

# Nelson Barros Colauto

## List of Publications by Year in descending order

Source: <https://exaly.com/author-pdf/9283856/publications.pdf>

Version: 2024-02-01

120  
papers

2,491  
citations

331259

21  
h-index

233125

45  
g-index

121  
all docs

121  
docs citations

121  
times ranked

2923  
citing authors

#	ARTICLE	IF	CITATIONS
1	Tomato as a Natural Source of Dyes in the Food Industry: A Patent Data Analysis. Recent Patents on Nanotechnology, 2023, 17, 243-258.	0.7	1
2	Iron-enriched mycelia of edible and medicinal basidiomycetes. Environmental Technology (United Kingdom), 2021, 42, 2611-2623.	1.2	10
3	Larvicidal activity of <i>Brunfelsia uniflora</i> extracts on <i>Aedes aegypti</i> larvae. Natural Product Research, 2022, 36, 1031-1037.	1.0	4
4	Cytotoxicity and anti-inflammatory activities of <i>Gallesia integrifolia</i> (Phytolaccaceae) fruit essential oil. Natural Product Research, 2022, 36, 2878-2883.	1.0	2
5	Bacopa monnieri: Historical aspects to promising pharmacological actions for the treatment of central nervous system diseases. Boletín Latinoamericano Y Del Caribe De Plantas Medicinales Y Aromaticas, 2022, 21, 131-155.	0.2	0
6	Basidiocarp structures of <i>Lentinus crinitus</i> : an antimicrobial source against foodborne pathogens and food spoilage microorganisms. World Journal of Microbiology and Biotechnology, 2022, 38, 74.	1.7	7
7	Endophytic fungi of <i>Brunfelsia uniflora</i> : isolation, cryopreservation, and determination of enzymatic and antioxidant activity. World Journal of Microbiology and Biotechnology, 2022, 38, 94.	1.7	7
8	Long-term cryopreservation of <i>Lentinus crinitus</i> strains by wheat grain technique. Journal of Microbiological Methods, 2022, 198, 106491.	0.7	2
9	Sugarcane biomass colonized by <i>Pleurotus ostreatus</i> for red 4B dye removal: a sustainable alternative. Environmental Technology (United Kingdom), 2021, 42, 2611-2623.	1.2	3
10	Produção de biomassa micelial e enzimas lignocelulolíticas de <i>Pleurotus</i> spp. em meio de cultivo líquido. Research, Society and Development, 2021, 10, e6810111406.	0.0	0
11	Insecticidal activity of <i>Gallesia integrifolia</i> (Phytolaccaceae) essential oil. Boletín Latinoamericano Y Del Caribe De Plantas Medicinales Y Aromaticas, 2021, 20, 38-50.	0.2	2
12	Antimicrobial activity, chemical composition and cytotoxicity of <i>Lentinus crinitus</i> basidiocarp. Food and Function, 2021, 12, 6780-6792.	2.1	11
13	Iron Bioaccumulation in <i>Lentinus crinitus</i> Mycelia Cultivated in Agroindustrial Byproducts. Waste and Biomass Valorization, 2021, 12, 4965-4974.	1.8	8
14	<i>Lentinus crinitus</i> basidiocarp stipe and pileus: chemical composition, cytotoxicity and antioxidant activity. European Food Research and Technology, 2021, 247, 1355-1366.	1.6	9
15	Use of green light to improve the production of lignocellulose-decay enzymes by <i>Pleurotus</i> spp. in liquid cultivation. Enzyme and Microbial Technology, 2021, 149, 109860.	1.6	10
16	Red Tomato Products as an Alternative to Reduce Synthetic Dyes in the Food Industry: A Review. Molecules, 2021, 26, 7125.	1.7	18
17	Crude extract of the tropical tree <i>Gallesia integrifolia</i> (Phytolaccaceae) for the control of <i>Aedes aegypti</i> (Diptera: Culicidae) larvae. Revista De Biología Tropical, 2021, 69, .	0.1	2
18	Essential oil and fractions isolated of Laurel to control adults and larvae of cattle ticks. Natural Product Research, 2020, 34, 731-735.	1.0	12

#	ARTICLE	IF	CITATIONS
19	Decolorization of azo and anthraquinone dyes by crude laccase produced by <i>Lentinus crinitus</i> in solid state cultivation. <i>Brazilian Journal of Microbiology</i> , 2020, 51, 99-106.	0.8	21
20	Improved antioxidant activity of a starch and gelatin-based biodegradable coating containing <i>Tetradenia riparia</i> extract. <i>International Journal of Biological Macromolecules</i> , 2020, 165, 1038-1046.	3.6	18
21	Five-year cryopreservation at $\sim 80^{\circ}\text{C}$ of edible and medicinal basidiomycetes by wheat grain technique. <i>Journal of Microbiological Methods</i> , 2020, 176, 106030.	0.7	8
22	Iron biofortification and availability in the mycelial biomass of edible and medicinal basidiomycetes cultivated in sugarcane molasses. <i>Scientific Reports</i> , 2020, 10, 12875.	1.6	17
23	Shelf-life of guavas coated with biodegradable starch and cellulose-based films. <i>International Journal of Biological Macromolecules</i> , 2020, 152, 272-279.	3.6	48
24	Mycelial biomass cultivation of <i>Lentinus crinitus</i> . <i>Bioscience Journal</i> , 2020, 36, .	0.4	9
25	Iron Or Zinc Bioaccumulated In Mycelial Biomass Of Edible Basidiomycetes. <i>Anais Da Academia Brasileira De Ciencias</i> , 2020, 92, e20191350.	0.3	9
26	Coculture of white rot fungi enhance laccase activity and its dye decolorization capacity. <i>Research, Society and Development</i> , 2020, 9, e88191110643.	0.0	2
27	<i>Inga laurina</i> crude extract to control <i>Aedes aegypti</i> . <i>Research, Society and Development</i> , 2020, 9, e1819119683.	0.0	3
28	Antimicrobial activity of essential oil from <i>Psidium cattleianum</i> Afzel. ex Sabine leaves. <i>Boletim Latinoamericano Y Del Caribe De Plantas Medicinales Y Aromaticas</i> , 2020, 19, 614-627.	0.2	8
29	Fases fenol <sup>3</sup> gicas da jabuticaba ( <i>Plinia cauliflora</i> ) e composi <sup>3</sup> o qu <sup>3</sup> mica do <sup>3</sup> leo essencial das folhas e atividade antioxidante. <i>Research, Society and Development</i> , 2020, 9, e396997305.	0.0	3
30	Citologia comparativa do processo de infec <sup>3</sup> o do con <sup>3</sup> dio falcado e oval de <i>Colletotrichum sublineola</i> em cultivar de sorgo suscet <sup>3</sup> vel e resistente. <i>Research, Society and Development</i> , 2020, 9, e78491110211.	0.0	0
31	In silico characterization of laccase gene isoforms of edible and medicinal basidiomycetes. <i>Research, Society and Development</i> , 2020, 9, e1791210388.	0.0	0
32	Lacase de <i>Agaricus subrufescens</i> cultivado em meio com mel <sup>3</sup> o de cana-de-a <sup>3</sup> car promove a descolora <sup>3</sup> o de corantes sint <sup>3</sup> icos. <i>Research, Society and Development</i> , 2020, 9, e12391210942.	0.0	2
33	Evolu <sup>3</sup> o da curva de casos de COVID-19 nas cidades que pertencem <sup>3</sup> macrorregi <sup>3</sup> o noroeste do Estado do Paran <sup>3</sup> , Brasil. <i>Research, Society and Development</i> , 2020, 9, e14891210978.	0.0	1
34	Capacidade de bioacumula <sup>3</sup> o de l <sup>3</sup> io por basidiomicetos - uma breve revis <sup>3</sup> o. <i>Research, Society and Development</i> , 2020, 9, e21291210998.	0.0	0
35	Atividade bioinseticida de <i>Philodendron bipinnatifidum</i> . <i>Research, Society and Development</i> , 2020, 9, e85791110464.	0.0	1
36	Levantamento epidemiol <sup>3</sup> gico dos casos de dengue, febre chikungunya e v <sup>3</sup> rus Zika na macro regi <sup>3</sup> o noroeste do Estado do Paran <sup>3</sup> no per <sup>3</sup> odo de 2015 a 2020. <i>Research, Society and Development</i> , 2020, 9, e14591210950.	0.0	0

#	ARTICLE	IF	CITATIONS
37	Potencial Antioxidante do Óleo essencial de <i>Campomanesia xanthocarpa</i> O. Berg. <i>Research, Society and Development</i> , 2020, 9, e85891110474.	0.0	0
38	Structural soil quality related to microbiological parameters in sugarcane. <i>Anais Da Academia Brasileira De Ciencias</i> , 2020, 92, e20190450.	0.3	0
39	<i>Lentinus crinitus</i> response to blue light on carbohydrate-active enzymes. <i>Bioscience Journal</i> , 2020, 36, .	0.4	2
40	<i>Baccharis dracunculifolia</i> DC (Asteraceae) leaf and flower essential oils to control <i>Rhipicephalus microplus</i> Canestrini (Arachnida: Ixodidae) in the free-living stage. <i>Research, Society and Development</i> , 2020, 9, e5049108788.	0.0	3
41	<i>Schinus terebinthifolius</i> (Anacardiaceae) essential oil for minas frescal cheese preservation. <i>Research, Society and Development</i> , 2020, 9, e1619119760.	0.0	0
42	Gene characterization of <i>Bradyrhizobium</i> spp. strains contrasting in biological nitrogen fixation efficiency in soybean. <i>Semina: Ciencias Agrarias</i> , 2020, 41, 3067-3080.	0.1	1
43	Determinação dos Índices físico-químicos dos óleos essenciais de <i>Rosmarinus officinalis</i> , <i>Cymbopogon citratus</i> e <i>Cymbopogon winterianus</i> . <i>Research, Society and Development</i> , 2020, 9, e4359119959.	0.0	0
44	Caracterização química e sensorial de geleia mista de uva e maracujá nas formulações tradicional, light e diet. <i>Research, Society and Development</i> , 2020, 9, e64191110026.	0.0	1
45	Lithium bioaccumulation in <i>Lentinus crinitus</i> mycelial biomass as a potential functional food. <i>Chemosphere</i> , 2019, 235, 538-542.	4.2	27
46	Control of bovine tick [ <i>Rhipicephalus (Boophilus) microplus</i> ] with <i>Brunfelsia uniflora</i> leaf extract. <i>Australian Journal of Crop Science</i> , 2019, , 903-910.	0.1	4
47	Semisolid culture medium improves mycelial recovery of <i>Agaricus subrufescens</i> cryopreserved in cereal grains. <i>Brazilian Journal of Microbiology</i> , 2019, 50, 527-532.	0.8	8
48	Antimicrobial Activity of Essential Oil of <i>Baccharis dracunculifolia</i> DC (Asteraceae) Aerial Parts at Flowering Period. <i>Frontiers in Plant Science</i> , 2019, 10, 27.	1.7	65
49	Iron and zinc mycelial bioaccumulation in <i>Agaricus subrufescens</i> strains. <i>Semina: Ciencias Agrarias</i> , 2019, 40, 2513.	0.1	10
50	Cover crop and deep tillage on sandstone soil structure and microbial biomass. <i>Archives of Agronomy and Soil Science</i> , 2019, 65, 980-993.	1.3	9
51	<i>Schinus terebinthifolius</i> essential oil and fractions in the control of <i>Aedes aegypti</i> . <i>Bioscience Journal</i> , 2019, 35, .	0.4	9
52	Antifungal activity of <i>Gallesia integrifolia</i> fruit essential oil. <i>Brazilian Journal of Microbiology</i> , 2018, 49, 229-235.	0.8	17
53	Cryopreservation at $\sim 75^\circ\text{C}$ of <i>Agaricus subrufescens</i> on wheat grains with sucrose. <i>Brazilian Journal of Microbiology</i> , 2018, 49, 370-377.	0.8	7
54	Long-term cryopreservation of basidiomycetes. <i>Brazilian Journal of Microbiology</i> , 2018, 49, 220-231.	0.8	14

#	ARTICLE	IF	CITATIONS
55	Panus strigellus laccase decolorizes anthraquinone, azo, and triphenylmethane dyes. Biocatalysis and Agricultural Biotechnology, 2018, 16, 558-563.	1.5	20
56	Metallic-aromatic compounds synergistically induce Lentinus crinitus laccase production. Biocatalysis and Agricultural Biotechnology, 2018, 16, 625-630.	1.5	17
57	Larvicidal activity against <i>Aedes aegypti</i> of essential oil of <i>Laurus nobilis</i> leaves obtained at different seasons. Journal of Essential Oil Research, 2018, 30, 379-387.	1.3	9
58	Decolorization of remazol brilliant blue R with laccase from Lentinus crinitus grown in agro-industrial by-products. Anais Da Academia Brasileira De Ciencias, 2018, 90, 3463-3473.	0.3	20
59	Bioaccumulation of Lithium (Li <sub>2</sub> CO <sub>3</sub> ) in Mycelia of the Culinary-Medicinal Oyster Mushroom, Pleurotus ostreatus (Agaricomycetes). International Journal of Medicinal Mushrooms, 2018, 20, 901-907.	0.9	20
60	Research Article Lentinus crinitus strains respond differently to cultivation pH and temperature. Genetics and Molecular Research, 2018, 17, .	0.3	18
61	Characterization of aapP and nopP genes related to the biological nitrogen fixation efficiency with soybean in contrasting strains of Bradyrhizobium japonicum. Genetics and Molecular Research, 2018, 17, .	0.3	1
62	Research Article Antioxidant activity and chemical composition of oleoresin from leaves and flowers of Brunfelsia uniflora.. Genetics and Molecular Research, 2017, 16, .	0.3	5
63	Antimicrobial activity and chemical composition of Brunfelsia uniflora flower oleoresin extracted by supercritical carbon dioxide. Genetics and Molecular Research, 2017, 16, .	0.3	3
64	Genetic diversity and pectinolytic activity of epiphytic yeasts from grape carposphere. Genetics and Molecular Research, 2017, 16, .	0.3	4
65	Research Article High molecular weight glutenin subunits and the classification used in Brazilian wheat industry.. Genetics and Molecular Research, 2017, 16, .	0.3	3
66	Research Article Internal amplification control of PCR for the Glu1-Dx5 allele in wheat.. Genetics and Molecular Research, 2017, 16, .	0.3	0
67	Iron translocation in Pleurotus ostreatus basidiocarps: production, bioavailability, and antioxidant activity. Genetics and Molecular Research, 2016, 15, .	0.3	19
68	Identification and characterization of genes related to cellulolytic activity in basidiomycetes. Genetics and Molecular Research, 2016, 15, .	0.3	2
69	Genomic variability of Pantoea ananatis in maize white spot lesions assessed by AFLP markers. Genetics and Molecular Research, 2016, 15, .	0.3	2
70	Quimiotipos, Extracci3n, Composici3n y Aplicaciones del Aceite Esencial de Lippia alba. Revista Brasileira De Plantas Medicinai, 2016, 18, 191-200.	0.3	14
71	Use of sugarcane molasses by Pycnoporus sanguineus for the production of laccase for dye decolorization. Genetics and Molecular Research, 2016, 15, .	0.3	22
72	Antifungal and antibacterial activities of Petroselinum crispum essential oil. Genetics and Molecular Research, 2016, 15, .	0.3	50

#	ARTICLE	IF	CITATIONS
73	Characterization of the <i>inaA</i> gene and expression of ice nucleation phenotype in <i>Pantoea ananatis</i> isolates from Maize White Spot disease. <i>Genetics and Molecular Research</i> , 2016, 15, 15017863.	0.3	11
74	<i>Agaricus subrufescens</i> : substratum nitrogen concentration and mycelial extraction method on antitumor activity. <i>Anais Da Academia Brasileira De Ciencias</i> , 2016, 88, 2239-2246.	0.3	7
75	Evaluation of Pb (II) biosorption utilizing sugarcane bagasse colonized by Basidiomycetes. <i>Environmental Monitoring and Assessment</i> , 2016, 188, 279.	1.3	23
76	<i>Pseudomonas putida</i> Stimulates Primordia on <i>Agaricus bitorquis</i> . <i>Current Microbiology</i> , 2016, 72, 482-488.	1.0	34
77	Biosorption of Pb <sup>2+</sup> , Cr <sup>3+</sup> , and Cu <sup>2+</sup> by peach palm sheath modified colonized by <i>Agaricus Blazei</i> . <i>Desalination and Water Treatment</i> , 2016, 57, 19927-19938.	1.0	5
78	Short Communication Screening of basidiomycetes in submerged cultivation based on antioxidant activity. <i>Genetics and Molecular Research</i> , 2015, 14, 9907-9914.	0.3	21
79	Effect of different compounds on the induction of laccase production by <i>Agaricus blazei</i> . <i>Genetics and Molecular Research</i> , 2015, 14, 15882-15891.	0.3	28
80	Iron bioaccumulation in mycelium of <i>Pleurotus ostreatus</i> . <i>Brazilian Journal of Microbiology</i> , 2015, 46, 195-200.	0.8	32
81	Novel insights into the early stages of infection by oval conidia of <i>Colletotrichum sublineolum</i> . <i>Scientia Agricola</i> , 2015, 72, 351-355.	0.6	4
82	Oyster Culinary-Medicinal Mushroom, <i>Pleurotus ostreatus</i> (Higher Basidiomycetes), Growth in Grain-Based Diet Improves Broiler Chicken Production. <i>International Journal of Medicinal Mushrooms</i> , 2015, 17, 169-178.	0.9	5
83	Fungicidal effect of <i>Lippia alba</i> essential oil on a white-rot fungus. <i>Maderas: Ciencia Y Tecnologia</i> , 2015, , 0-0.	0.7	2
84	Photoprotective and Antimutagenic Activity of <i>Agaricus subrufescens</i> Basidiocarp Extracts. <i>Current Microbiology</i> , 2015, 71, 476-482.	1.0	11
85	New Natural Diterpene-Type Abietane from <i>Tetradenia riparia</i> Essential Oil with Cytotoxic and Antioxidant Activities. <i>Molecules</i> , 2014, 19, 514-524.	1.7	43
86	Optimization of <i>Agaricus blazei</i> laccase production by submerged cultivation with sugarcane molasses. <i>African Journal of Microbiology Research</i> , 2014, 8, 939-946.	0.4	18
87	Regenera~o de plantas a partir de dois tipos de explantes de milho submetidos ~ transformac~o gen~tica por biobal~stica. <i>Ciencia Rural</i> , 2014, 44, 1804-1809.	0.3	0
88	Optimum conditions for inducing laccase production in <i>Lentinus crinitus</i> . <i>Genetics and Molecular Research</i> , 2014, 13, 8544-8551.	0.3	27
89	Mycelial antineoplastic activity of <i>Agaricus blazei</i> . <i>World Journal of Microbiology and Biotechnology</i> , 2014, 30, 2307-2313.	1.7	14
90	Diversidade gen~tica de popula~es naturais de pariparoba [ <i>Pothomorphe umbellata</i> (L.) Miq.] por RAPD. <i>Revista Brasileira De Plantas Medicinai</i> s, 2013, 15, 47-53.	0.3	4

#	ARTICLE	IF	CITATIONS
91	Molecular authentication of <i>Maytenus</i> sp by PCR-RFLP. <i>Semina:Ciencias Agrarias</i> , 2013, 34, 627-634.	0.1	2
92	Formulação de substratos na produção de biomassa micelial e de lacase de <i>Pleurotus ostreatus</i> . <i>Semina:Ciencias Agrarias</i> , 2012, 33, 1681-1692.	0.1	2
93	Cryopreservation at $-20^{\circ}\text{C}$ and $-70^{\circ}\text{C}$ of <i>Pleurotus ostreatus</i> on Grains. <i>Indian Journal of Microbiology</i> , 2012, 52, 484-488.	1.5	11
94	Viability of <i>Agaricus blazei</i> after long-term cryopreservation. <i>Annals of Microbiology</i> , 2012, 62, 871-876.	1.1	15
95	Changes to Taste Perception in the Food Industry: Use of Cyclodextrins. , 2011, , 99-118.		4
96	Production flush of <i>Agaricus blazei</i> on Brazilian casing layers. <i>Brazilian Journal of Microbiology</i> , 2011, 42, 616-623.	0.8	16
97	Chemical characterization of <i>Lippia alba</i> essential oil: an alternative to control green molds. <i>Brazilian Journal of Microbiology</i> , 2011, 42, 1537-1546.	0.8	29
98	Pasteurização de turfa brasileira para o cultivo de <i>Agaricus brasiliensis</i> . <i>Semina:Ciencias Agrarias</i> , 2011, 31, 1331.	0.1	5
99	Antioxidant activity of <i>Agaricus brasiliensis</i> basidiocarps on different maturation phases. <i>Brazilian Journal of Microbiology</i> , 2011, 42, 197-202.	0.8	31
100	Low carbon/nitrogen ratio increases laccase production from basidiomycetes in solid substrate cultivation. <i>Scientia Agricola</i> , 2011, 68, 295-300.	0.6	39
101	Cryopreservation at $-80^{\circ}\text{C}$ of <i>Agaricus blazei</i> on rice grains. <i>World Journal of Microbiology and Biotechnology</i> , 2011, 27, 3015-3018.	1.7	13
102	Anti-inflammatory activity of <i>Agaricus blazei</i> in different basidiocarp maturation phases. <i>Food and Agricultural Immunology</i> , 2011, 22, 325-333.	0.7	10
103	Genome of <i>Herbaspirillum seropedicae</i> Strain SmR1, a Specialized Diazotrophic Endophyte of Tropical Grasses. <i>PLoS Genetics</i> , 2011, 7, e1002064.	1.5	188
104	Production flush of <i>Agaricus blazei</i> on Brazilian casing layers. <i>Brazilian Journal of Microbiology</i> , 2011, 42, 616-23.	0.8	2
105	Alternative to peat for <i>Agaricus brasiliensis</i> yield. <i>Bioresource Technology</i> , 2010, 101, 712-716.	4.8	45
106	Tratamentos térmicos do calcisto para uso como camada de cobertura no cultivo de <i>Agaricus brasiliensis</i> . <i>Ciencia Rural</i> , 2010, 40, 1660-1663.	0.3	5
107	Carbon-to-nitrogen ratios for <i>Agaricus brasiliensis</i> on the axenic method. <i>Acta Scientiarum - Agronomy</i> , 2010, 32, .	0.6	1
108	The use of 2D NMR to study $\beta$ -cyclodextrin complexation and debittering of amino acids and peptides. <i>Food Research International</i> , 2010, 43, 187-192.	2.9	54

#	ARTICLE	IF	CITATIONS
109	Effects of <i>Agaricus brasiliensis</i> mushroom in Walker-256 tumor-bearing rats. Canadian Journal of Physiology and Pharmacology, 2010, 88, 21-27.	0.7	32
110	Taste modification of amino acids and protein hydrolysate by $\beta$ -cyclodextrin. Food Research International, 2009, 42, 814-818.	2.9	43
111	Antineoplastic activity of <i>Agaricus brasiliensis</i> basidiocarps on different maturation phases. Brazilian Journal of Microbiology, 2009, 40, 901-905.	0.8	15
112	Antineoplastic activity of <i>Agaricus brasiliensis</i> basidiocarps on different maturation phases. Brazilian Journal of Microbiology, 2009, 40, 901-5.	0.8	10
113	Condições de temperatura e pH para o crescimento micelial de <i>Agaricus brasiliensis</i> em cultivo axênico. Semina: Ciências Agrárias, 2008, 29, 307.	0.1	16
114	Column bioreactor use for optimization of pectinase production in solid substrate cultivation. Brazilian Journal of Microbiology, 2007, 38, 557-562.	0.8	14
115	Effect of the addition of nitrogen sources to cassava fiber and carbon-to-nitrogen ratios on <i>Agaricus brasiliensis</i> growth. Canadian Journal of Microbiology, 2007, 53, 139-143.	0.8	23
116	<i>Bradysia difformis</i> Frey and <i>Bradysia ocellaris</i> (Comstock): Two Additional Neotropical Species of Black Fungus Gnats (Diptera: Sciaridae) of Economic Importance: A Redescription and Review. Annals of the Entomological Society of America, 2003, 96, 448-457.	1.3	54
117	Genetic characterization of isolates of the basidiomycete <i>Agaricus blazei</i> by RAPD. Brazilian Journal of Microbiology, 2002, 33, 131.	0.8	30
118	The genome sequence of the plant pathogen <i>Xylella fastidiosa</i> . Nature, 2000, 406, 151-157.	13.7	827
119	Biosorption of reactive red-120 dye onto fungal biomass of wild <i>Ganoderma stipitatum</i> . , 0, 102, 280-288.		1
120	Lithium bioaccumulation in <i>Lentinus crinitus</i> mycelia grown in media with different lithium sources and pH values. Environmental Science and Pollution Research, 0, , .	2.7	0