Programa Analítico de Disciplina

BAN 664 - Plasticidade Fenotípica na Teoria Evolutiva

Departamento de Biologia Animal - Centro de Ciências Biológicas e da Saúde	
Catálogo: 2026	
Número de créditos: 4 Carga horária semestral: 60h Carga horária semanal teórica: 4h Carga horária semanal prática: 0h	Semestres: II

Ementa
Origem das variações e evolução adaptativa: perspectiva histórica Plasticidade fenotípica e microevolução Plasticidade fenotípica e macroevolução

Conteúdo

Unidade	T	P	To
1. **Origem das variações e evolução adaptativa: perspectiva histórica** 1. Revisão dos conceitos fundamentais da teoria evolutiva, processos evolutivos, micro e macroevolução. 2. As fontes de variações entre indivíduos, e o avanço histórico na compreensão da origem das variações. O papel do desenvolvimento na geração de novos fenótipos. A extensão da síntese evolutiva. Discussão de artigos.	16h	0h	16h
2. **Plasticidade fenotípica e microevolução** 1. Normas de reação. Variação genética da plasticidade (interação GxE). Plasticidade fenotípica e adaptação. Construção de nicho. Exemplos da literatura. 2. Populações: plasticidade fenotípica na adaptação a ambientes heterogêneos. Plasticidade fenotípica x adaptação local. Fluxo Gênico e interação GxE. Discussão de artigos.	28h	0h	28h
3. **Plasticidade fenotípica e macroevolução** 1. Os dois passos da evolução adaptativa. Acomodação fenotípica. Exemplos da literatura. 2. Acomodação genética: efeito de Baldwin e assimilação genética. Genes como líderes ou seguidores na evolução. Discussão de artigos.	16h	0h	16h
Total	**60h**	**0h**	**60h**

Teórica (T); Prática (P); Total (To);

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Bibliografias básicas	
Descrição	**Exemplares**
West-Eberhard, M.J. (2003) Developmental Plasticity and Evolution. Oxford University Press: New York.	0
Herron, J.C. & Freeman, S. (2014) Evolutionary Analysis. 5a edição. Pearson: Boston.	0
Futuyma, D.J. & Kirkpatrick, M. (2017) Evolution. 4a edição. Sinauer Associates: Massachusetts.	0

Bibliografias complementares	
Descrição	**Exemplares**
Agrawal, A.A. (2001) Phenotypic plasticity in the interactions and evolution of species. Science 294: 321-326.	0
Jablonka, E. & Lamb, M.J. (2010) Evolução em quatro dimensões: DNA, comportamento e a história da vida. Companhia das letras: São Paulo.	0
Jablonka, E. & Lamb, M.J. (2014) Evolution in four dimensions: genetic, epigenetic, behavioral, and symbolic variation in the history of life. Revised Edition. MIT Press: Massachussetts.	0
Laland, K.N., Uller, T., Fieldman, M.W., Sterelny, K., Müller, G.B., Moczek, A., Jablonka, E., Odling-Smee, J. (2015) The extended evolutionary synthesis: its structure, assumptions and predictions. Proceedings of the Royal Society B, Biological Sciences 282: 20151019.	0
Pfennig, D.W., Wund, M.A., Snell-Rood, E.C., Cruickshank, T., Schlichting, C.D., & Moczek, A.P. (2010) Phenotypic plasticity`s impact on diversification and speciation. Trends in Ecology and Evolution 25: 459-467.	0
Pfennig, D.W. (2021) Phenotypic Plasticity & Evolution: causes, consequences and controversies. CRC Press: Florida.	0
Pigliucci, M. (2005) Evolution of phenotypic plasticity: where are we going now? Trends in Ecology and Evolution 20(9): 481-486.	0
Price, T.D., Qvarnström, A., Irwin, D.E. (2003) The role of phenotypic plasticity in driving genetic evolution. Proceedings of the Royal Society B, Biological Sciences 270: 1433-1440.	0
Schwander, T. & Leimar, O. (2011) Genes as leaders and followers in evolution. Trends in Ecology and Evolution 26(3): 143-151.	0
West-Eberhard, M.J. (1989) Phenotypic plasticity and the origin of diversity. Annual Review of Ecology and Systematics 20: 249-278.	0
West-Eberhard, M.J. (2005) Developmental plasticity and the origin of species differences. Proceedings of the National Academy of Sciences 102(1): 6543-6549.	0

Syllabus

BAN 664 - Phenotypic Plasticity in the Evolutionary Theory

Departamento de Biologia Animal - Centro de Ciências Biológicas e da Saúde	
Catalog: 2026	
Number of credits: 4 Total hours: 60h Weekly workload - Theoretical: 4h Weekly workload - Practical: 0h	Period: II

Content
The origin of variations and adaptive evolution: historical perspective Phenotypic plasticity and microevolution Phenotypic plasticity and macroevolution

Course program

Unit	T	P	To
1. **The origin of variations and adaptive evolution: historical perspective** 1. Review of the conceptual framework of the evolutionary theory, evolutionary processes, micro and macroevolution. 2. The sources of variation among individuals, and the historical advances in the comprehension of the sources of variation. The role of developmental plasticity in the origin of new phenotypes. The extended evolutionary synthesis. Discussion of scientific literature.	16h	0h	16h
2. **Phenotypic plasticity and microevolution** 1. Reaction norms. Genetic variation in phenotypic plasticity (GxE interaction). Phenotypic plasticity and adaptation. Niche construction. Examples from the literature. 2. Populations: phenotypic plasticity and the adaptation to heterogeneous environments. Phenotypic plasticity vs local adaptation. Gene flow and GxE interaction. Discussion of scientific literature.	28h	0h	28h
3. **Phenotypic plasticity and macroevolution** 1. The two steps of adaptive evolution. Phenotypic accommodation. Examples from the literature. 2. Genetic accommodation: the Baldwin effect and genetic assimilation. Genes as followers or leaders in evolution. Discussion of scientific literature.	16h	0h	16h
Total	**60h**	**0h**	**60h**

Theoretical (T); Practical (P); Total (To);

BAN 664 - Phenotypic Plasticity in the Evolutionary Theory

Fundamental references	
Description	**Copies**
West-Eberhard, M.J. (2003) Developmental Plasticity and Evolution. Oxford University Press: New York.	0
Herron, J.C. & Freeman, S. (2014) Evolutionary Analysis. 5a edição. Pearson: Boston.	0
Futuyma, D.J. & Kirkpatrick, M. (2017) Evolution. 4a edição. Sinauer Associates: Massachusetts.	0

Complementary references	
Description	**Copies**
Agrawal, A.A. (2001) Phenotypic plasticity in the interactions and evolution of species. Science 294: 321-326.	0
Jablonka, E. & Lamb, M.J. (2010) Evolução em quatro dimensões: DNA, comportamento e a história da vida. Companhia das letras: São Paulo.	0
Jablonka, E. & Lamb, M.J. (2014) Evolution in four dimensions: genetic, epigenetic, behavioral, and symbolic variation in the history of life. Revised Edition. MIT Press: Massachussetts.	0
Laland, K.N., Uller, T., Fieldman, M.W., Sterelny, K., Müller, G.B., Moczek, A., Jablonka, E., Odling-Smee, J. (2015) The extended evolutionary synthesis: its structure, assumptions and predictions. Proceedings of the Royal Society B, Biological Sciences 282: 20151019.	0
Pfennig, D.W., Wund, M.A., Snell-Rood, E.C., Cruickshank, T., Schlichting, C.D., & Moczek, A.P. (2010) Phenotypic plasticity`s impact on diversification and speciation. Trends in Ecology and Evolution 25: 459-467.	0
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Schwander, T. & Leimar, O. (2011) Genes as leaders and followers in evolution. Trends in Ecology and Evolution 26(3): 143-151.	0
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