Zootaxa 3080: 1–108 (2011)
www.mapress.com/zootaxa/

Monograph

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

ZOOTAXA

3080

Phylogenetics and comparative morphology of crab spiders (Araneae: Dionycha, Thomisidae)

SURESH P. BENJAMIN

Institute of Fundamental Studies, Hantana Road, Kandy, Sri Lanka

Department of Entomology, National Museum of Natural History MRC 105, PO Box 37012, Smithsonian Institution, Washington DC, 20013-7012, USA. Email: suresh.benjamin@gmail.com

Magnolia Press
Auckland, New Zealand

Accepted by C. Muster: 4 Jul. 2011; published: 28 Oct. 2011

SURESH P. BENJAMIN
Phylogenetics and comparative morphology of crab spiders (Araneae: Dionycha, Thomisidae)
(*Zootaxa* 3080)

108 pp.; 30 cm.

28 Oct. 2011

ISBN 978-1-86977-799-9 (paperback)

ISBN 978-1-86977-800-2 (Online edition)

FIRST PUBLISHED IN 2011 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

http://www.mapress.com/zootaxa/

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of contents

Abstract . . . 3
Introduction . . . 3
Material and methods . . . 4
Results . . . 7
Discussion . . . 8
Taxonomic changes . . . 11
Family Thomisidae . . . 11
Genus *Aphantochilus* O. P.-Cambridge, 1870 . . . 11
Borboropactus cinerascens (Doleschall, 1859) . . . 12
Borboropactus nyerere sp. nov. . . . 12
Genus *Cebrenninus* Simon, 1887 . . . 13
Cebrenninus rugosus Simon, 1887. . . . 13
Genus *Epidius* Thorell, 1877. . . . 14
Epidius binotatus Simon, 1897 . . . 14
Epidius rubropictus Simon, 1909 . . . 15
Epidius typicus (Bösenberg & Strand, 1906) comb. nov.. . . . 15
Genus *Geraesta* Simon, 1889 . . . 15
Geraesta hirta Simon, 1889 . . . 16
Geraesta lehtineni sp. nov.. . . . 17
Geraesta mkwawa sp. nov . . . 17
Genus *Pharta* Thorell, 1891 . . . 17
Pharta bimaculata Thorell, 1891 . . . 18
Pharta brevipalpus (Simon, 1903) comb. nov.. . . . 18
Other material examined . . . 19
Acknowledgments . . . 20
References . . . 20
Appendix A. Characters and character state descriptions . . . 25
Appendix B. Phylogenetic data matrix . . . 31

Abstract

The higher-level phylogenetic relationships of crab spiders (Thomisidae) are studied from morphological data. 33 taxa are coded for 74 characters (53 binary and 21 multistate). Several analyses using equal, successive and implied weights were carried out. The most parsimonious tree obtained by analysis with successive and implied weights is put forward as the preferred hypothesis of thomisid relationships (length 222 steps, CI 0.74, RI 0.83). Thomisidae emerge monophyletic in all analyses, supported by four unambiguous synapomorphies. It is now apparent that thomisid taxa have been mostly defined on the basis of plesiomorphic character states. A number of taxonomic changes, including the description of new taxa are proposed and the evolution of diverse behaviors of thomisids is studied in light of the new phylogenetic result. Color change behavior evolved once within the family, but eye arrangement patterns of the median ocular quadrangle, thought to be diagnostic for many genera, evolved as much as 10 times independently. The following new species are described: *Borboropactus nyerere* **sp. nov.**, *Cebrenninus srivijaya* **sp. nov.**, *Geraesta lehtineni* **sp. nov.** and *Geraesta mkwawa* **sp. nov.** The following new generic synonymies are proposed: *Bucranium* O. P.-Cambridge, 1881 = *Aphantochilus* O. P.-Cambridge, 1870; *Sanmenia* Song and Kim, 1992 = *Pharta* Thorell, 1891 and *Cupa* Strand, 1906 = *Epidius* Thorell, 1877. The following species are synonymized: *Regillus divergens* Hogg, 1914 and *Borboropactus hainanus* Song, 1993 = *Borboropactus bituberculatus* Simon, 1884 **syn. nov.**, *Epidius ganxiensis* (Yin, Peng & Kim, 1999) = *Epidius rubropictus* Simon, 1909 **syn. nov.**, *Geraesta bilobata* Simon, 1897 = *Geraesta hirta* Simon, 1889 **syn. nov.**, *Sanmenia kohi* Ono, 1995 = *Pharta bimaculata* Thorell, 1891 **syn. nov.** and *Sanmenia zhengi* (Ono & Song, 1986) = *Pharta brevipalpus* (Simon, 1903) **syn. nov.** The following new combinations are proposed: *Aphantochilus taurifrons* (O. P.-Cambridge, 1881) **comb. nov.**, *Epidius typicus* (Bösenberg & Strand, 1906) **comb. nov.**, *Pharta brevipalpus* (Simon, 1903) **comb. nov.**, *Pharta gongshan* (Yang, Zhu and Song, 2006) **comb. nov.**, *Pharta nigra* (Tang, Griswold & Peng, 2009) **comb. nov.** and *Pharta tengchong* (Tang, Griswold & Yin, 2009) **comb. nov.**

Key words: Arachnida, Biodiversity, Character weighting, Cladistics, Color change behavior, implied weights, sampling bias

Introduction

Crab spiders, family Thomisidae, are cryptically colored sit-and-wait predators that generally do not build capture webs. Thomisidae is a speciose family which includes 2146 described species in 177 genera (Platnick 2011).