

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

Index

Note: page numbers in *italics* refer to figures and tables

- acetate 24, 27
- acetyl choline 80
 - esterase inhibitor 80
 - muscarinic type receptor 81
 - receptor 81
 - replacement therapy 84
- adadze 214
- adaptation 145
 - secondary compounds 21
- Aframomum melgueta* 215
- Aframomum* spp. 216, 217
- African traditional medicine 202
- aggregate variability 155
- agriculture
 - archaeological evidence 147
 - capital goods accumulation 149–50
 - economic process 149
 - human advancement 147
 - pre-selected species 149
 - produced commodities 164
 - production 164, 241
 - selection of species 146–7
- AIDS 33
 - DNA molecule synthesis 76
 - HIV-protease 75, 76
 - plant materials 35
 - plant screening 113
 - plant-based cure 208
 - research project 75–9
 - spread 38
 - targeting disease 100
 - virus inhibition 38
- alkaloids 7, 20, 25, 26, 29
 - protectants 29
- Alstonia boonei* 212, 213, 215, 217
- Alzheimer's disease
 - muscarinic drug design 81–2
 - muscarinic type acetyl choline receptor 81
- severity 80
- treatment 80–4
- amines 29
- amino acids 24
 - alkaloid synthesis 29
 - non-protein 29
- amphibia 29
- amyloid β -protein 84
- angiosperm secondary compounds 31
- angiotensin 70, 74, 77
 - converting enzyme (ACE) inhibitors 77
- animals, plant-eating 33
- anti-cancer agents
 - development from plants 111–12
 - drugs 35, 37, 84, 103, 249
 - National Cancer Institute (US) screening 106–7
 - plant collection 108
 - see also* cancer treatment
- anti-fertility drugs 69
- anti-fungal agent development 103
- antibiotics 68
 - designing 85
 - discovery 70–1
 - microorganism products 85–6
- antimetabolite theory 69
- antioxidant defences, plant-derived 33
- antiparasitic drugs 88–90
 - Areca catechu* 82
 - arecoline 82
 - arrow poisons 50, 58, 81
- Arrow's Fundamental Paradox of Information 165
- arsenic 68
- arthritis 69
- arthropod diversity 105
- Ashanti pepper 225
- aspirin 58, 68

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

Index

255

- assets
 - benefit diffusion 164
 - diffusive 164
 - information-generating 172
 - investment 164
 - property right institutions 164
- asthma 70
- attractants 2, 21
- avermectin 88, 90, 91
- ayahuasca vine 57
 - see also caapi*
- Ayurvedic tradition 32
 - ethnobotanical information 202
 - reference works for doctors 53
- Azadirachta indica* 212, 213, 215
- Bacillus thuringiensis* pesticide 90
- bacteria
 - age of 30
 - amines 29
 - patenting 184
- Banisteriopsis caapi* 51
- base resource
 - allocation 143, 146
 - peaks 146
 - uneven distribution 145
- Belize Association of Traditional Healers 54
- benefit channelling 164
- betel nut palm 82
- beverage, ritual intoxicating/hallucinatory 51
- Bignoniaceae vine 52
- Bio-Ex 116
- biodiversity
 - choice set 158
 - component values 161–2
 - decline 142–51
 - developmental uniformity 150–1
 - extinction process 142–6
 - homogenisation 146–8, 151, 152
 - human development 151
 - socioeconomic force 149
 - uniformity in development 148–50
 - destruction 233
 - economic value 154
 - ethnobotany role 46
 - evolutionary value 151
 - exploration extent 100
 - exploration value 161–2
 - global 154, 155
 - policy 162
 - homogeneity benefits to humans 142
 - human decision making 5, 6
 - human effects 142
 - information-based values 160
 - informational content 169
 - interest in 233–5
 - international institutions 162
- legal institutions 15
- losses 46, 145
- marginal 154–5
 - value 154, 159, 162–3
- medicine finding 91
- opinion value 157
- option value 158
- payment 13
- pharmaceutical discovery process 14
- pharmaceutical potential 95
- pharmaceutically active substances 201
- pooling capacity 155
- portfolio effect 161
- potential 60
- property rights system 6
- quasi-options value 161
- reserves 171
- resource exploitation 234, 235
- static value 155–6
- support 132
- surrogate rights regime 170
- threat 3
- total values 154–5
- uniform property regimes 246
- value
 - appropriation 127, 162, 163–72
 - of conversion 161
 - of global 154, 155
 - biodiversity conservation 4, 58, 235–40
 - appropriation of values 127, 162, 163–72
 - developing countries 233
 - economic value 127
 - genetic erosion 235
 - Ghana 201–3
 - indigenous communities 235
 - institutional analysis 141–2
 - intellectual property rights 171–2
 - regime application 169–71
 - medicinal plants 225–7
 - values 130
 - property systems of developing countries 241
 - undermining by intellectual property rights 251–2
 - uniform patent protection 232
- Biodiversity Convention (Rio de Janeiro, 1992) 4, 92, 131, 132
- biological activity template 9
- biological assets
 - aggregate variability of yields 155
 - specialised 160
 - unused 160
- biological diversity *see* biodiversity
- biological goods production 149
- biological invention patentability 183
- biological level, diversity loss 13
- biological process, evolutionary 159

- biological product flows 159
 biosphere
 convergence on specialised species 150
 homogenisation 3, 5
 biodiversity decline 151
 economic process 149
 human choice 147–8
 land use conversion 148
 biosynthetic pathways 21
 biotechnology 90
 biodiversity pressures 235
 independent companies 97
 industry
 commercial exploitation 189–90
 trade secret law 189
 innovation generation 244
 patents 184, 186, 187
 Biotics Ltd 94, 115, 116–17, 121
 contracts 116
 exclusivity period 117
 fees 121
 payment 131
 phytochemical programme 116
 royalties 117, 122, 131
 suppliers 116–17
 birth attendants, Ghana 211
 bitter manioc 49, 50
 blood–brain barrier 82
 botanic gardens 94
 payments 122
 plant gathering 131
 royalties 122
 brain, blood–brain barrier 82
 bush fire 236–7
- caapi* 51
 calabar beans 80
 calanolide A 113
 camptothecin 104, 111–12
 cancer 33, 37
 Cancer Chemotherapy National Service Centre (CCNSC) 106
 cancer treatment 84
 Maytenus buchananii 249
 plant products 35
 see also anti-cancer agents
Captotheca acuminata 111
 capturable production value 132
 carbon sink 233
 carotenoid pigments 25
 carvone 25
Catharanthus alkaloids 84
Catharanthus roseus 35, 38, 103, 129, 249
 causation 10, 11
 cells, primitive 30
 cephalosporin 85
chacruna 51
- chemical diversity 19
 chemical industry 34–6
 chemical leads
 natural products 102–6
 plants 102–6
 chewsticks 223, 225
 chimpanzees 32
 China
 policy support for medicinal plants 237
 traditional medicine 53, 202
 chlorophyll breakdown products, fossil 30
 Chlorophytia 28
 cholesterol 69
 control 86
 drug safety 88
 drugs lowering blood levels 86–8
 choline acetyl transferase 80
Chondodendron tomentosum 58
Chondodendron vine 50
Cinchona bark 48–9
- climate
 maintenance 233
 variability 144
 coevolution 9, 21
 communication 12
 community 149, 169
 information 169
 toxic compound avoidance 22
 collective ownership 241
 colonialism in Ghana 206
Combretum spp. 127
 commodities, tangible 163
 common ownership 181
 communication 3, 4
 coevolution 12
 human society 8
 secondary metabolites 7
 community
 coevolution 149, 169
 evolution 169
 global 170
 management responsibilities 226
 resource management 226
 see also indigenous communities
Compactin 87
 comparability of human society 3
 compensation
 donated germplasm 180
 indigenous communities 250
 right 179–80
 competition 1–2
 base resource allocation 146
 territorial 143
 compound synthesis 37
 consensus products 98
 conservation
 ethnobotany 45, 46

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)*Index*

257

- marketable dimensions 127
- medicinal plants 202–3, 220–2, 232, 238
- rate of return analysis 127
- traditional healers 243
- training needs of traditional healers 223
- see also* biodiversity conservation
- consumer
 - demand for natural products 35
 - information dissemination 167
 - preference 163
 - product marketing 167
 - surplus 134
- context-dependent characteristics 2
- contraceptive steroid synthesis 34–5
- conversion process 152
 - aggregate benefits 153
 - evolutionary process product loss 169
- frontier 150
 - global 154, 155
 - marginal 160
 - marginal costliness 152
 - marginal value 154
 - opportunity cost 152–4, 155
 - optimal policy 153
 - resource loss 153
 - resource stock cost 152
 - total global 155
- value 161
 - value of halting 157
- see also* non-conversion
- copyright 188, 192, 194
- coronary heart disease 69–70
- cortisone 69
- Costa Rica
 - collection permits 120
 - collectors 119
 - conservation 119
 - Ministry of Natural Resources, Minerals and Energy (MIRENEM) 120
 - wildlife legislation 120
- see also* National Biodiversity Institute (Costa Rica)
- coumarins 26
- counterfeiting 245
- cowpea trypsin inhibitor 249
- crab catching 52
- creativity 243–4
- creditor nations 176
- crops, defensive trait re-introduction 39
- cultivation 57
- cultural diversity 3, 15
- cultural ties to place 53
- curare 50, 81
 - anaesthesia adjunct 81
- curcins 212
- cyanide 50
- cyanobacteria 29
- cyanogenic compounds 25, 29–30
- cytotoxicity, selective 107
- data flow, transborder 191
- debt burden 176
- debt swaps 176
- decision
 - making 159
 - theory 157
- defensive compounds 22
- deforestation 233
 - wild species reduction 236
- deoxynojirimycin 38
- depression 70
- developed world
 - biodiversity destruction 234
 - ownership of indigenous knowledge 247
 - property systems 240–1
 - trust in developing countries 235
- developing countries
 - benefits from biotic heritage 232
 - biodiversity conservation 233
 - competition threat 245
 - data flow 191
 - debts 176
 - development facilitation 245
 - economic return for investment 177
 - economics 234–5
 - health care 201–2
 - intellectual property regimes 245
 - medicinal plants 202
 - patents 246
 - poverty 234
 - property systems 240
 - research 192
 - rights of indigenous communities 233
 - sustainable development 233–4
 - technology transfer 246
 - trade retaliation threats 246
 - uniform patent protection 232
 - urbanisation 234
- development path choice 163
- developmental uniformity 148–50, 151
- diet 94, 96
- digitoxin 128
- Dioscorea* sp. 35, 129
- diosgenin 35, 129
- Diplopterys cabrerana* 51
- discovery
 - disclosure of method of application 185
 - rights 192
- disease
 - classification in Ghana 208–9
 - developed world 38
 - knowledge for drug screening 102
 - medicinal plants 212

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

258

Index

- disease (*cont.*)
 natural agents 208, 209
 natural causes 212
 pattern 38
 resistance to treatment 100
 supernatural agents 208–9
 taboo breach 209
 targeting novel 100
 treatment 209
 optimisation 100
 underlying biomolecular process 99
- disease-orientated screening 107
- dispersal 159
- diverse resources investment 169
- diversity 1–6
 conservation 15
 information
 supply 157
 value 158
 informational systems 9–11
 institutional systems 11–13
 loss at biological level 13
 metabolic traits conferring 23
 portfolio value 156
 regulation 15
 retention 158
 temporal dimension values 156
 within evolutionary system 7–9
- diviners, Ghana 210
- DNA
 ecological significance 23
 molecule synthesis 76
- do-nothing option 95
- Doctrine of Signatures 47
- domesticated plants 57
- drug development
 chemical structures 98
 cost effectiveness 102
 costs 97
 empirical approach 99, 100, 101, 102
 laws 38
 methods 98–102
 plant screening 93
 rational design 93
 screens 102
 trial and error 93
 see also lead compounds
- drugs
 alternative leads 123
 approval processes 239
 biochemical mechanism 72
 consumption 96
 design 36, 73
 complexity 84
 rational 99
 discovery of exceptional 84–90
 price 134
- screening programmes for natural product substitutes 93
- dysentery 210
- echitamine 212
- economic botany 56
- ecosystem management
 indigenous approaches 57
 indigenous experience 46
- eczema
 evening primrose oil 35
 herbal treatment 11
- edibility 49
- Eli Lilly and Co. 101, 103
- empirical approaches to drug development 99
 renewable characteristics 100, 101
 scientific values 102
- endod 16
 genetic erosion 248
 patent 247, 248
 research 247–8
- endogenous information 159–60
- environmental degradation 226
- environmental policy implementation 176
- environmental variability 144
- enzymes, secondary metabolism 24
- estrogen 69
- ethical pharmaceuticals 94
- Ethiopia, endod 247, 248
- ethno-directed sampling hypothesis 58
- ethnobotany 45–6
 academic study 54–6
 applications 45, 56–7
 Ayurvedic tradition information 202
 chemical activity correlation with use 59
 compound screening sources 37–8
 conservation 45, 61
 current role 56–8
 development 54–5
 importance of study 56
 indigenous discovery/utilisation 48–52
 information 9
 folk practitioners 202
 knowledge 60–1
 erosion 52
 evolution 48
 local 52
 preservation/perpetuation 53–4
 stocks 100
 list making 55
 pharmaceutical prospecting 58–60
 research 59
 resource loss 52
 species collection 59
 written records 53
- ethnomedicine 53

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

Index

259

- etoposide 35
- eukaryotes, age 30
- European Patent Convention 183
- European Patents Handbook 183
- evening primrose oil 35
- evolution
 - appropriation of values 141–2
 - assault by human society 141
 - community 169
 - dependence on new variation 39
 - exploitation of existing processes 39
 - human usurpation of function 146
- evolutionary fitness 149
- evolutionary process
 - base resource allocation 143
 - biodiversity 169
 - product 169
- evolutionary product value 151–63
- evolutionary role, human benefits 141
- exclusive territory regime 167
- exercise 94, 96
- expected production value 132
- expeditions, collecting 55
- exploration value 159–60, 161–2
- explorers 54
- extinction
 - mass 145–6
 - medicinal plants 235–6
 - necessity 144
- niche appropriation 145
- process 142–6
 - continuous 143
 - human choice 146
 - natural 145
- faith healers, Ghana 210
- false cola 218
- famine foods 53
- farming 32
 - species eaten 32
- fatty acids 25, 26
- fish poisons 214
- fitness, plant metabolites 7
- flavonoids 25, 26, 27, 28, 33
 - physiological activity 28
 - UV absorption 28
- flexibility
 - expected value 160
 - value 157, 158
- flow appropriation 166–7
- flowering plants
 - chemical composition 46
 - evolution 31
- folic acid 68–9
- folk culture medicinal biodiversity 232
- folk medicine 67
- food
 - colourants 35
 - supply 147
- Food and Drug Administration (FDA) 239
- forest
 - access control 220–1
 - common ownership of resources 236
 - culture health care systems 236
 - government policy 226
 - loss 35, 227
 - products 201
 - non-timber 222
 - sustainable harvesting 224
 - protection 35–6, 220
 - religious 226
 - reserves 218
 - sacred 220–1
 - tribal member knowledge 236
 - tropical 35–6, 104
- free access right 181
- freedom of information 190
- fruits 7
- Fundamental Paradox of Information 165
- fungicide, natural 16
- gaharu* 239–40
- Garcinia epunctata* 223
- Garcinia kola* 218, 225
- gene banks 178
 - medicinal plant preservation 237–8
 - national 228
- gene pool erosion 40
- gene sequence
 - discovery 186
 - patents 186–7
- gene therapy 123
- Genentech 185–6
- General Agreement on Tariffs and Trade (GATT) 245, 246
- generality 2
- genetic diversity of secondary compounds 39–40
- genetic drift
 - random 23
 - specialisation impact 156
- genetic erosion 241
 - biodiversity conservation 235
 - endod 248
- genetic material
 - access 197
 - control 180
 - restriction 195
 - commercial exploitation protection 177
 - exclusive ownership 177
 - exploitation control 180
 - identified use 194
 - information protection 195
 - intellectual property rights 190, 196

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

260

Index

- genetic material (*cont.*)
 - legal access 178
 - legal mechanism control 181
 - legal status 182
 - ownership 191–3, 197
 - patent law 184, 195
 - patentability 183, 184, 193
 - potential value awareness 195
 - property rights 196
 - sui generis* right 196
- genetic mutations 21
- genetic resources
 - access 240
 - collection 130
 - competitive market 192
 - development agreement 178
 - economic incentive for preservation 180
 - income benefit denial 249
 - indigenous community conservation 232
 - institutional arrangements 250
 - intellectual property rights 232
 - marketing agreement 178
 - national inventory 228
 - ownership 249
 - preservation 130, 176
 - producer goods 130
 - right 180
- geraniol 25
- germplasm
 - compensation for donated 180
 - economic exploitation control 195
 - exchange for medicinal plants 238
 - income benefits of innovations 249
 - payment to country owning 191
 - storage 178
 - access 178
 - open access policy 179
- Ghana
 - accessibility of Western medicine 222
 - basic needs indicators 205
 - biodiversity conservation 201–3
 - birth attendants 211
 - colonialism 206
 - decline in health/health care 205
 - disease concepts/treatment 208–10
 - diviners 210
 - ecological diversity 203–4
 - education level 212
 - faith healers 210
 - forest 204, 205
 - loss 227
 - healer recognition 202
 - health care 205–8
 - primary 224–5
 - herbal drug availability 211
 - herbalists 210
 - indigenous knowledge loss 227
- medical system integration 224, 225
- medicinal plants 203–5
 - conservation 220–2
 - cultural values 220–2
 - demand 218–20
 - livelihood sustaining 222–4
 - overexploitation 218–20
 - trade 215–16, 217
 - use 211–12, 213, 214–15
- profile 203
- spiritualists 210
- traditional practitioners 205, 210–11
- welfare decline 205
- global choice set 158
- global community 170
- global conversion 155
- global institutions 5–6
- global portfolio narrowing 148
- global warming 39
- glucosinolates 25, 29–30
- glutathione 33
- glycosides 27
- C-glycosides 28
- O-glycosides 28
- green products 60
- Green Revolution 241
- growth-differentiation balance 23
- habitat
 - destruction 53
 - homogeneous development 148
- harmine 51
- harvesting of medicinal plants 214–15, 236
- healers *see* traditional healers
- healing, ritual 220
- Healing Forest Conservancy 60
- health care
 - cost-effectiveness measures 93
 - costs 123
 - developing countries 201–2
 - drug demands 94
 - Ghana 205–8
 - integrated approach 225
 - investment 95
 - methods of provision 94
 - potential substitutes 93
 - systems in forest cultures 236
 - value of traditional 201
 - see also* primary health care
- herb gardens 218
- herbal medicines 32
 - availability 211
 - demand 219
 - education level 212
 - rural people 212
 - screening programmes 37–8
 - self-administration 207

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)*Index*

261

- urban areas 212
- uses 38
- see also* medicinal plants
- herbalists
 - chief 216
 - general therapy 243
 - Ghana 210
- heterogeneity 3
 - preservation 19
- HIV *see* human immunodeficiency virus (HIV)
- HIV-protease 75, 76, 77
 - inhibitors 78, 79
- Homalanthus nutans* stemwood 113
- homogeneity benefits of biodiversity to humans 142
- homogenisation
 - biodiversity decline 146–8, 151, 152
 - economic process 149
 - human choice 147–8
 - land use conversion 148
- horticulture, ethnobotanical tradition 53
- Hoslundia opposita asifuaka* 213, 215
- host state
 - biodiversity value appropriation 162
 - development path choice 163
- human capital 6, 169
 - investment 12
- human choice process 146
- human genome project 186–7
- human immune system 95
- human immunodeficiency virus (HIV) 75
 - screening 58, 113
- human society
 - communication 4, 8
 - cooperation 4
 - development 150
 - evolutionary product
 - allocation 151
 - depletion 141
 - homogeneity 4, 8
 - interaction webs 8
 - mobility 8
- primary characteristics 3
- primary productivity 1, 4, 5, 8
- production strategies 4
- secondary characteristics 3
- humans
 - advancement through agriculture 147
 - base resource allocation 146
 - biotechnology patent on tissues 184
 - diet 32
 - growth of species 147–8
 - nutrition 57
 - ownership of body components 187
 - plant chemicals in evolution 32–4
 - plant diet 32
 - prey species 146–7
 - recuperative powers of body 95
 - technology development 147–8
 - usurpation of evolutionary function 146
- hunters 53
- hydrogen cyanide 29
- hydroxy-methyl-glutaric(HMG)-CoA-reductase 86, 87
 - inhibition 87
- hypertension 70
- immune system 95
- incentive awards to host/supplier states 170
- India, medicinal plants 238
- Indian Snake Root 58
- indigenous communities
 - biodiversity conservation 235
 - compensation 250
 - knowledge 242, 251
 - modern medicine intrusion 100
 - natural ingredient utilisation 9
 - plant genetic resource conservation 232
 - primary health care system 237
 - recognition of rights 233
 - rights 181
 - transition to Western lifestyles 250
- indigenous discovery 48–52
- indigenous knowledge 242, 251
 - industrialised country ownership 247
 - institutions 228
 - loss 227
 - systems 227
- indigenous medicine 201–3
- indigenous property rights 249
 - recognition 250
 - regimes 227
- indigenous utilisation 48–52
- individualism 241
- indole alkaloids 26
- inflammatory diseases 69, 70
- information
 - arrival 159
 - benefit channelling 167
 - benefits 165–6
 - coevolution 169
 - consumer interface 167
 - diffusion 165–6
 - dispersal 52–4
 - endogenous 159–60, 161
 - exogenous 161
 - expected value 157
 - flow
 - investment in diverse stocks 169
 - in non-conversion 160
 - segregation 165
 - global public good 165
 - incentive mechanism creation 167

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

262

Index

- information (*cont.*)
 - incentives 12
 - intellectual property rights of services 163
 - international regulation 12
 - investors in generation 166
 - natural resource-generated 171
 - naturally generated 12
 - over time 158
 - perpetuation 52–4
 - product space 170
 - property rights system 6, 13
 - relevant 159
 - resource right system 171
 - revealed 165
 - supply 157
 - uniformity bias 12
 - values 12, 157, 160, 173
- innovation, patent 168
- insects
 - alkaloid accumulation 29
 - alkaloid synthesis 29
 - diversity 105
 - host plant interaction 21
- insulin 74
 - human autoimmune diseases 90
- intellectual property laws 181
 - Genentech 185–6, 187
 - human creations 182
 - human genome project 186–7
 - natural creations 182
 - patent law 182–5
 - plant breeding rights 187–8
 - trade secret law 188–90
- intellectual property rights 163, 181–2
 - biodiversity conservation 171–2
 - copyright-based system 194
 - debt swaps 176
 - diverse system 233
 - economic benefits 192
 - flow
 - direction 173
 - of value generation 171
 - formalities 193–4
 - genetic material 190, 196
 - genetic resources 232
 - industrialised countries 232
 - informational services 163
 - institutional analysis 141–2
 - intangible 179
 - investment in natural resources 173
 - licensing 172
 - market allocation 168
 - multiple use 193
 - ownership 193–4
 - of genetic material 191–3
 - patent-based system 194
 - payment to right-holder countries 192
- positive 195
- product space 166
- products making use of idea 166
- protection 92
 - strengthening 244
- regime 166
- registration 172
- return on investment 190
- rewarded producer 173
- scope 193
- standardisation 251–2
- sui generis* right 179, 187, 191, 193, 194, 196
- system 11
- uniformity 234, 245
- use issue 193
- International Convention for the Protection of New Varieties of Plants 188
- international flows of intangible services 163
- international institutions 173
- International Plant Genetic Resources Institute (IPGRI) 178
- intervention, planned 88
- intestinal parasite prevention 210
- inventions
 - animate 187
 - disclosure of method of application of discovery 185–6
 - economics 132
 - genetic 196
 - inanimate 187
- inventors 166
 - inducements 244
 - patent entitlement 184
- investment
 - assets 177
 - incentive systems 168
 - incentives to supplier states 170
 - information-generating assets/diversity 172
 - informational 167
 - natural capital 169
 - in natural resources 173
 - return 172
- investors, property rights 168
- Ipomea batatas* 37
- 4-ipomeanol 37
- isoflavonoids 28
- isoprene unit 27
- isoprenoids
 - linear 27
 - see also* terpenoids
- isoquinoline alkaloids 26
- ivermectin 89
- Ix Chel Tropical Research Foundation (Belize) 54
- jaguba vine 51

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

Index

263

- Japan**, new chemical entity output 97–8
Jatropha curcas 212, 214, 214
- kayu putih* 240
Khaya senegalensis 237
- knowledge**
 benefit of community 242
 domestic 233
 ethnobotany 60–1
 global systems 15
 indigenous systems 227, 228
 oral traditions 53
 potential of traditional 60
 preservation 53–4
 protection 243
 rewards 11
 sacredness 242
 traditional communities 242
- Kuikuru (Central Amazon)** 50
- land**
 conversion 152–3
 compensation 162
 costliness 152–3
 halting 162
 marginal 160
 values 162
- investment asset 177
 legal arrangement complexity 177
 ownership 164, 177
 product sale by owner 180
 rights
 assertion 180
 tangible 179
 static uses 45
 tenure
 communal systems 225
 individual ownership 225
 use 160
 value 132, 136, 137
- latex residues, fossil** 30
- lead compounds** 98
 alternative 123
 derivation from plant collections 118
 improvement of existing compounds 99
- microbial diversity** 104
- natural products** 102–6
- naturally occurring compounds** 99
 plants 102–6
- learning, species-specific** 149, 150
- lemons** 10
- leprosy treatment** 250
- leukotrienes** 70
- life concept** 143
- life form**
 changing 144
 diversity 154–5
- intellectual property rights** 172
 range 144
 resource allocation 143
 solar energy capture 143
- lifestyle** 94
- lignans** 26
- lignins** 26, 28
- lipids** 26
 cyanogenic 30
- locally evolved systems, disrespect** 15–16
- locust bean** 212, 213
- low density lipoprotein (LDL) receptor gene** 88
- Madagascan periwinkle** *see* **rosy periwinkle**
- malaria** 48–9
 herbal treatment 212
- malonate pathway** 24
- Malshegu (Ghana) sacred grove** 220–1
- mammalian herbivores**
 detoxification system 33
 generalist feeding pattern 33
- mammals, plant chemicals in evolution** 32–4
- management regimes, decentralised** 163–4
- Mangifera indica* 212, 213, 215
- mango** 212, 213, 215
- Manihot esculenta* 49
- manioc** 49–50
- marginal cost curve** 152
 area under 155
- marine diversity** 104, 105
 secondary metabolites 105
- market forces** 241
- marketing, consumer product** 167
- mass screening programmes** 59–60
- material transfer agreement** 178–9
- May apple** 35
- Maytenus buchananii* 249
- Mectisan** 89, 90
- medicarpin** 28
- medicinal biodiversity** 232
- medicinal chemistry** 14, 69–70
- medicinal plants** 201–3
 access 214, 240
 administration 215
 application 215
 bark
 harvesting 237
 use 219
 biodiversity conservation 225–7
 collecting 216
 commercial exploitation 15, 239–40
 conservation 202–3, 220–2, 232, 238
 strategies 215
 coppicing 219
 cultivation 215, 240

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

264

Index

- medicinal plants (*cont.*)
 cultural values 220–2
 demand 218–20
 developing countries 202
 drug approval processes 239
 economic aspects 203
 economic valuation 131
 model 132–6
 economic value incentives 239
 environmental change adaptation 207
 exploration 99
 exports 237
 legislation 240
 extinction danger 235–6
 forest area protection 220
 forest reserves 218
 germplasm exchange 238
 global commercial value 127
 government intervention 238
 habitat decline 218, 227
 harvesting 236
 rate monitoring 236
 techniques 214–15
 herb gardens 218
 importance to multinational companies 235
 imports 237
 income 224
 increased use 219
 indigenous vegetation area reduction 219
 land values 132, 136, 137
 lead provision 130
 life forms 219
 livelihood sustaining 222–4
 major commercial use 128
 management practices 214
 marketing 223
 Mexico 238
 overexploitation 218–20, 227, 237
 overharvesting 236, 240
 plant
 parts 219
 size 237
 policy
 implications 222–7
 support in China 237
 prescriptions 222–7
 primary health care 224–5
 probability of success 133
 processing 215
 property regimes 225–7
 property rights 214, 220
 range of diseases 212
 rent capture 133–4
 rights for forest communities 233
 royalties 133
 Rwanda 238–9
 screening programmes 236
 species
 distribution 219
 loss in India 238
 synthetic production of chemicals 128
 trade 215–16, 217
 traditional medicines 128
 traditional uses 101
 use 128, 202–3, 211–12, 213, 214–15
 value 130, 201
 of drugs 134–6
 of land 132, 136, 137
see also Ghana, medicinal plants; herbal medicines
 medicinal systems
 locally derived 9
 natural-based 10
 Merck & Co. 117–20, 121, 129, 178
 metabolic by-ways 20
 Mevacor 87, 88, 91, 104
 mevalonate pathway 24
 mevinolin 87
 Mexico, medicinal plants 238
 michellamine B 113, 193
 microbial diversity in lead chemicals 104
 microbial sample collection 104
 microorganisms
 ability to kill others 70
 biologically active compound production 72
 cultivation 70
 new antibiotics 34
 patentability 183
 products 85–6
 research limitations 129
Mimosa tenuiflora 238
 Missouri Botanical Garden 112, 113, 122
 mobility of human society 8
 molecular biology 90
 molecular genetic technology 36
 molluscicide 247
 monasteries 53
 monoculturalisation 241
Monodora myristica 216, 217
 monopoly
 demarcation 167–8
 institutionalisation 164
 rent 168
 right 164, 165, 172
 territorial right 167
 monoterpenes 27
 moral rights 180
 morphine 34
 multinational companies 97, 234
 medicinal plant importance 235
 murine leukaemia cell lines 106
 muscarine 81, 83

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)*Index*

265

- muscarinic agonists 82
- muscarinic receptor genes 83
- mutation 159
- myrosinase 30
- National Biodiversity Institute (Costa Rica) 94, 115, 117–22, 178, 228
 - Biodiversity Prospecting Unit 118
 - biological resources role 118
 - chemical extraction facilities 119
 - chemical prospecting 118, 119
 - collaborative programmes 119–20
 - Conservation Database 118
 - conservation role 118–19, 121
 - indigenous culture knowledge 251
 - local biotechnology capability 119
 - Merck & Co. relationship 117–20, 121, 129, 178
 - MIRENEM relationship 120–1
 - national biodiversity inventory 118
 - royalties 121–2
- National Cancer Institute (US) 94, 104
 - compound oriented screening 106–7
 - disease-orientated screening 107
 - high throughput screening programme 107
 - marine organisms 105
 - plant screening programme 106–7
 - clinical successes/failures 110
 - clinical trials 109, 111
 - initial activity 109
 - Phase I (1955–82) 107–9, 110, 111–12
 - Phase II (1986–present) 112–14
 - pre-clinical trials 109, 111
 - screening methods 106
- National Institutes of Health (US) 186
- national territorial claims 181
- natural assets 148
- natural capital 6
 - investment 170
- natural habitat
 - believed usefulness 172
 - legal ownership 178
- natural products
 - chemical leads 102–6
 - consumer demand 130
 - cost-effectiveness of programme 112
 - demand 61
 - developing markets 60
 - leads 114
 - modification 38
 - random screening 100
 - research 59
- natural resource-generated information 171
- natural resources
 - common ownership 181
 - economic rate of return 127
- exploitation 234, 235
- international treaties 181
- investment 173
- safeguards 234
- sovereign rights 177
- sustainable 127
- natural selection
 - failure 39
 - success 39
- natural systems, static uses 46
- neem tree 212, 213, 215
- nematode worms 88
- neo-herbalists 207, 212
- Net Primary Product 143
- neuron subtypes 83
- neurotransmitters 80
 - deficiencies 70
- new chemical entities 96, 97
 - consensus products 98
- New York Botanical Garden 54, 112, 113, 122
- Newbouldia laevis* 213–14
- niche
 - appropriation 145
 - dynamic 144–5
 - rate of turnover 144
 - refinement 142, 143, 144, 149
 - species 144
 - fit 149
- nicotinic receptor 81
- Nigeria, sweetener 249
- nitrogen compounds 25
- non-conversion 160
- nutrition 94, 96
- oco-yajé* 51
- Oenothera* sp 35
- onchocerciasis 89–90
- Onco-Mouse 184
- opinion value 157
- opium poppy 34
- options
 - gaining endogenous information 161
 - value 157–8, 159
- oral traditions 53
- output variability 159
- ovarian cancer 111
- oxygen influence 33–4
- Pacific yew 37, 47, 48, 84, 111
- pain relief 10
- Paris Patent Union 12, 163, 165, 171
- Parkia clappertoniana* 212, 213
- Parkinson's disease 70
- partial agonists 83, 84
- patent law 182–5
 - genetic material 195

- patent law (*cont.*)
 international treaties 182
 property rights 194
 requirements 182
 patents 11–12, 243
 alternative use applications 193
 biological inventions 183
 biotechnology 184, 187
 industry 186
 developing countries 246
 endod 247, 248
 European law 183–4
 frauds 247–51
 gene sequences 186–7
Genentech claim 185
 natural plant products 16
 process 182
 product 182
 products making use of idea 166
 range of material 194
 requirements 38
 source material 184
 systems 232
 uniform protection 232
 value of discovery 132
 Patents Act (UK, 1977) 185
 penicillin 70, 104
 action 72
 pepsin 76
 pepstatin 76–7, 78
 peptides
 structure 73–4
 synthesis 73–5
 perfumes 35
 pesticides, synthetic 34
 pharmaceutical discovery process 67
 Alzheimer's disease treatment 80–4
 medicinal chemistry 69–70
 protein structure 73
 screening 70–1, 72
 pharmaceutical industry 4–5, 6
 botanical product interest 129
 competition 91–2
 development costs 97
 discovery process 14
 economies of scale 97
 financial risk 96
 lead-times 96, 97
 mass screening programmes 59–60
 medicinal chemistry 14
 multinational companies 97
 natural product research 59
 natural screening 14
 plant-based diversity 14
 rate of approval 97
 royalties 92
 technology transfer 92
 value of plant use 14–15
 pharmaceutical research and development
 96–8
 biotechnology 90
 consensus products 98
 costs 97
 empirical approaches 100
 expenditure 96
 innovation pace 98
 investment costs 97
 molecular biology 90
 rational approaches 100
 pharmaceuticals
 biological activity template 9
 plant-based 103
 prospecting 58–60
 traditional origins 58
see also plant-based pharmaceuticals
 pharmacopoeias, traditional 58–9
 phaeolin 28
 phenolics 25, 27–8
 A ring 27
 B ring 27
 phenotypes, suppressed traits 162
 photosynthesis 143
 physic nut 214
Physostigma venenosum 80
 physostigmine 80
 phytoalexines 28
 phytochemicals
 long-term prospects 123
 programme 116
 phytol side chain 27
Picralima nitida 217
Piper guineensis 216, 217, 225
 piperidine 26
 piracy 245
 pisatin 28
 plant breeding rights 183, 187–8
 international agreement 188
 plant collection 107–9, 110, 111–12
 collectors 54, 115
 information required 115
 intermediaries 115
 payments 121, 122, 123
 plant gathering agencies 131
 quantity for screening 114
 re-collection information 115
 royalties 121–2, 123
 plant communities 2–3
 informational value 14
 secondary characteristics 3
 survivability 8–9
 plant medicines
 biomedical application 202
 disease treatment 209
 marketing 223

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)

Index

267

- pharmaceutical properties 227
- sustainable livelihoods 228
 - see also* medicinal plants
- plant-based pharmaceuticals
 - assays 129
 - avoided death value 135
 - consumer demand 130
 - difficulties 129
 - economic value 127–8, 131–2, 137
 - loss from species reduction 135
 - market value 134, 135
 - patents 129
 - prescription value 135
 - renewed interest 129–30
 - rent capture 133–4
 - retail value 136
 - royalties 133
 - screening programmes 130
 - synthetic substitution 131
 - usage 134
 - value 128
 - of drugs 134–6
 - of life 135, 136
- plants
 - biologically active compound production 72
 - chemical diversity preservation 36–8
 - chemical leads 102–6
 - collecting 54, 55
 - defences 22, 23
 - derivative manufacture 57
 - DNA amounts 23
 - domesticated 57
 - drug components 34
 - economic value of resources 137
 - experience-intensive sampling 48
 - genetic material processing 129
 - germplasm storage 178–9
 - heterogeneity preservation 19
 - knowledge 46–7
 - medicinal efficacy 47
 - medicinal uses 128
 - morphology 47
 - primary characteristics 2
 - primary/secondary strategy 7
 - properties 19
 - relative toxicity 33
 - screening 93–4
 - screening programme
 - National Cancer Institute (US) 94
 - re-vitalisation 123
 - secondary characteristics 2
 - species
 - conservation 35
 - fitness 7
 - supply 93–4
 - for random screening 114
- sustainable supply 48
- tenure 221–2
- trade secret law for genetic material 188
- uses 47
- virtues 19
- plasminogen activator, recombinant tissue (tPA) 185
- plastics, heat resistant 165
- Podophyllum peltatum* 35
- poisons 21, 50
- polyacetylenes 25
- polyketides 25
- polysaccharides, fossil 30
- pooling of distinct assets 155
- portfolio effect 155–6
 - biodiversity value 161
 - diverse asset retention 159
 - diversity value 158
 - dynamic 158
 - international 156
 - nation-wide 156
 - species-specific 156
- poverty 234
- Pravachol 87
- pre-menstrual tension 35
- predators, toxic compound avoidance 22
- preventive medicine 94, 95
- prey species, humans 146–7
- primary characteristics 2, 3
- primary compounds 19
- primary health care
 - indigenous population 237
 - medicinal plants 224–5
- primary metabolism, genetic mutations 21
- primary metabolites 7
- primary productivity 1, 4, 5
 - human society 8
- primary value 128
- primates
 - evolution 31
 - fleshy fruit relationship 32
- Primaxin 86
- process patents 182
- product patents 182
- product space 166
 - allocation 170
- product-by-process patent claim 182–3
- production strategies 4
- profit motive 241
- progesterone 69
- Prontosil 68
- property
 - intangible 190
 - law 177
 - ownership 177
 - regimes
 - indigenous 227

- property (*cont.*)
 medicinal plants 225–7
 traditional communities 232
 uniform 246
 systems 240–6
 tangible 190
- property rights 168, 176–7
 assertion 180
 continuum 179
 creation 241
 homogenisation 252
 institutionalisation 244
 institutions 15
 investors 168
 labour 244
 legal systems 177
 medicinal plants 214, 220
 national level 181
 protection 244
 regimes 163–6
 benefit channelling 164
 systems 6, 11–13
 information 12, 13
 intellectual 11, 12
 wealth creation 13
 tangible 178
- prostaglandins 70
- prostatic hypertrophy, benign 70
- prostratin 113
- proteases 77
- protein
 structure 73
 synthesis inhibition 72
- protoalkaloids 29
- pseudoalkaloids 29
- Psychic and Traditional Healing Association (Ghana) 224
- Psychotria viridis* 51
- pterocarpans 28
- public good
 globally recognised 165
 information 165
- public policy 226
- Pygeum africanus* 237
- pyrrolidine alkaloids 26
- quasi-options value 161
- quinine 48
- quinoline alkaloids 26
- quinones 25, 26
- random screening, supply of plants 114–15
- range management 226
- rational approaches to drug development
 renewable characteristics 100, 101
 scientific values 102
- rational drug design 9, 103
- synthetic compounds 100–2
- Rauvolfia* alkaloid 84
- Rauvolfia serpentina* 58, 129
- Rauvolfia vomitoria* 217
- reactive oxygen species, scavengers 33
- receptor molecules 82
- recuperative powers of body 95
- regulation of plants 57
- relative fitness 1, 2
- religious forest classification 226
- renin 70
 inhibition 77
- rent
 capture 132, 133–4
 sharing 131, 132
- repellants 2, 21
- repressed pathway induction 37
- research funding 37
- reserpine 58, 84, 129
- resource allocation
 evolutionary process 143
 life form 143
- resource management
 communities 226
 responsibilities 226
 traditional 57, 227
- resources
 disinvestment 151
 loss of stocks 152
 maintenance incentives 170
- reverse transcriptase
 enzyme 75, 76
 inhibitors 79
- right holders 182
 countries 192
- ritual sites 220
- river blindness 89–90
- RNA transcription 75
- rosy periwinkle 35, 38, 103, 129, 249
- rotenones 28
- Royal Botanic Garden (Kew) 122
 seed bank royalties 179
- royalties
 competitive market 192
 drug discoveries 92
 economic valuation of medicinal plants
 132
 fixing 192
 National Biodiversity Institute (Costa Rica) 121–2
 property rights system 133
 rent sharing 131, 132
- RU486 abortion pill 102
- rubbers 20
- Rwanda, medicinal plants 238–9
- sacred areas 220, 221

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)*Index*

269

- sacred groves
 - local leader powers 226
 - traditional authority control 227
- sainto daime* see *caapi*
- salicin 67
- salicylic acid 10, 67
- Salix alba* 67
- Salix* spp. 58
- salvarsan 68
- sampling
 - ethno-directed hypothesis 58
 - experience-intensive 48
- sasanemasa 213–14
- scientific method
 - framework 11
 - heterogeneity 10
 - uniformity 10
 - Western style 10–11
- screening
 - disease knowledge 102
 - evaluation 102
 - pharmaceuticals 70–1, 72
 - strategies 47
 - technology 47
- screening programmes
 - ethnobotanical sources 37–8
 - high-throughput 36
 - hit rate 35, 36
 - manipulation of chemicals 37
 - mass 59–60
 - novel compounds 36, 37
 - random 35, 38
- scurvy 10
- secondary characteristics 2, 3
- secondary compounds 19
 - active 22
 - adaptation 21
 - angiosperms 31
 - attractants 21
 - biological diversity retention 22–3
 - chemical industry 34–6
 - chemical leads 103
 - cost-benefit relation of accumulation 23
 - defence effectiveness 33
 - defensive agents 22
 - defensive compound production restriction 24
 - evolution 30–1
 - genetic diversity 39–40
 - genetic variability indicators 19
 - higher plants 31
 - human evolution 32
 - mammalian herbivory 32
 - marine organisms 105
 - metabolic cost reduction 23–4
 - natural product leads 114
 - no biological activity 22
- origin 30–1
- phylogenetic relationships 31
- poisons 21
- potency 24
- recycling into primary metabolism 24
- repellants 21
- resource diversion from growth 23
- role 20–4
- structural range 24–5, 26, 27–30
- synthesis 20–1
- turnover 21
- uses 24
- waste product hypothesis 20, 21
- world distribution 32
- secondary metabolic pathways 25
- secondary metabolism
 - enzymes 24
 - genetic mutations 21–2
- secondary metabolites 1, 2, 4–5
 - evolutionary benefits 7
 - plant species fitness 7
 - response attraction 7
- seed banks 178–9
 - royalties 179
- seed dispersal 7
- selection 159
- sesquiterpenes 27
- shaman 53
- Shaman Pharmaceuticals 59, 60, 103
 - ethnobotanical screening 101
 - strategy 250, 251
- shikimic acid 20, 24, 27
- sinduro tree 212, 213, 215
- skills, handing on 242
- societal development 150
- soils 250
- solar energy capture 143
- specialisation
 - aggregate benefits 153
 - impact on genetic drift 156
- speciation 143
 - rate 145
- species
 - assets 148
 - collection 59
 - distribution 145
 - diverse 159
 - diversification bursts 33
 - diversity
 - preservation 58
 - tropical climates 91
 - extinction 39, 40, 142
 - rate 145
 - fitness 7
 - longevity 143
 - niche 144
 - prey 146–7

- species (*cont.*)
resolution 145
sampling theory 58
selection by agriculture 146–7
specialised 149, 150, 159
stability 39
world food crops 147
species-specific learning 149, 150
species-specific tools 150
spiritualists, Ghana 210
Sri Lanka, traditional medicine 202
static analysis 160
steroids 20, 25, 69
contraceptive 34–5
Diosgenin 129
sterols 20
stewardship of land 226
Streptomyces, soil-inhabiting 71
streptomycin 71, 72
Strophanthus hispidus 217
Strychnos vine 50
substance P 74
sui generis 187, 193, 194, 196
genetic material 196
right 179, 191
usefulness 196
sulfonamide group 68–9
sumankwahene 216
surrogate rights 163
award mechanisms 168
property 167–8
surrogate rights regime 166–7
biodiversity 170
flow appropriation 166–7
incentives 170
investors in information generation 170–1
survivability 8–9
sustainability 1–6, 8
natural products 60
sustainable development 95, 233–4
sweet manioc 49
sweet potato 37
sweeteners 249
synthesis, commercial 114
synthetic molecules 34
syphilis 68
- Tamarindus indica* 217
tannins 20, 25, 26, 27
condensed 28
defensive 28
extraction for herbal medicines 212, 214
hydrolysable 28
taste, poisons 50
taxol 37, 47, 84, 104
regulatory approval 111
taxotere 111
- Taxus brevifolia* 37, 111
technology
replication 245
transfer 92
terpenes 20
terpenoids 25, 26, 27
testosterone 70
Tetradenia riparia 238
thaumatin 249
therapeutic application 49
therapeutic effect 88
thienamycin 85–6, 91
inhibitor administration 85–6
time passage 157
tissue culture 37
tomato 48, 49
tools, species-specific 150
topotecan 112
toxalbumen 212
tractors 150
- Trade Related Aspects of Intellectual Property Rights (TRIPS) 245, 246
trade retaliation threats 246
trade secret law 188–90
international problems 189
objective fact 189
property concept 189
traditional healers 47, 53
authority 243
colonialism 206
conservation training needs 223
decline in numbers 218
Ghana 205, 210–11
handing on skills 242
protection of areas 243
reduction in numbers 100
supply of plants 218
traders in medicinal plants 216
value of health care 201
traditional management regimes 226
traditional medicine
accessibility 206, 207
adaptability 206, 207
Africa 202
anti-tumour agents 108
availability 206
China 202
cultural change 207
dependence on 201
disease concepts 208–10
economic aspects 203
economic value 127–8
extent of use 15
institutionalisation 207
integration with Western 202, 224, 225
new applications 61

Cambridge University Press

978-0-521-63580-6 - Intellectual Property Rights and Biodiversity Conservation: An Interdisciplinary Analysis of the Values of Medicinal Plants

Edited by Timothy Swanson

Index

[More information](#)*Index*

271

- novel compounds 61
- open systems 207
- preventative 210
- protective 210
- recognition in Ghana 224
- referrals 207
- registered practitioners 202
- reorientation 240
- resurfacing in Ghana 206
- self-treatment 209
- specialisation 208
- Sri Lanka 202
- state sanction in Ghana 207
- treatment 208–10
- value of health care 201
- traditional property rights 163
 - recognition 250
- traditional resource management 227
- transferable development rights 162
- transportation 57
- trees
 - protection 220
 - symbolism 222
- triterpenes 30
- triterpenoid biosynthesis pathways 30
- tropical climates
 - medicine finding 91
 - species diversity 91
- tropical forests
 - loss 35
 - popular concern 104
 - preservation 35–6
- trust 235
 - protection of medicinal plant areas 243
- tryptamines 51
- D-tubocurarine 58
- uniform patent protection 232
- uniformity 10
 - evolutionary fitness 149
 - societal development 150
- unit of land
- medicinal plant value 132
 - value 136, 137
- universality of societal development 150
- University of Illinois 112, 113, 122
- urbanisation 234
- variability
 - reduced 158
 - uncertainty 158
- vertical distribution agreements 167
- vinblastine 35, 84, 103, 129, 249
- Vinca alkaloids 129
- vincristine 35, 84, 103, 129, 249
 - synthetic 128
- vitamin C 10
- vitamins 69
- waste product hypothesis 20, 21
- waxes 26
- Western medicine
 - accessibility 15, 222
 - cultural acceptance 202
 - Ghana 205–6
 - globalisation 9–10
 - integration with traditional 202, 224, 225
 - tropical countries 227
- willow bark 10, 58, 67
- world economy 245
- xanthones 26
- Xylopia aethiopica* 216, 217
- Xylopia* sp. 215
- yajé see caapi*
- yew *see Pacific yew*
- yield
 - increase 158
 - land clearance/conversion 161
 - specialised biological assets 160
- Zanthoxylum xanthoxyloides* 217
- Zocor 87, 88