FORGOTTEN CARPOLOGICAL COLLECTION OF PROFESSOR IVO HORVAT DISCOVERED AND DIGITIZED

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The carpological collection of Professor Ivo Horvat, a famous Croatian botanist of the 20th century, was saved from oblivion, after its unexpected discovery at the Faculty of Veterinary Medicine in Zagreb in 2019. As many as 515 diaspores (fruits and seeds) of 486 vascular plant taxa were systematised and digitised and the nomenclature was updated. A comprehensive comparison of Horvat’s carpological and herbarium collection (ZAHO) revealed a large amount of overlap. A large photo-catalogue was created and will be publicly accessible through the Flora Croatica Database.

Key words: diaspores, fruits, herbarium, photo-catalogue, seeds, vascular plants

ESSERT, S., ŠEGOTA, V., GOD, I., MAS, N., ŠPOLJARIĆ, D. & POPOVIĆ, M.: Pronađena i digitalizirana zaboravljena karpološka zbirka profesora Iive Horvata. Nat. Croat. Vol. 30, No. 1., 269–287, 2021, Zagreb.

Karpološka zbirka profesora Iive Horvata, velikog hrvatskog botaničara 20. stoljeća, sačuvana je od zaborava nakon neočekivanog pronalaska na Veterinarskom fakultetu u Zagrebu tijekom 2019. godine. Ukupno 515 dijaspora (plodova i sjemenki) koje pripadaju 486 svojti vaskularne flore je sistematisirano i digitalizirano, a nomenklatura je ažurirana. Sveobuhvatna usporedba Horvatove karpološke i herbarijske zbirke (ZAHO) rezultirala je velikom količinom preklapanja. Formiran je veliki fotokatalog koji će biti javno dostupan u bazi podataka Flora Croatica.

Ključne riječi: dijaspose, plodovi, herbarij, fotokatalog, sjemenke, vaskularna flora

INTRODUCTION

Professor Ivo Horvat (1897–1963) was one of the most prominent Croatian botanists and one of the most active explorers of the vegetation of the former Yugoslavia and the Balkan Peninsula (BERTOVIĆ, 1963). During his 40 years of scientific work as a
pioneer in vegetation studies based on the principles of the Braun-Blanquet phytosociological school, he became one of the leading phytocoenologists at that time in Europe. He started to work as a professor of botany at the former Institute of Botany at the Faculty of Science of the University of Zagreb, but the majority of his professional life was spent working at the former Department of Botany of the Faculty of Veterinary Medicine of the same university (Horvatić, 1963). He published more than 80 scientific and 90 professional papers (Bertović, 1963). During his numerous field trips, he collected a huge amount of plant material, systemized after his death in the Herbarium of Ivo and Marija Horvat (ZAHO) (Theirs, 2020), which was finally, after many relocations, housed in the Botanical Garden of the Faculty of Science in Zagreb in 1998. The collection contains 71,611 herbarium sheets collected mostly in Croatia and South-East Europe (Horvat & Plazibat, 2007).

Carpological collections, specialized herbarium collections containing only diaspores (fruits and seeds) of vascular plants, are mostly kept within botanical gardens and are regularly used in education as well as in scientific studies dealing with seed germination ecology. The best-known seed bank, the Svalbard Global Seed Vault on the Norwegian island of Spitsbergen, keeps as many as 860,000 seeds of various vascular plants (wild and cultivated crops, rare and endangered taxa etc.). Currently, there are around 1,400 seed banks in 100 countries, preserving global plant genetic diversity (Bolf, 2018). In addition, carpological collections are regularly used as comparative compendia in archaeobotanical studies of plant macrofossils (Cappers & Neef, 2012; Pearsall, 2000).

MATERIALS AND METHODS

The carpological collection of Professor Ivo Horvat was surveyed and analysed at the Division of Botany of the Faculty of Science during 2019. The nomenclature of the taxa was validated and updated based on the Flora Croatica Database (Nikolić, 2019) and The Plant List (2019). For each collected taxon, affiliation to plant family, endemic, threatened and strictly protected flora were inspected (Anonymous, 2016; Nikolić & Topić, 2005; Nikolić, 2019). An effort was made to compare the taxa from the studied carpological collection with the herbarium specimens from the Herbarium of Ivo and Marija Horvat (ZAHO). All herbarium sheets potentially connected to the carpological collection were digitised following the standard procedure (Šegota et al., 2017). Finally, the whole carpological collection was photographed – each glass container with numerous diaspores with a Huawei p20 smartphone, and several isolated diaspores of each taxon by USB Dino-Lite Pro HR, AM7000/AD7000 series (5 megapixels) digital microscope, resulting in a catalogue of 486 seeds and fruits.

RESULTS AND DISCUSSION

This large carpological collection was found by mere chance in 2019 in the cellar of the Faculty of Veterinary Medicine. It was hypothesized that it belonged to Professor Ivo Horvat, a botanist who had worked there from 1947 to 1963. However, no written evidence of the existence of this collection was identified, either in his bibliography or in several posthumous biographies (e.g. Bertović, 1963; Horvatić, 1963). Moreover, not a single mention of this collection was found among the professor’s scientific or private documents and handbooks, while his relatives have no information about his work with the carpological collection. We discovered that in the 1960s the collection
was moved to the cellar of the Faculty of Veterinary Medicine where it was managed for some time by Dr Željko Horvat and subsequently faded into oblivion. However, it is highly probable that this collection was compiled by Professor Horvat while collecting numerous plants for his scientific herbarium, as well as for teaching material for botany lectures.

We summarized the collection of as many as 515 tube-like glass containers with metal caps and the labels with handwritten or typed Latin name of the taxon (Fig. 1). Five containers were different, with a wooden stand, used probably as exemplars during lectures. No other basic metadata such as locality, habitat, collecting date or collector were found on the labels, with the exception of just three labels on which localities were noted (Prunus spinosa L. – Krk & Zagreb, Abies alba Mill. – G. Kotar). Repetitions were found only in 12 taxa, one (Medicago lupulina L.) being collected in three, and 11 (Biscutella laevigata L., Festuca pratensis Huds., Hypochaeris maculata L., Laurus nobilis L., Lycopus europaeus L., Medicago sativa L., Pinus halepensis Mill., Trifolium incarnatum L., Trifolium pratense L., Prunus spinosa L., Vicia sativa L.) in two containers. After the analysis, the collection was returned and deposited within the Department of Veterinary Biology of the Faculty of Veterinary medicine in Zagreb (Fig. 2).

The comprehensive inventory and nomenclature update revealed as many as 486 vascular plant taxa (Appendix 1). A nomenclature validation was necessary for 19.75 % of inspected taxa names. As many as 95.28 % of the taxa are members of the Croatian flora (Nikolić, 2019) indicating that the majority of the collection was most likely collected in Croatia or neighbouring countries, as was also the case with Horvat’s herbarium collection (Horvat & Plazibat, 2007). The collected specimens belong to 102 plant families, with Asteraceae and Fabaceae (10.88 % each) and Poaceae (7.59 %) being the most abundant (Tab. 1).
Six endemic taxa (\textit{Tanacetum cinerariifolium}, \textit{Edraianthus tenuifolius}, \textit{Iris illyrica}, \textit{Leucanthemum atratum} ssp. platylepis, \textit{Peltaria alliacea} and \textit{Chouardia litardierei}) and 28 Red-listed, three of which critically endangered (\textit{Digitalis lanata}, \textit{Ligularia sibirica} and \textit{Plantago indica}) were found. According to the latest legislation, 19 taxa from the collection
are currently strictly protected in Croatia (Achillea ptarmica, Alopecurus rendlei, Arnica montana, Tanacetum cinerarifolium, Digitalis lanata, Edraianthus tenuifolius, Glaucium flavum, Hibiscus trionum, Iris pseudacorus, Iris sibirica, Ligularia sibirica, Lilium martagon, Paeonia mascula, Peltaria alliacea, Plantago subulata, Plantago indica, Taxus baccata and Trapa natans).

Comparison between Horvat’s carpological and herbarium (ZAHO) collections revealed overlapping in 334 (68.58 %) taxa (Fig. 3, Fig. 4). As many as 78.44 % of those taxa have herbarium specimens with mature fruits and seeds. Among them, only 20.10 % of taxa from carpological collection could be related to herbarium specimens collected at solely one locality.

![Image](image1.png)

**Fig. 3.** Specimens of *Ferulago campestris* (Besser) Grecescu from Horvat’s herbarium (ZAHO) and its fruits from the carpological collection.

![Image](image2.png)

**Fig. 4.** Specimens of *Clematis vitalba* L. from Horvat’s herbarium (ZAHO) and its fruits from carpological collection.
The remaining 21.56% of inspected taxa herbarium specimens lacked diaspires, or fruits and seeds were collected immature. Based on this data, we could only assume that Horvat collected simultaneously plants for herbarium and their diaspires for carpological collection. However, about half of the taxa (51.20%) specimens with mature fruits were collected from two or more localities. It is possible that the collection was also partially created by material exchange with other local and foreign botanists, that the material was collected simultaneously by several collectors that cooperated with Professor Horvat, or that part of the collection was obtained from other foreign collections for lecture purposes. We have no evidence for any of these scenarios. Since there are no written documents indicating that this collection was actually used in lecture processes at the Faculty of Veterinary Medicine in Zagreb, further study should include interviews with Horvat’s students who possibly have memories of this collection. Unfortunately, since this collection was probably not used after the 1960s, locating witnesses would be rather challenging.

The photo-catalogue of the collection contains as many as 1186 pictures and represents the first comprehensive digitised photo-catalogue of diaspires in Croatia (Fig. 5). Pictures are currently stored in the Archaeobotanical Laboratory (Division of Botany, Faculty of Science) and will soon be published and made publicly available in the Flora Croatica Database. Since this database contains mostly pictures of plant habitus, leaves and flowers, the addition of pictures of fruits and seeds will certainly be a valuable contribution and helpful tool for all users during plant identifications. Finally, several diaspires of each taxon were extracted from Horvat’s collection and included in the carpological collection of the Archaeobotanical Laboratory (Division of Botany, Faculty of Science).

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APPENDIX 1.

List of taxa found in the carpological collection of Professor Ivo Horvat (HR – present in Croatian flora, ZAHO – present in Herbarium of Ivo and Marija Horvat)

| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 1   | Abies alba Mill.       | Abies alba Mill. | Pinaceae | x  |      |
| 2   | Abutilon theophrasti   | Abutilon theophrasti Medik. | Malvaceae | x  |      |
| 3   | Acer monspessulanum L. | Acer monspessulanum L. | Aceraceae | x  | x   |
| 4   | Acer negundo           | Acer negundo L. | Aceraceae | x  | x   |
| 5   | Acer pseudoplatanus L. | Acer pseudoplatanus L. | Aceraceae | x  | x   |
| 6   | Achillea millefolium L. | Achillea millefolium L. | Asteraceae | x  | x   |
| 7   | Achillea ptarmica L.   | Achillea ptarmica L. | Asteraceae | x  |      |
| 8   | Adenostyles alpina Bl. et Fingr. | Adenostyles alpina (L.) Bluff et Fingerh | Asteraceae | x  |      |
| 9   | Agrimonia pilosa Ledeb. | Agrimonia pilosa Ledeb. | Rosaceae |      |      |
| 10  | Agrostemma githago L.  | Agrostemma githago L. | Caryophyllaceae | x  |      |
| 11  | Agrostis alba L.       | Agrostis gigantea Roth | Poaceae | x  | x   |
| 12  | Ailanthus glandulosa   | Ailanthus altissima (Mill.) Swingle | Simaroubaceae | x  | x   |
| 13  | Alisma plantago aquatica L. | Alisma plantago-aquatica L. | Alismataceae | x  | x   |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 14  | Alliaria officinalis Andr. | *Alliaria petiolarata* (M. Bieb.) Cavara et Grande | Brassicaceae | x | x |
| 15  | Allium porrum L. | *Allium porrum* L. | Amaryllidaceae | x | |
| 16  | Alopecurus pratense L. | *Alopecurus pratensis* L. | Poaceae | x | |
| 17  | Alopecurus utriculatus Pens. | *Alopecurus rendlei* Eig | | | |
| 18  | Althea officinalis L. | *Althaea officinalis* L. | Malvaceae | x | |
| 19  | Alyssoides utriculatum (L.) Med.J. | *Alyssoides utriculata* (L.) Medik. | Brassicaceae | x | |
| 20  | Amaranthus silvestris Desf. | *Amaranthus graecizans* ssp. silvestris (Vill.) Brenan | Amaranthaceae | x | |
| 21  | Amaranthus caudatus L. | *Amaranthus caudatus* L. | Amaranthaceae | x | |
| 22  | Amorpha fruticosa L. | *Amorpha fruticosa* L. | Fabaceae | x | x |
| 23  | Anagallis arvensis L. | *Anagallis arvensis* L. | Primulaceae | x | x |
| 24  | Anemone nemorosa L. | *Anemone nemorosa* L. | Ranunculaceae | x | x |
| 25  | Anemone graecizans L. | *Anemone graecizans* L. | Apiceae | x | x |
| 26  | Angelica archangelica L. | *Angelica archangelica* L. | | Apiceae | x |
| 27  | Angelica sylvestris L. | *Angelica sylvestris* L. | Apiaceae | x | x |
| 28  | Anoda hastata Cav. | *Anoda cristata* (L.) Schltdl. | Malvaceae | | |
| 29  | Anthoxanthum odoratum | *Anthoxanthum odoratum* L. | Poaceae | x | x |
| 30  | Anthericum ramosum L. | *Anthericum ramosum* L. | Asparagaceae | x | x |
| 31  | Anthyllis jacquini Kern. | *Anthyllis montana* ssp. jacquinii (A. Kern.) Hayek | Fabaceae | x | x |
| 32  | Anthyllis vulneraria L. | *Anthyllis vulneraria* L. | Fabaceae | x | x |
| 33  | Arenaria serpyllifolia L. | *Arenaria serpyllifolia* L. | Caryophyllaceae | x | x |
| 34  | Arachis hypogaea | *Arachis hypogaea* L. | Fabaceae | x | x |
| 35  | Arabis turrita L. | *Arabis turrita* L. | Brassicaceae | x | x |
| 36  | Aruncus dioica L. | *Aruncus dioica* L. | | | |
| 37  | Aruncus hygrogra | *Arachis hygrogra* L. | | | |
| 38  | Asparagus acutifolius | *Asparagus acutifolius* L. | Asparagaceae | x | |
| 39  | Asparagus acutifolius L. | *Asparagus acutifolius* L. | Asparagaceae | x | |
| 40  | Asparagus tenuifolius Lam. | *Asparagus tenuifolius* Lam. | Asparagaceae | x | x |
| 41  | Arum maculatum L. | *Arum maculatum* L. | | | |
| 42  | Atriplex hortense L. | *Atriplex hortense* L. | Chenopodiaceae | x | |
| 43  | Atriplex hortense L. | *Atriplex hortense* L. | Chenopodiaceae | x | |
| 44  | Asparagus acutifolius L. | *Asparagus acutifolius* L. | Asparagaceae | x | |
| 45  | Asparagus acutifolius L. | *Asparagus acutifolius* L. | Asparagaceae | x | |
| 46  | Asparagus tenuifolius Lam. | *Asparagus tenuifolius* Lam. | Asparagaceae | x | x |
| 47  | Asparagus tenuifolius Lam. | *Asparagus tenuifolius* Lam. | Asparagaceae | x | x |
| 48  | Astragalus glycyphyllos L. | *Astragalus glycyphyllos* L. | Fabaceae | x | x |
| 49  | Asphodelus albus Mill. | *Asphodelus albus* Mill. | Xanthorrhoeaceae | x | x |
| 50  | Asphodeline lutea Rchb. | *Asphodeline lutea* (L.) Rchb. | Xanthorrhoeaceae | x | x |
| 51  | Aster alpinum | *Aster alpinum* L. | | | |
| 52  | Atriplex hortense L. | *Atriplex hortense* L. | Chenopodiaceae | x | x |
| 53  | Atriplex hortense L. | *Atriplex hortense* L. | Chenopodiaceae | x | x |
| 54  | Atriplex hortense L. | *Atriplex hortense* L. | Chenopodiaceae | x | x |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 55  | Atropa belladonna L.   | Atropa belladonna L. | Solanaceae | x  | x    |
| 56  | Avena barbata Brot.    | Avena barbata Pott ex Link | Poaceae |    | x    |
| 57  | Avena elatior          | Arrhenatherum elatius (L.) P.Beauv. ex J.Presl & C.Presl. | Poaceae | x  | x    |
| 58  | Ballota                | Ballota sp. | Lamiales | x  | x    |
| 59  | Berberis vulgaris L.   | Berberis vulgaris L. | Berberidaceae | x  | x    |
| 60  | Berterea incana (L.) DC. | Berterea incana (L.) DC. | Brassicaceae | x  | x    |
| 61  | Beta vulgaris L.       | Beta vulgaris L. | Amaranthaceae |    | x    |
| 62  | Bidens tripartitus L.  | Bidens tripartita L. | Asteraceae | x  | x    |
| 63  | Biscutella laevigata L.| Biscutella laevigata L. | Brassicaceae | x  | x    |
| 64  | Brassica oleracea L.   | Brassica oleracea L. | Brassicaceae | x  |      |
| 65  | Briza maxima L.        | Briza maxima L. | Poaceae | x  | x    |
| 66  | Bromus erectus Huds.   | Bromus erectus Huds. | Poaceae | x  | x    |
| 67  | Bromus mollis          | Bromus hordeaceus L. | Poaceae | x  | x    |
| 68  | Bromus sterilis L.     | Bromus sterilis L. | Poaceae | x  | x    |
| 69  | Brunella vulgaris L.   | Prunella vulgaris L. | Lamiaceae | x  | x    |
| 70  | Bunias orientalis L.   | Bunias orientalis L. | Brassicaceae | x  | x    |
| 71  | Buphthalmum salicifolium L. | Buphthalmum salicifolium L. | Asteraceae | x  | x    |
| 72  | Calendula officinalis L.J. | Calendula officinalis L.J. | Astersaciae | x |      |
| 73  | Campanula formanekiana | Campanula formanekiana Degen & Dörf. | Campanulaceae | x |      |
| 74  | Campanula persicifolia L.J. | Campanula persicifolia L.J. | Campanulaceae | x | x    |
| 75  | Campanula rapunculoides L. | Campanula rapunculoides L. | Campanulaceae | x | x    |
| 76  | Cannabis sativa L.     | Cannabis sativa L. | Cannabaceae | x |      |
| 77  | Capsella bursa-pastoris (L.) | Capsella bursa-pastoris (L.) Medik. | Brassicaceae | x |      |
| 78  | Carduus acanthoides L. | Carduus acanthoides L. | Astersaciae | x |      |
| 79  | Carlina aggregata W.K. | Carlina acaulis subsp. caulescens (Lam.) Schübl. & G.Martens | Astersaciae | x | x    |
| 80  | Carpinus betulus L.    | Carpinus betulus L. | Corylaceae | x |      |
| 81  | Carum carvi L.         | Carum carvi L. | Apiaceae | x  | x    |
| 82  | Catalpa bignonioides Walt. | Catalpa bignonioides Walter | Bignoniaceae | x | x    |
| 83  | Cedrus Libani Barr.    | Cedrus libani A.Rich. | Pinaceae | x  |      |
| 84  | Celtis australis L.    | Celtis australis L. | Ulmaceae | x  | x    |
| 85  | Centaurea Fritschii Hay. | Centaurea scabiosa ssp. fritschii (Hayek) Hayek | Asteraceae | x  | x    |
| 86  | Centaurea leucopelis DC. | Centaurea deusta Ten. ssp. concolor (DC.) Hayek | Asteraceae | x  | x    |
| 87  | Centaurea rhenana Bor. | Centaurea rhenana Boreau | Asteraceae | x |      |
| 88  | Centaurea rupestris L. | Centaurea rupestris L. | Asteraceae | x  | x    |
| 89  | Centaurea scabiosa L.  | Centaurea scabiosa L. | Asteraceae | x  | x    |
| 90  | Cephalaria lecantha Schrad. | Cephalaria lecantha (L.) Roem. et Schult. | Dipsacaceae | x  | x    |
| 91  | Ceratonia silqua L.     | Ceratonia silqua L. | Fabaceae | x  | x    |
| 92  | Cercis silquastrum L.   | Cercis silquastrum L. | Fabaceae | x  | x    |
| 93  | Chaenorhinhum minus L. | Chaenorhinhum minus (L.) Lange | Scrophulariaceae | x  | x    |
| No. | Original name on label | Valid name | Family | HR | Zaho |
|-----|------------------------|------------|--------|----|------|
| 94  | Chaerophyllum aromaticum L. | Chaerophyllum aromaticum L. | Apiaceae | x | x |
| 95  | Chelidonium majus L. | Chelidonium majus L. | Papaveraceae | x | x |
| 96  | Chenopodium album L. | Chenopodium album L. | Chenopodiaceae | x | x |
| 97  | Chenopodium polyspermum L. | Chenopodium polyspermum L. | Chenopodiaceae | x | x |
| 98  | Chondrilla juncea L. | Chondrilla juncea L. | Cichoriaceae | x | x |
| 99  | Chrysanthemum vulgare L. | Tanacetum vulgare L. | Asteraceae | x | x |
| 100 | Chrysanthemum cinerariifolium | Tanacetum cinerariifolium (Trevir.) Sch.Bip. | Asteraceae | x | x |
| 101 | Cicer arietinum L. | Cicer arietinum L. | Fabaceae | x | x |
| 102 | Cichorium intybus L. | Cichorium intybus L. | Cichoriaceae | x | x |
| 103 | Cinnamomum camphora N. | Cinnamomum camphora (L.) J.Presl | Lauraceae | x | x |
| 104 | Cirsium acaule Web. | Cirsium acaulon (L.) Scop. | Asteraceae | x | x |
| 105 | Cirsium eriophorum Scop. | Cirsium eriophorum Scop. | Asteraceae | x | x |
| 106 | Cirsium lanceolatum L. | Cirsium vulgare (Savi) Ten. | Asteraceae | x | x |
| 107 | Citrus aurantium L. | Citrus aurantium L. | Rutaceae | x | x |
| 108 | Citrus medica L. | Citrus medica L. | Rutaceae | x | x |
| 109 | Citrus nobilis | Citrus nobilis Lour. | Rutaceae | x | x |
| 110 | Citrus paradisi “Grapefruit” T. | Citrus paradisi Macfad. | Rutaceae | x | x |
| 111 | Clematis flammula L. | Clematis flammula L. | Ranunculaceae | x | x |
| 112 | Clematis tangutica | Clematis tangutica (Maxim.) Korsh. | Ranunculaceae | x | x |
| 113 | Clematis vitalba L. | Clematis vitalba L. | Ranunculaceae | x | x |
| 114 | Cnicus benedictus L. | Centaurea benedicta (L.) L. | Asteraceae | x | x |
| 115 | Colchicum autumnale L. | Colchicum autumnale L. | Colchicaceae | x | x |
| 116 | Colocynthis citrullus (L.) Fritsch | Citrullus lanatus (Thunb.) Matsum. & Nakai | Cucurbitaceae | x | x |
| 117 | Colutea arborescens L. | Colutea arborescens L. | Fabaceae | x | x |
| 118 | Conium maculatum L. | Conium maculatum L. | Apiaceae | x | x |
| 119 | Corydalis cava (L.) Schw. et K. | Corydalis cava (L.) Schw. et K. | Fumariaceae | x | x |
| 120 | Cornus mas L. | Cornus mas L. | Cornaceae | x | x |
| 121 | Coronilla emerus ssp. emeroides L. | Coronilla emerus L. ssp. emeroides Boiss. et Spruner | Fabaceae | x | x |
| 122 | Coronilla varia L. | Securigera varia (L.) Lassen | Fabaceae | x | x |
| 123 | Corylus avellana L. | Corylus avellana L. | Corylaceae | x | x |
| 124 | Cotoneaster tomentosa Lindl. | Cotoneaster nebrodensis (Guss.) K. Koch | Rosaceae | x | x |
| 125 | Crataegus coccinea L. | Crataegus coccinea L. | Rosaceae | x | x |
| 126 | Crataegus monogyna Jacq. | Crataegus monogyna Jacq. | Rosaceae | x | x |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 131 | Crepis biennis L.      | Crepis biennis Lapeyr. | Cichoriaceae | x | x |
| 132 | Crepis chondrilloides L. | Crepis chondrilloides Jacq. | Cichoriaceae | x | x |
| 133 | Crithmum maritimum L.  | Crithmum maritimum L. | Apiaceae | x | x |
| 134 | Cucumis melo L.        | Cucumis melo L. | Cucurbitaceae | x |
| 135 | Cucumis sativus L.      | Cucumis sativus L. | Cucurbitaceae | x |
| 136 | Cucurbita pepo L.       | Cucurbita pepo L. | Cucurbitaceae | x | x |
| 137 | Cupressus sempervirens v. stricta L., Cupressus sempervirens L. | Cupressus sempervirens L. | Cupressaceae | x |
| 138 | Cuscuta sp.             | Cuscuta sp. | Cuscutaceae | x | x |
| 139 | Cynara cardunculus L.   | Cynara cardunculus L. | Asteraceae | x |
| 140 | Cynodon dactylon (L.) Fers. | Cynodon dactylon (L.) Pers. | Poaceae | x | x |
| 141 | Cytisus laburnum L.     | Laburnum anagyroides Medik. | Fabaceae | x |
| 142 | Cytisus nigricans L.    | Lembotropis nigricans (L.) Griseb. | Fabaceae | x | x |
| 143 | Dactylis glomerata L.   | Dactylis glomerata L. | Poaceae | x | x |
| 144 | Dalbergia officinalis    | Dalbergia officinalis L. | Boraginaceae | x |
| 145 | Daphne mezereum L.      | Daphne mezereum L. | Thymelaeaceae | x | x |
| 146 | Dictamnus albus L.      | Dictamnus albus L. | Rutaceae | x | x |
| 147 | Digitalis purpurea L.   | Digitalis purpurea L. | Scrophulariaceae | x |
| 148 | Dryas octopetala L.     | Dryas octopetala L. | Rosaceae | x | x |
| 149 | Echinacea angustifolia L. | Echinacea angustifolia L. | Compositae | x | x |
| 150 | Echinochloa crus-galli L. | Echinochloa crus-galli L. | Poaceae | x | x |
| 151 | Echinacea purpurea L.   | Echinacea purpurea L. | Scrophulariaceae | x |
| 152 | Equisetum arvense L.    | Equisetum arvense L. | Equisetaceae | x | x |
| 153 | Equisetum telmateia L.  | Equisetum telmateia L. | Equisetaceae | x | x |
| 154 | Erigeron annuus L.       | Erigeron annuus L. | Compositae | x | x |
| 155 | Erigeron karvinskianus L. | Erigeron karvinskianus L. | Compositae | x | x |
| 156 | Erechtites hieracifolia L. | Erechtites hieracifolia L. | Compositae | x | x |
| 157 | Erechtites pyrethoides L. | Erechtites pyrethoides L. | Compositae | x | x |
| 158 | Erechtites pyrethoides L. | Erechtites pyrethoides L. | Compositae | x | x |
| 159 | Eruca vesicaria L.       | Eruca vesicaria L. | Brassicaceae | x | x |
| 160 | Eryngium campestre L.    | Eryngium campestre L. | Apiaceae | x | x |
| 161 | Eryngium foetidum L.     | Eryngium foetidum L. | Apiaceae | x | x |
| 162 | Eryngium giganteum L.    | Eryngium giganteum L. | Apiaceae | x | x |
| 163 | Eryngium latifolium L.   | Eryngium latifolium L. | Apiaceae | x | x |
| 164 | Eryngium campestre L.    | Eryngium campestre L. | Apiaceae | x | x |
| 165 | Euphorbia lathyris L.    | Euphorbia lathyris L. | Euphorbiaceae | x | x |
| 166 | Euphorbia lathyris L.    | Euphorbia lathyris L. | Euphorbiaceae | x | x |
| 167 | Euphorbia myrsinites L.  | Euphorbia myrsinites L. | Euphorbiaceae | x | x |
| 168 | Euphorbia myrsinites L.  | Euphorbia myrsinites L. | Euphorbiaceae | x | x |
| 169 | Euphorbia myrsinites L.  | Euphorbia myrsinites L. | Euphorbiaceae | x | x |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 170 | *Echium vulgare* L.    | *Echium vulgare* L.  | Boraginaceae | x  | x    |
| 171 | *Edraianthus tenuifolius* (W.K.) | *Edraianthus tenuifolius* (A.DC.) A.DC. | Campanulaceae | x  | x    |
| 172 | *Elaeagnus angustifolia* L.J. | *Elaeagnus angustifolia* L.J. | Elaeagnaceae | x  |      |
| 173 | *Epilobium angustifolium Scop.*, *Epilobium spicatum* L. Haenk R. | *Epilobium angustifolium* L. | Onagraceae | x  |      |
| 174 | *Epilobium rosarinifolium* | *Epilobium dodonaei Vill.* | Onagraceae | x  |      |
| 175 | *Epilobium sp.* L. | *Epilobium* sp. | Onagraceae | x  | x    |
| 176 | *Erigeron canadensis* L. | *Erigeron canadensis* L. | Asteraceae | x  | x    |
| 177 | *Erodium cicutarium* L. | *Erodium cicutarium* (L.) L’Hér. | Geraniaceae | x  | x    |
| 178 | *Eruca sativa* L. | *Eruca vesicaria* (L.) Cav. ssp. *sativa* (Mill.) Thell. | Brassicaceae | x  |      |
| 179 | *Erythronium dens-canis* L. | *Erythronium dens-canis* L. | Liliaceae | x  |      |
| 180 | *Euonymus europaea* L. | *Euonymus europaea* L. | Celastraceae | x  | x    |
| 181 | *Euonymus japonica* Thbg. | *Euonymus japonicus* Thunb. | Celastraceae | x  | x    |
| 182 | *Eupatorium cannabinum* L. | *Eupatorium cannabinum* L. | Asteraceae | x  | x    |
| 183 | *Euphorbia amygdaloides* L. | *Euphorbia amygdaloides* L. | Euphorbiaceae | x  | x    |
| 184 | *Euphorbia cyparissias* L. | *Euphorbia cyparissias* L. | Euphorbiaceae | x  | x    |
| 185 | *Euphorbia falcata* L. | *Euphorbia falcata* L. | Euphorbiaceae | x  |      |
| 186 | *Euphorbia helioscopia* L. | *Euphorbia helioscopia* L. | Euphorbiaceae | x  | x    |
| 187 | *Euphorbia polychroma* Kern. | *Euphorbia epithymoides* L. | Euphorbiaceae | x  | x    |
| 188 | *Euphorbia verrucosa* L. | *Euphorbia verrucosa* L. | Euphorbiaceae | x  |      |
| 189 | *Fagopyrum vulgare Hill. sagittatum* Gill. | *Fagopyrum esculentum* Moench | Polygonaceae | x  |      |
| 190 | *Fagus silvatica* L. | *Fagus sylvatica* L. | Fagaceae | x  | x    |
| 191 | *Ferula galbanifera* Koch. | *Ferula campestris* (Besser) Grecescu | Apiaceae | x  | x    |
| 192 | *Festuca gigantea* L. | *Festuca gigantea* (L.) Vill | Poaceae | x  | x    |
| 193 | *Festuca ovina* L. | *Festuca ovina* L. | Poaceae | x  | x    |
| 194 | *Festuca pratensis* Huds. | *Festuca pratensis* Huds. | Poaceae | x  | x    |
| 195 | *Filago arvensis* L. | *Filago arvensis* L. | Poaceae | x  | x    |
| 196 | *Filipendula hexapetala* Gilib. | *Filipendula vulgaris* Moench | Rosaceae | x  | x    |
| 197 | *Filipendula ulmaria* Maxim. | *Filipendula ulmaria* (L.) Maxim. | Rosaceae | x  | x    |
| 198 | *Foeniculum vulgare* Mill. | *Foeniculum vulgare* Mill. | Apiaceae | x  |      |
| 199 | *Fraxinus ornus* L. | *Fraxinus ornus* L. | Oleaceae | x  | x    |
| 200 | *Fumana procumbens* | *Fumana procumbens* (Dunal) Gren. & Godr. | Cistaceae | x  |      |
| 201 | *Galega officinalis* L. | *Galega officinalis* L. | Fabaceae | x  | x    |
| 202 | *Galeopsis speciosa* Mill. | *Galeopsis speciosa* Mill. | Lamiaeae | x  | x    |
| 203 | *Galinsoga parviflora* Carvan. | *Galinsoga parviflora* Cav. | Lamiaceae | x  |      |
| 204 | *Galium verum* L. | *Cruciata glabra* (L.) Opiz | Rubiaceae | x  | x    |
| 205 | *Galtonia candidans* Decaisne J. | *Ornithogalum candidans* (Baker) J.C.Manning & Goldblatt | Asparagaceae | x  |      |
| 206 | *Gentiana anisodonta* Borb. | *Gentianella anisodonta* (Borbás) Á. Löve et D. Löve | Gentianaceae | x  | x    |
| 207 | *Gentiana asclepiadea* L. | *Gentiana asclepiadea* L. | Gentianaceae | x  | x    |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 208 | Geranium robertianum L. | Geranium robertianum L. | Geraniaceae | x | x |
| 209 | Geum urbanum L. | Geum urbanum L. | Rosaceae | x | x |
| 210 | Gladiolus illyricus Koch. | Gladiolus illyricus W. D. J. Koch. | Iridaceae | x | x |
| 211 | Glaucium luteum | Glaucium flavum Crantz. | Papaveraceae | x | x |
| 212 | Gleditschia triacanthos L. | Gleditschia triacanthos L. | Fabaceae | x |
| 213 | Globularia bellidifolia Ten. | Globularia cordifolia L. ssp. bellidifolia (Ten.) Wettst. | Globulariaceae | x | x |
| 214 | Globularia Willkommii Nym. | Globularia punctata Lapeyr. | Globulariaceae | x | x |
| 215 | Gomphocarpus fruticosus L. | Gomphocarpus fruticosus (L.) W.T.Aiton | Asclepiadaceae | x |
| 216 | Gossypium herbaceus L. | Gossypium herbaceum L. | Malvaceae | x |
| 217 | Hedera helix L. | Hedera helix L. | Araliaceae | x | x |
| 218 | Helianthemum obscurum | Helianthemum nummularium (L.) Mill. ssp. obscurum (Čelak.) Holub | Cistaceae | x | x |
| 219 | Helianthus annua L. | Helianthus annuus L. | Asteraceae | x |
| 220 | Helichrysum italicum Guss. | Helichrysum italicum (Roth) G.Don | Asteraceae | x | x |
| 221 | Heracleum sphondylium L. | Heracleum sphondylium L. | Apiaceae | x | x |
| 222 | Hibiscus syriacus L. | Hibiscus syriacus L. | Malvaceae | x |
| 223 | Hibiscus trionum L. | Hibiscus trionum L. | Malvaceae | x | x |
| 224 | Hieracium pilosella L. | Hieracium pilosella L. | Cichoriaceae | x | x |
| 225 | Holcus lanatus Holcus lanatus L. | Holcus lanatus L. | Poaceae | x | x |
| 226 | Homogyne silvestris (Scop.) Cass. | Homogyne sylvestris (Jacq.) Cass. | Asteraceae | x | x |
| 227 | Hordeum sativum L. | Hordeum vulgare L. | Poaceae | x |
| 228 | Humulus lupulus L. | Humulus lupulus L. | Cannabaceae | x | x |
| 229 | Hyoscyamus niger | Hyoscyamus niger L. | Solanacea | x | x |
| 230 | Hypericum montanum L. | Hypericum montanum L. | Clusiaceae | x | x |
| 231 | Hypericum perforatum L. | Hypericum perforatum L. | Hypericaceae | x | x |
| 232 | Hypochoeris maculata L. | Hypochoeris radicata L. | Cichoriaceae | x | x |
| 233 | Hypochoeris radicata L. | Hypochoeris radicata L. | Cichoriaceae | x | x |
| 234 | Hyssopus officinalis L. | Hyssopus officinalis L. | Lamiaceae | x | x |
| 235 | Impatiens noli-tangere L. | Impatiens noli-tangere L. | Balsaminaceae | x | x |
| 236 | Inula britannica L. | Inula britannica L. | Asteraceae | x | x |
| 237 | Inula conyza DC. | Inula conyza (Griess.) DC. | Asteraceae | x | x |
| 238 | Inula helenium L. | Inula helenium L. | Asteraceae | x |
| 239 | Inula hirta L. | Inula hirta L. | Asteraceae | x | x |
| 240 | Iris illyrica Tomm. | Iris illyrica Tomm. | Iridaceae | x | x |
| 241 | Iris pseudacorus L. | Iris pseudacorus L. | Iridaceae | x | x |
| 242 | Iris sibirica L. | Iris sibirica L. | Iridaceae | x | x |
| 243 | Isatis tinctoria L. | Isatis tinctoria L. | Brassicaceae | x |
| 244 | Jurinea mollis L. | Jurinea mollis (L.) Rchb. | Asteraceae | x | x |
| 245 | Kickxia spuria (L.) Dum. | Kickxia spuria (L.) Dumort. | Scrophulariaceae | x | x |
| 246 | Knautia arvensis L. | Knautia arvensis (L.) Coult. | Dipsacaceae | x | x |
| No.  | original name on label | valid name                                      | family            | HR | ZAHO |
|------|-----------------------|------------------------------------------------|-------------------|----|------|
| 247  | Kniphofia uvaria Hook. | Kniphofia uvaria (L.) Oken                     | Asphodelaceae     |    |      |
| 248  | Kochia scoparia (L.) Schrad. | Bassia scoparia (L.) A. J. Scott | Chenopodiaceae     |    |      |
| 249  | Koelreuteria paniculata Laxm. | Koelreuteria paniculata Laxm. | Sapindaceae       |    |      |
| 250  | Lactuca muralis Gartn. | Lactuca muralis (L.) Fresen.                  | Cichoriaceae      |    |      |
| 251  | Lactuca serriola L. | Lactuca serriola L.                            | Cichoriaceae      |    |      |
| 252  | Lamium purpureum L. | Lamium purpureum L.                           | Lamiaeae          | x  |      |
| 253  | Lapsana communis L. | Lapsana communis L.                           | Cichoriaceae      | x  |      |
| 254  | Laserpitium siler L. | Laserpitium siler L.                          | Apiaceae          | x  |      |
| 255  | Lathyrus aphaca L. | Lathyrus aphaca L.                            | Fabaceae          |    |      |
| 256  | Lathyrus niger L. | Lathyrus niger L. (Bernh)                    | Fabaceae          | x  |      |
| 257  | Lathyrus sativus L. | Lathyrus sativus L.                           | Fabaceae          | x  |      |
| 258  | Lathyrus silvestris | Lathyrus sylvestris L.                       | Fabaceae          | x  |      |
| 259  | Lathyrus sp. | Lathyrus sp.                                  | Fabaceae          | x  |      |
| 260  | Lathyrus vernus Bernh. | Lathyrus vernus (L.) Bernh. | Fabaceae          | x  |      |
| 261  | Laurus nobilis L. | Laurus nobilis L.                             | Lauraceae         |    |      |
| 262  | Lavandula vera DC. | Lavandula angustifolia subsp. pyrenaica (DC.) Guinea | Lamiaceae         |    |      |
| 263  | Leontodon autumnalis L. | Leontodon autumnalis L.                  | Cichoriaceae      | x  |      |
| 264  | Leontodon danubialis Jacq. | Leontodon hispidus L. ssp. danubialis (Jacq) Simonk. | Cichoriaceae      |    |      |
| 265  | Lepidium campestre (L.) R. Br. | Lepidium campestre (L.) R. Br. | Brassicaceae      |    |      |
| 266  | Lepidium sativum L. | Lepidium sativum L.                           | Brassicaceae      |    |      |
| 267  | Leucanthemum Liburnicum L. | Leucanthemum atratum (Jacq.) DC. ssp. platylepis (Borbás) Heywood | Asteraceae        | x  |      |
| 268  | Leucojum aestivum L. | Leucojum aestivum L.                         | Amaryllidaceae    | x  |      |
| 269  | Levisticum officinale Koch. | Levisticum officinale W. D. J. Koch           | Apiaceae          | x  |      |
| 270  | Libanotis montana Cr. | Seseli libanotis (L.) W. D. J. Koch          | Apiaceae          | x  |      |
| 271  | Ligularia vulgaris | Ligularia sibirica (L.) Cass.               | Asteraceae        | x  |      |
| 272  | Ligustrum vulgare L. | Ligustrum vulgare L.                          | Oleaceae          | x  |      |
| 273  | Lilium martagon L. | Lilium martagon L.                            | Liliaceae         | x  |      |
| 274  | Linum catharticum L. | Linum catharticum L.                         | Linaceae          | x  |      |
| 275  | Linum usitatissimum L. | Linum usitatissimum L.                     | Linaceae          | x  |      |
| 276  | Lithospermum arvense L. | Lithospermum arvense L.                    | Boraginaceae      | x  |      |
| 277  | Lolium italicum (Č.sel.), Lolium westvoldicum | Lolium multiflorum Lam. | Poaceae          | x  |      |
| 278  | Lolium perenne L. | Lolium perenne L.                             | Poaceae           | x  |      |
| 279  | Lonicera alpigena L. | Lonicera alpigena L.                          | Caprifoliaceae    | x  |      |
| 280  | Lotus corniculatus L. | Lotus corniculatus L.                        | Fabaceae          | x  |      |
| 281  | Lunaria rediviva L. | Lunaria rediviva L.                           | Brassicaceae      | x  |      |
| 282  | Lupinus albus L. | Lupinus albus L.                              | Fabaceae          | x  |      |
| 283  | Lycopterus europaeus L. | Lycopterus europaeus L.             | Lamiaceae         | x  |      |
| 284  | Majorana hortensis Mchn. | Origanum majorana L.                       | Lamiaceae         | x  |      |
| No. | original name on label | valid name | family | HR | ZAHOB |
|-----|------------------------|------------|--------|----|-------|
| 285 | Malus pumila Mill.     | Malus pumila Mill. | Rosaceae | x  |       |
| 286 | Malus sylvestris L., Malus mauritiana L. | Malus sylvestris L. | Malvaceae | x | x |
| 287 | Marrubium vulgare L.   | Marrubium vulgare L. | Lamiaeeae | x  |       |
| 288 | Matricaria discoidea DC. | Matricaria discoidea DC. | Asteraceae | x  |       |
| 289 | Matricaria inodora L.  | Matricaria perforata Mérat | Asteraceae | x | x |
| 290 | Medicago lupulina L.   | Medicago lupulina L. | Fabaceae | x  |       |
| 291 | Medicago orbicularis All. | Medicago orbicularis (L.) Bartal. | Fabaceae | x | x |
| 292 | Medicago sativa L.     | Medicago sativa L. | Fabaceae | x  |       |
| 293 | Medicago tuberculata Willd. | Medicago tuberculata (Retz.) Willd. | Fabaceae | x | x |
| 294 | Melandryum album (Mill.) Garcke. | Silene latifolia Poir. ssp. alba (Mill.) Greuter et Bourdet | Caryophyllaceae | x |       |
| 295 | Melandryum silvestre Rohl. | Silene dioica (L.) Clairv. | Caryophyllaceae | x | x |
| 296 | Melia azedarach L.     | Melia azedarach L. | Meliaceae | x  |       |
| 297 | Melica ciliata L.      | Melica ciliata L. | Poaceae | x  | x |
| 298 | Melilotus alba L.      | Melilotus albus Medik. | Fabaceae | x | x |
| 299 | Melissa officinalis L. | Melissa officinalis L. | Lamiaceae | x  |       |
| 300 | Mirabilis jalapa L.    | Mirabilis jalapa L. | Nyctaginaceae | x |       |
| 301 | Muscari comosum L.     | Muscari comosum (L.) Mill. | Asparagaceae | x | x |
| 302 | Myrtus communis Mill.  | Myrtus communis L. | Myrtaceae | x  |       |
| 303 | Nerium oleander L.     | Nerium oleander L. | Apocynaceae | x | x |
| 304 | Nicandra physaloides Gartn. | Nicandra physalodes (L.) Gaertn. | Solanaceae | x |       |
| 305 | Nicotiana tabacum L.   | Nicotiana tabacum L. | Solanaceae | x  |       |
| 306 | Nigella arvensis L.    | Nigella arvensis L. | Ranunculaceae | x | x |
| 307 | Nigella damascena L.   | Nigella damascena L. | Ranunculaceae | x | x |
| 308 | Ocimum basilicum L.    | Ocimum basilicum L. | Lamiaceae | x  |       |
| 309 | Oenothera biennis L.   | Oenothera biennis L. | Onagraceae | x |       |
| 310 | Olea europaea          | Olea europaea L. | Oleaceae | x  | x |
| 311 | Ononis spinosa L.      | Ononis spinosa L. | Fabaceae | x | x |
| 312 | Orlaya grandiflora Hoffm. | Orlaya grandiflora (L.) Hoffm. | Apiaceae | x | x |
| 313 | Ornithogalum umbellatum L. | Ornithogalum umbellatum L. | Asparagaceae | x | x |
| 314 | Oryza sativa L.        | Oryza sativa L. | Poaceae | x  |       |
| 315 | Ostrya carpinifolia Scop. | Ostrya carpinifolia Scop. | Corylaceae | x | x |
| 316 | Osyris alba L.         | Osyris alba L. | Santalaceae | x | x |
| 317 | Oxalis stricta L.      | Oxalis stricta L. | Oxalidaceae | x | x |
| 318 | Paeonia corallina Retz. | Paeonia mascula (L.) Mill. | Paeoniaceae | x | x |
| 319 | Paliurus spina Christi Mill. | Paliurus spina-christi Mill. | Rhamnaceae | x | x |
| 320 | Panicum capillare L.   | Panicum capillare L. | Poaceae | x  | x |
| 321 | Panicum miliaceum L.   | Panicum miliaceum L. | Poaceae | x | x |
| 322 | Papaver orientale L.   | Papaver orientale L. | Papaveraceae | x | x |
| 323 | Papaver rhoas L.       | Papaver rhoas L. | Papaveraceae | x | x |
| No.  | original name on label | valid name | family | HR | ZAHO |
|------|------------------------|------------|--------|----|------|
| 324  | *Papaver somniferum* L. | *Papaver somniferum* L. | Papaveraceae | x  |
| 325  | *Paris quadrifolia* L.  | *Paris quadrifolia* L. | Melanthiaceae | x  |
| 326  | *Parnassia palustris* L. | *Parnassia palustris* L. | Parnassiaceae | x  |
| 327  | *Pastinaca sativa* L.    | *Pastinaca sativa* L. | Apiaceae | x  |
| 328  | *Peltaria alliacea* Jacq. | *Peltaria alliacea* Jacq. | Brassicaceae | x  |
| 329  | *Petasites albus* (L.) Gaertn. | *Petasites albus* (L.) Gaertn. | Asteraceae | x  |
| 330  | *Petroselinum hortense* Hoffm. | *Petroselinum crispum* (Mill.) Fuss | Apiaceae | x  |
| 331  | *Peucedanum oreoselinum* (L.) Moench. | *Peucedanum oreoselinum* (L.) Moench. | Apiaceae | x  |
| 332  | *Phacelia tanacetifolia* Benth. | *Phacelia tanacetifolia* Benth. | Hydrophyllaceae | x  |
| 333  | *Phleum pratense* L.     | *Phleum pratense* L. | Poaceae | x  |
| 334  | *Phoenix canariensis* L. | *Phoenix canariensis* Chabaud | Arecales | x  |
| 335  | *Physalis alkekengi* L.  | *Physalis alkekengi* L. | Solanaceae | x  |
| 336  | *Phytolacca americana* L. | *Phytolacca americana* L. | Phytolaccaceae | x  |
| 337  | *Picea excelsa* Lk.      | *Picea abies* (L.) H. Karst. | Pinaceae | x  |
| 338  | *Picris hieracioides*     | *Picris hieracioides* Sibth. & Sm. | Cichoriaceae | x  |
| 339  | *Pinus communis* L.      | *Pyrus communis* L. | Rosaceae | x  |
| 340  | *Pinus halepensis* Mill. | *Pinus halepensis* Mill. | Pinaceae | x  |
| 341  | *Pinus peuce* (Perister) | *Pinus peuce* Griseb. | Pinaceae | x  |
| 342  | *Pinus pinea* L.         | *Pinus pinea* L. | Pinaceae | x  |
| 343  | *Pistacia canariensis* L. | *Pistacia lenticrus* L. | Anacardiaceae | x  |
| 344  | *Pistacia lentiscus* L.  | *Pistacia lentiscus* L. | Anacardiaceae | x  |
| 345  | *Pittosporum tobira* (Thbg.) Ait. | *Pittosporum tobira* (Thunb.) W.T.Aiton | Pittosporaceae | x  |
| 346  | *Plantago carinata* Schrad. | *Plantago subulata* L. | Plantaginaceae | x  |
| 347  | *Plantago indica* L.     | *Plantago indica* L. | Plantaginaceae | x  |
| 348  | *Plantago intermedia*    | *Plantago major* ssp. intermedia (Gilib.) Lange | Plantaginaceae | x  |
| 349  | *Plantago lanceolata* L. | *Plantago lanceolata* L. | Plantaginaceae | x  |
| 350  | *Plantago major* L.      | *Plantago major* L. | Plantaginaceae | x  |
| 351  | *Platanus orientalis* L. | *Platanus orientalis* L. | Platanaceae | x  |
| 352  | *Poa nemoralis* L.       | *Poa nemoralis* L. | Poaceae | x  |
| 353  | *Poa palustris* L.       | *Poa palustris* L. | Poaceae | x  |
| 354  | *Poa pratensis* L.       | *Poa pratensis* L. | Poaceae | x  |
| 355  | *Poa trivialis*          | *Poa trivialis* L. | Poaceae | x  |
| 356  | *Polygonum lapathifolium* L. | *Polygonum lapathifolium* L. | Polygonaceae | x  |
| 357  | *Portulaca oleracea* L.  | *Portulaca oleracea* L. | Portulacaceae | x  |
| 358  | *Prenanthes purpurea*    | *Prenanthes purpurea* L. | Cichoriaceae | x  |
| 359  | *Primula columnae* Ten.  | *Primula veris* L. ssp. columnae (Ten.) Lüdi | Primulaceae | x  |
| 360  | *Prunella laciniata* L.  | *Prunella laciniata* (L.) L. | Lamiaceae | x  |
| 361  | *Prunus armeniaca* L.J.  | *Prunus armeniaca* L. | Rosaceae | x  |
| 362  | *Prunus communis* J. (L.) | *Prunus dulcis* (Mill.) D. A. Webb | Rosaceae | x  |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|-------|
| 363 | Prunus spinosa L.       | Prunus spinosa L. | Rosaceae | x  | x     |
| 364 | Pyracantha cocinea M.Roem | Pyracantha cocinea M.Roem | Rosaceae | x  |       |
| 365 | Punica granatum L.      | Punica granatum L. | Punicaceae | x  | x     |
| 366 | Quercus ilex L.         | Quercus ilex L. | Fagaceae | x  | x     |
| 367 | Quercus palustris        | Quercus palustris | Fagaceae | x  | x     |
| 368 | Quercus rubra           | Quercus rubra | Fagaceae | x  | x     |
| 369 | Quercus suber            | Quercus suber | Fagaceae | x  | x     |
| 370 | Quercus suber            | Quercus suber | Fagaceae | x  | x     |
| 371 | Ranunculus acer L.      | Ranunculus acer L. | Ranunculaceae | x  | x     |
| 372 | Ranunculus sardous Cr.   | Ranunculus sardous Cr. | Ranunculaceae | x  | x     |
| 373 | Reseda lutea             | Reseda lutea | Resedaceae | x  | x     |
| 374 | Rheum palmatum L.       | Rheum palmatum L. | Polygonaceae | x  | x     |
| 375 | Ricinus communis L.     | Ricinus communis L. | Euphorbiaceae | x  |       |
| 376 | Robinia pseudoacacia L. | Robinia pseudoacacia L. | Fabaceae | x  | x     |
| 377 | Roripa sylvestris L.    | Roripa sylvestris L. | Brassicaceae | x  | x     |
| 378 | Rubia peregrina L.      | Rubia peregrina L. | Rubiaceae | x  | x     |
| 379 | Rumex acerosa L.         | Rumex acerosa L. | Polygonaceae | x  | x     |
| 380 | Rumex obtusifolius L.   | Rumex obtusifolius L. | Polygonaceae | x  | x     |
| 381 | Rumex patientia L.      | Rumex patientia L. | Polygonaceae | x  |       |
| 382 | Rumex scutatus L.       | Rumex scutatus L. | Polygonaceae | x  | x     |
| 383 | Ruscus hypoglossum      | Ruscus hypoglossum | Asparagaceae | x  | x     |
| 384 | Ruta graveolens L.      | Ruta graveolens L. | Rutaceae | x  | x     |
| 385 | Salvia officinalis L.   | Salvia officinalis L. | Lamiaceae | x  | x     |
| 386 | Salvia pratensis L.     | Salvia pratensis L. | Lamiaceae | x  | x     |
| 387 | Salvia scarea L.        | Salvia scarea L. | Lamiaceae | x  | x     |
| 388 | Salvia verticillata L.  | Salvia verticillata L. | Lamiaceae | x  | x     |
| 389 | Sambucus nigra L.       | Sambucus nigra L. | Caprifoliaceae | x  | x     |
| 390 | Sambucus racemosa L.    | Sambucus racemosa L. | Caprifoliaceae | x  | x     |
| 391 | Sanguisorba murrayensis (Spach.) | Sanguisorba minor Scop. ssp. murrayensis (Spach.) | Rosaceae | x  | x     |
| 392 | Saponaria officinalis    | Saponaria officinalis | Caryophyllaceae | x  | x     |
| 393 | Scabiosa graminifolia L. | Scabiosa graminifolia L. | Dipsacaceae | x  | x     |
| 394 | Scilla pratensis Waldst. | Chouardia litardierii (Breistr.) | Asparagaceae | x  | x     |
| 395 | Scoparia carnolica Jacq. | Scoparia carnolica Jacq. | Solanaceae | x  | x     |
| 396 | Scolymus hispanicus Scop. | Scolymus hispanicus Scop. | Cichoraceae | x  | x     |
| 397 | Scorzonera villosa Scop. | Scorzonera villosa Scop. | Cichoraceae | x  | x     |
| 398 | Scrophularia canina L.  | Scrophularia canina L. | Scrophulariaceae | x  | x     |
| 399 | Secale cereale L.       | Secale cereale L. | Poaceae | x  |       |
| 400 | Senecio jacobaea L.     | Senecio jacobaea L. | Asteraceae | x  | x     |
| 401 | Senecio nemorensis L.   | Senecio nemorensis L. | Asteraceae | x  | x     |
| 402 | Senecio umbrosus W.K.B. | Senecio umbrosus Waldst. & Kit. | Asteraceae | x  | x     |
| 403 | Sesamum indicum L.      | Sesamum indicum L. | Pedaliaceae | x  | x     |
| 404 | Sesanum indicum L.J.    | Sesanum indicum L.J. | Pedaliaceae | x  | x     |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 405 | Setaria glauca (L.) R. et. Sch. | Pennisetum glaucum (L.) R. Br. | Poaceae | x | x |
| 406 | Setaria italica | Setaria italica (L.) P. Beauv. | Poaceae | x | |
| 407 | Silene sp. | Silene sp. | Caryophyllaceae | x | x |
| 408 | Sinapis alba L. | Sinapis alba L. | Brassicaceae | x | |
| 409 | Sinapis arvensis L. | Sinapis arvensis L. | Brassicaceae | x | |
| 410 | Sinapis sp. | Sinapis sp. | Brassicaceae | x | |
| 411 | Sisymbrium officinale (L.) Scop. | Sisymbrium officinale (L.) Scop. | Brassicaceae | x | x |
| 412 | Solidago canadensis | Solidago canadensis | Asteraceae | x | |
| 413 | Sorghum halepense (L.) Pers. | Sorghum halepense (L.) Pers. | Poaceae | x | x |
| 414 | Stachys officinalis (L.) Trevisan | Stachys officinalis (L.) Trevis. | Lamiaceae | x | x |
| 415 | Staphylea silvatica | Staphylea silvatica L. | Lamiaceae | x | x |
| 416 | Stenophyllum monpeliérii | Stenophyllum monpeliérii | Boraginaceae | x | |
| 417 | Taraxacum Ko-k-saghyzi | Taraxacum Ko-k-saghyzi L.E.Rodin | Asteraceae | x | |
| 418 | Taraxacum officinale L. | Taraxacum officinale L. | Cichoriaceae | x | |
| 419 | Taxodium distichum | Taxodium distichum (L.) Rich. | Taxodiaceae | x | |
| 420 | Taxus baccata L. | Taxus baccata L. | Taxaceae | x | x |
| 421 | Telekia speciosa Schreb. | Telekia speciosa (Schreb.) Baumg. | Asteraceae | x | x |
| 422 | Thuja orientalis L. | Thuja orientalis L. | Cupressaceae | x | |
| No. | original name on label | valid name | family | HR | ZAHO |
|-----|------------------------|------------|--------|----|------|
| 445 | Tilia argentea Desf.   | Tilia tomentosa Moench | Tiliaceae | x  |
| 446 | Tordylium apulum L.    | Tordylium apulum L. | Apiceae   | x  | x   |
| 447 | Torilis arvensis (Huds.) Lk | Torilis arvensis (Huds.) Lk | Apiceae | x  |
| 448 | Trachycarpus excelsa Wendl. | Rhaps excelsa (Thunb.) Henry | Areaceae | x  |
| 449 | Tragopogon pratensis L. | Tragopogon pratensis L. | Cichoriceae | x  | x   |
| 450 | Trapa natans L. J.     | Trapa natans L. | Trapaceae | x  |
| 451 | Trifolium arvense L.   | Trifolium arvense L. | Fabaceae  | x  | x   |
| 452 | Trifolium aureum, Trifolium strepens Cr. | Trifolium aureum Pollich | Fabaceae | x  | x   |
| 453 | Trifolium campestre Schre. | Trifolium campestre Schre. | Fabaceae  | x  | x   |
| 454 | Trifolium fragiferum L. | Trifolium fragiferum L. | Fabaceae  | x  |
| 455 | Trifolium hybridum      | Trifolium hybridum L. | Fabaceae  | x  | x   |
| 456 | Trifolium incarnatum L. | Trifolium incarnatum L. | Fabaceae  | x  | x   |
| 457 | Trifolium montanum L.   | Trifolium montanum L. | Fabaceae  | x  | x   |
| 458 | Trifolium pratense L.   | Trifolium pratense L. | Fabaceae  | x  | x   |
| 459 | Trifolium rubens L.     | Trifolium rubens L. | Fabaceae  | x  | x   |
| 460 | Trifolium stellatunum L. | Trifolium stellatunum L. | Fabaceae | x  | x   |
| 461 | Trilium subterraneum L. | Trilium subterraneum L. | Fabaceae | x  |
| 462 | Trollius europaeus L.   | Trollius europaeus L. | Ranunculaceae | x  | x   |
| 463 | Tussilago farfara L.    | Tussilago farfara L. | Asteraceae | x  | x   |
| 464 | Typha latifolia L.      | Typha latifolia L. | Typhaceae | x  | x   |
| 465 | Onopordum acanthium L.  | Onopordum acanthium L. | Asteraceae | x  |
| 466 | Urtica dioica L.        | Urtica dioica L. | Urticaceae | x  | x   |
| 467 | Valeriana officinalis L. | Valeriana officinalis L. | Valerianaceae | x  | x   |
| 468 | Veratrum album L.       | Veratrum album L. | Melanthiaceae | x  | x   |
| 469 | Verbasum floscosum W.K. | Verbasum pulvrentum Vill. | Scrophulariaceae | x  |
| 470 | Verbasum phomoides L.   | Verbasum phomoides L. | Scrophulariaceae | x  |
| 471 | Verbena officinalis L.  | Verbena officinalis L. | Verbanaceae | x  | x   |
| 472 | Veronica officinalis L. | Veronica officinalis L. | Scrophulariaceae | x  | x   |
| 473 | Viburnum lantana L.     | Viburnum lantana L. | Caprifoliaceae | x  | x   |
| 474 | Viburnum opulus L.      | Viburnum opulus L. | Caprifoliaceae | x  | x   |
| 475 | Viburnum tinus L.       | Viburnum tinus L. | Caprifoliaceae | x  | x   |
| 476 | Vicia calcarata         | Vicia monanthe Retz. | Fabaceae | x  |
| 477 | Vicia ervila (L.) Willd. | Vicia ervila (L.) Willd. | Fabaceae | x  | x   |
| 478 | Vicia faba L.           | Vicia faba L. | Fabaceae | x  |
| 479 | Vicia lutea L.          | Vicia lutea L. | Fabaceae | x  | x   |
| 480 | Vicia sativa L.         | Vicia sativa L. | Fabaceae | x  | x   |
| 481 | Viola odorata L.        | Viola odorata L. | Violaceae | x  | x   |
| 482 | Vitex agnus-castus L.   | Vitex agnus-castus L. | Verbanaceae | x  | x   |
| 483 | Xanthium italicum Moretti. | Xanthium orientare subsp. italicum (Moretti) Greuter | Asteraceae | x  |
| 484 | Xanthium strumarium L.  | Xanthium strumarium L. | Asteraceae | x  | x   |
| 485 | Zea mays L.             | Zea mays L. | Poaceae | x  |
| 486 | Ziziphus sativus Gaert. | Ziziphus jujuba Mill. | Rhamnaceae | x  |