authentic material, cochromatography (TLC-3 solvents), IR and UV analysis The results are tabulated below

TABLE 1 SURVEY OF FLAVONOIDS IN TEN *Liatris* SPECIES

Plant	Flavonoids				
	Kaempferitrin	Vicenins	Isoquercitrin	Kaempferol	Quercetin
L provincialis	+	–	–	–	–
L pycnostachya	+	–	+	+	–
L punctata	+	–	–	+	–
*L chapmanii**	+	V–2	–	+	–
L secunda	+	V–2	–	+	–
L graminifolia	+	–	–	–	–
L gracilis	–	V–2	Rutin	–	+
L spicata	–	–	Rutin	–	–
*L tenuifolia**	+	V–1 + V–2	–	–	–
L elegans	+	V–1 + V–2	–	–	–

* These were selected as typical examples for isolation

As can be seen from the above table, kaempferitrin is present in all species except in *L gracilis* and *L spicata* Except for rutin and some flavonoid-like substances which were present only in traces in *L spicata*, none of the compounds mentioned by Kagan[1] could be seen in our sample It is also worth mentioning here that the occurrence of kaempferitrin in 8 *Liatris* species is the second report of kaempferitrin in Compositae, the first being the observation that it occurs in *Notonia grandiflora* [7] Vicenin-1 which has been found in 5 of the *Liatris* species is still not a commonly-occurring glycoside although it has been synthesized an its structure thoroughly established by Bouillant and Chopin [4]

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LONICEROSIDE (SECOLOGANIN) IN *CORNUS OFFICINALIS* AND *C MAS*

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Key Word Index—*Cornus officinalis*, *C mas*, Cornaceae, loniceroside (secologanin), iridoid glucosides

Plants *Cornus officinalis* Sieb et Zucc and *C mas* L (sect *Macrocarpium* Spach) [1] *Source* Hørsholm Arboretum Denmark *Previous work on iridoid glycosides* In *C*

[1] WANGERIN, W (1910) in *Das Pflanzenreich* (ENGLER, A , ed), Vol IV, p 229, Engelmann, Leipzig

officinalis: loganin and morroniside,[2] morroniside (in fruits) [3] *Present work* Acetylation of an iridoid glycoside fraction (700 mg), obtained by the method previously described[4] from frozen leaves (300 g, collected in September, processed in December, 1971) of *C officinalis*, followed by preparative TLC separation (silica gel–Et_2O–C_6H_6) of the reaction mixture, yielded, as the major product, the tetraacetate of loniceroside[5] (secologanin[6]), a glucoside previously encountered in leaves of *Lonicera morrowii* A Gray (Caprifoliaceae) [5] The non-crystalline tetraacetate, exhibiting the expected and almost completely interpreted NMR spectrum, crystallized on seeding with an authentic specimen of loniceroside tetraacetate, kindly provided by Professor Mitsuhashi, Hokkaido University, Sapporo, Japan The purified product melted at 111–112°, alone or in admixture with the authentic specimen (reported [5] m p 115–116°) Similar processing of leaves of *C mas* gave identical results

Feeding experiments previously established that loniceroside is a precursor for morroniside in fruits of *C officinalis* [3] The present finding ascertains that loniceroside is, in fact, a true intermediate on the pathway from loganin to morroniside

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GENIPOSIDE AND MONOTROPEIN IN *CORNUS SUECICA*

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Key Word Index—*Cornus suecica*, Cornaceae, geniposide, monotropein, iridoid glucosides

Plant Cornus suecica L (subgenus Arctocrania Endl) [1] *Source* Rold Skov, Denmark *Previous work* Aucubin, weak reaction on paper chromatography [2] *Present work.* Whole frozen plants (385 g) were extracted with 75% EtOH The water-soluble part was extracted with BuOH (4 × 30 ml) and divided into a soluble fraction, *A* (4 1 g), and a residue, *B* (14 0 g) After treatment with Al_2O_3,[3] *A* gave 0 38 g of mixture, purified by preparative TLC ($CHCl_3$–MeOH, 3 1) Two recrystallizations from wet EtOAc of the major fraction (144 mg) afforded pure geniposide (46 mg), m p 161–162°, $[\alpha]_D^{23}$ +8 7° (*c* 2 2, H_2O) [lit values [4] m p 163–164°, $[\alpha]_D$ +7 5°, H_2O], identified by its characteristic ^1H NMR

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