

Almut Kelber – List of publications

Original papers in refereed journals

- P 1. Collett, T. S., **Kelber, A.** (1988) The retrieval of visuo-spatial memories by honeybees. *J. Comp. Physiol. A* 163, 145 – 150.
- P 2. **Kelber, A.**, Zeil, J. (1990) A robust procedure for visual stabilisation of hovering flight position in guard bees of *Trigona (Tetragonisca) angustula* (Apidae: Meliponini). *J. Comp. Physiol. A* 167, 569 – 577.
- P 3. Brünnert, U., **Kelber, A.**, Zeil, J. (1994) Ground-nesting bees determine the location of their nest relative to a landmark by other than angular size cues. *J. Comp. Physiol. A* 175, 363 – 369.
- P 4. Zeil, J., **Kelber, A.**, Voss, R. (1996) Structure and function of learning flights in ground-nesting bees and wasps. *J. Exp. Biol.* 199, 245 – 252.
- P 5. **Kelber, A.** (1996) Colour learning in the hawkmoth *Macroglossum stellatarum*. *J. Exp. Biol.* 199, 1127 – 1131.
- P 6. **Kelber, A.** (1997) Innate preferences for flower features in the hawkmoth *Macroglossum stellatarum*. *J. Exp. Biol.* 200, 826 – 835.
- P 7. **Kelber, A.**, Pfaff, M. (1997) Spontaneous and learned preferences for flower features in a diurnal hawkmoth. *Isr. J. Plant Sciences* 45, 231 – 241.
- P 8. **Kelber, A.**, Zeil, J. (1997) *Tetragonisca* guard bees take expanding and contracting patterns as unintended displacement in space. *J. Comp. Physiol. A* 181, 257 – 265.
- P 9. **Kelber, A.**, Pfaff, M. (1999) True colour vision in the orchard butterfly, *Papilio aegeus*. *Naturwissenschaften* 86, 221 – 224.
- P10. **Kelber, A.**, Hénique, U. (1999) Trichromatic colour vision in the hummingbird hawkmoth, *Macroglossum stellatarum*. *J. Comp. Physiol. A* 184, 535 – 541.
- P11. **Kelber, A.** (1999) Ovipositing butterflies use a red receptor to see green. *J. Exp. Biol.* 202, 2619 – 2630.
- P12. **Kelber, A.** (1999) Why "false colours" are seen by butterflies. *Nature* 402, 251.
- P13. **Kelber, A.** (2001) Receptor based models for spontaneous colour choices in flies and butterflies. *Ent. Exp. & Appl.* 99, 231 – 244.
- P14. **Kelber, A.**, Thunell, C., Arikawa, K. (2001) Polarisation-dependent colour vision in the butterfly *Papilio*. *J. Exp. Biol.* 204, 2469 – 2480.
- P15. **Kelber, A.**, Balkenius, A. & Warrant, E. J. (2002) Scotopic colour vision in nocturnal hawkmoths. *Nature* 419, 922 – 925.
- P16. **Kelber, A.** (2002) Pattern recognition in a hawkmoth: innate preferences, learning and ecology. *Proc. R. Soc. Lond. B* 269, 2573 – 2577.
- P17. **Kelber, A.** (2003). Sugar preferences and feeding strategies in a hawkmoth. *J. Comp. Physiol. A* 189, 661 – 666.
- P18. **Kelber, A.**, Vorobyev, M., Osorio, D. (2003) Colour vision in animals – behavioural tests and physiological concepts. *Biol. Reviews* 78, 81 – 118.
- P19. **Kelber, A.**, Balkenius, A. & Warrant, E. J. (2003) Colour vision in diurnal and nocturnal hawkmoths. *Integr. Comp. Biol.* 43, 571 – 579.
- P20. Balkenius, A., **Kelber, A.**, Balkenius, C. (2004) A model of selection between stimulus and

place strategy in a hawkmoth. *Adaptive Behaviour* 12, 21 – 35.

- P21. Warrant, E. J., **Kelber, A.**, Gislén, A., Greiner, B., Ribi, W. & Wcislo, W. T. (2004) Nocturnal vision and landmark orientation in a tropical halictid bee. *Current Biology* 14, 1309 – 1318.
- P22. Balkenius, A. & **Kelber, A.** (2004) Colour constancy in diurnal and nocturnal hawkmoths. *J. Exp. Biol.* 207, 3307 – 3316.
- P23. Roth, L. S. V. & **Kelber, A.** (2004) Nocturnal colour vision in geckos. *Biology Letters/Proc. R. Soc. Lond. B (Suppl.)* S6, S485 – S487 (doi:10.1098/rsbl.2004.0227).
- P24. **Kelber, A.** (2005) Alternative use of chromatic and achromatic cues by a diurnal hawkmoth. *Proc. R. Soc. Lond. B* 272, 2143 – 2147 (d.o.i.10.1098/rspb.2005.3507).
- P25. **Kelber, A.**, Warrant, E. J., Pfaff, M., Wallén, R., Theobald, J. C., Wcislo, W. W. & Raguso, R. A. (2006) Light intensity limits the foraging activity in nocturnal and crepuscular bees. *Behav. Ecol.* 17, 63 – 72.
- P26. **Kelber, A.**, Roth, L. S. V. (2006) Nocturnal colour vision – not as rare as we might think. *J. Exp. Biol.* 209, 781 – 788.
- P27. Johnsen, S., **Kelber, A.**, Warrant, E. J., Sweeney, A. M., Widder, E. A., Lee, R. L. & Hernandez-Andres, J. (2006) Twilight and nocturnal illumination and its effects on color perception by the nocturnal hawkmoth *Deilephila elpenor*. *J. Exp. Biol.* 209, 789 – 800.
- P28. Balkenius, A., Rosén, W. & **Kelber, A.** (2006) The relative importance of olfaction and vision in a diurnal and a nocturnal hawkmoth. *J. Comp. Physiol. A* 192, 431 – 437.
- P29. Balkenius, A. & **Kelber, A.** (2006) Colour preferences influence odour learning in the hawkmoth *Macroglossum stellatarum*. *Naturwissenschaften*, 93, 255-258.
- P30. Zaccardi, G., **Kelber, A.**, Sison-Mangus, M. P. & Briscoe, A. D. (2006) Color discrimination in the red range with only one long-wavelength sensitive opsin. *J. Exp. Biol.* 209, 1944 – 1955.
- P31. Warrant, E. J., **Kelber, A.**, Wallén, R. & Wcislo, W. T. (2006) Ocellar optics in diurnal and nocturnal bees and wasps. *Arthr. Struct. Dev.* 35, 293 – 305.
- P32. Raguso, R. A., **Kelber, A.**, Pfaff, M., Levin, R. A. & McDade, L. A. (2007) Floral biology of North American *Oenothera* sect. *Lavauxia*: advertisements, rewards and extreme variation in floral depth. *Annals of the Missouri Botanical Gardens* 94 (1), 236-257.
- P 33. **Kelber, A.** & Balkenius, A. (2007) Sensory ecology of feeding in the hummingbird hawkmoth *Macroglossum stellatarum* L. (Lepidoptera, Sphingidae). *Ent. Gen.* 29, 97 – 110.
- P 34. Roth, L. S. V., Balkenius, A. & **Kelber, A.** (2007) Colour perception in a dichromat. *J. Exp. Biol.* 210, 2795 – 2800.
- P 35. Nilsson, D.-E. & **Kelber, A.** (2007) A functional analysis of compound eye evolution. *Arthr. Struct. Dev.* 36, 373 – 385.
- P 36. Somanathan, H., Borges, R. M., Warrant, E. J. and **Kelber, A.** (2008) Visual ecology of Indian carpenter bees I: Light intensities and flight activity. *J. Comp. Physiol. A* 194, 97 – 107.
- P 37. Sison-Mangus, M. P., Briscoe, A. D., Zaccardi, G., Knüttel, H. & **Kelber, A.** (2008) The lycaenid *Polyommatus icarus* uses a blue opsin to see green. *J. Exp. Biol.*, 211, 361 – 369.
- P 38. Scholtyšek, C., **Kelber, A.** and Dehnhardt, G. (2008) Brightness discrimination in the harbor seal (*Phoca vitulina*). *Vision Res.* 48, 96 – 103.

- P 39. Goyret, J., Pfaff, M., Raguso, R. A., & **Kelber, A.** (2008) Why do *Manduca sexta* feed from white flowers? Innate and learnt colour preferences in a hawkmoth. *Naturwissenschaften* 95, 569 – 576.
- P 40. Lind, O. E., **Kelber, A.**, Kröger, R. H. H. (2008) Multifocal optics and pupil dynamics of birds. *J. Exp. Biol.* 211, 2752 – 2758.
- P 41. Roth, L.S.V., Balkenius, A. & **Kelber, A.** (2008) The absolute threshold of colour vision in the horse. *PLoS One* 3 e3711, 1-6. doi:10.1371/journal.pone.0003711.
- P 42. Somanathan, H., Borges, R. M., Warrant, E. J. and **Kelber, A.** (2008). Nocturnal carpenter bees learn landmark colours in starlight. *Curr. Biol.*, 18, R996-R997.
- P 43. Balkenius, A., **Kelber, A.**, Balkenius, C. (2008) How do hawkmoths learn multi-modal stimuli? A comparison of three models. *Adaptive Behav.* 16, 349-360.
- P 44. Roth L. S. V., Lundström, L., **Kelber, A.**, Kröger, R. H. H. & Unsbo, P. (2009) The pupils and optical systems of gecko eyes. *J. Vis.* 9(3):27, 1 – 11; doi:10.1167/9.3.27
- P 45. Somanathan, H., **Kelber, A.**, Wallén, R., Borges, R. M., Warrant, E. J. (2009) Visual ecology of Indian carpenter bees II: visual adaptations to nocturnal and diurnal lifestyles. *J. Comp. Physiol. A* 195, 571 – 583.
- P 46. Somanathan, H., Warrant, E. J., Borges, R. M., Wallén, R., **Kelber, A.** (2009) Resolution and sensitivity of the eyes of the Asian honeybees *Apis florea*, *Apis cerana* and *Apis dorsata*. *J. Exp. Biol.* 212, 2448 – 2453.
- P 47. Goyret, J., **Kelber, A.**, Pfaff, M. & Raguso, R. A. (2009) Larval diet influences the use of visual and olfactory stimuli by feeding adults of *Manduca sexta*. *Proc. R. Soc. Lond. B* 276, 2739– 2745.
- P 48. Lind, O. & **Kelber, A.** (2009) Avian colour vision: Effects of variation in receptor sensitivity and noise data on model predictions as compared to behavioural results. *Vision Res.* 49, 1939 – 1947.
- P 49. Lind, O. & **Kelber, A.** (2009) The absolute threshold of colour vision in two species of parrot. *J. Exp. Biol.* 212, 3693 –3699.
- P 50. **Kelber, A.** & Osorio, D. (2010) From spectral information to animal colour vision: concepts and terminology. *Proc. R. Soc. Lond. B.* 277, 1617–1625. doi: 10.1098/rspb.2009.2118.
- P 51. **Kelber, A.** (2010) What a hawkmoth remembers after hibernation depends on innate preferences and conditioning situation. *Behav. Ecol.* 21, 1093 – 1097.
- P 52. **Kelber, A.** & Lind, O. (2010) Limits of colour vision in dim light. *Ophthalmic and Physiological Optics*, 30, 454–459.
- P. 53 Goyret, J. & **Kelber, A.** (2011) How does a diurnal hawkmoth find nectar? Differences in sensory control with a nocturnal relative. *Behav. Ecol.* 22, 976-984; doi:10.1093/beheco/arr078
- P. 54 Lind, O. & **Kelber, A.** (2011) The spatial tuning of achromatic and chromatic vision in budgerigars. *J. Vis.* June 2, 2011 11(7): 2, 1-8; doi: 10.1167/11.7.2
- P. 55 **Kelber, A.**, Jonsson, F., Warrant, E. J., Wallén, R., Kornfeldt, T., Baird, E. (2011) Hornets can fly at night without obvious adaptations of eyes and ocelli. *PLoS One* 6, e21892, 1-9; doi:10.1371/journal.pone.0021892
- P. 56 Lind, O., Sunesson, T., Mitkus, M. & **Kelber, A.** (2012) Luminance dependence of spatial vision in budgerigars (*Melopsittacus undulatus*) and Bourke's parrots (*Neopsephotus Bourkii*). *J. Comp. Physiol. A* doi:10.1007/s00359-011-0689-7

Refereed conference contributions

- C 1. Balkenius, A., **Kelber, A.** & Balkenius, C. (2002) Simulations of learning and behaviour in the hawkmoth *Deilephila elpenor*. In: Hallam, B., Floreano, D., Hallam, J., Hayes, G., & Meyer, J.-A. (eds) *From Animals to Animats 7. Proceeding of the 7th International Conference on Simulation of Adaptive Behaviour*. MIT Press, Cambridge MA, pp. 85-92.
- C2. Balkenius, A., **Kelber, A.** & Balkenius, C. (2006) Modelling multi-modal learning in a hawkmoth. *Lecture Notes in Computer Science* 4095: 422-433.
- C3. **Kelber, A.** (2006) Nocturnal colour vision. *Perception* 35, 166-167.
- C4. Zaccardi, G., **Kelber, A.**, Sison-Mangus, M. P. & Briscoe, A. D. (2006) Opsin expression in the eyes of *Heliconius erato*. *Perception* 35, 142-143.
- C5. Sison-Mangus, M. P., Zaccardi, G., **Kelber, A.** & Briscoe, A. D. (2009) Duplicate UV opsins for co-mimicking *Heliconius* butterflies. *Int. Comp. Biol.* 49, E157.

Book chapters

- B 1. Warrant, E. J., **Kelber, A.** & Kristensen, N. P. (2003) Eyes and vision. In: Kristensen N. P. (ed.) *Handbook of Zoology Vol. IV 36, Lepidoptera 2*. De Gruyter, Berlin, pp. 325-360.
- B 2. **Kelber, A.** (2006) Invertebrate colour vision. In: Warrant, E.J. & Nilsson, D.-E. (eds) *Invertebrate Vision*. Cambridge University Press, Cambridge, pp 250-290.
- B 3. Warrant, E. J., **Kelber, A.** & Frederiksen, R. (2007) Ommatidial adaptations for spatial, spectral and polarisation vision in arthropods. In: North, G. & Greenspan, R. (eds) *Invertebrate Neurobiology*. Cold Spring Harbor Laboratory Press, Woodbury, pp. 123-154.

Popular scientific articles

- POP1. **Kelber, A.** (2000) Eyes up. *New Scientist* 166, U1.
- POP2. Warrant, E. J. & **Kelber, A.** (2001) Färgen finns i betraktarens ögon. In: *Med färg i blicken, Naturvetenskapliga forskningsrådets årsbok 2001*, pp.45-58.
- POP 3. Pfaff, M. & **Kelber, A.** (2003) Ein vielseitiger Futterspender für anthophile Insekten. *Entomologische Zeitschrift* 113, 360-361.
- POP4. Pfaff, M. & **Kelber, A.** (2005) Observations on development and hibernation of the hummingbird hawkmoth *Macroglossum stellatarum* L. (Lepidoptera: Sphingidae). *Entomologische Zeitschrift* 115, 267-270.
- POP5. **Kelber, A.** (2006) Färg med fjärlarnas ögon – colour with the eyes of butterflies. *FärgNotiser från Stiftelsen Svenskt Färgcentrum Stockholm* 84, 7-8.
- POP6. Roth, L. & **Kelber, A.** (2007) Djur ser mörkret i färg. *Forskning och framsteg* 08/2007, 40-43.
- POP7. **Kelber, A.** (2008) Bei Nacht sind nicht alle Katzen grau. *Biologie in unserer Zeit* 2/2008 (38), 110-115.

E. Theses

- T1. **Kelber, A.** (1989) Die Bedeutung von Kontextinformation für das Erinnern von Dressurmarken und Mustern bei der Honigbiene (*Apis mellifera*) [The influence of context information for the retrieval of landmark and pattern memory in the honeybee, *Apis mellifera*]. Diploma thesis, Tübingen University.

T2. **Kelber, A.** (1993) Visuelle Orientierung im Fluge: Die schwebenden Wächterinnen der stachellosen Biene *Tetragonisca angustula* (Meliponinae, Hymenoptera) [Visual orientation on the wing: the hovering guards of the stingless bee *Tetragonisca angustula* (Hymenoptera, Meliponini)]. Doctoral thesis, Tübingen University.