**Unionicola (Unionicolides) poundsi** Vidrine 1986d

Plates 101-103 in Vidrine (1996a)

**Synonymy**--
- *Unionicola fossulata* group variable 2 in Vidrine 1980a.
- *Unionicola fossulata* (Koenike) in Downes 1986, 1988 and 1989
- *Unionicola (Unionicoloides) poundsi* Vidrine 1986 (sic) in Edwards and Labhart 2000

**Museum type number(s) and location**-- CNC 19102, Canadian National Collections, Biosystematics Research Institute, Ottawa, Canada.

**Type locality and host**-- Holotype (male) found in *Villosa amygdala* (Lea) from Kissimmee River at Rte. U. S. 98, border of Okeechobee and Highlands Counties, Florida, collected on 9 July 1977 by M. F. Vidrine.

**Etymology**-- Named to honor J. Alan Pounds.

**Diagnosis**-- Character states of the subgenus; dorsum with 2 pairs of small, rounded apodemes; posterior coxal group with an incomplete suture; genital field well-sclerotized; pedipalps well-sclerotized; all legs setose, but first walking leg Ge with 6-7, large, blunt setae; all tarsal claws of walking legs deeply bifid; male and female walking legs similar.

- **Male** (8 specimens) (all measurements in micrometers)--
  Length including capitulum 925 (850-1000); length of posterior coxal group 367 (350-380); dorsal lengths of pedipalp segments: Ti 143 (130-155); Ta 63 (57-70); dorsal lengths of leg segments: leg I: TFe 156 (140-170); Ge 221 (200-240); Ti 180 (170-190); Ta 134 (130-140); leg IV: TFe 184 (170-200); Ge 281 (270-290); Ti 368 (340-390); Ta 349 (330-370).
- **Female** (6 specimens)-- Length including capitulum 950 (800-1000); length of posterior coxal group 350 (310-370); dorsal lengths of pedipalp segments: Ti 143 (130-150); Ta 61 (55-65); dorsal lengths of leg segments: leg I: TFe 158 (150-170); Ge 222 (200-240); Ti 178 (170-190); Ta 130 (120-140); leg IV: TFe 192 (170-200); Ge 295 (270-320); Ti 372 (330-400); Ta 347 (330-360).

**Notes**-- Usually a single male and one or two females occur in each host. A number of behavioral studies have been conducted on this species over a 10-year period (Downes 1986-1995); however, the lack of clarity as to the identity of the species made the works somewhat confusing. In spite of all this, there are a number of observations in these studies that provide insight and help us to understand these mites. Downes also did work on other species of *Unionicola* in these studies.

*Unionicola poundsi* resembles *U. hoesei*, especially in tarsal claw structure of the walking legs; however, it has very few setae on the first walking legs compared to *U. hoesei*. *Unionicola poundsi* is a distinctive species morphologically and genetically (Dimock *et al.* 1995 and Edwards and Labhart 1998, 2000).

Barbara J. Downes (1986, 1988, 1989, 1990, 1991 and 1995) studied this species and consistently confused this species with *U. lasallei*, while trying every measure to place both of these species into a single taxon, *U. fossulata* and later *U. poundsi*. Numerous studies by Downes on populations in the St. Mark’s River in Florida were published in prestigious journals and used to attempt to refute ideas I proposed regarding coevolutionary relationships involving mites and mussels. Collectively, these studies addressed a number of important questions regarding the evolutionary ecology of *Unionicola* mites. Other species, *U. serrata, U. abnormipes* and *U. formosa* (= *U. foili*), in her works provided her with some basic population ecology, but she missed her real opportunity to make a difference in the field of the biology of *Unionicola*. Her works are listed here:

Her concept that U. poundsi and U. lasallei are host-induced morphs of a single species that was able to change morphology in response to their host signals (host-induced morphology). This concept for these species was refuted in the following works:

• Dimock, Jr., R. V., N. A. MacLaurin, and M. F. Vidrine. 1995. Genetic data for symbiotic water mites support original species descriptions and not a host-induced morphology hypothesis. ASB Bull. 42 (2): 104.
At several points, especially in her 1990 paper on host-induced morphology where she had reduced *U. poundsi* and *U. lasallei* to a single species, she strongly argued that using morphology to distinguish species was potentially a skewed approach to revealing biological species. She argued that host-induced signals changed the morphology of *Unionicola* clearly implying that many of my newly named species within *Unionicolides* were morphs of a few species. She made a strong and lengthy argument that my hypotheses regarding host-specificity and co-evolution of mites and mussels were compromised by my focus on identifying the hosts from which the mites came, i.e., focusing on the host and parasite as an entity.

Samuel Fuller, in Hart and Fuller (1974) as he closed his discussion on *Unionicola* (p. 226), had strongly argued, “Sadly, in view of superior species concepts and nomenclature developed in the later papers many records in the earlier ones must be considered suspect.” He routinely told me that understanding these mites would make sense only if I understood the hosts, by placing their interactions into central focus. So, I viewed all of these mites as parasites of specific and identifiable mollusks—I often told my professors, who wanted me to study mites or mussels not both, that I was studying ‘mites and mussels.’ Thus, I identified mites as ‘X’ mite from ‘Y’ host—at each step, I tried to get the best available name for both X and Y. Each species name for a population or group of populations is the hypothesis that is to be tested by any means possible and either accepted or refuted again and again as science develops and provides new tools for studying discrimination.

There is some precedence in the literature for why we should be paying attention to the mussels that serve as hosts for these mites. Edwards and Vidrine (1994) were able to discover a new species, *U. foilli*, although it was morphologically identical to *U. formosa*. Edwards suspected this based upon behavioral aspects of their life histories, and he confirmed it with molecular analyses—note these 2 species were parasites of different hosts in different genera, *Utterbackia* and *Pyganodon*, respectively. With recent work by Ernsting et al. (2014) and many other studies by Ernsting and Edwards, molecular discrimination of the species of mites appears to match their specificity for a host or hosts. With *U. hoesei*, there appears to be at
least 5 genetically identified species—each parasitic upon a single or 2 host species.

Such detailed analyses of *U. poundsi* and *U. lasallei* have yet to be conducted, but their obvious morphological differences, host choice differences, and the reported genetic differences were sufficient for me to re-instate them to species status in 1996.

Downes’ work gave *Unionicola* some much needed exposure. Unfortunately, some of her work incorrectly suggested that these mites can undergo host-induced changes in morphology, thus leading to the argument that coevolutionary relationships between mites and mussels were literally impossible to address using morphological studies. Since her work, molecular studies have showed a very different story—morphology if anything is limited in its usefulness for just the opposite reason.

Species are evolving chemically/genetically faster than they are evolving morphologically, and thus, morphological species are actually complexes of species that may only be separated by chemical/genetic studies. However, both the morphology, behavior and host choice differences predict what we are finding by using chemical/genetic analyses. My choice to follow Sam Fuller’s advice and look at each mite and its mussel host as an identity turns out to be a really good predictor of the findings of the chemical/genetic studies.

**Hosts:** *Unionicola poundsi* is a parasite of species of the genus *Villosa*, including *V. amygdala* and *V. villosa.*
Plate 102: Top left: tarsus of leg IV. Top right: female venter. Middle upper left: tarsal claw of leg IV. Middle upper right: female genital field. Middle lower left: male genital field. Middle lower right: pedipalps. Bottom left: male leg I. Bottom right: female leg I.
Plate 103: Top left: leg I. Top right: pedipalp. Middle left: tarsal claw of leg I. Middle center: tarsal claw of leg III. Middle right: tarsal claw of leg IV. Bottom: leg I (3 photos: left to right: proximal to distal segments).
New plates:
Plate 1: male venter:
Plate 2: male venter:

Plate 3: male genital field:
Plate 4: pedipalps:

Plate 5: leg I:

Plate 6: leg I:
Plate 7: leg I:

Plate 8: genu and tibia of leg I:

Plate 9: tibia and tarsus of leg I:
Plate 10: tarsus of leg IV:

Plate 11: tarsal claws of leg IV:
Plate 12: female venter:
Plate 13: female venter:
Plate 14: female genital field: