



## Subject Index Vol. 21, 2019

- 16S rRNA gene 859  
 6-Benzylaminopurine 997  
 8-OHdG 583  
 ABCA 597  
 ACC-deaminase 1212, 869  
 Accumulation 135  
 Acer 1073  
 Acid rain 391  
 Adaptability 827  
 Adjuvant 899  
 Adjuvants 486  
*Aegilops tauschii* 463  
 Afforestation 527  
 Aging corn 201  
 Agriculture wastes 125  
*Agrobacterium* mediated transformation 429  
*Agrobacterium tumefaciens* 443  
 Agronomic traits 289, 891  
 Allelic variation 891  
 Allelopathic 463  
 Allelopathic mixtures 215  
 Allelopathy 1083, 215  
 Allocation pattern 1049  
 AMF 175  
 AMMI model 289  
 Ammonia oxidizing archaea 421  
 Ammonia oxidizing bacteria 421  
 Anatomy 171  
 Antagonistic experiment 282  
 Anthocyanin 590  
 Antibiotics 1031  
 Antifungal activity 1256, 775  
 Antimicrobial 743  
 Anti-nutrient 1137  
 Antioxidant 1137, 743  
 Antioxidant enzyme 237, 140, 140, 583  
 Antioxidants 936, 971  
 Antioxidative ability 201  
*Aphrophora flavipes* 115  
 Apple 1097  
 Apricot orchard 399  
*Arabidopsis thaliana* 864  
 Arbuscular mycorrhizal fungi 479  
 Arid region 943  
 Artemisia 630  
*Artemisia sieberi* 1241  
 Assimilate distribution pattern 184  
 Atmospheric vapor pressure deficit 506  
 Atomic force microscopy 775  
 AUDPC 251  
 Auqab 2000 1013  
*B. licheniformis* 125  
*Bacillus megaterium* 1024  
*Bacillus* spp. 282  
*Bacillus* spp. strain MN-54 538  
 Bacteria 456  
 Begomoviruses 711  
 Behavior 93  
 Bioassay 577  
 Bioavailability 135  
 Biochar 1173, 936  
 Biochemical composition 1063  
 Biodegradation 689  
 Biofortification 615, 929  
 Biogas slurry 869  
 Bio-herbicide 215  
 Biological control 282  
 Biological efficiency 989  
 Biomass 1043  
 Biomass remobilization 351  
 Black seed 569  
 Bleaching 486  
 Boron 209, 359, 385  
 Boron deficiency 538  
 Bract 810  
*Brassica napus* 597  
 Breeding 251  
 Broad-sense heritability 229  
 Bt cotton 577  
 Burkina faso 547  
 Burrowing ability 848  
 Ca<sup>2+</sup> 1263  
 Cadmium contamination 1205  
 Calcareous soils 538  
 Calcium 359  
 Calcium inhibitors 1263  
 Callose deposition 85  
 Callus 719  
 Calreticulin 85  
*Camelina sativa* 443  
*Camellia grijsii* 819  
*Camellia oleifera* seed shell 989  
 Canola 538  
 Canopy temperature 506  
*Carex* 659  
 Carotenoids 606  
 Carrier 77  
*Carthamus tinctorius* 1106  
 Catalase 1271  
*Catharanthus roseus* 1293  
 Cationic/Anionic composition 1271  
 Cd 879  
 Cell cycle 105  
 Cell membrane thermostability 229  
 Cellulase 125  
 CH<sub>4</sub> flux 345  
 Channels 864  
 Characterization 19, 300  
 Chelated Zn 1197  
 China 1043, 1049  
 Chinese mitten crab 859  
 Chinese pine 456  
 Chitosan oligosaccharide 85  
 Chl *a* fluorescence 237  
 Chlorogenic acid 743  
 Chlorophyll 171, 209, 1279  
 Chlorophyll *a* fluorescence 391  
 Chlorophyll fluorescence 1279  
 Chloroplast 149  
 Chourouk 499  
 Chromium stress 140  
 Chronic stress 1166  
*Cinnamomum longepaniculatum* 1301, 835  
 Citrus 1221  
 Clay soil 399  
 Climate change 520  
 Cloning 1189  
 Cluster analysis 491  
 Cob 810  
 Coleosporium 885  
 Collagen-like peptides 750  
 Color 271  
 Colorectal cancer 1123  
 Competition 1083  
 Compost 879  
 Computational biology 223  
 Conservation agriculture 367  
 Conservation tillage 675, 803  
 Control 115  
 Corn 810  
 Correlation 289, 93, 606  
 Cotton fiber 1063  
 Cover crops 399

Cowpea 1137  
 Cowshed 93  
 Crop residue 367  
 Crop rotation 367, 689  
 Crop water stress index 506  
 Crossbred buffalo 560  
 Crude extract 648  
 Cry1Ac 577  
 CTD 520  
*Cucumber mosaic virus* 149  
 Cultivar differences 1147  
 CuO 171  
 Cuticular wax 911, 1249  
*Cyperus rotundus* L. 1083  
 Cytochrome P450 1036  
 Dairy cow 93  
 DAS-ELISA 1221  
 Database 864  
 dCas9 711  
 Deficit irrigation 1004  
 DEGs 899  
 Dendrobium 885  
 Diallel 229, 621  
 Diazinon 583  
 Directed self-assembly 750  
 Disease management 409  
 Disease severity 333, 547  
 Distorted conidia and mycelia 1241  
 Distribution pattern 1043  
 DNA barcoding 1073  
 Drechslera teres 1089  
 Drought 338, 869, 971  
 Duck 201  
 Durum wheat 891  
 Dwarfing mechanism 1097  
 Eating and cooking quality 1181  
 Ectomycorrhizae 853  
 Efficiency 164  
 EGCG 314  
 Eggplant 971  
 Emergence 553  
 Endemic 997  
 Endogenous hormones 1097  
 Endophyte 743  
 Endophytic fungal elicitors 835  
 Endophytic fungi 1301  
 Enhanced fermentation 757  
 Environmental conditions 1166  
 Environmental stimuli 911  
 Environmental stress 259  
 Enzyme 456  
 Enzyme activity 1181  
 Epidermal cells 630  
 Essential oil 1301, 835  
 Estrus cycle 560  
 Eucalyptus plantation age 527  
 Eukaryotic expression 19  
 Evolution canyon 1055  
 Exopolysaccharides 943  
 Expressed sequence tags 1293  
 Expression analysis 54, 597  
 Expression profiling 325  
 Fatty acid desaturase 3 443  
 Fatty acid elongase 1 443  
 Fatty acid elongation 1228  
 Fecal characteristics 1019  
 Fecundity potential 41  
 Feeding 164  
 Field capacity 767  
 Field conditions 479  
*Flammulina velutipes* 989  
 Flavonoid content 648  
 Flavonoids 955  
 Flavonol synthase 653  
 Flower opening 653  
 Fluorescent activated cell sorting 105  
 Foliar application 209  
 Follicular dynamics 560  
 Food quality 1173  
 Forest 1043  
 Forest biomass 1049  
 Fruit set 819  
 FTIR 1241, 359  
 Functional response 41  
 Fungal biomass 569  
 Fuzzy subordinate function analysis 1106  
 G2/M junction cells 105  
 Gas exchange 391  
 Gas exchange parameters 936  
 GC-MS 1241, 1249  
 GCMS analysis 569  
 Gene action 621  
 Gene cloning 54  
 Gene expression 1228, 653  
 Gene identification 71  
 Genetic architecture 810  
 Genetic diversity 1089, 1129, 1235, 155, 795  
 Genetic resources 520  
 Genetic variability 679  
 Genetic variance 621  
 Genotype 1221  
 Genotyping 25  
 Germination 648, 841  
 Germination characteristics 47  
 Germination stage 1106  
 Germplasm resources 1235  
 GGE biplot 289  
*Gibberella fujikuroi* species complex 409  
 Gilgit-Baltistan 630  
 Glycosylation 1055  
 Goat kid 1019  
 Grafting 1097  
 Grain 615  
 Grain filling rate 184  
 Grain quality 929  
 Grain set 385  
 Grain yield 33, 472, 827  
 Grain zinc concentration 1205  
 Grapevine 1263  
 Growth 1147, 34, 472, 964, 971  
 Growth hormones 1212  
 Growth parameters 25  
 Growth stage 486  
 Growth trait 61  
 Guaiacyl unit 1063  
 GWAS 810  
 Hair cortisol 1166  
 Hanwoo cattle 1166  
 Hayman's approach 229  
 Heat stress 3  
 Heat tolerance 385  
 Heavy metals 1173, 135  
*Helicoverpa armigera* 577  
 Hepatic fibrosis 314  
 Hepatic transporters 1036  
 Heritability 621  
*Heterodera glycines* 1024  
 Higher plants 325  
 Histopathology 583  
 Hormones 325  
 Host-pathogen interactions 67  
 Hulled wheat 979  
 Human health 135  
 Hybrid 1197  
 Hybrid cattle 61  
 Hydroponics 667  
 Hydropriming 719  
 HYDRUS-2D 191  
 Identification 115, 99  
 Idling 164  
 ihpRNA interference 67  
 Illumina miseq sequencing 527  
 Imbalance 3  
 Immune activation 899  
 Immune function 11  
 Immunosuppression 1189  
*In vitro* 997  
 Incubation 879  
 Inoculation 77  
 Integrated nutrient management 244

Interferon gamma 19  
 Invertase 437  
 Ion homeostasis 733  
 Ion transport 864  
 Ion uptake 1097  
 Ions analysis 964  
 iPBS-retrotransposons 155  
 Irrigation 943  
 Irrigation regime 191  
 Irrigation uniformity 416  
 Irrigation water-regimes 936  
 Isolation 115, 743  
 Isoproturon 689  
 ISSR 1089, 1235, 795  
 ITS 1073  
 Japanese red pine pure forests 726  
 Jerusalem artichoke 1019  
 K<sup>+</sup> uptake 733  
 KEGG pathways 1293  
 Kernels positions on an ear 184  
 Land races 520  
 Land use change 421  
 Landraces 891  
 Lanzhou fat-tailed sheep 1287  
 Lateral buds 997  
 Leaf appearance rate and phyllochron 1117  
 Leaf elongation rate 1117  
 leaf rust 520  
 Lettuce 175, 54  
 Light quality 955  
*Lilium* 1235  
 Lily mottle virus 67  
 Lipid A 325  
 Lipid peroxidation 338  
 Lipoxygenase activity 979  
 Liquid medium 905  
*Litopenaeus vannamei* 11  
 Little seed canary grass 675  
 Liver 201  
 lpx genes 325  
*LsMAPK4* 54  
 Macrophomina phaseolina 547  
 Magnetic field 841  
 Maize 184, 229, 1147  
 Maize hybrids 922  
 Maize-soybean intercropping 639  
 Malaysian Rice Cultivars 375  
 Male sterility 437  
 Malnutrition 1197  
 Malondialdehyde 1279  
 Margarine 1123  
 Marginal quality water 1159  
 Marker trait association 929  
 Mass spectrometry 786  
 Meat quality 201  
 Mechanism 314  
 Metagenome 1031  
 Metal ion toxicity 307  
 Metal noxiousness 1159  
 Meteorological disaster 1279  
 Mexi-Pak 1013  
 Microbes 879  
 Microbial community 345, 859  
 Microbial fertilizer 77  
 Microbial metabolic profiling 639  
 Micromorphology 659  
 Micronutrients 675  
 Microorganism dynamics 175  
 Micropropagation 997  
 Milk performance 93  
 Minerals and proximate 120  
 Miseq 859  
 MNEI 449  
 Molecular characterization 11  
 Molecular dynamics 449  
 Molecular identification 1073, 1212  
 Molecular marker 1235, 885  
 Molecular mechanisms 259  
 Molecular phylogeny 659  
 Morphogenesis 1031  
 Morphological characteristics 853  
 Morphological traits 345  
 Morphology 1137, 1249, 391  
 Mud-sand ratio 848  
 Mulch 767  
 Muscle 1287  
 Mushroom cultivation 989  
 Nanoparticle 171, 259  
 Nanosuspension 775  
 NDVI 520  
*Nelumbo nucifera* 653  
*Neoseiulus californicus* 41  
 Net blotch 1089  
*Nicotiana banthamiana* 429  
 Nitric oxide 105, 85  
 Nitrogen application 1147  
 Nitrogen utilization 1147  
 Nonanucleotide 711  
 Noodle 271  
 Nucleic acids 899  
 Nucleotide 1055  
 Nutrient utilization 359  
 Nutrients 175  
 Octadecadienoic acid 569  
 Oil 201  
 Oil bearing roses 1159  
 Oil contents 209  
 Oilseeds 679  
 Oiltea 237  
*Onchidium struma* 307  
 Onion 1173, 120  
 Optimization 125, 77  
 Ore tailings 1205  
 Organic amendments 244  
 Organophosphate 456  
 Ornamental trees 47  
*Orobanche crenata* 499  
*Orobanche foetida* 499  
*Oryza sativa* 667, 703  
 Osmotic resistance 1106  
 Ovarian self-incompatibility 819  
 Ovule abortion 819  
 Oxidative damage 606  
 Oxidative stress 149  
 P solubilization 538  
 Paclitaxel 719  
 Paddy yield 703  
 Pakistani genotypes 513  
 Paulownia elongate 841  
 Pb 879  
 PCA 513  
 PCR 1221  
 Peanut 491, 99  
 PEG 6000 375  
 PEG stress 1106  
*Pestalotiopsis* spp 115  
 PGPR 175  
 PGPRs 1212  
 Phenolic acid 590, 757  
 Phenolic content 648  
 Phenolics 1063, 215  
 Phenylalanine ammonia-lyase 955  
 Phosphate rock 786  
 Phosphorylation 1055  
 Photoinhibition 1279  
 Photosynthesis 338  
 Photosynthetic pigments 34  
 Photosynthetic rate 1271  
 Photosystem II 391  
 Phycosphere 1031  
 Phylogenetic analysis 1129, 1221, 223, 853  
 Phylogenetic relationship 1073  
 Phytochemical compounds 569  
 Phytohormone 943, 955  
 Phytohormones 105  
*Pichia pastoris* 19  
 PICRUS 859  
 Pig 3  
 Pigmented rice 590  
 Pine needle blight 726  
*Piriformospora indica* 333  
 Pistillate scale 659  
 Plant growth 140, 338

Plant virus resistance 711  
 Planting dates 922  
 Plasma metabolites 583  
 Polyethylene glycol 6000 1212  
 Polymorphism 6, 1055  
 Population genetic structure 885  
 Post-anthesis P uptake 351  
 Post-partum 560  
 Pre-anthesis P accumulation 351  
 Precipitation 1049  
 Prey preference 41  
 Priming 964  
 Principal component analysis  
     1106, 1129, 491  
 Production 125  
 Proliferation 905  
 Protein extraction 786  
 Protein-protein interaction 223  
 Proteomics 679  
 Proximate composition 1137  
 Puberty 560  
*Puccinia graminis* 1013  
 Purification 125, 300  
 Purple blotch 120  
*Pyrenophora teres* 1089  
*Pyricularia oryzae* 1256  
 qRT-PCR 597  
 Quality 271, 922  
 Quality parameters 891  
 Quality traits 491  
 Quantitative trait loci (QTLs) 929  
 Race nonspecific resistance 251  
 RACER 1189  
 Rainbow trout 583  
*Ran* gene structure 11  
 Rape pollen 300  
 rDNA-ITS 99  
 Reactive oxygen species 140  
 Recombinant quasi-spider silk  
     protein 750  
 Recombinases 429  
 Reduce dose 486  
 Redundancy analysis 726  
 Reference genes 1024  
 Relationship 1235  
 Relative expression level 979  
 Remobilization efficiency 351  
 Resistance 499, 547  
 Resistance analysis 71  
 Resistance detection 67  
 Reversible glycosylated  
     polypeptide 300  
*Rheum ribes* 795  
 Rhizobacteria 869, 943  
 Rhizosphere fungal diversity 479  
 Rice 1129, 1181, 1205  
 Rice bakanae disease 409  
 Rice blast 71  
 Rice restorer line 71  
 Rice-wheat cropping systems 803  
 RNA-Seq 314, 597, 899  
 Root 1043, 1049  
 Root areas 639  
 Root configuration 359  
 Root exudate 237  
 Root length density 191  
 Root system 191, 667  
 Root-shoot ratio 703  
 Rootstock 1097  
 ROS 1263, 149  
*Rosa centifolia* 513  
 RPG genes 1013  
 RPL16 223  
 RT-qPCR 1024  
 Rumination 164  
 Saline stress 1263  
 Salinity 34, 964  
 Salinity stress 338  
 Salt concentrations 25  
 Salt stress 307, 47, 667, 733  
 Salt tolerance 47  
 Salt-affected B-spiked soils 1271  
 Scanning electron microscopy  
     659  
*Schistosoma japonicum* 314  
 Seasons 606  
 Secondary metabolism 955  
 Secondary metabolite 786  
 Secondary roots 553  
 Secondary wall 1063  
 Seed germination 463  
 Seed priming 803  
 Seed size 803  
 Seed vigour 47  
 Seedling dry weight 553  
 Seeds 841  
 SEM 1241  
 Sensitivity 99  
 Sequence alignments 1189  
 Shading 472  
 Shoot ratio 1043, 1049  
*Sibiraea altaiensis* 997  
 Signal transduction 1301  
 Signaling 606  
 Simple sequence repeat 513  
 Simple sequence repeats 1293  
 Single-chain monellin 449  
 Siphon 416  
 Site-specific gene integration 429  
 Slow rusting genes 251  
 SNP 810  
 SOD activity 463  
 Soil bacterial community 527  
 Soil chemical properties 367  
 Soil dehydrogenase activity 879  
 Soil microbial communities 421  
 Soil moisture content 506  
 Soil organic matter 767  
 Soil properties 244, 689, 726  
 Soil quality parameters 399  
 Soil water balance 1004  
 Soil water content 191  
 Somatic embryo 905  
 Somatic embryogenesis 905  
 Soybean 1024, 757  
 SPAD-values 1271  
 Spatial variability 689  
 Specificity 99  
*Sphingobium* 689  
 Spring barley 171  
 Sr22 1013  
 SSR 795  
 SSR markers 929, 1129  
 Stability analysis 289  
 Stability parameters 827  
 Stand characteristics 726  
 Stand type 726  
 Standard evaluation system 25  
 Starch 271  
 Starch biosynthesis genes 1181  
 Stem extract 1256  
 Stem nematode 99  
 Stomatal conductance 229, 1271  
 Stomatal diversity 630  
 Storage proteins 679  
 Stress factor 703  
 Strigolactones 34  
 Stripe rust 621  
 Structural modification 1159  
 Structure characterization 750  
 Subcutaneous adipose 1287  
 Substrate grain size 848  
 Sucrose metabolism 437  
 Sufu paste 757  
 Sugarcane 905  
 Summer crops 1083  
 Sunflower 209, 34  
 Superoxide dismutase 1271  
 Surge irrigation 416  
 Suspension cells 835  
 Sustainable productivity 1197  
 Sweet clover 675  
 Sweetness 449  
*Swertia mussotii* 1036  
 Symbiotic bacteria 1031  
 Synbiotic 1019  
 Syringyl unit 1063  
 T lymphocyte 3

*Takifugu rubripes* 19  
 TALEs 711  
 Taxoid-metabolite 719  
*Taxus chinensis* var. *mairei* 719  
 Temperature gradient 1043  
*Tetranychus truncata* 41  
*Tetranychus turkestanii* 41  
 Tetraploid wheat 155  
 Thermal image 506  
 Thermal variations 922  
 Thermostability 449  
 Thiourea 606  
 Three leaves 486  
 Threshing efficiency 810  
 Tibetan traditional medicine 1036  
 Tillage 367  
 Tillering 486  
 Tobacco mosaic virus 85  
 Tofu 757  
 Tolerance 333  
 Tomentella 853  
 Total antioxidant capacity 1123  
 Total oxidative stress 1123  
 Total water use 767  
 Transcriptional factors 1228  
 Transcriptome 1287, 1301  
 Transcriptome analysis 1189  
 Transcriptomic profiling 375  
 Transgenic plant 443  
 Translation elongation factor 1- $\alpha$  409  
 Transpiration rate 1271  
 Transporters 864  
*Tribulus terrestris* 1256  
*Trichoderma viride* 333  
 Trichomes variation 630  
 Trifoliate rootstock 359  
*Triticum aestivum* 936  
 Tube plantlet 719  
 Tunisia 499  
 Turkey 795  
*U. prolifera* 1031  
 UCP3 61  
 Ultrasonography 560  
 Ultrastructural changes 171  
 UPGMA 513  
 UPGMA dendrogram 25  
 UPLC-MS 590  
*Urechis unicinctus* 848  
 Utilization efficiency 703  
 Vegetables 1173  
 Venom genes 1189  
 Vermicompost 786  
 Viability indices 979  
 Vibration 345  
*Vicia faba* 499  
*Vigna subterranean* 547  
 Wastewater 135  
 Water dynamics in soil profile 1004  
 Water scarcity 1004  
 Water stress 943  
 Water use efficiency 416, 767  
 Waterlogging 472  
 Wax biosynthesis 911  
 Wax diversity 911  
 Wax recovery 1228  
 Weed control 1083  
 Weed-plant water extracts 215  
 Western Himalayas 659  
 Wet dry cycles 244  
 Wheat 1249, 244, 271, 351, 385, 416, 437, 463, 615, 733, 964  
 Wheat growth 1117  
 Wheat rusts 251  
 Wheat sharp eyespot 282  
 Wild emmer 155  
 Wild soybean and cultivated soybean 479  
 WinRhizo pro 667  
 Winter wheat 472  
 Wistar Albino rats 1123  
 yellow rust 520  
 Yield 120, 615, 922, 1137  
 Yield formation 385  
 Yield traits 621  
*Zea mays* L. 1197, 827  
 Zeta potential 775  
 Zinc application 553  
 Zinc deficiency 615  
 Zinc mining industry 1205  
 Zinc toxicity 553  
 $\alpha$ -tocopherol 971  
 $\beta$ -1,3-glucanase 85  
 $\beta$ -diketones 1249