Ms.) three localities are given from that country: Vihorlat, Humenné and Kalinov. Now, it is possible to add two further localities found in new accessions in PR:

Distr. Spišská Nová Ves, ad fluvium Hornád, prope vicum Čingov; 1976 Soják; PR. - Distr. Trebišov, Veľký Kamenec, ad ruinam arcis; 1988 Chrtěk; PR.

From other regions of Central Europe the occurrence of *L. villosus* in the Transcarpathian Ukraine can be mentioned; it occurs there in the vicinity of Rachov, Chust, Miškarovicja, Solotvinske Kopalni and Jasina. Further occurrence in Central Europe (PR, PRC) is known from the vicinity of Nordhausen (Thuringia) and Munich (two sheets; 1934 Gerstlauer, PRC; also from the railway station Südbahnhof there - PRC). The species was edited in two exsiccate collections from the (broadly delimited) Central Europe:

Flora Siles. Exsicc. No 1134; Flora Moldav. Dobrog. Exsicc. (Jassi) no 351.

In comparison with *L. cardiaca*, *L. villosus* is a species with a more eastern centre of its occurrence; however, it does not transgress anyhow to the adjacent Siberian region, where other taxa from sect. *Leonurus* occur, but not indicating any rather close relationships to *L. villosus* (e. g. *L. tataricus* L.). Sheets with plants of this species were seen also from the Crimea and the Caucasus. After Krestovskaja (1988a) *L. villosus* often hybridizes in Armenia and Turkey with *L. glaucescens* Bunge (i.e. with the species having a goniotrichous distribution of the stem indumentum as *L. cardiaca* s. s.). These hybrid plants represent a parallel type to *L. intermedius*.

3. *Leonurus japonicus* Houtt.

During the study for this communication, two sheets from Bohemia were found in PR, one of which was designated (by Gusuleac) as *L. sibiricus*, the second one by its collector as *L. cardiaca*. They certainly do not refer to these species. The texts of their labels follow:

1. Mlíkojed, Hackel; *Leonurus sibiricus* L.; det. Gusuleac 1917; PR 146 028; evid. no. P4, S4, 391/110. (= Distr. Litoměřice, pagum Mlíkojedy).
2. *Leonurus cardiaca* L.; Böhmen, Harta, im Fabriksgarten ... 435 m, 31. 8. 1923; V. Cypers; PR s.n.; evid. no P4 S4 91/221.

The plants from these two sheets belong to the same species; after studying literature and herbaria, a previous assumption that they might belong to *L. sibiricus* (as Gusuleac considered for one of them) has not proved to be correct. The plants of these sheets have to be classified to *L. japonicus* Houtt. (= *L. sibiricus* auct., non L. sensu orig.). The real *L. sibiricus* L. differs from *L. japonicus* Houtt. (in addition to other characters) by the calyx indumentum having outside in the central part of the calyx also longer hairs, whereas *L. japonicus* has a monomorphous indumentum consisting only of very short appressed hairs. Further the upper subtending leaves in the inflorescence are simple, entire, linear-lanceolate and the corolla is minor, only 9-13 mm long. *L. sibiricus* has the upper subtending leaves in the inflorescence trisect, with linear laciniae and the corolla is greater, 15-20 mm long. It must be emphasized here, that under the name *L. sibiricus* (auct.) not only *L. japonicus* has been hidden, but also other *Leonurus* species, e.g. in East Siberia often *L. deminutus* V. Kreč. even from another taxonomic group (= *Leonurus* L. sect. *Leonurus*).

The two mentioned species (*L. japonicus* and *L. sibiricus*) belong to sect. *Cardiochilium* (V. Kreč. et Kupr.) Krestovskaja, Novosti Sist. Vysšich Rast. 25: 145, 1989, classified originally as a subgenus of *Leonurus* - subgen. *Cardiochilium* V. Kreč. et Kupr. apud Kupr., Flora SSSR 21: 650, 1954. Krečetovič very probably considered this taxon to be classified as a separate genus. However, the name in the generic rank was not published by him. Alternative names with *Cardiochilium* were proposed for the species occurring in the territory of the former SSSR in Flora SSSR (Kuprijanova 1954), mentioned there in the synonymy of individual species. Regarding the invalidity of that generic name (and also considering the time limitation of validity of alternative names by the date 1.1.1953 - cf. the Code ICBN Art. 34.3), these alternative names are invalid. Differences between the sections sect. *Cardiochilium* and sect. *Leonurus* are given by Krestovskaja (1989). The rank of taxonomic classification of this group still requires further consideration. In comparison with Central European members of the genus *Leonurus* from the group *L. cardiaca* agg., *L. japonicus* differs by the structure of the calyx, the indumentum of the upper corolla lip, the length of bracts and by the indumentum of nutlets; these principal differences between the two sections are included in the following determination key:

- 1a Calyx acutely angled by five prominent ribs, with five nerves; the upper corolla lip long villous outside; bracts usually shorter than 1/2 of the calyx length; nutlets hairy at the top *L. cardiaca* agg.
- 1b Calyx not acutely angled, with ten non-prominent nerves; the upper corolla lip only shortly pubescent outside; bracts as long as 1/2 to 1/1 of the calyx length; nutlets glabrous on the whole surface *L. japonicus*

The nomenclature of *L. japonicus* was studied by Krestovskaja (1987). *L. japonicus* is native in Asia, where it occurs in the eastern and southeastern part, from East Siberia (Dahuria) over Russian Far East to Korea and Japan, over China, Taiwan, Vietnam and Indonesia to India (vidi e.g. from Bengal). As a secondarily introduced plant it invaded further areas, in Africa Ethiopia, in North America eastern and southern coast of the USA, the Caribbean region (vidi e.g. plants from the Bahamas, St. Thomas Isl.), in South America Brazil and Argentina, in the Pacific area New Caledonia (vidi: Plantae Schlechterianae, Iter Neo-Caledonicum, no 14898 - ut *L. sibiricus* L.) etc. No information is known on the newly found occurrence in Bohemia. Hackel's collection from Mlékojedy (vicinity of the town Litoměřice) originates from the period about the half of the past century and does not has its own original label. The collection from Harta by Cypers may represent a cultivated plant. At the close, brief information on synonymy and morphology of the species are given:

Leonurus japonicus Houtt. Nat. Hist. 9: 366, 1778

Syn.: *Stachys artemisiae* Lour. Fl. Cochinch. 2: 365, 1790

Leonurus condensatus Hornem. Hort. Hafn. 2: 557, 1815

L. heterophyllus Sweet Brit. Flower Gard. 2: 197, 1827

L. mexicanus Sesse et Mocino Fl. Mexic., ed. 2, 136, 1892

L. pseudomacranthus Kitagawa, Bot. Mag. Tokyo 18: 109, 1934

L. artemisiae (Lour.) S. Y. Hu, Journ. Chin. Univ. Hongkong. 2/2: 381, 1974

L. sibiricus auct. plur., non L. 1753 sensu orig.

Usually biennials, 50-100 cm high, greyish green, shortly appressed hairy. Stems erect, ramose, angled, hairy at angles, grooved in sides. Basal leaves ovate-cordate, incised, long petiolate, withering already before the flowering period. Cauline leaves 5-10 cm long, ovate in outline, deeply trisect, cuneate at base, long petiolate, rough, the main lobe oblong rhombic; the lower leaves of the inflorescence tripartite, laciniae linear, acuminate; the most upper leaves of the inflorescence entire, narrowly lanceolate. Inflorescence long, with remote verticillasters; bracts as long

as 1/2-1/1 of the calyx length. Calyx narrowly conic, c. 8 mm long, with not prominent nerves, shortly appressed hairy, calyx dents upright, directed upwards, aristate with short awl-shaped tips. Corolla 9-13 mm long, rose to lilac rose; the upper lip slightly pubescent outside, the lower lip with a purple central lobe. Nutlets 2 mm long, black, acutely angled, slightly compressed, glabrous on the whole surface.

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Souhrn

V předložené studii je řešena taxonomická a chorologická problematika taxonů příbuzenského okruhu *Leonurus cardiaca* agg. sekce *Leonurus* rodu *Leonurus* v České republice (ČR). Tento taxonomický komplex představuje sérii blízce příbuzných taxonů rozšířených od západní Evropy do východní Sibiře, severní Číny a centrální Asie, které se svým výskytem navzájem podstatně vikarizují. Ve střední Evropě jsou zastoupeny 3 drobné druhy okruhu, zmíněné autorem již v jeho předběžných publikacích v r. 1961 a 1978. Zde je nyní jako nový druh popsán *L. intermedius* a je podáno jeho rozšíření v ČR podle herbariových sbírek PR a PRC (jejichž materiál byl autorem určen a opatřen revizními schedami). Pro nový druh bylo užito již dříve navržené provizorní označení *L. intermedius*, zachycující postavení nového taxonu mezi oběma krajními, silně odlišnými zástupci okruhu ve střední Evropě – *L. cardiaca* L. a *L. villosus* Dum.-d'Urv. Ne vždy však je postavení *L. intermedius* vskutku intermediární mezi těmito druhy; mnohdy totiž směřuje tento druh svými morfologickými znaky spíše k *L. villosus* než k *L. cardiaca*. Také vergentní typy směřující k *L. villosus* (verg. *villosoides*) jsou početně více zastoupeny než vergentní typy směřující k *L. cardiaca* (verg. *cardiacoides*).

Jako základní rozlišovací znak v této skupině je nutno podtrhnout kvalitativní charakter odění rostliny (lodyhy, řapíků horních listů a kalicha); kvantitativní rozdíly v odění bývají způsobeny rozdílnými podmínkami prostředí. Intermediární typ překrývá původní morfologický hiát mezi *L. cardiaca* a *L. villosus* a tím se do určité míry smazává jejich primární charakteristický ráz; tento jev je však druhotný, vznikl následkem hybridizace. Existence přechodných typů charakteru *L. intermedius* vede některé autory k hodnocení obou krajních taxonů okruhu – *L. cardiaca* a *L. villosus* – jako subspecií jednoho druhu; taková klasifikace (užitá nepřímo ve Flora Europaea či v širší míře i ve Flora Iranica, dále Hylanderem atd.) je nepřirozená; realitě odpovídá více klasifikace těchto taxonů na úrovni druhů, užitá např. v dílech jako jsou Flora SSSR nebo Flora of Turkey. Tři středoevropské členy okruhu *L. cardiaca* agg. je možno určit podle následujícího klíče:

- 1a Lodyha jen na hranách chlupatá; chlupy velmi krátké, nejvýše 0,5 mm dl., tuhé, dolů sehnuté, k lodyze přitisklé. – Čepele listové do 1/3-1/2 rozdělené, ± lysé nebo krátce přitiskle roztroušeně chlupaté; čepele podpůrných listů v květenství v obrysu eliptické; kalich lysý nebo přitiskle kratičce chlupatý, bez jednotlivých delších chlupů *L. cardiaca*
- 1b Lodyha kolem dokola chlupatá; chlupy delší, 1-2 mm dl., měkké, různým způsobem od lodyhy odstálé. – Čepele listové do 1/2-2/3 rozdělené, roztroušeně chlupaté až měkce huňaté; čepele podpůrných listů v květenství v obrysu podlouhle kosočtverečné; kalich odstále huňatý nebo krátce přitiskle chlupatý, a pak zpravidla s jednotlivými delšími chlupy rozmištnými při kališních žilkách 2
- 2a Lodyha huňatá; všechny chlupy stejné, ± rovnovážně odstálé; řapíky podpůrných listů v květenství s chlupy rovnovážně (kolmo) odstávajícími; kalich hustě dlouze odstále chlupatý (jeho povrch není zřetelně viditelný). – Čepele listů měkce až huňatě chlupaté *L. villosus*
- 2b Lodyha pyřitá; její odění (často) ze dvou typů chlupů: na bocích lodyhy chlupy delší, 1-2 mm dl., odstálé, přímé nebo zvlněné, na hranách lodyhy chlupy kratší, dolů ohnuté nebo obloukovité; řapíky podpůrných listů v květenství s chlupy nahoru směřujícími, ± přitisklými nebo obloukovitými; kalich přitiskle krátce chlupatý (vzácně i lysý), zpravidla s roztroušenými delšími chlupy při kališních žilkách. – Čepele listů roztroušeně až hustě chlupaté *L. intermedius*

Celkové rozšíření *L. intermedius* není zatím známé; vedle výskytu v ČR (pro jejíž území je v anglickém textu tohoto článku uveden přehled 88 lokalit v okresech a podokresech fytogeografického členění ČR sestaveného pro Květenu ČR) je tento druh znám zatím z ojedinělých lokalit v Německu (Vestfálsko, 1), Slovensku (4), Zakarpatské Ukrajině (2-3, zde většinou verg. *villosoides* !) a zatím izolovaně též ze středního

Ruska (severně od Moskvy). Vedle lokalit v ČR uvedených podle herbářů PR a PRC je *L. intermedius* znám z dalších lokalit, které budou vzaty v úvahu při mapování výskytu všech 3 druhů okruhu na území ČR. *L. intermedius* byl u nás sbírán převážně v období 1930-1990; z předchozích 50 (-100) let je znám z pouhých 5 lokalit; to ukazuje na jeho pozdní vznik, jsoucí v souvislosti s příchodem *L. villosus* do území až ke konci minulého století, což umožnilo vznik nového taxonu hybridogeneze. *L. intermedius* počtem svých lokalit překonává podstatně zastoupení *L. villosus* v ČR a je pro něj charakteristický i zcela samostatný výskyt na určitých lokalitách či v určitých oblastech, bez zastoupení některého z obou předpokládaných rodičů.

U druhu *L. cardiaca* se vyskytuje odchylka s odlišným typem odění kalicha, která je zde popsána jako var. *hirtella* z Čech; je pro ni uvedeno 10 lokalit, převážně z teplejších oblastí. Kalich má odění z kratších přitisklých chlupů dávajících mu někdy našedlou barvu; u normálních rostlin *L. cardiaca* je kalich bez chlupů, zelený, jen se žlutavými, přisedlými, kulovitými žlázkami. Areál tohoto druhu nezasahuje daleko na východ (nejdále vůbec po dolní Volhu a do severozápadního Turecka); vývojová návaznost tohoto druhu je pravděpodobně ve spojení s *L. glaucescens* Bunge (asi jako descendent tohoto eurasijského kontinentálního druhu, vázaný na střední Evropu, s centrem vzniku v jižnější nebo jihovýchodní části střední Evropy); vzhledem k jeho všeobecnému výskytu pouze na ruderalních stanovištích v jeho celém areálu, není vyloučeno, že *L. cardiaca* představuje v květeně střední Evropy vhodný příklad deuteroapofyta.

Nomenklatura druhu *L. villosus* není dosud dostatečně vyřešena, avšak jméno *L. quinquelobatus* Gilib. užívané ustáleně sovětskými a ruskými autory se nyní objevuje i u dalších autorů. Podle mého názoru není v dostupných pracích Giliberta toto jméno validně publikováno a změna jeho publikačního místa (ve Flora of Turkey s rokem 1785 a v Med-Checklist 3 naopak s rokem 1806) vyžaduje nutně revizi a zasvěcený komentář, aby některé jméno z těchto publikací mohlo být přijato vskutku jako jméno správné. Tento druh s centrem svého výskytu ve východní Evropě a v územích nacházejících se jižně od ní zasahuje do Sibiře jen nepatrně. Do střední Evropy se dostal hlavně ve druhé polovině minulého století a později se zde začal vytvářet jeho synantropní areál. V herbářích PR a PRC je znám tento druh z ČR celkem z 19 lokalit. U nás se zdá, že k jeho rozšíření přispěla i jeho obliba jako včelařské (medonosné) rostliny. Podle ruské monografie Krestovskaja, s původně východoasijským, nyní již téměř subkosmopolitním areálem. O charakteru výskytu tohoto druhu u nás není nic známo (položka Mlékojedy nemá původní schedu; rostlina z Harty mohla být nejspíše pěstována). Často je tento druh mylně označován jako *L. sibiricus* L.

V herbáři PR byly nalezeny dvě položky druhu *L. japonicus* Houtt. (Mlékojedy, Harta), patřící již do jiné taxonomické skupiny rodu *Leonurus* - sect. *Cardiochilum* (V. Kreč. et Kupr.) Krestovskaja, s původně východoasijským, nyní již téměř subkosmopolitním areálem. O charakteru výskytu tohoto druhu u nás není nic známo (položka Mlékojedy nemá původní schedu; rostlina z Harty mohla být nejspíše pěstována). Často je tento druh mylně označován jako *L. sibiricus* L.

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