

The Great Lakes Entomologist

Volume 45
Numbers 3 & 4 - Fall/Winter 2012 *Numbers 3 &
4 - Fall/Winter 2012*

Article 3

October 2012

***Mcphersonarcys*, a New Genus for *Pentatoma Aequalis* Say (Heteroptera: Pentatomidae)**

Donald B. Thomas
USDA-Agricultural

Follow this and additional works at: <https://scholar.valpo.edu/tgle>



Part of the [Entomology Commons](#)

Recommended Citation

Thomas, Donald B. 2012. "*Mcphersonarcys*, a New Genus for *Pentatoma Aequalis* Say (Heteroptera: Pentatomidae)," *The Great Lakes Entomologist*, vol 45 (2)
Available at: <https://scholar.valpo.edu/tgle/vol45/iss2/3>

This Peer-Review Article is brought to you for free and open access by the Department of Biology at ValpoScholar. It has been accepted for inclusion in *The Great Lakes Entomologist* by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.

***Mcpersonarcys*, a new genus for *Pentatoma aequalis* Say
(Heteroptera: Pentatomidae)**

Donald B. Thomas¹

Abstract

A new monotypic genus, *Mcpersonarcys* is erected to hold *Pentatoma aequalis* Say, a species formerly placed in the genus *Hymenarcys*. Based on the distribution of 19 character-states *Hymenarcys* forms a clade with its sister genus *Coenus*. Both genera are related to the large genus *Euschistus*. *Mcpersonarcys* is basal to *Euschistus*, whereas the clade with *Hymenarcys* and *Coenus* is derived. Removal of *P. aequalis* to a new genus resolves the paraphyly of *Hymenarcys sensu lato*.

The genus *Hymenarcys* Amyot and Serville, 1843, containing four species, was revised by Rolston (1973). Regarding relationships among these Rolston stated, "The evidence seems overwhelming that *H. nervosa*, *H. reticulata*, and *H. crassa* are closely related species and that *H. aequalis* is phylogenetically distant. Erection of a monotypic genus or subgenus for *H. aequalis* is justifiable, but ... no practical benefit would result from a division of the genus."

It is a simple truth that in any genus containing three or more species some will be relatively close to one another and others relatively distant, thus forming objectively recognizable clades. The formal application of names to each and every such clade would tend to diminish the value of higher classifications. In this case, while I agree completely with Rolston's analysis of relationships within *Hymenarcys*, his understandable restraint overlooked a deeper problem. The problem is that the suite of character states encompassed within *Hymenarcys* as then constituted, are inextricably entangled with those of its sister genus *Coenus* Dallas. *Coenus* was revised by Rider (1995) and contains three closely related species. Based on the characteristics that define and separate the two genera, the species described as *Pentatoma aequalis* Say, is so distant from its congeners that it could as well be placed in *Coenus*, or for that matter, *Euschistus* Dallas, 1851, as in *Hymenarcys*. Thus, one could erect a new genus, or sink all of the species into a single genus. But the present arrangement is untenable.

***Hymenarcys* vs. *Coenus*.** The two genera have always been difficult to separate, primarily because of *H. aequalis*. In Torre-Bueno's (1939) key to the North American Pentatomini, *Coenus* and *Hymenarcys* were separated in the very last couplet. The couplet reads:

"Apical part of the scutellum narrower than hemelytra*Hymenarcys*
Apical part of scutellum broader than hemelytra*Coenus*."

However, the widest part of the hemelytral corium is wider than the post-frenal scutellum in all species of both genera. Torre-Bueno's error is not mitigated because he considered *Coenus* to be monotypic having overlooked *Coenus inermis* Harris and Johnston, a rare species described in an obscure journal

¹USDA- Agricultural Research Service, Cattle Fever Tick Research Lab, 22675 N. Moorefield Road, Edinburg, TX 78541.

(Harris and Johnston 1936); or by the subsequent discovery and description of *Coenus explanatus* Rider.

McPherson's (1982) key to the genera of northeastern North America has *Coenus* and *Hymenarcys* separating at couplet 9 which reads,

"Hind tibiae distinctly sulcate dorsally throughout their lengths.... *Coenus* ,
Hind tibiae not distinctly sulcate throughout their lengths...*Hymenarcys*."

But according to Rolston and McDonald (1984) the hind tibiae are sulcate in both genera which belies the fact that the species of *Hymenarcys* vary in the degree of sulcation with *H. crassa* Uhler being mostly asulcate. In their key to the genera of the western Hemisphere Pentatomini Part III, *Hymenarcys* keys out in two places, with *H. aequalis* falling out separately, scored as having the bucculae evanescent (vs. lobed) posteriorly. But the bucculae, while not clearly lobate, are strongly truncate in *H. aequalis* and certainly not evanescent or arcuate. *Hymenarcys* can be separated from *Coenus* because in the former the scutellum is distinctly shorter than the hemelytral corium. Thus, while Rolston and McDonald retained the two traditional taxa, their dichotomous arrangement based on two characters, separated the included species into three natural groups. Consideration of a larger suite of characters gives a similar result.

Character States. Males and females of all seven included species were examined. Rider (1995) states that *Coenus* belongs to a group of genera which includes *Euschistus* and that it is most closely related to *Hymenarcys*. Rolston (1974) provided a key including *Hymenarcys* for those genera related to *Euschistus* Dallas. Therefore the nominate subgenus of *Euschistus*, type-species *Euschistus tristigmus* (Say), is used as the out-group for the purpose of establishing the polarity of character states. A total of 19 characters were found to have variable states among these species.

Male Genital characters.

1. Dorsal Thecal Appendages. All species of *Hymenarcys*, all species of *Coenus* and all species of *Euschistus* have these appendages. According to Rider (1995) this character is unique to the genera related to *Euschistus* and is thus an important synapomorphy indicating a common ancestry for the taxa under consideration.

2. Thecal Lobes. In all species of *Coenus*, *Euschistus tristigmus*, most but not all species of the subgenus *Euschistus*, and all species of *Hymenarcys* except *H. aequalis*, the theca has lateral lobes. All species of *Coenus* and all species of *Hymenarcys* except *H. aequalis* have a well developed dorsal lobe. The dorsal lobe is absent in *E. tristigmus* and most but not all species of the subgenus *Euschistus*. In *H. aequalis* the sides and dorsum of the theca is simple, devoid of lobes.

3. Distiphallus. In all species of *Coenus*, all species in the nominate subgenus *Euschistus* (except *E. schaffneri* Rolston and *E. zafadus* Rolston) and all species of *Hymenarcys* except *H. aequalis*, the distiphallus (penisfilum) is long and coiled. In *H. aequalis* the distiphallus (illustrated by Rolston 1973) is about as long as the theca but not long enough to coil.

4. Inferior Ridge of Pygophore. All species of *Euschistus* and all species of *Coenus* have a ridge just ental to the posterior margin of the pygophore. None of the species of *Hymenarcys* have an inferior ridge except *H. aequalis* (Fig. 1).

5. Proctigeral tubercles. In all species of the nominate subgenus *Euschistus*, all species of *Coenus* and all species of *Hymenarcys*, except *H. aequalis*, the tubercles on the proctiger are located subapically. In *H. aequalis* the tubercles are submedial (Fig. 1). Rolston (1974) accorded this character some importance in defining subgenera of *Euschistus*.

6. Pygophoral Tooth. *Coenus delius* (Say) is unique among all of the included species in having an erect tooth on the posterior margin of the pygophore.

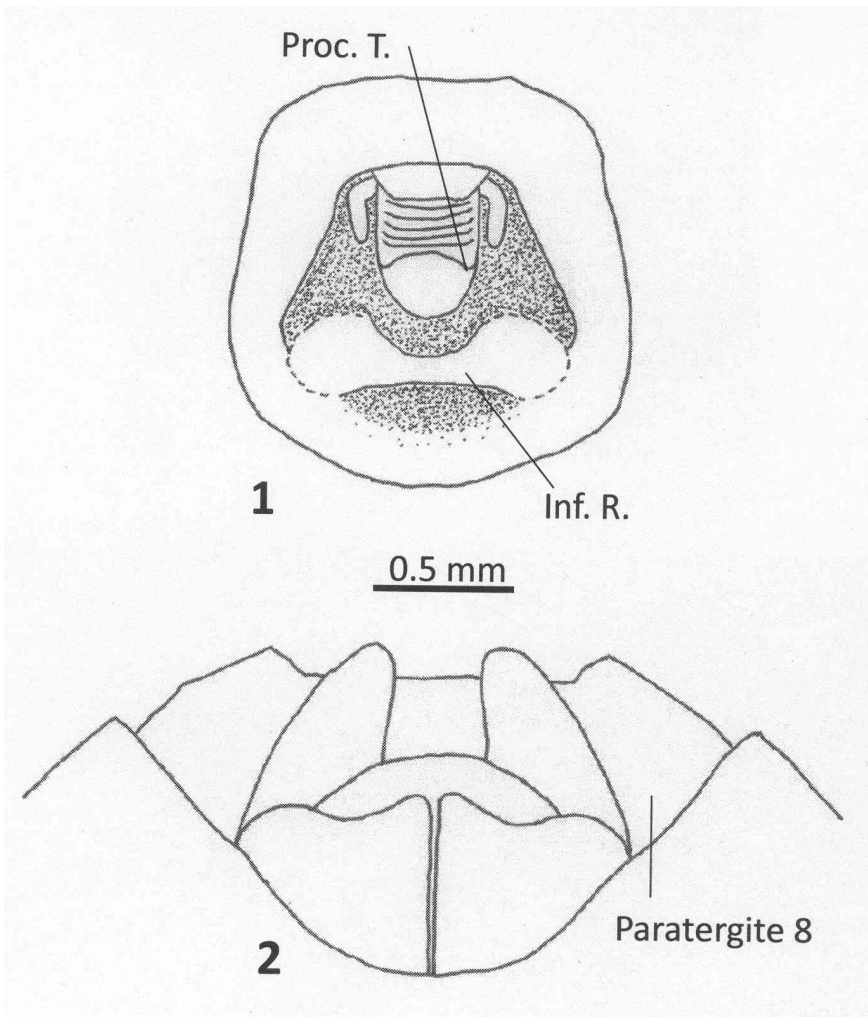


Figure 1. Male pygophore, dorsal view.
Proc. T = proctigeral tubercle. Inf. R. = inferior ridge.

Figure 2. Female terminalia, postero-ventral view.

Female genitalic characters.

7. Spiracles. The eighth paratergite (Fig. 2) of all species of *Euschistus* (except *E. zafadus*), *Coenus* and *Hymenarcys* lack a functional spiracle. The spiracle is present in most Pentatomine genera including some of those considered to be related to *Euschistus*. It is unlikely in the extreme that the spiracle would re-evolve after being lost and thus the absence of the spiracle is the apomorphic condition.

8. Spermathecal Duct. The spermathecal duct is relatively long and convoluted in all species of *Coenus* and all species of *Hymenarcys* except *H. aequalis*. In *H. aequalis* and in *Euschistus* the spermathecal duct is short and simple.

Somatic characters.

9. Scutellar fovea. In all species of *Euschistus*, all species of *Coenus*, and all species of *Hymenarcys* except *H. nervosa* (Say), the fovea are lacking. *Hymenarcys nervosa* is unique in having a foveum at each basal angle of the scutellum.

10. Paraclypeal length. *Hymenarcys crassa* is unique in having the paraclypei much longer than the clypeus. In all other species of *Hymenarcys*, all species of *Coenus* and *Euschistus tristigmus*, and most species of *Euschistus* (including all of those in the nominate subgenus), the clypeus and paraclypei are equal or subequal in length.

11. Buccular terminus. In all species of *Euschistus*, including *E. tristigmus*, the bucculae are evanescent posteriorly. In *H. aequalis* the terminus of the bucculae is truncate. In all species of *Coenus* and all other species of *Hymenarcys*, the terminus of the bucculae is lobate. Rolston and McDonald (1984) mistakenly included *H. aequalis* in a branch of their key with those pentatomine genera that have the buccular terminus evanescent.

12. Rostral Length. In all species of *Hymenarcys* except *H. aequalis*, the apex of the rostrum does not attain the metacoxae. In all species of *Coenus* and *Euschistus*, and *H. aequalis* the apex of the rostrum attains the posterior margin of the metacoxae.

13. Clypeal punctation. In all species of *Coenus* the clypeus is contrastingly devoid of punctures. In all species of *Hymenarcys* and in most *Euschistus* including *E. tristigmus*, the clypeus has many punctures, typically as dense as on the paraclypei.

14. Hemelytral membrane. In all species of *Coenus* and all species of *Hymenarcys* except *H. aequalis*, the veins of the membrane are reticulate. In *H. aequalis* and in all species of the nominate subgenus of *Euschistus* (except *E. schaffneri*) the venation is simple.

15. Anterolateral pronotal margin. Species of *Euschistus* characteristically have the margin dentate. In *Hymenarcys* and *Coenus* the margin is edentate.

16. Pronotal shape. *Hymenarcys nervosa* is unique in having the pronotal margin convex in dorsal view. All other species of *Hymenarcys*, all species of *Coenus*, and in all species in the nominate subgenus of *Euschistus* (except *E. schaffneri*), the margin is subrectilinear or even somewhat concave (e.g., *Coenus explanatus*).

17. Punctuation of pronotal margin. In *Hymenarcys crassa* and in the species of *Coenus*, the inframargin of the anterolateral pronotal margin is contrastingly devoid of punctures. In the other species of *Hymenarcys* and in *Euschistus tristigmus*, the punctations of the disc extend to the edge of the pronotum.

18. Hemelytral corium. In all species of *Hymenarcys* and *Euschistus* the hemelytral corium extends distinctly past the apex of the scutellum. In all species of *Coenus* the hemelytral corium does not distinctly surpass the apex of the corium.

19. Metasternum. In all species of *Hymenarcys* except *H. aequalis* the metasternum is sulcate. In all species of *Coenus*, *Euschistus* and *H. aequalis* the metasternum is flat.

Character Analysis. Of the 19 included characters two had character states common to all species of *Euschistus*, *Coenus*, and *Hymenarcys sensu* Rolston: the spiracles vestigial on the female 8th paratergite and the presence of thecal appendages in the males. This synapomorphy is significant as evidence of common ancestry of the included species.

Six of the characters had states unique to single species: the long rostrum in *H. aequalis*, the truncate buccular terminus in *H. aequalis*, the scutellar fovea of *H. nervosa*, the convex anterolateral pronotal margin of *H. nervosa*, the medial pygophoral tooth of *Coenus delius* and the elongated paraclypei in *H. crassa*. Because these states were unique at the species level they provide no information on relationships. It is the pattern of shared characteristics that provide evidence of the latter.

All species of *Euschistus* have the anterolateral pronotal margins dentate and the terminus of the bucculae evanescent. None of the species of *Coenus* or *Hymenarcys sensu* Rolston have either of these two character states. Thus, *Euschistus* forms a clade separable from the other included taxa.

In all species of *Coenus* the clypeus is impunctate and the corium fails to surpass the apex of the scutellum whereas in all species of *Euschistus* and *Hymenarcys* the corium is distinctly longer than the scutellum and the clypeus is densely punctate. Thus *Coenus* as constituted in the revision by Rider forms a clade separable from *Euschistus* and *Hymenarcys sensu* Rolston.

However, there are no synapomorphic character states that unite the species of *Hymenarcys* unless one eliminates *H. aequalis* and thus *Hymenarcys sensu* Rolston is paraphyletic. But when *H. aequalis* is removed the genus *Hymenarcys sensu novo* can be defined by having a sulcate metasternum (in *H. aequalis*, *Coenus* and *Euschistus* the metasternum is flat) and by having a pygophore without an inferior ridge (all species of *Euschistus*, *Coenus* and *H. aequalis* have an inferior ridge). Thus *Hymenarcys sensu novo* is a definable clade.

Furthermore, the genera *Coenus* and *Hymenarcys sensu novo* form a clade separable from *Euschistus* and *H. aequalis* because they share the character states of having the spermathecal duct long and convolute (vs. short and simple in the latter) and the terminus of the bucculae lobate (vs. evanescent in *Euschistus* and truncate in *H. aequalis*). Further support for this clade is found in the hemelytral membrane which is reticulate in all *Coenus* and *Hymenarcys sensu novo* but simple in *H. aequalis* and in the subgenus *Euschistus* (except *E. schaffneri*).

Lastly, *Coenus*, *Hymenarcys sensu novo* and almost all species of *Euschistus* form a clade separable from *H. aequalis* because they have a long, coiled distiphallus (short and simple in *H. aequalis*) and the theca of the aedeagus lobate (entire in *H. aequalis*). Thus, *H. aequalis* lacking the synapomorphies found even in most *Euschistus*, is not just an aberrant species, but clearly not even related to either *Hymenarcys* or to *Coenus*. In a genus as large as *Euschistus* some secondarily evolved plesiomorphies can be expected. But the aforementioned aberrant species *E. zafadus* and *E. schaffneri* have combinations of plesiomorphic characters that lead this author to believe that they are wrongly placed in the subgenus *Euschistus*, yet, they lack the synapomorphies which define the other subgenera. Their reassignment must be held in abeyance until further study. In any case a new genus is required to hold *H. aequalis* and I here propose the name *Mcphersonarcys*.

Mcphersonarcys Thomas, new genus (Fig. 3).

Type-species: *Pentatoma aequalis* Say, 1832, by monotypy and herein designated.

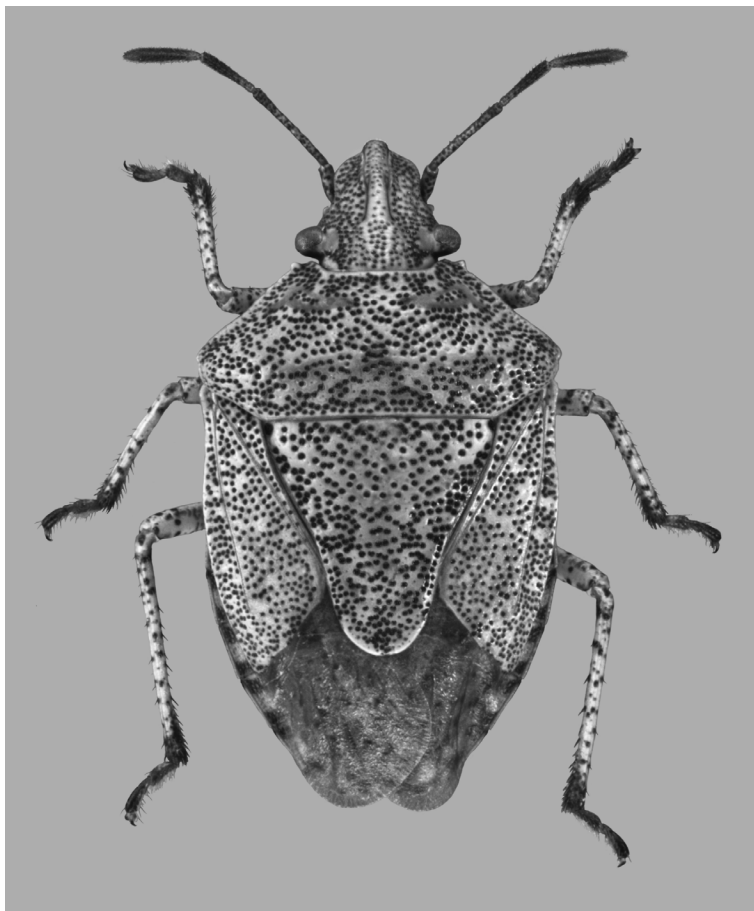


Figure 3. *Mephersonarcys aequalis* (Say), dorsal habitus.

Description: Head length subequal to pronotal length at midline; eyes subpedunculate. Anterolateral pronotal margin carinate, simple, not dentate, not reflexed; humeral angles not produced; anterolateral angles with a tooth. Width of scutellum at end of frenum slightly greater than half basal width. Hemelytral corium longer than scutellum, terminating at fourth visible connexival segment; hemelytral membrane with simple venation. Abdominal venter without basal tubercle or spine. Metasternum flat. Metathoracic scent gland orifice with short auriculate peritreme. Femora unarmed; tibiae shallowly sulcate. Clypeus and paraclypei subequal in length, apically obtuse; basal antennal segment not quite reaching apex of head. Bucculae truncate at posterior terminus; apex of first rostral segment not surpassing posterior terminus of bucculae. Eighth paratergites of female lacking spiracles; spermathecal duct short and simple. Male pygophore with a transverse ridge seated ental to the posterior margin (inferior ridge); tubercles on dorsum of proctiger submedial in position; distiphallus of aedeagus not longer than the theca; theca simple, without lobes.

Etymology: Derived from a combination of the surname *McPherson* and the suffix of the name *Hymenarcys*, the genus to which the only species was formerly combined. The new genus is named to honor Prof. Jay McPherson of Southern Illinois University for his contributions to the knowledge of the family of which this genus is a member.

Material Examined: **Kansas:** *Onaga:* Creveceur. *Riley:* Manhattan. *Brown:* Hiawatha. **Mississippi:** *Sunflower:* Indianola. **Missouri:** *Boone:* Columbia. *Bloomsdale:* Bloomsdale. **Texas:** *Kerr:* Kerrville.

Acknowledgments

The habitus illustration was prepared by Robert Sites (University of Missouri). Joseph Eger (Dow AgroSciences) and David Rider (North Dakota State University) provided reviews of the manuscript. Mention of a product does not constitute endorsement by the USDA, an equal opportunity provider and employer.

Literature Cited

- Harris, H. M., and H. G. Johnston. 1936.** A new genus and species of Podopidae and a new *Coenus* (Hemiptera: Scutellerioideae [sic]). Iowa State College Journal of Science 10: 377–380.
- McPherson, J. E. 1982.** The Pentatomoidea (Hemiptera) of northeastern North America with emphasis on the fauna of Illinois. Southern Illinois University Press, Carbondale IL. 240 pp.
- Rider, D. A. 1995.** Review of the genus *Coenus* Dallas, with the description of *C. explanatus*, new species (Heteroptera: Pentatomidae). Journal of the New York Entomological Society 103: 39–47.
- Rolston, L. H. 1973.** A review of *Hymenarcys* (Hemiptera: Pentatomidae). Journal of the New York Entomological Society 81: 111–117.
- Rolston, L. H. 1974.** Revision of the genus *Euschistus* in middle America (Hemiptera, Pentatomidae, Pentatomini). Entomologica Americana 48: 1–102.
- Rolston, L. H., and F. J. D. McDonald. 1984.** A conspectus of Pentatomini of the Western Hemisphere, Part 3. (Hemiptera: Pentatomidae). Journal of the New York Entomological Society 92: 69–86.
- Torre-Bueno, J. R. de la. 1939.** A synopsis of the Hemiptera-Heteroptera of America north of Mexico. Part I. Families Scutelleridae, Cydnidae, Pentatomidae, Aradidae, Dysodiidae and Termitaphididae. Entomologica Americana 19: 141–304.