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TEMASEK LIFESCIENCES LABORATORY

27 January 2016 (Wednesday), 2pm
The Auditorium (Level 1)
Hosted by: Dr YU Fengwei

Phylogeny and evolution of Heteroptera (Insecta: Hemiptera)

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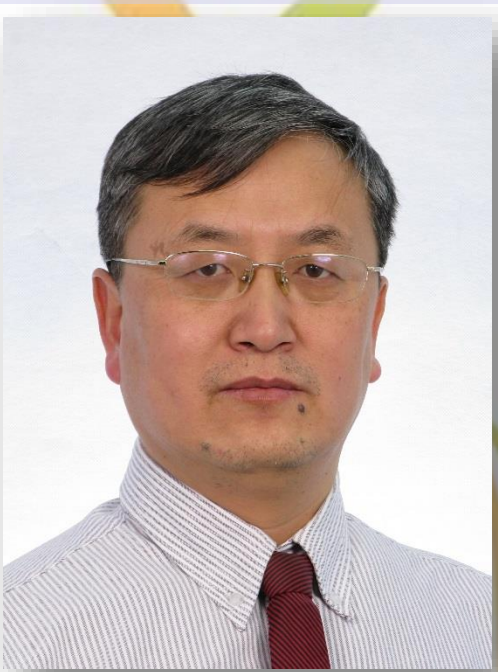

I got my PhD from Nankai University, Tianjin, China in 1990. My research focuses on insect taxonomy, phylogeny and evolution, phylogeography and molecular ecology based on morphological, molecular and distributional data, especially on the groups of Heteroptera, Odonata and Diptera (Cecidomyiidae).

Heteroptera are among the most diverse hemimetabolous insects. Seven infraorders have been recognized within this suborder of Hemiptera. Apart from the well-established sister-group relationship between the two terminal lineages Cimicomorpha and Pentatomomorpha, the pylogenetic relationships among the other five infraorders are still controversial, of which three (Gerromorpha, Nepomorpha and Leptopodomorpha) are intimately connected to aquatic environments. However, the various and often conflicting available phylogeny hypotheses do not offer a clear background for a connection between diversification and palaeoenvironments. Recently, a molecular data set representing 79 taxa and 10 149 homologous sites is used to infer the phylogenetic relationships within Heteroptera. Bayesian inference, maximum-likelihood and maximum parsimony analyses were employed. The results of phylogenetic inferences largely confirm the widely accepted phylogenetic context. Estimation of the divergence time based on the phylogenetic results revealed that Gerromorpha, Nepomorpha and Leptopodomorpha originated successively during the period from the Late Permian to Early Triassic (269 – 246 Ma). This timescale is consistent with the origin and radiation time of various aquatic holometabolans. Our results indicate that the aquatic and semi-aquatic true bugs evolved under environmental conditions of high air temperature and humidity in an evolutionary scenario similar to that of the aquatic holometabolans.

Recent Publications:

1. Yan-hui Wang, Ying Cui, David Redei, Petr Banar, Qiang Xie, Pavel Stys, Jakob Damgaarde, Ping-ping Chen, Wen-bo Yi, Ying Wang, Kai Dang, Chuan-ren Li, and **Wen-jun Bu**, 2015, Phylogenetic divergences of the true bugs (Insecta: Hemiptera: Heteroptera), with emphasis on the aquatic lineages: the last piece of the aquatic insect jigsaw originated in the Late Permian/Early Triassic. Cladistics (2015) 1–16.
2. Xin Yu, Junli Xue, Matti HÄMÄLÄINEN, Yang Liu & **Wenjun Bu**, 2015, A revised classification of the genus Matrona Selys,1853 using molecular and morphological methods (Odonata: Calopterygidae). Zoological Journal of the Linnean Society, 174 , 473–486.
3. Ye, Zhen; Zhu, Gengping; Chen, Pingping; Zhang, Danli; **Bu, Wenjun** 2014, Molecular data and ecological niche modelling reveal the Pleistocene history of a semi-aquatic bug (Microvelia douglasi douglasi) in East Asia. Molecular Ecology, 23(12): 3080-3096.