

Contents

Volume 216 (13) July 2013



Cover: This juvenile *Apteronotus leptorhynchus*, or brown ghost knifefish, belongs to one of approximately 200 species of South American gymnotiform weakly electric fishes. These animals use an active electrosense for foraging at night in often turbid waters as well as for communication. The total energetic cost of their electric behaviour, including generation and sensing of the electric field, is estimated to be about 30% of routine metabolic rate (Salazar et al., pp. 2459–2468). The articles in this special issue review the remarkable recent contributions of research on electric fishes to energetics and many other areas of biology. Photo credit: Guy l'Heureux.

SPECIAL ISSUE

Electric fishes: neural systems, behaviour and evolution

Guest editors: Rüdiger Krahe and Eric Fortune

Inside JEB

Seeing and communicating through weak electric fields i

Editorial

Krahe, R. and Fortune, E. S. Electric fishes: neural systems, behaviour and evolution. 2363-2364

Neural coding

Baker, C. A., Kohashi, T., Lyons-Warren, A. M., Ma, X. and Carlson, B. A. Multiplexed temporal coding of electric communication signals in mormyrid fishes. 2365-2379

Nogueira, J. and Caputi, A. A. From the intrinsic properties to the functional role of a neuron phenotype: an example from electric fish during signal trade-off. 2380-2392

Stamper, S. A., Fortune, E. S. and Chacron, M. J. Perception and coding of envelopes in weakly electric fishes. 2393-2402

Modulation of behaviour and sensory processing

Gavassa, S., Goldina, A., Silva, A. C. and Stoddard, P. K. Behavioral ecology, endocrinology and signal reliability of electric communication. 2403-2411

Silva, A. C., Perrone, R., Zubizarreta, L., Batista, G. and Stoddard, P. K. Neuromodulation of the agonistic behavior in two species of weakly electric fish that display different types of aggression. 2412-2420

Smith, G. T. Evolution and hormonal regulation of sex differences in the electrocommunication behavior of ghost knifefishes (Apterontidae). 2421-2433

Dunlap, K. D., Chung, M. and Castellano, J. F. Influence of long-term social interaction on chirping behavior, steroid levels and neurogenesis in weakly electric fish. 2434-2441

Toscano Márquez, B., Krahe, R. and Chacron, M. J. Neuromodulation of early electrosensory processing in gymnotiform weakly electric fish. 2442-2450

Electric organs

Markham, M. R. Electrocyte physiology: 50 years later. 2451-2458

Salazar, V. L., Krahe, R. and Lewis, J. E. The energetics of electric organ discharge generation in gymnotiform weakly electric fish. 2459-2468

Güth, R., Pinch, M. and Unguez, G. A. Mechanisms of muscle gene regulation in the electric organ of *Sternopygus macrurus*. 2469-2477

Unguez, G. A. Electric fish: new insights into conserved processes of adult tissue regeneration. 2478-2486

Locomotion and sensing of weakly electric fish

Hofmann, V., Sanguinetti-Scheck, J. I., Künzel, S., Geurten, B., Gómez-Sena, L. and Engelmann, J. Sensory flow shaped by active sensing: sensorimotor strategies in electric fish. 2487-2500

Neveln, I. D., Bai, Y., Snyder, J. B., Solberg, J. R., Curet, O. M., Lynch, K. M. and MacIver, M. A. Biomimetic and bio-inspired robotics in electric fish research. 2501-2514

Evolution of electrosensory and electromotor systems

Baker, C. V. H., Modrell, M. S. and Gillis, J. A. The evolution and development of vertebrate lateral line electroreceptors. 2515-2522

Crampton, W. G. R., Rodríguez-Cattáneo, A., Lovejoy, N. R. and Caputi, A. A. Proximate and ultimate causes of signal diversity in the electric fish *Gymnotus*. 2523-2541