



[A15-P-12] 森林総合研究所研究者による高被引用論文の研究分野の動向

(森林総研) ○香川 聡



ポスターPDFファイル(紙版自由ダウンロード)

日本の研究力については、諸外国と比較して、論文数の点で相対的・長期的に、地位が低下してきている。また、論文の質と関係する被引用回数...

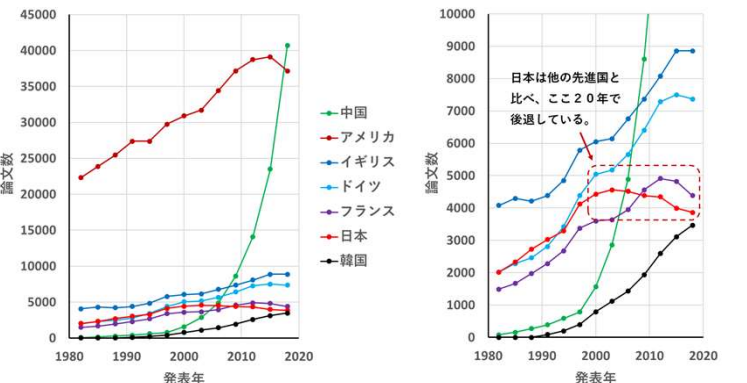


図1 主要国のTop10%補正論文数の推移 (出典)文部科学省 科学技術・学術政策研究所「科学研究のベンチマーキング(2020)および豊田(2019)を改変。論文の被引用数が上位10%に入る論文数において、2004年を境に日本のみが他国に比べて後退してきていることが分かる。

表1 論文の質と被引用回数は相関するか? (ノーベル賞受賞対象論文の被引用回数、2022年2月現在) ノーベル賞受賞対象論文の被引用回数...

被引用回数	受賞者名(筆頭著者名)	タイトル	雑誌名	掲載年
16127	山中 伸弥(英敏 邦利)	Induction of pluripotent stem cells from mouse embryonic and adult fibroblast cultures by defined factors	CELL	2006
5483	小林 誠, 山崎 義久	CP-violation in recombination theory of weak interaction	PROGRESS OF THEORETICAL PHYSICS	1975
3955	野村 浩徳	Somatic generation of antibody diversity	NATURE	1983
2490	本原 昭(村松 王道)	Class switch recombination and hypermutation require activation-induced cytosine deaminase (AID), a potential RNA editing enzyme	CELL	2000
1553	野村 浩徳	Extraction, purification and properties of aequorin, a bioluminescent protein from luminous hydromedusa, aequorea	JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY	1962
646	長瀬 源治	Thermal equilibrium of the atmosphere with a convective adjustment	JOURNAL OF THE ATMOSPHERIC SCIENCES	1964

【解析方法】 ゲーグル社の「ゲーグル・スカラー」やクラリベイト・アナリティクス社の「ウェブ・オブ・サイエンス」が論文の被引用回数のデータベースとしてよく利用されているが、前者の引用データにはIF値の存在しない国際学会要旨集や「ハゲタカジャーナル」の論文等も含まれているという問題があるため、より信頼性の高いある一定の基準を満たした英文誌に掲載された論文のみを対象とする後者を解析に用いた。著者所属の欄が「Forestry & Forest Products Research Institute - Japan」に該当する論文のみを解析対象とし、データベースに収録されている1900年-2022年に発表された全論文を被引用回数順に並び替えることにより、高被引用論文を抽出した。さらに、発表者の属する「組織と材質」研究分野に属する研究者の氏名でも絞り込みを行い、同分野での研究動向を調べた。

【結果および考察】 森林総合研究所全体では(1)多糖類やセルロースに関する論文(石井忠、近藤哲男、片岡厚、山田竜彦)、(2)一斉開花の同調性に関する論文(井鷲裕司)、(3)森林浴の生理学・心理学的効果に関する論文(恒次祐子)が最も多く引用されていた(表2)。組織材質分野においては、¹³C₂O₂パルスラベリング法による光合成産物の木材形成利用に関する論文(香川聡)、形成層加温による木部分化の再活動に関する論文(織部雄一郎)が最も多く引用されていた。筆者の所属する組織材質研究室全体の被引用回数は約1000回で(表3)、水と木材、木材中の放射性セシウムに関する論文が多く引用されていた(表4)。

【引用文献】 DORA(San Francisco Declaration on Research Assessment, 研究評価に関するサンフランシスコ宣言)、https://sfdrora.org/read/read-the-declaration-japanese/、科学技術・学術政策研究所(2020)科学研究のベンチマーキングhttps://www.nistep.go.jp/research/science-and-technology-indicators-and-scientometrics/benchmark、豊田長康(2019)科学立国の危機:失速する日本の研究力、東洋経済新報社、内閣府(2021)第6期科学技術・イノベーション基本計画 https://www8.cao.go.jp/cstp/kihonkeikaku/index6.html、質問・修正依頼等は右記までご連絡を:香川聡 森林総合研究所 木材加工・特性研究領域 組織材質研究室 Email: akagawa@ffpri.affrc.go.jp Tel:029-829-8301

表2 森林総合研究所における高被引用論文ランキング ウェブ・オブ・サイエンス収録誌に発表された、筆頭著者の所属が森林総合研究所である論文を被引用回数の多い順に並べたもの。注)太字は「組織と材質」研究分野に該当すると思われる分野の論文(2022年2月現在)

順位	被引用回数	筆頭著者	タイトル	雑誌名	掲載年
1	387	石井 忠	Structure and functions of feruloylated polysaccharides	PLANT SCIENCE	1997
2	240	近藤 哲男	A Fourier transform infra-red spectroscopic analysis of the character of hydrogen bonds in amorphous cellulose	POLYMER	1996
3	222	石井 忠	The assignment of IR absorption bands due to free hydroxyl groups in cellulose	CELLULOSE	1997
4	214	井鷲 裕司	How does masting happen and synchronize?	JOURNAL OF THEORETICAL BIOLOGY	1997
5	200	坂本 邦子	Physiological and psychological effects of viewing urban forest landscapes assessed by multiple measurements: Direct and indirect effects of view-angle specific repeat poly(ornithin) in Douglas-fir (Pseudotsuga menziesii) and sugi (Cryptomeria japonica)	LANDSCAPE AND URBAN PLANNING	2013
6	197	津村 英樹	Salivary proteins as a defense against dietary tannins	THEORETICAL AND APPLIED GENETICS	1996
7	184	奥田 真樹	FT-IR microscopic analysis of changing cellulose crystalline structure during wood cell wall formation	JOURNAL OF CHEMICAL ECOLOGY	2006
8	184	片岡 厚	Chemical structure of a novel cellulose derivative from the cell walls of sugar beet pulp	MACROMOLECULES	1999
9	183	高木 浩一	Isolation and characterization of a feruloyl arabinosyl hexosaccharide from bamboo shoot cell-walls	BIOPOLYMER LETTERS	1988
10	167	山田 竜彦	Rapid liquefaction of lignocellulosic waste by using ethylene carbonate	BIORESOURCES TECHNOLOGY	1998
11	167	石井 忠	Isolation and characterization of a feruloyl arabinosyl hexosaccharide from bamboo shoot cell-walls	CARBOHYDRATE RESEARCH	1991
12	166	小林 義久	The Japanese pine sawyer beetle as the vector of pine wilt disease	ANNUAL REVIEW OF ENTOMOLOGY	1984
13	164	穴水 隆彦	Stem strength and toughness of heat-treated wood	JOURNAL OF WOOD SCIENCE	2000
14	156	野口 正二	Morphological characteristics of macrospores and the distribution of preferential flow pathways in a forested slope segment	SOIL SCIENCE SOCIETY OF AMERICA JOURNAL	1999
15	156	山田 竜彦	Flow and solute transport through the soil matrix and macrospores of a hillside segment	WATER RESOURCES RESEARCH	1994
16	154	石井 忠	Isolation and characterization of a novel xanthan-galacturonate complex from cell walls of sugar beet pulp	CARBOHYDRATE RESEARCH	1996
17	154	香川 聡	¹³ C ₂ O ₂ pulse-labelling of photosynthates reveals carbon allocation within and between tree rings	PLANT CELL AND ENVIRONMENT	2006
18	154	織部 雄一	A family of glycosyl hydrolase family 45 cellulases from the pine wood nematode Bursaphelenchus xylophilus	FEBS LETTERS	2004
19	154	織部 雄一	Community structure of a species-rich temperate forest. Oligona forest reserves, central Japan	VEGETATIO	1992
20	152	香川 聡	Mast year synchrony of conifers using RFLP analysis of RFLP-amplified specific chloroplast genes	THEORETICAL AND APPLIED GENETICS	1996
21	146	山田 正樹	Preparation and characterization of polyurethane foams using a pain oil-based polyol	BIORESOURCES TECHNOLOGY	2008
22	146	山田 正樹	Accumulation to sudden increase in light favouring an invasive over native trees in subtropical islands, Japan	ECOLOGIA	2000
23	145	織部 雄一	The total amounts of radiatively contaminated materials in forests in Fukushima, Japan	SCIENTIFIC REPORTS	2012
24	143	香川 聡	A rapid and precise diagnostic method for detecting the pine wood nematode Bursaphelenchus xylophilus by rapid-depleted isothermal amplification	PHYTOPATHOLOGY	2009
25	142	石井 忠	The plant cell wall polysaccharide rhamnogalacturonan II self-assembles into a covalently cross-linked dimer	JOURNAL OF BIOLOGICAL CHEMISTRY	1999
26	141	織部 雄一	A new carbon fibre from lignin	JOURNAL OF APPLIED POLYMER SCIENCE	1992
27	134	織部 雄一	Relationships between cambial activity, cell differentiation and the localization of starch in storage tissues among the cambium of locally heated stems of Abies sachalinensis (Schmidt) Masters	TREES-STRUCTURE AND FUNCTION	2003
28	132	織部 雄一	Global spatiotemporal distribution of soil respiration modeled using a global database	BIOSCIENCE	2015
29	129	山田 正樹	Characterization of the products resulting from ethylene glycol liquefaction of cellulose	JOURNAL OF WOOD SCIENCE	2000
30	129	石井 忠	Formation of rhamnogalacturonan II borate dimers in pectin determines cell wall thickness of pumpkin tissue	PLANT PHYSIOLOGY	2000
31	124	中野 浩	Role of sprouting in composition and dynamics of an old-growth forest in Japan	ECOLOGY	1989
32	121	織部 雄一	"Nematic ordered cellulose": A concept of glucan chain association	BIOMACROMOLECULES	2000
33	121	穴水 隆彦	The effects of red-fall rot on wood properties	ENGINEERING GEOLOGY	2000
34	121	北原 光栄	Susceptibility to photoinhibition of three deciduous broadleaf tree species with different successional traits raised under various light regimes	PLANT CELL AND ENVIRONMENT	2000
35	120	森 亮	Mixed-power scaling of whole-plant respiration from seedlings to giant trees	PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	2010
36	118	谷 誠	Runoff generation processes estimated from hydrological observations on a steep forested hillside with a thin soil layer	JOURNAL OF HYDROLOGY	1997
37	117	織部 雄一	Nanosulfur-stabilized Pickering emulsions and their applications	SCIENCE AND TECHNOLOGY OF ADVANCED MATERIALS	2017
37	117	香川 聡	Seasonal course of translocation, storage and remobilization of C-13 pulse-labelled photosynthates in naturally growing Larix griffithii saplings	NEW PHYTOLOGIST	2006
39	112	井鷲 裕司	Net production and carbon cycling in a bamboo Phytostichus subspensus stand	PLANT ECOLOGY	1997
40	112	織部 雄一	Aluminum coloring, photosynthetic performance and leaf development of deciduous broad-leaved trees in relation to forest succession	TREE PHYSIOLOGY	1990
41	111	織部 雄一	Cambial reactivation in locally heated stems of the evergreen conifer Abies sachalinensis (Schmidt) Masters	PLANTA	2001
42	108	中野 浩	Regeneration dynamics of beech forests in Japan	VEGETATIO	1987
43	107	田中 重康	Changes in photosynthesis and leaf characteristics with tree height in five dipterocarp species in a tropical rain forest	TREE PHYSIOLOGY	2006
44	106	高山 龍輝	Emotional, restorative and vitalizing effects of forest and urban environments at four sites in Japan	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	2014
45	106	織部 雄一	Organic carbon flux in forest soils in Japan	GLOBAL CHANGE BIOLOGY	2004
46	97	織部 雄一	Loss of flight promotes beetle diversification	NATURE COMMUNICATIONS	2012
47	97	中川 浩文	Cosynopsis in lepidoptera and other mammalian herbivores	MAMMALIAN REVIEW	2001
48	97	穴水 隆彦	Aggressive foraging of social bees as a mechanism of floral resource partitioning in an Asian tropical rainforest	ECOLOGIA	1997
49	95	武生 啓明	Effects of topography on tropical lowland montane forest under different geological conditions on Mount Kinabalu, Borneo	PLANT ECOLOGY	2002
50	93	村上 隆博	A proposal for a new forest canopy interception mechanism: Spill-droplet evaporation	JOURNAL OF HYDROLOGY	2004
50	93	織部 雄一	Large-scale simulation of coherent turbulence structures associated with scalar ramps over plant canopies	BOUNDARY-LAYER METEOROLOGY	2004
50	93	織部 雄一	The effects of tracheal dimensions on variations in maximum density of Picea glehnii and relationships to climatic factors	TREES-STRUCTURE AND FUNCTION	2000
53	92	香川 聡	Whole-plant carbon sequestration of wind blown trees affected by stratospheric radiation	ECOLOGIA	2002
53	92	織部 雄一	Synchronised annual seed production by 16 principal tree species in a temperate deciduous forest, Japan	ECOLOGIA	2000
53	92	石井 忠	O-acetylated oligosaccharides from pectins of potato tuber cell walls	PLANT PHYSIOLOGY	1997
56	90	中野 浩	Limiting factors in the detection of tree roots using ground-penetrating radar	PLANT AND SOIL	2009
56	90	織部 雄一	Temporal water deficit and wood formation in Cystopteris japonica	TREE PHYSIOLOGY	2003
56	90	野村 浩徳	The change of a satsuman landscape and its causality in Kamiseya, Kyoto Prefecture, Japan between 1970 and 1995	LANDSCAPE ECOLOGY	2001
56	90	阿部 和伸	Effect of tree roots on a shear zone - modelling reinforced shear stress	CANADIAN JOURNAL OF FOREST RESEARCH	1991
60	89	山田 正樹	Soil phosphorus fractionation and phosphorus-use efficiencies of tropical rainforests along altitudinal gradients of Mount Kinabalu, Borneo	ECOLOGIA	2000
60	89	井鷲 裕司	The population dynamics of the vole Clethrionomys rufocanus in Hokkaido, Japan	RESEARCHES ON POPULATION ECOLOGY	1998
62	88	織部 雄一	Influence of the melamine core in melamine-urea-formaldehyde resins on formaldehyde emission and core resin structure	JOURNAL OF WOOD SCIENCE	2001
62	88	織部 雄一	Seed and seedling demography of 4 cooccurring carpinus species in a temperate deciduous forest	ECOLOGIA	1995
62	88	織部 雄一	Forest fragmentation and its effect on species-diversity in suburban coppice forests in Japan	FOREST ECOLOGY AND MANAGEMENT	1995
65	87	織部 雄一	Molecular biochemical characterization of an endo-beta-1,3-glucanase from the pine wood nematode Bursaphelenchus xylophilus acquired by horizontal gene transfer from bacteria	BIOCHEMICAL JOURNAL	2005
65	87	石塚 浩志	An intensive field study on CO ₂ , CH ₄ , and N ₂ O emissions from soils at four land-use types in Sumatra, Indonesia	GLOBAL BIOGEOCHEMICAL CYCLES	2002
65	87	織部 雄一	The relationship between intermolecular hydrogen bonds and certain physical properties of regioselectively substituted cellulose derivatives	JOURNAL OF POLYMER SCIENCE	1997
68	86	山田 正樹	Fifteen years of canopy dynamics analyzed by aerial photographs in a temperate deciduous forest, Japan	ECOLOGIA	1997
69	85	織部 雄一	Estimation of root biomass based on occurrence of individual root systems in a primary dipterocarp forest in Pasoh Forest Reserve, Peninsular Malaysia	JOURNAL OF TROPICAL ECOLOGY	2004
69	85	織部 雄一	Coordination between leaf and stem traits related to leaf carbon gain and hydraulic conductance in drought-tolerant angiosperms	ECOLOGIA	2008
69	85	石井 忠	Lactonase hydrolysis process by flame experiments	ENGINEERING GEOLOGY	2000
69	85	石井 忠	Polyacetaldehyde (rhamnogalacturonan II) is covalently linked to homogalacturonan	PHYTOCHEMISTRY	2001
69	85	織部 雄一	Condensation reactions of softwood and hardwood lignin model compounds under organic acid cooking conditions	JOURNAL OF WOOD CHEMISTRY AND TECHNOLOGY	1997

筆頭著者	被引用回数	割合 (%)
香川 聡	440	44.5
安部 久	247	25.0
黒田 文	171	17.3
山下 香菜	90	9.1
大橋 伸太	41	4.1
合計	989	100.0

(2022年2月現在)

表4 組織材質分野における高被引用論文の詳細 組織材質研究室発の論文では、安定炭素同位体ラベリング法を応用した研究の他に、水分動態・通導と木材形成・機能の関係、セルロースマイクロフィブリル、木材中の放射性セシウム形態についての論文が最も多く引用されていた。

順位	被引用回数	筆頭著者	タイトル	雑誌名	掲載年
1	154	香川 聡	¹³ C ₂ O ₂ pulse-labelling of photosynthates reveals carbon allocation within and between tree rings	PLANT CELL AND ENVIRONMENT	2006
2	117	香川 聡	Seasonal course of translocation, storage and remobilization of C-13 pulse-labelled photosynthates in naturally growing Larix griffithii saplings	NEW PHYTOLOGIST	2006
3	90	安部 久	Temporal water deficit and wood formation in Cystopteris japonica	TREE PHYSIOLOGY	2003
4	74	織部 雄一	Radicalium concentrations in the bark, sapwood and heartwood of three tree species collected at Fukushima forests half a year after the Fukushima Dai-ichi nuclear accident	JOURNAL OF ENVIRONMENTAL RADIOACTIVITY	2013
5	70	安部 久	Effect of the water status within a tree on tracheid morphogenesis in Cystopteris japonica D-Don	TREES-STRUCTURE AND FUNCTION	1999
6	41	香川 聡	An optimized method for stable isotope analysis of tree rings by extracting cellulose directly from cross-sectional laths	CHEMICAL GEOLOGY	2015
7	40	織部 雄一	Reversible cellulose microfibrils in the cell walls of tracheids in conifers	PLANT CELL AND ENVIRONMENT	2005
8	37	織部 雄一	Stable carbon isotopes of tree rings as a tool to pinpoint the geographic origin of timber	JOURNAL OF WOOD SCIENCE	2010
8	37	香川 聡	Effects of spatial and temporal variability in soil moisture on tracheid cell wall C-13 values of eastern Siberian tree rings	JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES	2003
10	33	織部 雄一	Cellular level observation of water loss and the healing of wounds in the xylem of Cystopteris japonica during heartwood formation	PLANT CELL AND ENVIRONMENT	2003
11	33	織部 雄一	The cryo-TOF-GIMS/SEM system for the analysis of the chemical distribution in freeze-dried Cystopteris japonica wood	SURFACE AND INTERFACE ANALYSIS	2013
12	27	織部 雄一	Temporal photosynthetic carbon isotope signatures revealed in a tree ring through ¹³ C ₂ O ₂ pulse-labelling	PLANT CELL AND ENVIRONMENT	2005
12	27	山下 香菜	Effects of microfibril angle and density on variation of modulus of elasticity of oak	MOKUZAI GAKKAISHI	2000
14	25	香川 聡	Tree-ring chromium-90 and cesium-137 as potential indicators of radioactive fallout	JOURNAL OF ENVIRONMENTAL QUALITY	2002
15	25	穴水 隆彦	Temporal trends in Cs-137 concentrations in the bark, sapwood, heartwood, and wood of four tree species in Japanese forests from 2011 to 2016	JOURNAL OF ENVIRONMENTAL RADIOACTIVITY	2017

組織材質研究室の職員が筆頭著者として発表した論文を、引用回数が多い順に並べたもの。筆頭著者以外の研究者は省略している。