

Index

- ABA *see* abscissic acid
Abies 218, 336
 abscissic acid 77, 78, 264
 abscission 58, 103
 Absinthe *see* *Artemisia absinthum*
Abutilon, nectar 171
Acacia 103, 242, 272, 285, 298, 338
 phyllodes 126
 Acanthaceae 247, 286, 288
Acanthus as a mangrove species
 267
Acetabularia 38–39, 46
 development 93–94
Acetobacter 21
Achillea, sneezewort 352
Acorus 230, 254, 350
Acrostichum 267
 Actinidiaceae 246
 Actinomorphy *see* flower symmetry
 Adanson, M. 384
Adansonia 186, 303
 adaptation 99, 396–398, 410
 adaptive landscape 119
 adaptive radiation 313–314
Adenium 303
 adventitious roots 158
Aegialitis 267
 vivipary 165
Aegiceras 267
Aegle marmelos, Bael Tree 343
Aeonium 313
Aerenchyma 56, 259
Aeschynanthus 278, 313–314
Aeschynomene 258
Aesculus 187
Aextoxicon 239
Agalmyla 313
 agar 21
Agathis 218, 220, 311–313
 Agavaceae 169
Agave sisalina, sisal 335, 345
Agave tequilana 349
 Aggregate fruit 329
Aglaophyton 203
 air plants 234, 235
 Aizoaceae 238–239, 263
Alchemilla 150
 alcohol, production of 349
Aleurites, Tung Nuts 326, 337
 algae 49
 colonial 40–41
 coenocytic or siphonous 39–40
 filamentous 41–43
 groups of 34–35
 intertidal 45
 multicellular 38–39
 unicellular 36–37
 Alismatales 231, 254
 allele 29
 allelopathy 99, 159
 Alliaceae as vegetables 329
 allicin 341
Allium 61, 223
 allometric growth 106–107
Alluaudia
Alnus 243, 255
 catkins 161
Alocasia 180
Aloe 185, 232, 301–302, 232, 314
 Aloeaceae 185
Alsomitra 164
 alternation of generations 31–32,
 136
 Amaranthaceae 238–239
 leaf venation 84
 pigments 176
 Amborella, Amborellaceae 227, 312
Ambrosia maritima ragweed 342
Ammophila, marram grass 160, 297
Amorphophallus 180, 186
Ampelodesmus 235
Amyema 279
Anabaena 18, 41, 212, 257, 273
Anacamptis 233
Anacardium occidentale 331
Anacyclus pyrethrum, white pellitory as
 snuff 352
Anadenanthera peregrina 355
Ananas pineapple 173, 332, 335
 Anarcardiaceae 245
Andropogon 297
Andreaea protonema 138
 Andreaeopsida, stone or lantern
 mosses 201
 place in phylogeny 195
 anemochory, *see* seeds, dispersal
Angiopteris 208
Angraecum sesquipedale 171
 animals differences from plants 49,
 52
 anisogamy 29–30
 anisophylly 68
 anisospory 145
 ANITA group 224
 annatto *see* *Bixa orellana*
 Annonaceae 173
 annual *see* life-forms
 annulus 142, 162
Anothofixus 279
 ant plants, ant-thorns 293, 299
 Antheridium 137
 Anthocerophyta, Anthocerotales,
 hornworts 198–199
 place in phylogeny 195
Anthoceros 143, 199
 anthocyanadins 175, 176
 anticlinal cell division 42
Antirrhinum 91, 418
 Apiaceae, Apiales 249, 339
 apical dominance 76
 apical meristem 64, 127
Apiopetalum 313
 Apocyanaceae 246, 289, 303
 Apoideae 249
 apomorphy 416
Aponogeton 165
 apophysis 142, 143
 apoplasm 78
 apostasioideae 233
 apple *see* *Malus*
 aquatic plants, general adaptations
 254–257
 Aquifoliaceae 248
Aquilegia 185
Arabidopsis 81
 Araceae 175, 290
 Araliaceae 249
Araucaria 116, 218, 312–313
 island endemics 311
 male gametophyte 153
 regular branching 76
 Araucariales, Araucariaceae 220
 Arber, A. 371, 387, 412, 414–415, 423
Arbutus 172, 270
Arceuthobium 279
 archaeobacteria 13, 19–22, 49
Archaeopteris 125, 207

- Archegonia 137
 archetypes 191, 192
 Archezoa 23
 architecture 116–118, 129–132
 Arctic-alpine plants 303–306
Arctium, burdock fruit 170
Artocarpus 157
Areca catechu 319
 Areaceae, Arecales palms 234, 284, 318, 326
Argemone 169
Argranthemum
Argyroxiphium 307–308, 313–314
 arid habitats 299
 aril 170, 173
Arisarum 181
Aristolochia 180, 223, 343–344
 Aristotle's Essentialism 372–374
Armeria 261, 262
 Aroid, *see* Araceae
Arrhenatherum elatius, False oat-grass 298
Artemisia absinthium, *A. nilagirica* 350–351
 allelopathy 159
Arthrocnemon 262
Artocarpus altilis 329
Arum 180
 pollination 175
Arundo 297
Asclepias 178, 246
 pollination, pollinia 246–247
 Asclepiad, Asclepiadaceae 180, 300
Ashwagandha *see* *Withania*
 asparagales 231–232
 aspirin 344
Asplenium 214, 288
Astelia 313
Aster 178, 264
 Asteraceae 189, 249–250, 313–315, 326, 329, 339
 Asterales 240, 245, 249
Asterella capsule 142
 Asterid *see* Asterales
Asteroxylon 68–69, 124, 203
Astilbe 239
Astragalus 242, 305
 ATP 9
Atrichum 201
Atriplex 261, 264
Atropa belladonna 355
Aucuba 246
Aulocommum 202
 Austrobaileyaceae 312
Austrotaxus 313
 autochory, explosive fruit 163
 autopoiesis 1, 4–7, 401
 auxins 66, 76–77, 82–83, 87
Avicenna *see* Ibn Sina
 Avicenniaceae, *Avicennia* 266–267
 avocado *see* *Persea americana*
 Ayahuasca 355
 Ayurvedic medicine 343
Azadirachta indica, neem 245, 346
Azolla 212, 257, 259
Azorella 305
Azorina 315
Azotobacter 272
 Bacillariophyceae 35–37
 bacteriochlorophyll 11
 Baer K. E. von 399
Balanites 241
 Baldwin effect 119
 Baldwin effect 405
 Balsam of Peru *see* *Myroxylon*
 Balsaminaceae 245
 Balsawood *see* *Ochroma*
 bamboo 235, 297
 leaf anatomy 86
 use of 318
 Bambusoideae 235
 banana *see* *Musa*
Bangia 42
 Bangiophycidae 36
Banisteriopsis caapi 355
Banksia 185
 Baobab *see* *Adansonia*
Barinophyton 145
 bark 73, 291
 barley *see* *Hordeum vulgare*
Barringtonia 165
 Bartram, John 364
Bartsia 276
 bat pollination 171, 186
 Bateson, W. 400–401, 404, 411
 Batidaceae 244
 Bauer, F. 406
 Bauhin, G. 379
 Bauplan 413
Bazzania 196
 bee pollination 182–183
 beetle pollination 184
Begonia 86, 243
Belamanda 224
 belladonna *see* *Atropa*
Bellium 173
 Bennettitales 215
 Bentham, G. 402
 benthic organisms 38
 Berberidaceae 237
Berberidopsis Berberidaceae, Berberidopsidales 239
Berberis 80, 171, 345
 berry 329–330
 Berry, W. 422
Bertholletia aril 170
 Bessey C. E. 402
Beta vulgaris, sugar beet 332
 beta-carotene 10, 36
 beta-cryptoxanthin 36
 betalains, betanidin, betaine 176, 264
 betel nut *see* *Areca catechu*
Betula 74, 161
 Betulaceae 243
 beverages 347
Bidens 250, 260, 315
 biennial 90, 103
 Bignoniaceae 247, 289
 bi-lipid membrane 6
 Biological Species Concept, BSC *see* species concepts
 BIOS 109
 bird pollination 184–185
 Bird's nest fern 288
Bixa orellana, annatto, bixin 337
 bloodroot *see* *Sanguinaria Canadensis*
 blue-green algae, *see* cyanobacteria
 Bobart, J. 380
Boehmeria 60, 334
Bolax 305
 Bonnet, C. 382
 Bonnier, G. 410
Borassus flabellifer 318
 botanical exploration 388
 botany, evolutionary 388
 botany, history of 372–385
 in the Age of Enlightenment 381–384
 in the Age of Romanticism 385
 in China 376, 377
 in the Renaissance 377–380
 of Ancient Greece 372–374
 Bourbon 349
 Bower, F. O. 414
 bracken *see* *Pteridium*
 Bradley, R. 380
 branching 67–69, 76
Brasenia 254

- Brassicaceae, Brassicales 149, 244
 as crops 318, 326–329
 lack of mycorrhizae 270
 brassinosteroid 78
 Braun–Blanquet vegetation
 classification 406
 breadfruit *see Artocarpus altilis*
 breeding systems 186
Brighamia 316
 Bromeliaceae 185, 234, 288
 Brongniart, A. and A.-T. 389
 brood place flowers 168
Broussonetia papyrifera, paper
 mulberry 162, 335
 brown algae, *see* Phaeophyceae
 Brown, R. 390, 399
Brugmansia 247, 355
Bruguiera 267
 Brunoniaceae 250
 brush blossom 179, 185
 Bryidae, arthrodonous mosses 202
 Bryophyta, Bryopsida, mosses 199–201
 adaptation 31, 47, 126, 138–142,
 160–163, 294–295, 299
 phylogeny 195, 196
Bryopsis 40
Bryum 162, 202
Bubbia 173
 Buch, L. von 395
 buckwheat *see Fagopyrum esculentum*
 bud 62, 67, 68
Buddleja 183
 Buffon G. L. L. 389, 395
 bulbil 61, 62
Bulbophyllum 61, 178
 Burmanniaceae 231
 Burseraceae 245
 Busbecq, G. 363
 Butomaceae 231
Butomus 230
 butterfly and moth pollination 183
Buxbaumia 140
 buzz pollination 182
 Byblidaceae 279
- C3 plants 282
 C4 plants 282
Cabomba Cabombaceae 228, 259,
 260
 Cactaceae, cactus 103, 238, 290,
 300–303
Cakile 260, 264
Calamites 209
 Calamostachys 145
- Calamus* 288, 289
see also Acorus calamus
Calceolaria, Calceolariaceae 172, 247
 California nutmeg 221
Calliandra 179
Callistemon 185
Callitriche 255, 418
Calluna 184, 246, 270
 calmodulin 81
 Calobryales 197
 Calvin cycle 16, 17
Calycanthus 180, 181
 CAM *see* Crassulacean Acid
 Metabolism
 cambium, bifacial 207
Camellia 245
Camellia sinensis, tea 347
 Camerarius, R. J. 381
Campanula, Campanulaceae 188, 315
Camptosperma 157
Canacomyrica 313
 Canada balsam *see Abies*
 canalization 405
Canarina canariensis 315
 canellales 229
 Candolle, A. de 388–390, 395, 402
Canna 178, 236
 Cannabidaceae 243, 326
Cannabis 60, 334, 353
 Cannaceae 236
 canola *see* oilseed crops
 cantharophily *see* beetle pollination
Canthium 313
 capitulum structure 249, 250
Capparis 179
 Caprifoliaceae 248
 capsaicin 341
Capsella embryogenesis 156
Capsicum 341
 capsule 142
Caralluma 300, 302
 carbon fixation 9, 18
 cardamon *see Elettaria cardomomum*
Carex 235
 Caricaceae 244
Carnegia gigantea 303
 carnivorous plants 279–280
 carob *see Ceratonia*
 carotenoid 10–11
 carpel 149
Carpinus winged fruit 163, 164
 carrageen 21
 Caryophyllaceae 238
 cashew nut *see Anacardium occidentale*
- cassava *see Manihot*
Cassia 242
Cassytha 276, 277
 castor oil plant *see Ricinus*
Casuarina, Casuarinaceae 243–244,
 270, 273, 279
Catharanthus roseus 344–345
Caulerpa 40
 cauliflory 186
Caytonia 149, 215
Cecropia seedling germination 158
Cedrus 130
Ceiba 186
 Celastrales 241
 cells 20–30
 complex 19
 determination 81
 division 22, 30
 membrane 21, 58
 signaling 75, 78–79
 size 21–22
 types, cell wall 20, 57–59, 66
 cellulose 21–23, 58
 in paper-making 335
Celmisia 304
Centaurea 250
 centriole 26
Centropogon 175
 Centrospermae *see* Caryophyllaceae
 Cephalotaceae 279
Cephalotaxus 143
Cephalotus 241
Cephaloza, spore dispersal 162
Ceratonia 337
Ceratophyllum Ceratophyllales 166,
 254, 256
Ceratopteris 260
 Cercidiphyllaceae 239
 cereal crops 318, 321
Ceropegia 180–181
 Cesalpinoideae 242
 Cesalpino, A. 378, 381
Chaetomorpha 42
Chaleuria 145
Chamaecyparis foliage 110
Chamaelium, chamomile as snuff 352
 Chamaephyte *see* life-forms
Chara, Charophyceae, Charales 32, 43,
 47–48, 137, 257
 chemical evolution of the Earth 2
 chemical repellants and deterrents
 249, 251
 chemoton 6
 Chenopodiaceae 176, 238–239

- Chenopodium quinoa* 325
 chewing gum *see* *Manilkara*
 chews 352
 chicle, *see* *Manilkara*
Chilopsis 255
 Chinese medicine 343–344
Chionophila 305
Chirita 115
 chiropterophily *see* bat pollination
Chlamydomonas 20, 29, 36–37
Chloranthus, Chloranthales 229
Chlorella 37
 chlorenchyma 58
 chlorobionta 28, 46–47
Chlorobium 14
Chlorococcus 18
Chloroflexus 14–15
 chlorophyll 11–13, 25
 Chlorophyta, Chlorophyceae 35–42, 46–48
 chloroplast 13, 24–26
 chlorosome 14, 19
 chocolate *see* *Theobroma cacao*
Chondrodendron 344
 chromatin 23
Chromatium 15
 chromophore 9, 13
 Chromophyta *see* Ochrophyta
 chromosome 23, 27, 30
 Chrysophyta, Chrysophyceae, 36
 Chyavanprash 343
Cinchona 346
 cinnamaldehyde 341
Cinnamomum 229, 340
 circadian rhythm 102
Cissus 239
 citronella *see* *Eucalyptus citriodora* 337
Citrus bergamia 356
 citrus *see* Rutaceae
 clade, cladistics 416–417
Cladophora 28, 42, 46
 classification *see* taxonomy
 Clausen, J. 410–411
 cleistogamy 187
Clematis winged fruit 163
 Clements, F. 410
Clermontia 316
 Clethraceae 246
 cline 122
 cloud forest 283
 cloves *see* *Eugenia caryophyllus*
 clubmoss *see* *Lycopodium*
Clusia resin production 173
Cobaea 186
 Coca Cola 354
 cocaine, *see* *Erythroxylon coca*
 Coccolithophore *see* Prymnesiophyta
 cocoa *see* *Theobroma cacao*
 cocoanut, *Cocos nucifera* 165, 318, 336
Codex Vindobonensis 343
Codium 40
Coelastrum 46
 coenocytic *see* algae, coenocytic
Coffea, coffee 347–348, 358
 Coir *see* cocoanut, *Cocos nucifer*
Cola nitida, *C. acuminata* 348
 Colchicaceae 232
 cold habitats, plants of 299
 Coleochaetales, Coleochaete 48
 collectors 363
 collenchyma 58–59
Colocasia 180
 colonial, *see* algae, colonial
 columnar plants 307
Columnea florida 176
Combretum, Combretaceae 241, 266
Commelina Commelinales 236
 commelinid 234
 Commerson, Philibert 364–365
Commiphora 336
 competition 397
 compression wood 102
 cone, strobilus 142, 216
 Conifer, Coniferopsida 30, 137, 156, 218–219
Conium maculatum, hemlock 345
Conocephalum gametophyte 139
Conophyton 8
 conservation 370
 convergence, evolutionary 105, 301
 Convolvulaceae 247, 276, 327
Cooksonia 54, 68, 124, 141
Coprosma 315
 Corallinaceae 21
Corallorhiza 274
Corchorus 334
Cordaites 215
Cordyline 313
Coriaria 243
 cork cambium *see* phellogen
 cork oak *see* *Quercus*
 cork *see* phellem
 corm 62
 Cornaceae 245
 Corner E. J. H. 192, 252
Cornus 245
Cortaderia selloana, pampas grass 296
Coryanthes 180
Corydalis 237
Corylus 244
 Costaceae 236
 cotton *see* *Gossypium*
Couroupita 168–169
 crassinucellate *see* nucellus
 Crassulaceae 239
 Crassulacean Acid Metabolism 102, 257, 282, 292, 300
Crataegus 150
 Crataeus 376
 Crocetin *see* *Crocus sativus*
Crococsmia 62
Crocus sativus 337
 Croizat, L. 395
 Cronquist, A. 418
 crop plant improvement 356–357, 358
 Crossomatales 241
Crotalaria 242
 Cruciferae *see* Brassicaceae
 Cryophyllaceae, Caryophyllales 73, 151, 176, 238, 279
 cryoprotectant 305
Cryptocoryne 165
 cryptophyte *see* life-forms
Cryptothallus 197
Cucurbita Cucurbitaceae, Cucurbitales 188, 243, 326, 329
 Cuivier, G. L. 399
 Cupressus, Cupressaceae, Cupressales 221
Curarea 344
Curcuma longa 340, 343
Cuscuta, dodder Cuscutaceae 276–277
 cushion plants 304
Cutleria life-cycle 33
Cyanea 316
 cyanelle 25
Cyanidium 37
 cyanobacteria, cyanobacteriaceae 8, 13, 16–18, 21, 24–26, 36–37, 41
 nitrogen fixation 273
Cyanophora 36
Cyathea, Cyatheales 213, 313
Cyathium 188
Cyathodium capsule 142
Cycas, Cycadaceae, Cycadidae, cycad 137, 143, 154, 156, 195, 217
Cyclanthus, Cyclanthaceae 283, 284
Cymbalaria muralis 98
Cymbidium 363
Cymbopogon citrates 338–339
Cymodocea 260
Cynara 250

- Cynodon dactylon*, Bermuda grass 297
 Cyperaceae 234–235, 255, 270
Cyphostemma 239
 Cyperpedioideae 233
Cypripedium, Lady's Slipper Orchid 179
 Cypress *see* *Cupressus*
 Cyrillaceae 246
Cyrtandra 314
Cytinus 275
Cytisus 180, 181
 cytokinesis 27, 28
 cytokinins 77
 cytoskeleton 23, 27, 28
- D'Arcy Thompson, W. 110, 400
Dacrycarpus 218
 Dahlgren, B. E. 418
Dalbergia, rosewood 333
Dalechampia 173
Darlingtonia 246, 281
 Darwin, E. 389
 Darwin, C. 97–98, 107, 388, 391–395, 399–401
 Dasycladales 46, 93
 date palm *see* *Phoenix*
Datura 172, 355
Dawsonia 201
Decaspermum 187
 decumbent 68
Degeneria, *Degeneriaceae* 312
Deherainia 184
Delissea 316
Delonix 242
 deme 409
Dendroceros 199
Dendrophatae 278
Dendrosenecio 307
Dendroseris 315
Dendrotrophe 278
Dennstaedtia 214
Derrbesia 47
 Descartes, René 379
Deschampsia klossii 307
Desmarestia life-cycle 32
 desmid 37
 determinate growth 89
 development 56–61, 70, 75, 110, 116
Dianella 313
 diaspore 157
 diatom *see* *Bacillariophyceae*
Dichondra 247
Dicksonia 213, 313
- dicliny, *diclinous* 188
Dicnemon gametophyte 139
Dicranella 202
 Didiereaceae 238, 301
 differentiation 57, 89
Digitalis 248, 418
Digitaria 324
 Dilleniidae 244
Dinobryon 36
Dinochloa 288
 dinophyta, *dinoflagellate* 23, 35–36
 diocles 375
 dioecy 30, 145, 187–188
Dionaea 99, 280
 Dionocophyllaceae 279
Dioscorea, *Dioscoreaceae*, *Dioscoreales*, 231, 327–328, 345
 Dioscorides 342–343
Diospyros ebony 313, 333
 diplobiontic *see* life-cycle
 diploidy 29, 33–34
Diplophyllum 142
 Dipsacaceae 248
 Dipteridiales 210, 211
 Dipterocarpaceae 244
Dischidia 293
 dispersal 31, 135–136, 140, 157–170
 distichous arrangement 68, 129
 DNA 6
 sequencing 419
 doctrine of signatures 344
Dodecathon 245
 Dokuchaev N. N. 395
 domains of life 21, 22
 domestication of crop plants 318
 double cocoanut *see* *Lodoicea*
 Douglas, David 365
Dracaena 312
Dracophyllum 307
 Drake 181
Draparnaldia 42
 Driesch, H. 400
Drimys 229
 drip-tip 285, 295
Drosera *Droseraceae* 239, 279, 282
 drought, response to 103
 drupe 329
Dryandra 270
Dryas octopetala 98
Drynaria 290
Dryopteris 63, 137–138, 141–143
Dubautia menziesii 307–308
durra *see* *Sorghum*
 dyes 337
- ebena stuff 355
 ebony *see* *Diospyros*
Ecbalium, seed dispersal 163
Echeveria 239
Echinocactus 301
Echinops 250
Echium 307, 313, 314, 315
 ecology 395, 406, 410, 421–422
 ectocarpales 44
 egg cell, ovum 137
 Eichler, A. W. 402
 Eigen, M. 4
Elaeis guineensis 320
Elaeocarpus 313
 elaiosome *see* oil bodies
 elater 141, 162
 electron transport 13
Elettaria cardomomum 340
Elizabetha princeps 355
Elodea 63, 166
 Embryobionta, Embryophyta, plants,
 land plants 28, 36, 46–53, 195
 embryogenesis 156
 embryosac 152
Empetrum hermaphroditum 306
Encelia allelopathy 159
Encephalartos 156, 217
 endemic plants 308–313, 369
 endocytosis 24
 endosperm 149
Endospermum 157
 endospory 146
 endosymbiont, endosymbiosis 24–26
 Engler, A. 402
Enhalus 260
Entada gigas hydrochory 165
Enteromorpha 48
 environment 97, 98
Ephedra 222, 345
 ephemerals 300, 301
Ephemerum 202
 epicotyl 62
Epidendrum 178, 392
 epidermis 84–85
 epigenetics 87–91
Epilobium 164
 epiphyte, diversity and adaptations 286–294
Episcia 288
Epulipiscum 21
Equisetum *Equisetopsida*, horsetails 85, 106, 138, 140, 143, 195, 209
 Eremolepidaceae 277–278

- Erica*, Ericaceae, Ericales 152, 168, 245–246, 270–271, 290
- Eriocaulaceae 235
- erucic acid 326
- Eryngium* 249, 314
- Erythroxyton coca* 354
- Espeletia* 307, 314
- essential oils 339
- ethanol 349
- ethylene 77
- eubacteria 18–22, 49
- Eucalyptus* 74, 185, 241, 291, 334–337
Eucalyptus citriodora, as source of citronella 337
- Euchema* 21
- eudicots 237, 240
- Eudorina* 41
- Eugenia caryophyllus* 340
- eugenol 356
- Euglenophyta, euglenoids 34–36, 46
- Eukarya, eukaryotes 19–27, 34, 49
- eumagnoliid 229
- Euonymus* 241
- Euphorbia*, Euphorbiaceae
 Euphorbiales 173, 188, 241, 300–302, 326, 327
- Euphrasia* 177, 276
- Euphyllphytina euphyllphytes 195, 203, 206–207
- Eupomatia* Eupomataceae 173, 312
- eusporangium 141–142
- Eustigmatophyceae 36
- Everglades 256
- evolution 112–113, 406
- Excoecaria* 255
- exfoliation 74–75
- exons 7
- Exospermum* 173
- explosive fruit *see* autochory
- extinction, rates on islands 308
- Fabaceae, Fabales 161, 179, 242, 272, 326
- Faboideae 242
- Fagus*, Fagaceae, Fagales 161, 243–244
- Fagopyrum esculentum* 325
- Fagraea* 290
- Fairchild, T. 380
- favism 325
- feedback loops 108, *see also* hypercycle
- fen succession *see* hydrosere
- Fennel, *see* *Foeniculum vulgare*
- fern *see* Polypodiopsida
- Ferocactus* 301
- ferredoxin 12
- fertilisation 144, 155
- Ferula* (Apiaceae) 338
- Festuca*, Fescue 62, 298, 307, 325
- Fibonacci angle 127–128
- fibre 60
- Ficus* 169–170, 173, 288–290
- fig, *see* *Ficus*
- Filipendula* 150, 345
- Fisher, R. A. 406
- Fissidens* 202
- flagellum(a) 26–27, 31, 36
- flavonoids 168
- flavourings 340–341
- flax *see* *Linum*
- Fleur de Lis *see* *Iris*
- florets in Asteraceae 250
- flower form (architecture, colour, patterning, symmetry) 174–179
 advertising 173
 development, ABC model 92–93
 pollination 175, 182–184
- flower symbolism 360
- flowering plants *see* Magnoliopsida
- flypaper traps 280
- Foeniculum vulgare* fennel 351, 362
- follicle 149–150
- Fonio *see* *Digitaria*
- Fontinalis* 63, 202
- food body 173
- Ford, E. B. 406
- Fouquieria* Fouquieriaceae 303
- Fragaria* 150
- Frankenia*, Frankeniaceae 238, 264
- Frankia* 243
- Franklinia* 313
- Fremontodendron* 313
- Freycinetia* 185, 288–290
- Fritillaria* 176–177
- Fritschiella* 42, 138
- fruits 149, 173, 329
- Frullania* 196
- Fucus*, Fucales 32, 44
- fuel plants 338
- Fumarioideae 237
- fungi 49, 51
- fynbos 269
- Galactites* 250
- galactose 21
- Galeola* 274
- Galvezia speciosa* 310
- gametophyte 31–32, 138–140, 146–147, 152–153
- Ganti, T. 6
- garden history 360
- Garner and Allard 102
- Garrya*, Garryales 246
- Gaza, T. 377
- gelatinous fibres 102
- gemmae 160
- gene regulation of development *see*
 epigenetics
- genetic drift 29
- genetic manipulation of crops 359–360
- genetic repair 29–30
- genetics, influence of 405
- Genlisea* 281
- genome 5
- genotype 33, 116–117, 121
- Gentiana*, Gentianaceae 246
- Gentianella* 117
- geological periods 53
- geophyte/cryptophyte *see* life-forms
- geotropism 98
- geraniol 356
- Geranium*, Geraniaceae, Geraniales 240, 307–308
- Gesner, C. 378–379
- Gesneriaceae 247, 290
- Gestalten 413
- Ghini, L. 378
- gibberellins 66, 77, 87
- Gimour, J. 350
- ginger *see* *Zingiber*
- Ginkgo* Ginkgoideae maidenhair tree 83, 137, 153, 155, 195, 217
- ginseng, *see* *Panax*
- Glaucocystis* 36
- Glaucophyta, Glaucocystophyta 25, 35–36
- Glaux* 264
- Glechoma hederacea* 187, 352
- Gleicheniales 210, 211
- Glochidia 104
- Gloeochaete* 36
- Gloger, C. W. L. 396
- glucosinolate distribution 244, 326
- Glycine max* 325
- Glycyrrhiza glabra*, source of liquorice 345, 351
- GM crops 359–360, 421
- Gmelinin, S. G. 384
- Gnetum* Gnetidae, gnetophytes 73, 83, 148, 195, 222

- Goethe, J. W. von 99, 129, 387–388, 423
 archetypes 413–414
 Goldschmidt, R. 412
Gonium 40–41
 Goodeniaceae
 Goodwin, B. 93–95
Gossypium 174, 335–336
 Gould S. J. 107
 Gram positive bacteria 20
 Gram, Christian 20
 grapes *see* *Vitis*
 Grass *see* Poaceae
 grassland 295–297, 324–325
 gravitropism 101
 Gray, A. 395, 404
 green algae *see* Chlorophyta
 green non-sulphur bacteria 13
 green plants *see* Embryophyta
 green revolution 421
 green sulphur bacteria 14
Grevillea 185
 Grew, N. 380
 Grisebach, A. 395
 Grossulariaceae 239
 ground meristem 65
 growth 69
Grypania 22, 39
Guaiacum officinale 333
 guerilla growth 159
 gum trees *see* *Eucalyptus*
 Gunflint Rock Formation Canada 38–39
Gunnera 273
 gutta percha *see* *Palaquium gutta*
 guttation 257
 gymnosperm 215
- Haeckel, E. 110, 399, 414
 Haldane, J. B. S. 406
 Hales, S. 380
Halimeda 40
Halimione 265
 Hallé, F. and Oldeman R. A. A. 130, 423
Halophila 260
 halophyte 260–262, 265
Hammarbya 61
 hapaxanthic 130
 haplobiontic and haplodiplobiontic *see* life-cycles
 haploid 29
Haplomitrium 197
Haplopappus canus 310
- Haptophyta *see* Prymnesiophyta
 hardwoods 333
 Hardy–Weinberg equilibrium 34, 406
 harmony 373
 Hartig Net mycorrhizae *see* mycorrhiza
 haustorium, in parasitic plant 275–276
 heathland 269
Hebe 304, 314, 418
 hedgehog plant 305
 Hedwig, J. 384
 Hegel, G. 386–387
Heliamphora 246, 281
Helianthus annua, sunflower 327
Helichrysum 249
Heliconia 236
Heliobacterium Heliobacteriaceae 13–15
Helleborus, honey leaves, nectar 171
 helophyte, marsh plants *see* life-forms
Helwingia 248
 hemp 334, *see also* *Cannabis*
 henna *see* *Lawsonia inermis*
 Hennig, W. 414, 416
Heraclium 249
 Heraclitus 373
 herbaceous vegetation 160
 herbalism 374–375, 378
Herberta 196
 herbivory, defences against 298–299
 herbs 338
 heroin 353
Hesperidium 329, 330
Hesperoromania 316
Heterochaenia 313
 heteroblastic development 110
Heterochaenia 313
 heteromorphy 32
 heterospory 145, 164
 heterotroph 24
Hetrochaenia 315
Hevea 241, 337
Hibiscadelphus 316
Hibiscus kenaf fibre plant 179, 244, 335
 hierarchy *see* taxonomy
 Himantandraceae 312
Hippuris 106, 418
 historical contingency 397
 Hofmeister, W. 391
 holdfast 42, 45
 homeosis 412
 homoiohydric 196
 honey-guides *see* flower patterning
- Hooker, J. D. 388, 365, 394–395, 402, 404
 hopeful monster 412
 hops *see* *Humulus*
Hordeum vulgare, for alcohol 349
 hormones *see* plant growth compounds
Horneophyton 203
 horticultural traditions 367
Hottonia palustris 259
 Humboldt, A. von 388
 humulone 341
Humulus 187, 350
Hura 344
 Hutchinson, J. 418
 Huxley T. H. 112
Hyacinthoides 62
 hybridisation, 409–410
 hydathode 257
Hydnocarpus kurzii, source of Chaulmoogra oil 345
Hydrangea 245
Hydrasperma 147
Hydrilla 165
Hydrocharis, Hydrocharitaceae 62, 231
Hydrocotyle, Hydrocotyloideae 249
 hydrocyanic acid HCN 328
Hydrodictyon 40
 hydrophyte, aquatic plant *see* life forms
 hydrosere 255
 Hymenophyllales 210–211
Hyoscyamus niger 344
 hypanthium 243
 hyper- and ultra-epiphyte 290
 hypercycle 4
Hypericum 168, 169, 241
 hyperpachycaul 314–315
Hypnum 202
 hypocotyls 62
Hypolepis 214
- IAA *see* auxins
 Ibn Sina 376
 Iboga vine *see* *Tabernanthe*
 ichthyochory, fish dispersal 166
 identity genes 89–92
 idioblast 60, 61
Ilex 248, 347
Illicium 228, 351
Impatiens, seed dispersal 163
 indeterminate growth 90
Indigofera 242, 337
 indusium 143

- initiation of organs 76
 integument 147–152
 intercalary concrescence 111
 intercellular connections 43
 interfascicular cambium 72
 internode 62, 67, 69
Intsia bijuga 332
Inula helenium, *I. racemosa*, source of
 Radix helenii, absinthe 345
 involucre in Asteraceae 249
 ionone 356
Ipomoea batatas 328, 355
Iris 178, 352, 362
Isatis tinctoria 337, *see also* woad
 island floras 308–311, 314
 theory of island biogeography, 395
Isoetes Isoetopsida, quillworts 137, 147,
 195, 205–206, 257
 isoetid form 257
 isogamy 29–30
Isoplexis 313
 isoprene 196

 Jacobi, K. G. J. 386
Jasione 250
 jasmone 356
Jepsonia malvifolia 310
 johannsen, W. 405
 Juglandaceae 243
Juglans 159, 243, 330, 337
 Juncaginaceae 231
Juncus Juncaceae 235, 257, 264, 269
 Jung, J. 380
 Jungermanniopsida, leafy and simple
 thalloid liverworts 195, 197
Juniperus 218, 221, 279, 333, 345, 349
 Jussieu, A. and B. de 383–385, 402
Justicia pectoralis 355
 jute *see* *Corchorus*

Kadsura 228, 239
Kalanchoe 61, 160, 239
Kallstroemia pollen 174
 Kant, I. 386
 Karite nuts *see* *Vitellona*
Karwinskia humboldtiana 345
 Kauffman 128
 kava *see* *Piper methysticum* 347
 kenaf *see* *Hibiscus*
 khaya 245, 333
Kidstonophyton 138–139
 kinetin *see* cytokinins
 kingdoms 49
 Klebsormidiales, *Klebsormidium* 48

Knautia 248
Kniphofia 224
 Koeberliniaceae 244
 Koelreuter, J. G. 384
Kokia 316
 kola *see* *Cola*
 Kranz anatomy 86

Lactoris, Lactoridaceae 312
Lagariosiphon 165, 167
 Lamarck, J. B. 388, 389
 Lamiaceae, Lamiales 247–248, 339
Laminaria 32, 33, 43, 45
 land plant *see* Embryobionta
 landscape gardening 365–367
Langiophyton 138–139
 language of flowers 362
Lantana 178
Larix larch 130, 333–334
Larrea 241
 laurel *see* *Prunus*
 Lauraceae, Laurales 229
 parasitic plants 276
Lavandula 182, 345
Lawsonia inermis, henna 337
 leaf anatomy 82–87, 285–286
 form 66–67, 109, 124–125, 253, 416
Lecanopteris 214
 Lecythidaceae 168, 245
Leea 239
 legumes *see* Fabaceae
 Leibniz, B. von 382, 398
Lemna 112, 230, 259
 lemon grass *see* *Cymbopogon*
 Lentibulariaceae 279
 lenticel 74, 267–268
Lepidocarpon 164
Lepidodendron 73, 206
Lepidophloios 146
Leptosporangium 141–143
Leucadendron 269
Leucobryum 202, 205
 liane *see* vines and woody climbers
Libocedrus 313
 life cycle 31–32
 life-forms of plants 253
 annual habit 90, 300
 chamaephyte 304
 cryptophyta 35, 305
 light, quality 284–286
 lignin 58
 Lignum vitae *see* *Guaiacum officinale*
Lilium, Liliaceae 183, 232, 360, 362,
 363

 Limnanthaceae 244
Limonium 123, 189–190, 263–265, 410
Limosella 187
Linaria 418
Lindenbergia 276
 Linnaeus, C. 382
 linoleic and linolenic acid 326–327
 Linum Linaceae 326, 334
 litchi 245
Lithops 300
Lithospermum 343
Litorea 257
 liverwort *see* Marchantiophyta
 Loasaceae 245
Lobelia 257, 307, 314
 Locke, J. 379
Lodoicea 165, 312
Loiseluria 306
Lolium 298
 long shoots/short shoot arrangement
 130
 long-day plants 102
Lonicera 183
Lophocolea 196
Lophophora 355
 Loranthaceae 239, 277–279
 lotus (water-lily) *see* *Nymphaea*
Lotus 315
Lunularia gemmae 160
Lupinus 307, 314, 325, 326
Lycopersicon, tomato 327
Lycopodium, Lycophytina, Lycopsidea,
 clubmosses 116, 137–138, 195,
 204–206, 287
Lygodium 212, 288
Lyonophyton 138–139
Lyonothamnus 313
Lysichiton 231
Lysimachia 343

 Maathai, W. 424
 mace *see* *Myristica*
Macrocystis 45
Macromitrium 145
 madder *see* *Rubia*
 MADS-box genes 91–92
 Magnol, P. 381
Magnolia Magnoliales 168, 229
 Magnoliopsida, angiosperms,
 flowering plants 195, 223–227
 reproduction 137, 138, 153–156
 mahogany 332
 Maize *see* *Zea*
 Maloideae 243

- Malpighi, M. 380
 malpighiales 241
Malus, apple 330
Malva 168
 Malvaceae 244
Mamiella 46
Mandragora officinalis, mandrake 344
 mangroves 263, 266–267
Manihot 241, 328
 Manila hemp *see* *Musa textilis*
Manilkara, 245, 327, 356
Mantoniella 46–47
Maranta, Marantaceae 236, 286
Marattia, Marattiopsida, primitive
 ferns 142, 195, 208
Marcgravia Marcgraviaceae 176, 245
Marchantia, Marchantiopsida,
 Marchantiophyta, complex
 thalloid liverworts 126, 138–144,
 160–163, 195–198
 marijuana *see* *Cannabis*
 maritime plants *see* halophyte
Marsilea, Marsileales 212
 Masson, Francis 364
 maté *see* *Ilex*
Materia medica 342
 Matonialaes 210, 211
Matricaria 264
 Maturana, H. 5, 401
Mauritia 320
 Mayr, E. 378, 400, 408
Maytenus 241
 medicines, from plants 342–345
 Mediterranean climate regions, plant
 adaptation in 300, 303
 medullosales 215
 Medusagyne, Medusagynaceae 312
Megaceros 199
 megaherbs 307
 megaphyll 126–127
 megasporangium 151
 megaspore 146–147
 meiosis 28
Melaleuca
Melampyrum 121–122, 276
 Melastomataceae 168, 241
 Meliaceae 245
 Melianthiaceae 232
Melilotus officinalis, source of
 dicoumarol 345
 melittophily *see* bee pollination
 Mendel, G. 391, 405–406
Mentha mints 339–340, 347
Menyanthes hydrochory
Mercurialis 162, 188
 mericarp 169, 249
 meristem 61–64, 69–70, 90, 103
 meristemoids 83, 85
 mescal *see* *Agave tequilana*
Mesembryanthemum 239, 264–265
 mesophyll 58–59, 84
Mesostigma 46
 metabolism 7
 metamer 68
 metaxylem 65, 70
 methionine 196
Metrosideros 313, 315
Metroxylon 320
 Metzgeriidae, simple thalloid
 liverworts 197
Micrastias 37
 Micromonadophyta,
 Micromonadophyceae 46–47
Micromonas 46
 microphyll 125
 microsporangium, microsporophyll
 and microspore 143
 microtubule 23, 26
 Miller, P. 364
 Miller/Urey experiment 3
 millets 324, 349
Mimosa 80, 98–99, 242
 Mimosoideae 242
Mimulus 411, 418
 Misodendraceae 239
 mistletoe 278
 mitochondrion 24–25
 mitosis 27, 28
Mnium gametophyte 140
 modular construction 68, 129–130
 molecules, complex molecules 4
 Molluginaceae 238
 Moniliformopses 195, 207
 monocarpic 90, 114
Monoclea 197
 monocot 84, 230
 monoecy, monoecious 30, 188
 Monotropaceae, *Monotropa* 274–275
Monstera 125, 285, 288–289
Moraea 232
 moriche 320 *see also* *Mauritia*
 Moringaceae 244
 morphogenesis 99, 103
 morphology,
 process 132
 rational 398
 morphospace 94–95, 106
Morus, Moraceae 102, 169, 243, 329
 moss *see* Bryophyta
 Muir, John 368
 Muir, J. 386–387
 mulberry *see* *Broussonetia*
 Muller, H. J., Muller's ratchet 29
 multicellularity 38
 advantages of 39
 multiplication 31
Musa Musaceae 236 330, 331
 Musa textilis, Manila hemp or abaca
 336
Musschia 313, 315–316, 410
 mutation 112
 mycorrhiza 71, 270–271
 mycotrophic plants, saprophytes
 273–274
 myophily *see* pollination
Myriophyllum 166, 257
Myristica fragrans 340, 350
 myrmecohory *see* dispersal
Myrmecodia 293
 myrmecotrophy *see* ant plants 293
Myroxylon 336
 myrrh *see* *Commiphora*
Myrsine 313
 Myrtaceae Myrtales 185, 241, 270

 NADPH 9
 Naess, A. 423
 Nageli, C. 391
Narcissus 363
Nardus stricta 298
 nastic movement 100
 Natural Selection 397
 nectar, nectary 170–172
 neem *see* *Azadirachta*
Nelumbo 237, 362
Nemesia 418
Neobalanocarpus heimii 285
Neocallitropsis 313
Neocystis 45
 Neo-Darwinian views 105, 406
 neoteny 111
Neottia 233, 274
Nepenthes Nepenthaceae 239, 279, 281
Nepeta cataria, catnip 345
Neptunia 258
Nerium 246, 255
 nerol 356
Nesocodon 313, 315, 316
 New Caledonia flora 309–311, 313
 New Systematics, the 403–404
Nicotiana tabacum 352, 353
Nitella 47, 257

- nitrogen fixation, in the rosids 240, 243, 271–272
- node 62, 67, 69
- Nolanaceae 247
- nomenclatural rules 382
- nominalism 377
- Nostoc* 273
- Nothofagus* 313
- Notholaena parryi*, resurrection fern 299
- Notothyllales, *Notothylas* 199
- nucellus, crassinucellate and tenuinucellate 151–152
- nucleus 20, 22
- numerical taxonomy 416–417
- Nuphar* 165, 166, 228
- nutmeg *see Myristica fragrans*
- nutrient conditions 269
- nuts 331
- Nyctaginaceae 238
- Nymphaea*, *Nympheaceae*, *Nympheales* 91–92, 165–166, 228, 254, 258–260, 362
- Nypa fruticans* 266, 318
- Oak *see Quercus*
- Ochroma* 186, 333
- Ochrophyta 26, 35–37
- Ockham, W. 377
- Oedogonium*, life cycle 32
- Oenanthe* 260
- oil bodies 172
- oilseed crops 326
- Oken, L. 386
- Olacaceae 239
- Olea europaea*, *Oleaceae*, source of oil 247, 326–327, 360
- oligotrophy 256, 258
- Onagraceae 241
- Oncidium* 176, 233
- ontogenetic contingency 117
- oogamy 29, 30
- oogonium 137
- Ophioglossopsida, Adder's-tongue and Moonworts 195, 208
- Ophrys* 174, 181
- Opiliaceae 239
- opium poppy *see Papaver*
- Opuntia* 303
- Orchid, *Orchidaceae* 163, 178, 190, 233, 274, 287, 291, 294
- order 108
- organelle 19–20, 23, 25
- organisation, polarity 81–83
- origin of species 396, 402
- ornithophily *see* bird pollination
- Orobanche*, *Orobanchaceae* 163, 248, 275–276
- Orris root *see Iris*
- orthostichy 128
- orthotropic axis 68
- Oryza*, rice 321, 322, 323
- Osbornia* 267
- Oscillatoria* 17
- osmoregulators and osmoconformers 263
- Osmunda* *Osmundales* 142, 210
- ovule and seeds 147–148, 151–152, 215–216
- as pollination attractants 168
- ovum *see* egg cell
- Owen, R. 400
- Oxalis*, *Oxalidales* 61–62, 241
- pachycaul 73
- Pachypodium* 303
- paedomorphosis 111
- Paeonia*, *Paeoniaceae* 224, 239, 363
- Palaeonitella* 47
- Palaquium* 246, 337
- palisade layer 84
- palm *see* *Arecaceae*
- pampas grass *see Cortaderia*
- Panax ginseng* 344
- Pancratium maritimum* 260, 363
- Pandanus*, *Pandanaceae* *Pandanales* 185, 231, 255
- Pandorina* 41
- Papaver* *Papaveroideae*, *Papaveraceae* 237, 326, 353
- paper making 335
- Papilionoideae* 242
- pappus 163–164, 250
- Paracryphia* 313
- Paramecium* 46
- parasitic plants 275–277
- Parasponia* 272
- parastichy 128
- parenchyma 58
- Parkinson, John 363
- Parmenides 374
- Parnassia* 121
- Passiflora* 179
- Pastis 351
- pattern formation 90
- pattern, cell 86
- pectic substances 58, 59
- Pedaliaceae*, source of oil 326
- Pediastrum* 41
- Pedicularis* 276
- Pelargonium* 240
- Pellia* 137, 162, 198
- peloric flower 91
- Pelvetia* 30
- Pennisetum glaucum* 324
- Pentaclethra* 285
- Pentastemona* 231
- Pentstemon* 418
- Peperomia* 313
- pepper *see Piper*
- peppermint 339
- peptidoglycan 20
- perennial 90
- Pereskia* 104
- perfume 356
- pericarp 149, 169
- periclinal cell division 42
- Pericopsis elata*, *afromosia* 333
- periderm *see* bark
- peristome 162
- Pernod 351
- Persea americana*, avocado 329
- petals 224
- petiolode 114
- peyote *see Lophophora*
- Phaeoceros* 199
- Phaeocystis* 36
- Phaeophyta, *Phaeophyceae* 30, 35, 37, 39, 43–44
- phagocytosis 24
- phalanx growth 159
- Phalaris arundinacea* 255
- phanerophyte *see* life-forms
- phellem, *see* bark 73
- phellogen, cork cambium 61
- phenomenology 423
- phenotype 33, 116–117
- Philesiaceae* 232
- Philodendron* 288
- Phlegmaria* 204
- phloem 59, 65–66, 70
- Phoenix dactylifera* 319
- Phormium tenax*, New Zealand flax 193
- photomorphogenesis *see* morphogenesis
- photoreceptors 102
- photosynthesis 8–16, 25, 36, 234, 238, 282
- Phragmipedium* 233
- Phragmites australis* 260
- phragmoplast 28

- phycobilisome 18, 25, 36
 phycocyanin, phycocyanobilin,
 phycobilin 10–12
 phycoerythrin 11–13
Phyllanthus embelici, Indian gooseberry
 343
Phyllites 214
Phyllocladus 218, 220
Phylloglossum 204
 phyllomorph 114
Phyllonoma 126–127, 248
 phyllotaxis 127–129
Physoplexis 250
Physostigma venenosum, calabar
 345
Phyteuma 109
 phytochrome 10, 100
 Phytolacaceae 238
 phytosociology 406
Picea 306, 333
Picrorhiza kuroa, Kutki 343
Pilularia 146, 212
Pimelea 304
 Pine *see* *Pinus*
 pineapple *see* *Ananas*
Pinguicula 282
 Pinopsida, gymnosperms, 195
Pinus, Pinales, Pinidae, conifers
 143–144, 151–153, 164, 195, 215,
 218
 anatomy 63, 64, 74, 270
 pioneer species 157, 158
 resins and timber 332–333, 336
Piper methysticum, kava 347
Piper, pepper seedling germination
 158, 229, 290, 340, 343
Pipturus 313
Pistacia 245
Pistia 231, 257, 258
 pistil 149
 Pitcher plants 281
 pitfall traps 280
Pitocalyx 228
 pits 43, 58, 60
Pittosporum 313
 plagiotropic branching 68, 76, 129,
 130
 plant breeding and improvement
 356–360
 plant disease 357–359
 plant form, concepts of 61, 105, 123,
 413
 plant geography of Darwin and
 Wallace 393, 396
 plant growth, growth compounds 60,
 77–78
 Plantae, kingdom *see* Embryobionta
Plantago 263, 265, 418
 plasmalemma *see* cells, membrane
 plasmodesmata 43, 58
 plasticity 13, 117–119, 397
 plastid 24
Platanus 237
 Plato's Idealism 372–374
Platyterium 214
Platyzoma 145
 pleiotropism 106
 pleonanthic 130
 plesiomorphy 416
 pleurostrophyceae 47
Pleurothallis 175
Plicosepalus 278
 plumbaginaceae 238
 pneumatophore 266
Poa 298
 Poaceae, grasses 85–86, 234–235
 for food 321
 grasslands and savanna 295–298
 lack of mycorrhizae 270
Podocarpus Podocarpaceae
 Podocarpaceae 153, 220
Podophyllum peltatum, source of
 etoposide, podophyllotoxin 345
 Podostemaceae 255
 poikilohydry 196, 205
 poisons, plants as a source of 344
 polarity *see* organisation
 Polemoniaceae 245
 pollard 62
 pollen 143–144, 153–155, 168
 pollen flowers 168–169
 pollen sac 144, 152
 presentation in Asteraceae 250
 release, deposition and entrapment
 161–164
 pollination flowering plants 153–155
 in aquatic plants 166, 167
 buzz-pollination 168
 syndromes 171, 181–186
 pollinia 179, 183, 247
 polyembryony 156
Polyepis 307
 Polygonaceae 125, 238, 270
 polyploidy 30, 251
 polypodiophytina 195, 208–214
 Polypodiopsida, Leptosporangiate
 ferns 195, 209
 reproduction 137, 162
 polysymmetry *see* flower symmetry
Polytrichum Polytrichidae 126, 138, 201
 pondweeds *see* Zannichelliaceae and
 Ruppiceae
 population genetics 406, 411
Populus 255
Posidonia Posidoniaceae 167, 231, 260
Potamogeton 165–166, 257–260
 potatoes *see* *Solanum tuberosum*
Potentilla 62
Pottia 202
 Prantl, K. 402
 prasinophyte 46
 prebiotic Earth 1–2
 Prigogene, Ilya 4
 primordium *see* apical meristem
Primula, Primulaceae 189, 245
Pringlea 315
 procambium 65
Prochloron Prochlorophytes 18
 procumbent 68
 proembryo 156
 programmed cell death 56–57
 prokaryote 22, 24, 27, 49
 prolepsis *see* growth
 proline 264
 promeristem 64, 69
 protandry 188
Protea Proteaceae, Proteales 185–186,
 237, 270
 protoctista 49
 protogyny 188
 protonema 138, 139, 140
Protosiphon 39
 protoxylem 65, 66, 70
 Prunoideae 243
Prunus 150, 188, 360
 Pymnesiophyta 35–36
 pseudanthium 248
 pseudocarp 330
Pseudoscourfeldia 46
Psilotum Psilotophytina Psilotopsida,
 whiskferns 63, 68, 195, 207–209
 psychoactive drugs 354–355
 psychophily *see* butterfly and moth
 pollination
Psychotria 313
Pteralyxia 316
Pteridium 214
Pteridium lateral spread, phalanx
 growth 159
Pterocarya 243
Puccinellia 265
 pulses 325

- purple bacteria 13
Puya 307
Pyramimonas 48
 pyrethrum *see* *Tanacetum cinerarifolium*
Pyrrhosia 214
 Pythagorean School 373
- Quassia cedron*, source of cedron 345
Quercus 74, 120, 243, 255, 332, 335
 quinine *see* *Cinchona*
 quinoa *see* *Chenopodium quinoa*
 quinone 12
- radiatopses 195, 207
 radicle 158
 rafflesia 275–276
 Ramie *see* *Boehmeria*
Ranunculus, Ranunculaceae,
 Ranunculales 171, 237, 260, 305,
 412
Raoulia 305
 Raphidophyceae 36
 rattan palm 288–289, *see also* *Calamus*
 Raunkiaer, C. 252–253, 395
Rauwolfia serpentina, source of
 reserpine (alkaloid) 345
 Ray, J. 380, 381, 384
 rays, wood 73
 reaction centre 9
 reaction norm 405, 412–413
 reaction wood 102
 recapitulation 399
 receptor 100
 red algae *see* Rhodophyta
 reductionism 420
 redwoods 221
Regnellidium 212
 relict flora 312, 313
 reproduction 27, 56, 61–62, 135, 157
 reproductive isolation 408–409
 Resedaceae 244
 resin 173
 restionaceae form of roots 270
 resupinate flower 179
 Reynold's law 136
Rhacomitrium 202, 205
 Rhamnaceae 243
Rhetinodendron 315
Rhinanthus 276
Rhizobium 272
Rhizoctonia *see* mycorrhiza
Rhizophora, Rhizophoraceae 165, 263,
 266–267
Rhododendron 171–172, 246
 Rhodophyta 21, 25, 30, 33–36, 42
Rhodospirillum 15
Rhoiocissus 239
Rhymia 68–69, 203
 rhynie chert 142
 Rhyniophyte 203
Ribes 239
 rice paper plant *see* *Tetrapanax*
 rice *see* *Oryza*
Ricinis 168, 170, 241, 327
Riella 198
 Rieske iron–sulphur protein 12, 15
 r–K strategists 157
 RNA world 6–7
 Robin, Jean and Vespasian 364
Robinia pseudoacacia 364
Rohdea 186
Rollandia 316
 Romanticism, appreciation of plants
 and the landscape 367
Romya 316
 root
 adaptation 71, 267
 anatomy 62, 70–71
 crop 327
Roridula 246
Rosa 150, 174, 243, 362
 Rosaceae fruits 150, 329–330
 rosette trees 307
 rosewood *see* *Dalbergia*
 rosid 240
 Rosoideae, Rosaceae, Rosales 243
Roucela 300
 rubber *see* *Hevea*
Rubia 337
 Rubiaceae 246, 293
 Ruppiceae 257
Ruscus 126–127
 Rutaceae 329–330
- Saccharum officinarum*, sugar cane
 331–332
Sagittaria 259
 sago palm 320, *see also* *Metroxylon*
 Saint-Hilaire, G 399
Salicornia 264–265, 268
Salix, as dwarf shrubs 304, 306
Salix, as source of aspirin 346
Salsola kali 264
 salt-exclusion mechanisms 262
 salt-flat, salt-marsh and mud-flats
 261, 268
 salt-gland 262, 267
Salvia 159, 248, 355
Salvinia Salviniales 124, 210, 212, 258
Sambucus, bark 74
Sanguinaria bloodroot 337
 Santalaceae, Santalales 239, 277
 Sapindaceae Sapindales 245
Sapium sebiferum 327
 Sapotaceae 245, 326
 saprophytes *see* mycotrophic plants
Sargassum 44
Sarracenia Sarraceniaceae 246, 279,
 281
 satinay *see* *Syncarpia*
 sattler 112, 125, 132–133
Saurauria 223
 savanna 295–298
Saxifraga Saxifragaceae 160, 239, 305
Scabiosa 248
 Scala Naturae 381, 382, 389, 399
Scenedesmus 41
 scent 174, 356
Schefflera 288, 290
 Schimper, A. F. W. 395
Schisandra, Schisandrales 228
Schizanthus 247
 schizeales 210, 212
 Schleiden, M. J. 386, 390, 399
 Naturphilosophie 386
 Schmalhausen, I. F. 412
 Schroeter, C. 410
Sciadopitys, Sciadoptiales, 221
 sciophyte, plants of moist shady
 habitats 282–286
Scirpus 235
 sclerenchyma 58–60
 sclerophyllous shrubs as tropicalpine
 plants 307
 scophulariaceae 247–248, 275, 418
 secondary thickening 72
Sedum 239
 seed 147–148, 157, 215–216
 dispersal 247, 283
 seed fern 215
 seedling types 158
Selaginella Selaginellopsida, clubmoss
 137, 146, 195, 205, 283–284, 287,
 299
Selago 418
 selection, directional 117
 self-incompatibility 187–190, 251
 self-replication 7
Sempervivum 239
Senecio 251, 314, 408
Senna leaf anatomy 85

- sepals 224
Sequoia 144, 221, 285
Sequoiadendron 221
Sesbania 255
 Setchellanthaceae 244
 sex, sexual development 33–34,
 135–137, 150–153
 sexual system of classification
 383
 shade tolerance *see* sciophyte
 shifting balance theory 119–120
 shoot model 123–124
 short-day plants 102
Sideritis 313
 sieve-plate 43
Sigillaria 206
 signalling, electrical 80–82
Silene dioica 187–188
 silica body 85
 Simmondsiaceae 326
Sinapis 172, 326
 siphonogamy 138, 154–155, *see also*
 pollination
 sisal *see* *Agave sisalina*
 skototropism 101
 Smilacaceae 232
 smokes 352
 snuff 352
 Socrates 371–372
 softwoods 333–334
Solanum, Solanaceae, Solanales 182,
 247, 327
 Solanum tuberosum, potato 327, 349,
 358
 as vegetables 329
Solidago 250
Sonchus 313
Sonneratia, Sonneratiaceae 263, 266
Sorghum 298, 324, 332, 349
 soybeans *see* *Glycine max*
Spartina 261, 268–269
 speciation 408
 species 122
 species concepts 408–411
 sperm 138, 154
 Spermatophytina, seed plants 195,
 215–216
Sphaelaria 42
Sphaerocarpus, Sphaerocarpaceae,
 bottle liverworts 198–199
Sphagnum, Sphagnopsida, bog mosses
 138, 162, 195, 200–202
 spice trade 338–341
 spikelet 235
 spindle 27–28
 Spirochaete 26
 Spiroideae 243
Spirulina 18
Splachnum *see* apophysis
 sporangium 31, 141
 spore, meiospore 31, 135, 140–141,
 168
 release 161–162
 sporophyll 142
 sporophyte 31–32
 Sprengel, C. von 385
 Spretnak, C. 424
 spur, floral 171
 stamen 144, 168–169
Stangeria, Stangeriaceae 217
Stapelia foetid scent 174–175
 star anise *see* *Illicium*
 Stebbins, G. L. 111–112, 406
 stele 87
Stephania 343–344
 Sterculiaceae 303
 stigma 153–154
 stipe 45
 stolon 62
 stomata 85–86, 285–286
 Stomatophyte 196
 stramenopile 26
 stranglers 290
 Strasburger, E. 414
Strasburgeria 312
Stratiotes aloides 259
Strelitzia 186
 streptobionta 28, 47
Streptocarpus 114–115
Streptothamnus 239
Striga 275–276
 strobilus *see* cone
 stromatolites 7–8
Strongylodon 186
Strophanthus 344
Strychnos 344
 stylopodium 249
Suaeda 264–265
Subularia aquatica 258
 succulence 104, 238, 301–302
 sugar beet 332, *see also* *Beta vulgaris*
 sugar cane *see* *Saccharum officinarum*
 sulphur bacteria 12
 sunflower 327, *see also* *Helianthus*
 annua
 swamp 255
 swamp-cypress *see* *Taxodium* 254
 sweet potato *see* *Ipomoea battatas*
Swietenia 245, 333
 syconium *see* *Ficus*
Symbegonia 243
 symplasm 78
 sympodial *see* branching
 synapomorphy 416
Syncarpia 332
 synergid 152
 syngamy 32–33
 systematic biology 40, 414,
 417–418
Syzigium source of eugenol 291,
 345
Tabebuia ironwood 333
Tabernanthe iboga 355
Takakia, Takakiopsida, 195, 200–201
 Takhtajan, A. 110–111, 418
 tallowtree *see* *Sapium sebiferum*
Tamarix Tamaricaceae 238, 255,
 265
Tanacetum cinerarifolium 339
 Tansley, A. 410
 tapetum 144, 152
Taraxacum 123, 163–164
Taxodium, Taxodiaceae 143, 144, 221,
 255
 taxon 193, 194
 taxonomy, the science of
 classification 49, 121–122, 371,
 401–402
Taxus Taxales 221, 345
 Tchvetverikov, S. S. 406
 tea *see* *Camellia sinensis* 347
Tectona grandis, teak 332
 teosinte *see* *Zea*
 tequila *see* *Agave tequilana*
Terminalia 241, 343
 terpenoids 174
Tetracentron 238
 tetrad 140–141
Tetramolopium humile 207
Tetrapanax 335
Tetraphis Tetraphidae 202–203
Thalassia pollen 167
Thalassina 266
Thalictrum carpel 149
 Theaceae 245
Theobroma cacao 340–341
 theobromine 341
 Theophrastaceae 184

- Theophrastos 375–376
 therophyte, annual plants *see*
 life-forms
Thesium 277
 Thoreau, H. D. 386
 Thorne, R. F. 418
 thorns 298–299
 thrip pollination 184
Thuja 156, 350–351
 thylakoid 18–20
Thymus 247
Tilia winged fruit 163–164, 172
Tillandsia 235, 294
 timber 332–333
Tipuana 163–164
Tmesipteris 207
 tobacco 352–353, *see also* *Nicotiana*
 tabacum
 tomato *see* *Lycopersicon*
Torrenticola 256
Torreya 221
Tortula 202
 Tournefort, J. P. de 381
 tracheid 59, 60
 Tracheophyta, vascular plants 31,
 195–196, 203
 Tradescant, J. 364
Tradescantia 364
 transplant experiments 410
 trap flowers and inflorescences
 179–180
Trapa 166
 tree architecture 131
 tree trunk 129
 treeline 303–304
 tree-rings 69, 73
Tricholea 196
 trichome, microhair, macrohair 85,
 171
Trifolium 242
Triglochin 260, 264
Trimenia 228
 triphala 343
Triticum, wheat 321–322
Trochetiopsis 316
Trochodendron, Trochodendrales
 238
 Troll, W. 412–414
 Tropaeolaceae 244
 tropicalpine plants, adaptation
 306–307
 tropism 80–81, 100–101
 trumpet-hyphae 45
Tulipa, tulip 232, 363–364
 Tung Nuts *see* *Aleurites*
Turbinia corymbosa 355
 Turesson, G. 406, 409, 410
 turmeric *see* *Curcuma longa*
 tussock grassland 297
 Typhaceae 235
 typology 413–414
 Tzu, Lao 372

Ulex 180
 Ulmaceae 243
Ulothrix 42
 ultraviolet light 9, 10
Ulva, Ulvophyceae 32, 47–48
 Umbelliferae *see* Apiaceae
 Undulipodia 26
 Unger, F. 391
Urtica dioica, pollen dispersal
 162
Utricularia 80–81, 127
Uvaria chamae, source of finger-root
 345

Vaccinium 168
Valeriana, Valerianaceae valerian 164,
 248, 347
Vallisneria 165–166, 257
Vanilla 340–341
 Varela, F. 5, 401
 variation, genetic or population
 120
 Vascular cambium 72–73
 vascular system 66
Vauquelina 313
 Vavilov, N. I. 411–412
 vegetable oils 320
 vegetables, important families
 328
 Venus's fly-trap *see* *Dionaea*
Veratrum album, source of
 protoveratrine 345
Verbascum 418
Verbena 176–177
 Verbenaceae 248
 vernal herbs 283
 vernalization 103
Veronica 418
 vesi *see* *Intsia bijuga*
 vesicular-arbuscular mycorrhizae *see*
 mycorrhiza
 vessel element 59–60
Viburnum 183

Vicia 242
Victoria 228, 258–259
Vinca 246
 vines and woody climbers
 286–290
Viola, Violaceae 163, 171, 241, 411
 Viridiplantae *see* Embryophyta
Viola theidora 355
 Viscaceae 277–279
Vitellona, Karite nuts 326
Vitis, Vitales, Vitaceae 239, 275, 351
 vivipary 159
 vodka 349
 volatile oils 356
Volvox 40, 41

 Waddington, C. H. 119, 405
 Wallace, A. R. 391–394
 Warming, E. 395
 water relations, in epiphytes
 292–294
Watsonia 232
 wax 172
 Weiditz, H. 377
 Weismann, A. 406
Welwitschia 137, 148, 155, 222
 wheat *see* *Triticum*
 Willdenows, K. L. 388
 Wilson, E. O. 422
 wine varieties 352
Withania somnifera, source of
 ashwagandha 343, 345
 woad 337
Wolffia 112, 231, 257, 259
Wollemia 313
 Woltereck, R. 405
 wood anatomy and development 60,
 72–73
 woodiness 253
 wormwood *see* *Artemisia*
 Wright, S. 119–120, 406

Xanthium hydrochory 165
Xanthocephalum sarothrae, source of
 snakeweed 345
 Xanthophyceae 36
Xanthorhoea 232
 xerophytic adaptations 301
 xylem 59–61, 65–66, 72
 Xyridaceae 234–235

 yams *see* *Dioscorea*
 yew *see* *Taxus*

- Yucca* 168, 300, 314, 345
Yunquera 315
- Zamia* Zamiaceae 143, 217
Zanichellia, Zannichelliaceae
 inflorescence 167, 257
Zanthoxylum 313, 345
Zea, maize 101, 149, 318, 323–324
- Zeaxanthin 36
Zimmermann, W. 125, 414
Zingiber Zingiberaceae Zingiberales
 178, 236, 340, 343
Zingiberene 341
zoochory *see* dispersal
Zostera, Zosteraceae 167, 231,
 258
- Zosterophyllum* 203
Zygenamatales 48
Zygogynum 173
zygomorphy *see* flower
 symmetry
Zygophyllales 241
Zygophyllum 241
zygote 29, 32