

## Marc-André Selosse

Born March 29th 1968 in Paris; French; married.

**Affiliations :** **Professor at the Muséum national d'Histoire Naturelle**, UMR 7205,  
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Head of the *Laboratory of Plant Symbiosis* (Faculty of Biology, Univ. of Gdansk).

**Academic career and positions** (more at [https://fr.wikipedia.org/wiki/Marc-André\\_Selosse](https://fr.wikipedia.org/wiki/Marc-André_Selosse))

1988 - 90 BSc and MSc degrees at the Ecole Normale Supérieure (Paris), with honours  
1991 - 93 ENGREF (French Institute of Forestry, Agricultural and Environmental Engineering).  
1993 - 94 Military service as a scientist at the Centre de l'Energie Atomique.  
1994 - 98 PhD, Univ. Paris XI (Population genetics of the mycorrhizal fungus *Laccaria bicolor*).  
1998 - 2000 Research and teaching assistant at ENGREF.  
2000 - 04 Maître de Conférences at the University Pierre & Marie Curie.  
2002 HDR (accreditation to supervise research) at Univ. Paris XI (Orsay).  
2004 - 12 Full 2nd and then 1st class Professor at the University of Montpellier II.  
2013 -> Full 1st and then exceptional class Professor at the Muséum nat. d'Histoire Naturelle.  
2015 - 2018 Visiting Researcher at the University of Viçosa (MG, Brazil).  
2015 -> Visiting Professor at the University of Gdansk (Poland).  
2019 -> Visiting Professor at the University of Kunming (China).

**Linguistic skills.** French, German & English (fluent, written & spoken); I read Latin.

**Decorations & honorific titles.** Médaille de Vermeille by the Acad. of Agriculture (1999); Chevalier du Mérite Agricole (2017); Grand Price of the Rector of the University of Gdansk (2019).

**Main research activities.** I work on mycorrhizae, a symbiosis linking plant roots and soil fungi. I use molecular biology (incl. transcriptomics), metabolomics, microbial ecology (barcoding), isotopic methods and *in situ* experiments. My main contributions to the fields of symbiosis and mycology are: (1) a model for evolutionary pressures on gene loss in organelles; (2) compelling evidence that plants exchange carbon underground by means of shared fungal symbionts (mycorrhizal networks); (3) the discovery that some green forest plants are partly heterotrophic (mixotrophy by recovering carbon from symbiotic fungi); (4) the discovery that the ecological niche of some fungi interacting with plants is larger than currently known, even for large guilds such as aquatic saprobic fungi or ectomycorrhizal fungi; (5) the discovery that some tropical non-green plants access dead soil organic matter by way of mycorrhizal fungi; (6) a partial elucidation of the truffle's life cycle and non-mycorrhizal, endophytic ecology; (7) a framework for the evolution of fungal symbioses of land plants over the last 400 Myrs; and (8) application of the 'interaction networks' theories to the mycorrhizal symbiosis.

**Visibility of research for large audience.** My works have been reported, on mixotrophy in *Nature* (2007, 449: 136), on mycorrhizal networks in *Science* (2004, 304: 1620), and on truffles in *PNAS* (2018, 115: 10188) and in *New Scientist* (2019, 3262: 73). My career was reviewed in *New Phytol.* (2015, 205: 32). My book "*Jamais seul*" (2017) gave rise to >40 press articles or interviews and >25 radio broadcasts. My research on truffles was featured in a CNRS film (<https://lejournal.cnrs.fr/videos/lenigmatique-sexualite-de-la-truffe>).

**Teaching.** I teach >220 hours per year in all, at the Muséum and in other French and European universities, as well as in two 'Grandes Ecoles', ENS rue d'Ulm and ENS de Lyon. My teaching encompasses field and lecture courses in ecology, soil sciences, microbiology, and the evolution of symbiosis, at all university levels (esp. M and D). Abroad, I teach at the University of Gdansk, and in the PhD programme of the Gulbenkian Foundation in Lisbon (2013-17, general ecology, 24h per year). I actively contribute to the writing of curricula for high schools (I was a member in the 2018-19

commission for new biology curricula for high schools). I supervised 24 MSc and 14 PhD theses (incl. 2 ongoing; 8 with permanent positions in research).

**Disseminating science.** Formerly organizer and/or member of the scientific council of 15 national and 26 international congresses. I devote time to outreach by means of articles (156), talks (>45/yr), presence in high schools, Internet material (incl. highly viewed *YouTube* videos, 146 items), radio interviews and broadcasts (e.g. *France-Inter* and *RTL*), TV outreach shows (*E=M6*), and scientific direction of scientific films (5). Collaboration with French outreach journals and newspapers. Three books, see below.

**Administration.** Administration of the team *Interactions et Evolution Végétale et Fongique* (Muséum, UMR 7205; Paris; 20 pers.) and of the *Laboratory of Plant Symbiosis* (Univ. of Gdansk; 15 pers.). Member of the Scientific Council of CNRS-INEE since 3 years. Former member of several *Commissions de Spécialistes* (section 67-68); member of recruitment and promotion commission (CSS3) of the IRD (2008-12). Scientific Council of LMI *Adaptation des Plantes et microorganismes associés aux Stress Environnementaux* in Dakar since 2011. Former member of the Unit Council of my lab (ISYEB, UMR 7205, 2014-18). Currently directing the M2 *Enseignement Agrégation SVTU* (Univ. Saclay, ENS, MNHN) for the MNHN.

**Editorships and memberships in academic organizations.** Editor of *New Phytologist* (IF: 7.4), *Ecology Letters* (IF: 9.1), *Botany Letters* (IF: 1.7), *Symbiosis* (IF: 1.3) and *Espèces* (outreach, in French); guest Editor for a spec. issue of *Microbiome* (IF: 9.1) on 'Holobionts' (2018). Since 2005, referee for six European research agencies and 21 journals, incl. *Science*, *PloS Biology*, and *Trends* journals. Board member of the *Internat. Society for Symbiosis* (since 2004) and the *Soc. Fr. d'Orchidophilie* (2016). President of the *Société botanique de France* in 2010-18 (now V-P.). Assoc. Member of the **Académie d'Agriculture** since 2017.

**Main grants:** Leader of the 'Systruf' project on truffles (ANR + Région Languedoc-Roussillon; 3 500 k€, 2010-14); sponsorings (60 k€ in 2015-18); research on orchid heterotrophy (Fondation *Ars Cuttoli*, 70 k€ in 2016-17), and on mycorrhizae of epiphytic orchids (Fondation *Franklinia*, 60 k€ in 2016-17; Brazilian CNPq, 100 k€ in 2016-17 at Viçosa Univ.); on orchid transcriptomics and metabolomics (Orchidomics, Polish Centre for Science, 880 k€ in 2016-20); on Saudi-Arabi soil microbes (767 k€ in 2019-23); for restauration of the Paris herbarium on fungi (Fondation *Ars Cuttoli*, 70 k€ in 2020-21).

**Publications** - 178 research papers (5932/9202 citations, H=42/51, i10=-/126 in ISI/Google Scholar on Dec. 15<sup>th</sup> 2019), 41 book chapters + 12 forewords to books, 147 videos or content on the Internet, and 156 outreach papers. See full lists online at: <http://isyeb.mnhn.fr/fr/annuaire/marc-andre-selosse-404>

### Eighth major papers

M.-A. SELOSSE, G. SCAPPATICCI, A. FACCIO, P. BONFANTE, 2004. Chlorophyllous and achlorophyllous specimens of *Epipactis microphylla* (Neottieae, *Orchidaceae*) are associated with ectomycorrhizal septomycetes, including truffles. *Microbial Ecology* 47: 416-426.

T. JULOU, B. BURGHARDT, G. GEBAUER, D. BERVILLER, C. DAMESIN, M.-A. SELOSSE, 2005. Mixotrophy in orchids: insights from a comparative study of green individuals and non-photosynthetic mutants of *Cephalanthera damasonium*. *New Phytologist* 166: 639-653.

M.-A. SELOSSE, F. RICHARD, X. HE, S. SIMARD, 2006. Mycorrhizal networks: les liaisons dangereuses. *Trends in Ecology and Evolution* 11: 621-628.

F. MARTOS, M. DULORMNE, T. PAILLER, P. BONFANTE, A. FACCIO, J. FOURNEL, M.-P. DUBOIS, M.-A. SELOSSE, 2009. Independent recruitment of saprotrophic fungi as mycorrhizal partners by tropical achlorophyllous orchids. *New Phytologist* 184: 668-681.

M.-A. SELOSSE, F. ROUSSET, 2011. The plant-fungal marketplace. *Science* 333: 828-829.

F. MARTOS, F. MUNOZ, I. KOTTKE, C. GONNEAU, M.-A. SELOSSE, 2012. The role of epiphytism in architecture and evolutionary constraint within mycorrhizal networks of tropical orchids. *Molecular Ecology* 21: 5098-5109.

M.-A. SELOSSE, M. CHARPIN, F. NOT, 2017. Mixotrophy everywhere on land and water: the *grand écart* hypothesis. *Ecology Letters* 20: 246-263.

F. LALLEMAND, M.-L. MARTIN-MAGNIETTE, F. GILARD, B. GAKIÈRE, A. AVON-LAUNAY, E. DELANNOY, M.-A. SELOSSE, 2019. *In situ* transcriptomic and metabolomic approach to the transition to the loss of photosynthesis in plants exploiting fungi. *The Plant Journal* 98: 826-841.

### Three books

M.-A. SELOSSE, 2000. *La symbiose : structures et fonctions, rôle écologique et évolutif*. Vuibert, 154 p. Sold 5500 times.

M.-A. SELOSSE, 2017. *Jamais seul : ces microbes qui construisent les plantes, les animaux et les civilisations*. Actes Sud, 368 p. Sold 22000 times; translated in Polish, Estonian and Korean in 2019, in Chinese in 2020.

M.-A. SELOSSE, 2019. *Les goûts et les couleurs du monde : une histoire naturelle des tannins, de l'écologie à la santé*. Actes Sud, 358 p. Sold ca. 5000 times