

Contributions to the urban flora and vegetation of Strasbourg (France)

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Abstract: A survey of the urban flora of Strasbourg (France) results in 134 species for the city (Grand'Île), and 185 species for railway stations and inland ports. The vegetation is documented by plant sociological relevés and some pictures.

1. Introduction

Strasbourg is situated in the Upper Rhine Valley 150 m above sea level. Because of the lee effect the precipitation is moderately low (approx. 600 mm); the average temperature of the year is 9,7°C, the mean temperature of July is 18.9°C, that of January 0.7°C.

Strasbourg was founded 16 A.D. by the Romans. The town shows a great diversity of important buildings and monuments of the Gothic, Renaissance and Baroque epochs. Its half-timbered houses are famous and well-known. Since 1949 Strasbourg is seat of the Council of Europe.

Strasbourg has approx. 250.000 inhabitants at 78 km². The population of the extended area comes to 400.000 inhabitants. Strasbourg owns the second largest inland port of the Rhine, and also of France (after Paris). In consideration of the size of the town one could expect a rich ruderal flora. This preliminary survey was conducted in autumn 2002 and 2003.

2. Flora of the historical centre [Grand'Île]

Acer negundo (riparian habitats)
Acer pseudoplatanus juv. (city; riparian habitats)
Aegopodium podagraria (riparian habitats)
Ailanthus altissima juv. (city; riparian habitats)
Alliaria petiolata (riparian habitats)
Alnus glutinosa juv. (riparian habitats)

Amaranthus blitum (city; riparian habitats)
Amaranthus powellii (riparian habitats)
Amaranthus retroflexus (riparian habitats)
Anthriscus sylvestris (city, riparian habitats)
Arctium lappa (riparian habitats)
Arctium minus (riparian habitats)
Armoracia rusticana (riparian habitats)
Artemisia vulgaris (city; riparian habitats)
Asplenium ruta-muraria (riparian habitats)
Aster cf. lanceolatus (riparian habitats)
Atriplex patula (riparian habitats)
Avena sativa (riparian habitats)

Barbarea vulgaris (riparian habitats)
Betula pendula (riparian habitats)
Bidens frondosa (riparian habitats)
Brassica napus (riparian habitats)

Calystegia sepium (riparian habitats)
Capsella bursa-pastoris (city; riparian habitats)
Carduus crispus (riparian habitats)
Centaurea jacea (riparian habitats)
Chelidonium majus (riparian habitats)
Chenopodium album (riparian habitats)
Chenopodium polyspermum (riparian habitats)
Cirsium arvense (riparian habitats)
Cirsium vulgare (riparian habitats)
Clematis vitalba (city; riparian habitats)
Conyza candensis (city; riparian habitats)

Cymbalaria muralis (riparian habitats)
Cynodon dactylon (riparian habitats)

Dactylis glomerata (riparian habitats)
Daucus carota (riparian habitats)
Digitalis sanguinalis (riparian habitats)
Dryopteris filix-mas (city; riparian habitats)

Echinochloa crus-galli (riparian habitats)
Eleusine indica (riparian habitats)
Epilobium hirsutum (riparian habitats)
Epilobium spec. (city; riparian habitats)
Eragrostis minor (city; riparian habitats)
Erigeron annuus (city; riparian habitats)
Erysimum cheiranthoides (riparian habitats)
Eupatorium cannabinum (riparian habitats)
Euphorbia helioscopia (riparian habitats)
Euphorbia peplus (city)

Fallopia japonica (riparian habitats)
Ficus carica (city)

Fraxinus excelsior (riparian habitats)

Galinsoga ciliata (city; riparian habitats)

Galinsoga parviflora (riparian habitats)

Galium mollugo agg. (riparian habitats)

Geranium robertianum (riparian habitats)

Geum urbanum (riparian habitats)

Glechoma hederacea (riparian habitats)

Gnaphalium uliginosum (city)

Hedera helix (riparian habitats)

Helianthus annuus (riparian habitats)

Hordeum murinum (riparian habitats)

Iris pseudacorus (riparian habitats)

Lactuca serriola (riparian habitats)

Lamium album (riparian habitats)

Lamium purpureum (city)

Lapsana communis (riparian habitats)

Lepidium ruderales (city)

Linaria vulgaris (city)

Lolium perenne (city; riparian habitats)

Lycopersicon esculentum (city; riparian habitats)

Lycopus europaeus (riparian habitats)

Lythrum salicaria (riparian habitats)

Mahonia aquifolium (city)

Malva neglecta (riparian habitats)

Medicago x varia (riparian habitats)

Mercurialis annua (city; riparian habitats)

Nicotiana sylvestris (city)

Paulownia tomentosa (city; riparian habitats)

Petasites hybridus (riparian habitats)

Phalaris arundinacea (riparian habitats)

Phleum pratense (riparian habitats)

Plantago lanceolata (riparian habitats)

Plantago major (city; riparian habitats)

Platanus x hybrida juv. (city; riparian habitats)

Poa annua (city; riparian habitats)

Polygonum aviculare (city; habitats)

Polygonum lapathifolium (city; riparian habitats)

Populus balsamifera juv. (city)

Populus x canadensis (city; riparian habitats)

Portulaca oleracea (city; riparian habitats)

Potentilla anserina (riparian habitats)

Potentilla reptans (riparian habitats)

Prunus avium juv. (city)

Pseudofumaria lutea (city)

Oxalis corniculata (riparian habitats)

Oxalis europaea (riparian habitats)

Ranunculus repens (riparian habitats)

Rorippa palustris (riparian habitats)

Rubus armeniacus (riparian habitats)

Rumex hydrolapathum (riparian habitats)

Rumex obtusifolius (city; riparian habitats)

Sagina procumbens (city; riparian habitats)

Salix alba juv. (city; riparian habitats)

Salix caprea (city; riparian habitats)

Salix cinerea (riparian habitats)

Salix spec. juv. (city)

Sambucus nigra (city; riparian habitats)

Scrophularia nodosa (riparian habitats)

Scrophularia umbrosa (riparian habitats)

Scutellaria galericulata (riparian habitats)

Senecio cinerea (riparian habitats)

Senecio inaequidens (Petite France)

Senecio vulgaris (city; riparian habitats)

Setaria pumila (riparian habitats)

Setaria viridis (riparian habitats)

Setaria viridis var. major (riparian habitats)

Sinapis alba (riparian habitats)

Sisymbrium officinale (city)

Solanum dulcamara (riparian habitats)

Solanum nigrum (city; riparian habitats)

Solidago gigantea (riparian habitats)

Sonchus asper (city; riparian habitats)

Sonchus oleraceus (city; riparian habitats)

Stellaria media (city; riparian habitats)

Symphytum officinale (city; riparian habitats)

Taraxacum officinale agg. (city; riparian habitats)

Tilia spec. juv. (riparian habitats)

Trifolium pratense (riparian habitats)

Trifolium repens (city; riparian habitats)

Tussilago farfara (riparian habitats)

Urtica dioica (riparian habitats)

Verbascum thapsus (riparian habitats)

Veronica arvensis (city)

3. Flora of railway stations and inland ports

- Acer negundo* juv. (railway stations; Bassin d'Austerlitz; Port du Rhin)
Acer platanoides juv. (railway stations; Port du Rhin)
Acer pseudoplatanus (railway stations; Port du Rhin)
Achillea millefolium (Bassin d'Austerlitz; Port du Rhin)
Ailanthus altissima (railway stations; Bassin d'Austerlitz; Port du Rhin)
Alliaria petiolata (Port du Rhin)
Amaranthus albus (Gare Central; Gare des Marchandises)
Amaranthus powellii (railway stations; Bassin d'Austerlitz; Port du Rhin)
Amaranthus retroflexus (railway stations; Bassin d'Austerlitz; Port du Rhin)
Ambrosia artemisiifolia (Bassin d'Austerlitz)
Apera spica-venti (Port du Rhin)
Arctium minus (railway stations)
Arenaria serpyllifolia (railway stations; Port du Rhin)
Arrhenatherum elatius (railway stations; Port du Rhin)
Artemisia vulgaris (railway stations; Bassin d'Austerlitz; Port du Rhin)
Asparagus officinalis (railway stations)
Aster spec. (Bassin d'Austerlitz)
Atriplex patula (railway stations; Bassin d'Austerlitz; Port du Rhin)
- Bellis perennis* (Port du Rhin)
Betula pendula (railway stations)
Brassica napus (railway stations; Bassin d'Austerlitz; Port du Rhin)
Bromus sterilis (railway stations; Bassin d'Austerlitz; Port du Rhin)
Bromus tectorum (Gare des Marchandises; Bassin d'Austerlitz)
Bryonia dioica (Gare du Rhin; Port du Rhin)
Buddleja davidii (railway stations; Bassin d'Austerlitz: very frequent; Port du Rhin)
- Calamagrostis epigejos* (railway stations; Port du Rhin)
Calystegia sepium (Gare du Rhin; Port du Rhin)
Cardamine hirsuta (Gare des Marchandises)
Carex hirta (Bassin d'Austerlitz; Port du Rhin)
Centaurea stoebe (Port du Rhin)
Chaenorhinum minus (railway stations; Bassin d'Austerlitz; Port du Rhin)
Chelidonium majus (Gare Central)
Chenopodium album (railway stations; Bassin d'Austerlitz; Port du Rhin)
Chenopodium hybridum (Bassin d'Austerlitz)
Chenopodium polyspermum (Port du Rhin)
Chenopodium cf. strictum (Bassin d'Austerlitz)
Chondrilla juncea (Bassin d'Austerlitz; Port du Rhin)
Cichorium intybus (Port du Rhin)
Cirsium arvense (railway stations; Bassin d'Austerlitz; Port du Rhin)
Cirsium vulgare (railway stations; Port du Rhin)
Clematis vitalba (railway stations; Bassin d'Austerlitz; Port du Rhin)
Convolvulus arvensis (railway stations; Bassin d'Austerlitz; Port du Rhin)
Conyza canadensis (railway stations; Bassin d'Austerlitz; Port du Rhin)

Cornus sanguinea (Port du Rhin)
Cymbalaria muralis (Port du Rhin)
Cynodon dactylon (Port du Rhin)

Dactylis glomerata (Bassin d'Austerlitz; Port du Rhin)
Datura stramonium (Port du Rhin)
Daucus carota (railway stations ; Bassin d'Austerlitz; Port du Rhin)
Digitaria sanguinalis (railway stations; Bassin d'Austerlitz; Port du Rhin)
Diplotaxis tenuifolia (railway stations; Bassin d'Austerlitz; Port du Rhin)
Dittrichia graveolens (Gare du Rhin; Port du Rhin)

Echinochloa crus-galli (railway stations; Bassin d'Austerlitz; Port du Rhin)
Echium vulgare (Port du Rhin)
Elymus repens (Port du Rhin)
Epilobium hirsutum (Gare Central)
Epilobium spec. (railway stations; Bassin d'Austerlitz)
Equisetum arvense (Gare du Rhin; Port du Rhin))
Eragrostis minor (railway stations; Bassin d'Austerlitz; Port du Rhin)
Erigeron annuus (Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)
Eupatorium cannabinum (Gare Central; Gare des Marchandises; Port du Rhin)
Euphorbia cyparissias (railway stations; Port du Rhin)
Euphorbia lathyris (Port du Rhin)

Fallopia dumetorum (railway stations; Bassin d'Austerlitz; Port du Rhin)
Fallopia japonica (Gare Central; Bassin d'Austerlitz)
Festuca rubra (Port du Rhin)
Fraxinus excelsior (railway stations; Port du Rhin)

Galeopsis tetrahit agg. (Port du Rhin)
Galinsoga parviflora (Gare Central; Bassin d'Austerlitz; Port du Rhin)
Galium mollugo agg. (Port du Rhin)
Geranium pusillum (Port du Rhin)
Geranium pyrenaicum (Gare des Marchandises; Port du Rhin)
Geranium robertianum (Gare des Marchandises; Port du Rhin)
Geranium rotundifolium (Gare des Marchandises)
Glechoma hederacea (Port du Rhin)

Hedera helix (railway stations, Port du Rhin)
Herniaria glabra (Port du Rhin)
Hieracium pilosella (Port du Rhin)
Hieracium spec. (Port du Rhin)
Hordeum vulgare (Gare Central)
Humulus lupulus (Gare du rhin; Port du Rhin)
Hypericum perforatum (railway stations; Bassin d'Austerlitz; Port du Rhin)
Hypochoeris radicata (Port du Rhin)

Impatiens parviflora (Gare du Rhin; Port du Rhin)

Juglans regia juv. (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)

- Lactuca serriola* (railway stations ; Bassin d'Austerlitz; Port du Rhin)
Lapsana communis (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)
Lepidium ruderae (Gare des Marchandises)
Lepidium virginicum (Bassin d'Austerlitz; Port du Rhin)
Linaria vulgaris (Gare du Rhin; Gares des Marchandises; Bassin d'Austerlitz; Port du Rhin)
Lolium perenne (Gare Central; Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)
Lotus corniculatus (Port du Rhin)
Lycopersicon esculentum (Gare Central; Bassin d'Austerlitz)
Lysimachia vulgaris (Gare du Rhin; Port du Rhin)
- Malva neglecta* (Port du Rhin)
Medicago lupulina (Bassin d'Austerlitz; Port du Rhin)
Medicago x varia (Gare du Rhin)
Melilotus albus (railway stations; Port du Rhin)
Mercurialis annua (railway stations; Bassin d'Austerlitz; Port du Rhin)
Mycelis muralis (Gare du Marchandises)
- Oenothera biennis* agg. (Gare des Marchandises; Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)
Oxalis corniculata (Port du Rhin)
Oxalis europaea (Bassin d'Austerlitz)
- Panicum capillare* (Gare du Rhin; Bassin d'Austerlitz: frequent; Port du Rhin: frequent)
Panicum miliaceum (Bassin d'Austerlitz; Port du Rhin)
Papaver rhoeas (Port du Rhin)
Parthenocissus inserta (Gare du Rhin)
Pastinaca sativa (railway stations; Port du Rhin)
Paulownia tomentosa (railway stations; Bassin d'Austerlitz: frequent; Port du Rhin)
Petrorhagia prolifera (Port du Rhin)
Phalaris canariensis (Bassin d'Austerlitz)
Phragmites australis (Port du Rhin)
Picris hieracioides (railway stations; Bassin d'Austerlitz; Port du Rhin)
Plantago lanceolata (Gare du Marchandises; Bassin d'Austerlitz; Port du Rhin)
Plantago major (railway stations; Bassin d'Austerlitz; Port du Rhin)
Plantago media (Port du Rhin)
Platanus x hybrida juv. (Bassin d'Austerlitz: very frequent; Port du Rhin)
Poa annua (Gare Central; Gare des Marchandises; Bassin d'Austerlitz)
Poa compressa (Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)
Polygonum aviculare (railway stations; Bassin d'Austerlitz; Gare du Rhin; Port du Rhin)
Polygonum persicaria (Gare Central; Port du Rhin)
Polygonum lapathifolium (Port du Rhin)
Populus balsamifera juv. (Bassin d'Austerlitz)
Populus x canadensis juv. (railway stations; Bassin d'Austerlitz; Port du Rhin)
Portulaca oleracea (Bassin d'Austerlitz; Port du Rhin)
Potentilla anserina (Gare du Rhin)

Potentilla argentea (Port du Rhin)

Potentilla cf. intermedia (Gare du Rhin)

Potentilla reptans (Port du Rhin)

Potentilla supina (Port du Rhin)

Prunus avium juv. (Port du Rhin)

Raphanus raphanistrum (Port du Rhin)

Reseda lutea (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)

Reseda luteola (Port du Rhin)

Robinia pseudoacacia (railway stations; Bassin d'Austerlitz; Port du Rhin)

Rosa spec. (Gare du Rhin; Port du Rhin)

Rubus armeniacus (Gare des Marchandises; Gare du Rhin; Port du Rhin)

Rubus caesius (Gare du Rhin; Port du Rhin)

Rubus fruticosus agg. (railway stations and banks of the tracks; Port du Rhin)

Rumex acetosella (Gare du Rhin; Port du Rhin)

Rumex spec. (Bassin d'Austerlitz)

Sagina procumbens (Gare Central)

Salix alba (Port du Rhin)

Salix caprea (Gare Central; Bassin d'Austerlitz; Port du Rhin)

Salvia pratensis (Gare des Marchandises)

Sambucus nigra (Gare Central; Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)

Saponaria officinalis (Port du Rhin)

Sedum album (Gare des Marchandises)

Senecio erucifolius (Gare du Rhin; Port du Rhin)

Senecio inaequidens (railway stations; Port du Rhin)

Senecio viscosus (railway stations; Bassin d'Austerlitz; Port du Rhin)

Senecio vulgaris (Gare Central; Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)

Setaria adhaerens (Bassin d'Austerlitz; Port du Rhin)

Setaria pumila (Gare du Rhin; Port du Rhin)

Setaria viridis (Gare du Rhin; Gare des Marchandises; Bassin d'Austerlitz; Port du Rhin)

Setaria viridis var. *major* (Bassin d'Austerlitz; Port du Rhin)

Silene vulgaris (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)

Sinapis arvensis (Port du Rhin)

Solanum nigrum (Gare du Marchandises; Bassin d'Austerlitz; Port du Rhin)

Solanum sarachoides (Bassin d'Austerlitz)

Solidago canadensis (Gare du Marchandises; Bassin d'Austerlitz; Port du Rhin)

Solidago gigantea (Gare Central; Bassin d'Austerlitz; Port du Rhin)

Sonchus asper (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)

Sonchus oleraceus (railway stations; Bassin d'Austerlitz; Port du Rhin)

Sorghum halepense (Gare du Rhin; Port du Rhin)

Symphytum officinale (Port du Rhin)

Tanacetum vulgare (Port du Rhin)

Taraxacum officinale agg. (Gare Central; Bassin d'Austerlitz; Port du Rhin)

Thymus pulegioides s.l. (Port du Rhin)

Tragopogon dubius (Port du Rhin)
Tragus racemosus (railway stations; Port du Rhin)
Trifolium pratense (Port du Rhin)
Trifolium repens (Gare du Rhin; Bassin d'Austerlitz; Port du Rhin)
Tripleurospermum perforatum (Bassin d'Austerlitz; Port du Rhin)
Triticum aestivum (Gare Central; Port du Rhin)
Tussilago farfara (Bassin d'Austerlitz; Port du Rhin; Gare du Rhin)

Ulmus minor (Port du Rhin)
Urtica dioica (railway stations; Bassin d'Austerlitz; Port du Rhin)

Verbascum blattaria (Bassin d'Austerlitz; Port du Rhin)
Verbascum densiflorum (Port du Rhin)
Verbascum thapsus (Gare du Rhin; Port du Rhin)
Verbena officinalis (Bassin d'Austerlitz; Port du Rhin)
Viola x wittrockiana (Gare du Rhin)
Vitis vinifera (Bassin d'Austerlitz)
Vulpia myuros (Bassin d'Austerlitz)

4. Ruderal Vegetation of the inland ports

The scarce vegetation of the inland ports is dominated by communities of the ruderal classes Stellarietea and Artemisietea. The Stellarietea communities are close connected to the order Eragrostietalia because of the frequent occurrence of panicoid grasses. The first two relevés show the species combination of *Panicum capillare* communities:

(i) Strasbourg. Port du Rhin: Bassin du Commerce. Relevé No.1649
Gravel. 10.9.2003. Area 15 m², vegetation cover 50 %:

Species of the class Stellarietea: 3.3 *Panicum capillare*, 2.2 *Setaria pumila*, 1.2 *Digitaria sanguinalis*;

Species of the class Artemisietea: *Echium vulgare*, + *Diplotaxis tenuifolia*,
+ *Artemisia vulgaris* juv., + *Daucus carota* juv.;

others: 1.2 *Silene vulgaris*, r *Euphorbia cyparissias*.

(ii) Strasbourg: Port du Rhin. Relevé No. 1658. Abandoned railway tracks.
12.9.2003. Area 20 m², vegetation cover 95 %:

Species of the class Stellarietea: 5.5 *Panicum capillare*, 1.2 *Conyza canadensis*, 1.2 *Setaria viridis*, 1.1 *Chenopodium album*;

others: 1.2 *Calamagrostis epigejos*, 1.2 *Linaria vulgaris*, +.2 *Erigeron annuus*,
+ *Daucus carota*, + *Medicago lupulina*.

The very typical stands with *Tragus racemosus* grow on gravelly soils moderately trampled. Their species combination shows a clear relationship to Stellarietea resp. Eragrostietalia and not to Polygono-Poetea (table 1):

Tab. 1: Stands with *Tragus racemosus*.

| | | | | | | | | | | |
|------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Number of relevé | 1645 | 1646 | 1652 | 1653 | 1656 | 1651 | 1657 | 1650 | 1647 | 1655 |
| Area [m ²] | 10 | 30 | 5 | 10 | 4 | 3 | 10 | 10 | 40 | 20 |
| Vegetation cover [%] | 10 | <5 | 40 | 70 | 40 | 30 | 40 | <5 | <5 | <5 |
| Location | P | P | P | P | G | P | G | P | P | P |
| Species number | 6 | 5 | 6 | 7 | 7 | 10 | 4 | 4 | 2 | 2 |
| <i>Tragus racemosus</i> | 1.1 | 1.1 | 2.2 | 3.4 | 3.2 | 2.2 | 3.3 | 1.1 | 2.1 | 2.2 |
| Species of the class | | | | | | | | | | |
| Chenopodietea: | | | | | | | | | | |
| <i>Digitaria sanguinalis</i> | 2.3 | 1.1 | 1.1 | 2.3 | 1.1 | . | . | . | . | . |
| <i>Ergrostis minor</i> | 1.1 | 1.2 | . | 1.2 | 1.2 | 1°.2 | . | . | . | . |
| <i>Panicum capillare</i> | 1.1 | . | 2.2 | 1.2 | . | + | . | . | . | . |
| <i>Setaria viridis</i> | . | r | 3.2 | . | . | . | 1.2 | . | + | . |
| <i>Conyza canadensis</i> | . | . | . | +°.2 | 2.2 | 1°.2 | + | . | . | . |
| <i>Echinochloa crus-galli</i> | . | . | . | + | . | . | . | . | . | . |
| <i>Amaranthus retroflexus</i> | . | . | . | . | . | . | . | . | . | 1.1 |
| Others: | | | | | | | | | | |
| <i>Chondrilla juncea</i> | . | r | . | . | . | +° | . | 1.2 | . | . |
| <i>Medicago lupulina</i> | + | . | + | . | . | . | . | . | . | . |
| <i>Taraxacum officinale</i> agg. | +2 | . | . | . | . | +° | . | . | . | . |
| <i>Senecio inaequidens</i> | . | . | . | . | 1.1 | . | 2.3 | . | . | . |
| <i>Artemisia vulgaris</i> juv. | . | . | r° | . | . | . | . | . | . | . |
| <i>Bryum argenteum</i> | . | . | . | 1.2 | . | . | . | . | . | . |
| <i>Hypericum perforatum</i> | . | . | . | . | + | . | . | . | . | . |
| <i>Populus x canadensis</i> Keiml. | . | . | . | . | R | . | . | . | . | . |
| <i>Arenaria serpyllifolia</i> | . | . | . | . | . | +2 | . | . | . | . |
| <i>Plantago lanceolata</i> | . | . | . | . | . | + | . | . | . | . |
| <i>Diplotaxis tenuifolia</i> juv. | . | . | . | . | . | + | . | . | . | . |
| <i>Cirsium vulgare</i> juv. | . | . | . | . | . | r | . | . | . | . |
| <i>Cymbalaria muralis</i> | . | . | . | . | . | . | . | +2 | . | . |
| <i>Chaenarhinum minus</i> | . | . | . | . | . | . | . | + | . | . |

P: Port du Rhin; G: Gare des Marchandises.

Luxuriant growing of *Amaranthus* species was only observed on deep loamy soils on the banks of new constructed streets:

(iii) Strasbourg. Port du Rhin. Relevé No. 1648. Street to the Bassin du Commerce: loamy soil of the margin. Area 40 m², vegetation cover 65%:

Species of the class Stellarietea: 3.3 *Amaranthus powellii*, 2.3 *Echinochloa crus-galli*, 2.2 *Amaranthus retroflexus*, 1.2 *Setaria adhaerens*, 1.2 *Eragrostis minor*, 1.2 *Diploaxis sanguinalis*, 1.1 *Chenopodium album*, + *Portulaca oleracea*, + *Solanum nigrum*, r *Brassica napus*;
others: + *Polygonum aviculare*.

The succession on consolidated gravelly soil leads to Onopordetalia communities with *Chondrilla juncea*, *Echium vulgare*, *Reseda lutea*, *Erigeron annuus*, and/or *Verbascum blattaria*:

Strasbourg. Relevé No.1644. Port du Rhin, gravelly soil. 10.9.2003. Area 40 m²; vegetation cover 35 %:

Species of the order Onopordetalia: 2.2 *Linaria vulgaris*, + *Daucus carota*, + *Reseda lutea*, + *Chondrilla juncea*;
species of the class Stellarietea: 2.2 *Setaria viridis*, 1.2 *Conyza canadensis*, 1.2 *Panicum capillare*, 1.2 *Digitaria sanguinalis*;
others: 1.2 *Rubus fruticosus* agg., 1.2 *Euphorbia cyparissias*, + *Verbena officinalis*, + *Populus x canadensis* juv., +° *Hypericum perforatum*.

(iv) Strasbourg. Relevé No. 1654: Port du Rhin. Gravelly soil near the Bassin du Commerce. 11.9.2003. Area 50 m², vegetation cover 40 %:

Species of the order Onopordetalia: 3/2.2 *Echium vulgare*, 2.1 *Verbascum blattaria*, 2.1 *Cichorium intybus*, 1°.1 *Artemisia vulgaris*, 1.1 *Erigeron annuus*, + *Daucus carota*;
others: 2.2 *Plantago lanceolata*, 2.2 *Silene vulgaris*, 1.2 *Eragrostis minor*, 1.2 *Medicago lupulina*, 1.1 *Setaria viridis*, +.2 *Petrorhagia prolifera*, + *Taraxacum officinale* agg.

On loose rubble heaps phanerophytes are very important already in the first stages of succession:

(v) Strasbourg, Bassin d'Austerlitz, Relevé No. 1643. Gravelly deposits. 9.9.2003. Area 30 m², vegetation cover 80 %:

Shrub layer: 4.4 *Buddleja davidii*, 2.3 *Clematis vitalba*, 1.1 *Robinia pseudoacacia*;

perennials: 1.2 *Solidago canadensis*, 1°.1 *Solidago gigantea*, + *Artemisia vulgaris*;
annuals: 1.2 *Lepidium virginicum*, 1.2 *Chenopodium album*, 1.2 *Amaranthus powellii*, 1.2 *Setaria viridis* var. *major*, 1.2 *Panicum capillare*.



Fig. 1: *Paulownia tomentosa* (right) and *Mercurialis annua* at the central railway station of Strasbourg.

Fig. 2: *Panicum capillare* - *Conyza canadensis* - community at abandoned railway land in the southern part of the port (Port du Rhin).



Fig. 3 and 4: *Verbascum blattaria* (flowering and rosette), Port du Rhin.



Fig. 5: *Sorghum halepense* near the Gare du Rhin.

Fig. 6: *Setaria viridis* var. *major* in crevices of the quay of the river Ill (Grand'Île).



Fig. 7: *Alnus glutinosa*, *Senecio cinerea* and *Platanus x hispanica* in a quay of the river Ill.



Fig. 8: *Paulownia tomentosa* in the crevices of the basement of a building near the river Ill.

Fig. 9: *Petunia x hybrida* running wild near the Rives de l'Aar.

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