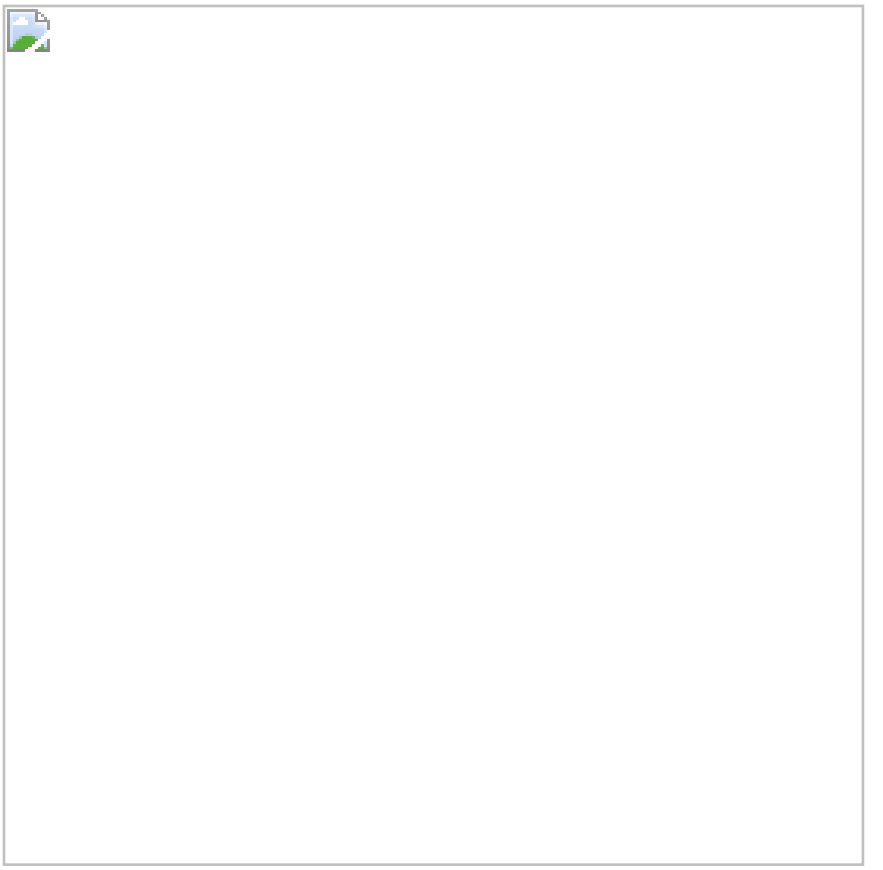

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A New Species of Leech from the New York Metropolitan Area

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ABSTRACT

Placobdella ali, n.sp., a sanguivorous glossiphoniid leech, is described from material collected in Harriman State Park, approximately 50 km north of the island of Manhattan, New York City. The new species resembles *Placobdella ornata* and could be easily confused with *Placobdella papillifera*. Dorsal papillation and internal reproductive anatomy distinguish *P. ali* from existing descriptions of the latter. Ventral pigmentation and salivary anatomy distinguish it from the former.

INTRODUCTION

Placobdella Blanchard, 1893 is a principally North American genus of freshwater, ectoparasitic glossiphoniid leeches. They are commonly found feeding on turtles and other aquatic tetrapods. Definitive characters of the genus include two pairs of closely apposed eyespots, ovarian lobes that bifurcate anteriorly, and a pair of caecate mycetomes housing endosymbiotic bacteria connected to the esophagus below the proboscis (Siddall et al., 2003).

Many of the currently valid species of *Placobdella* were described (in the genus *Clepsine*) by Verrill (1872, 1874; and see Moore, 1952). Given the ubiquity of *Placobdella* in lakes and ponds throughout the northeastern United States, it was surprising to find a new species of this genus in such proximity to metropolitan New York City. The heterogeneous pigment patterns known for species of *Placobdella*, coupled with incomplete or inaccurate descriptions, makes some species identifications difficult (Sawyer and Shelley, 1976; Davies and Wilkialis, 1982; Barta and Sawyer, 1990) such that this new species could have been mistaken for other papillated species in the genus.

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MATERIALS AND METHODS

Leeches were collected in Silver Mine Lake, Harriman State Park, Orange County, New York (41°17′69N, 74°03′50W), by checking the underside of branches submerged in approximately 20–50 cm of water. Relaxation and fixation in ethanol was accomplished according to the protocols in Oosthuizen and Siddall (2003). Examination of external morphology and dissections were accomplished with a Nikon Coolpix 5700 and a Nikon SMZ-U stereomicroscope with a SPOT-RT digital camera. Drawing of internal morphology was made by superposition of vector art on placed images in Adobe Illustrator. Numbering conventions are those traditionally used for leeches; body somites are denoted by roman numerals from anterior to posterior; and annuli in each somite are given alphanumeric designations.

RHYNCHOBDELLIDA BLANCHARD, 1893

GLOSSIPHONIIDAE VAILLANT, 1890

PLACOBDELLA BLANCHARD, 1893

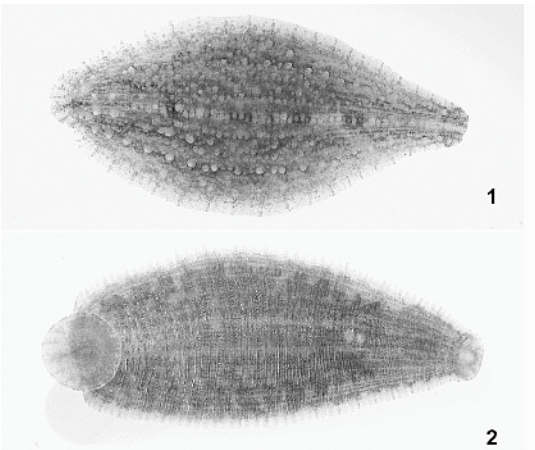
Placobdella ali, new species

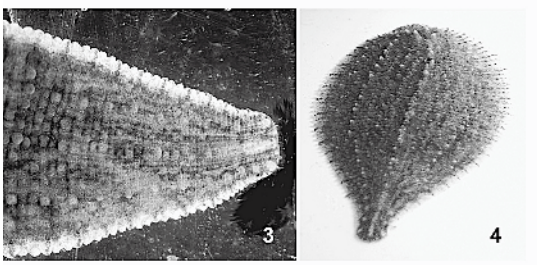
External appearance (figs. 1–9): Body ovate-lanceolate, opaque. Somites I and II uniannulate, III and IV biannulate, V–XXIV triannulate, XXV biannulate at margin though uniannulate medially, and XXVI sufficiently subdivided to be biannulate at margin although uniannulate, and XVII biannulate. Base color brown. Anterior medial light stripe, II–V, fading to VII (figs. 1, 3). Two to four pairs paramedial brown stripes from III to X (figs. 1, 3, 6). Medial dark interrupted stripe from X to anus (figs. 1, 4). Midbody metameric pigmented marginal patches on annulus a2. Venter smooth, with 10–12 lateral brown stripes extending to margins (figs. 2, 5). Green chromatophores randomly arranged on dorsum and venter. Midbody annuli ventrally subdivided. Male gonopore conspicuous at XI/XII, female gonopore conspicuous at XIIa2/a3 (fig. 5). Caudal sucker pigmented except at positions of 14 radiating rows of three tubercules and secondary papillae. Two pairs of eyespots (in II and III) in typical placobdellid arrangement.

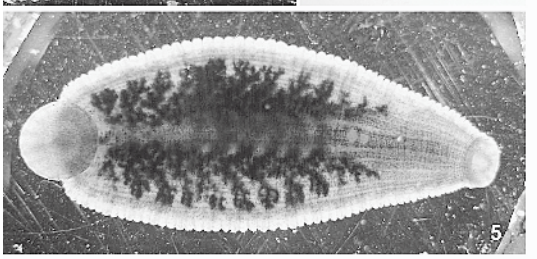
Three most prominent longitudinal tubercular rows include: one row irregular medial series on a1, a2, and a3, largest on a2, from VIIIa2 through XXIIa3; two rows irregular lateral paired series always on a2 from VIa2 through XXIVa2, often on a3 from XVI through XXII (excepting IXX), occasionally on a1, largest on a2 and often with laterally associated simple pointed papillus (figs. 1, 4, 11). In addition to preceding three rows, less prominent marginal row of tubercules usually, but not always, on a2 from XXIIa2 through XXIIa2 (excepting IXX). Medial prominent row of tubercules replaced posteriorly (fig. 7) by paired inner paramedial rows in XXIII and XXIV. These, and lateral series together, replaced by outer paramedial paired series in XXV–XXVII. Midbody annuli warty, each typically with 23–28 irregularly spaced (i.e., not forming regular series) secondary tubercules and minor papillae not forming series described above: normally two tubercules bracketing single pigmented papillus on either side of a2 between the medial and lateral prominent tubercular series. Typically three or

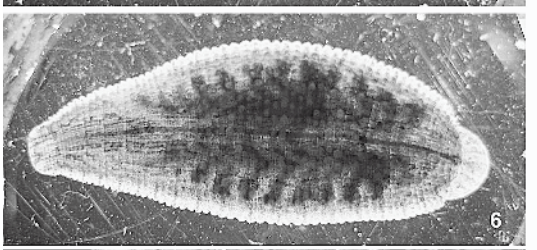
→

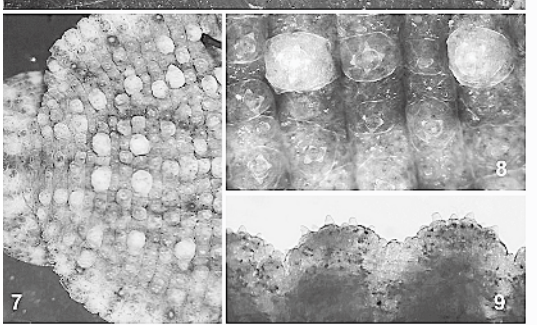
Figs. 1–11. *Placobdella ali*, n.sp. **1**. Dorsal, incident lighting. **2**. Ventral, incident lighting. **3**. Anterior dorsal pigmentation pattern. **4**. Dorsal view of live leech illustrating major papillation series. **5**. Ventral, transilluminated. **6**. Dorsal, transilluminated. **7**. Dorsal surface of posteriormost somites. **8**. Tubercules and papillae. **9**. Marginal papillae. **10**. Diagrammatic representation of internal anatomy: pr, proboscis; ms, medial salivary gland; ls, lateral salivary gland; at, male atrium; md, male sperm ducts; ov, ovaries; ov*, anterior accessory lobe of ovaries. **11**. Midbody dorsal papillation patterns. Somites are demarcated by solid lines, annuli by interrupted lines. Primary medial (Pm) and lateral (Pl) as well as secondary paramedial (Sp) and marginal (Sm) tubercular series are demarcated by solid circles; papillae associated with those series are represented by dots. Additional tubercules not in series are demarcated by interrupted circles.

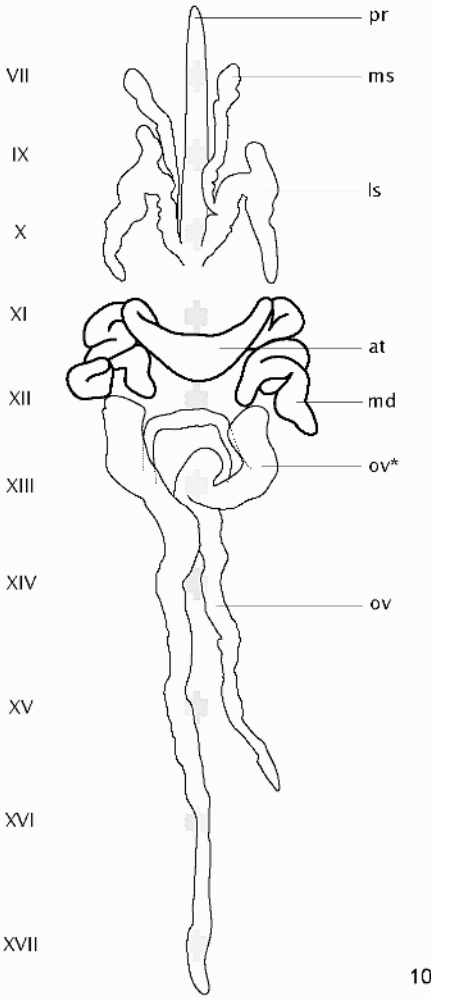


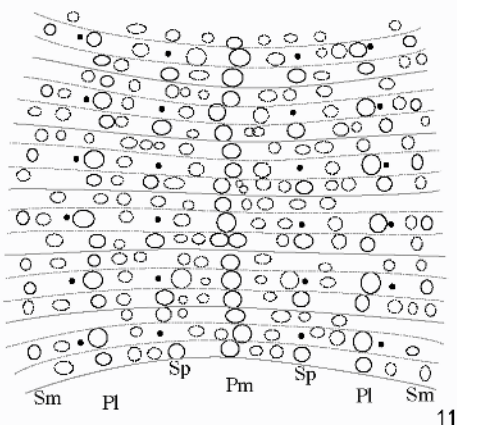












more tubercules on a1 and a3 between the medial and lateral prominent tubercular series. Marginal papillae prominent (figs. 9, 11). Tubercules stellate (fig. 8), bearing a full cap of five to six sensory papillae. Midbody annuli weakly subdivided between tubercules. Ventral blood vessel unusually prominent, visible in a live leech under transilluminating light (fig. 6).

Alimentary tract (fig. 10): Proboscis muscular, not strongly tapered, unlooped when retracted, base at X/XI. Salivary cells arranged in two pairs of glands; medial glands club-shaped, extending anteriorly to VIIIa2; lateral glands from IX to X, bilobed, posterior lobe three times larger than anterior lobe. Pair of short lateral cecate mycetomes from esophagus in IX/X only. Six pairs foliaceous gastric caeca (figs. 5, 6) including postcaeca, first pair occupy XI–XIV. Four pairs intestinal caeca. Anus in furrow between the two annuli (between a1/2 and a3) of XXVII.

Reproductive anatomy (fig. 10): No common oviduct. Ovarian lobes from XIIa2 to XVII, with robust accessory anterior lobe from bifurcation in XIII anteriorly to XII. Male atrium weak, in XI giving rise ventrally to male ducts. Ventral blood vessel same color and thickness as (and easily confused with) ovaries in posterior somites. Male ducts strongly coiled, robust, restricted to XI and XII. Testisacs in six intersegmental pairs.

TYPE LOCALITY: Silver Mine Lake, 41°17′69N, 74°03′50W, Orange County, New York, 216 m.

TYPE MATERIAL: Holotype, collected on 17 June 2006, AMNH Annelida 5327. Additional material, paratypes, dissected, AMNH Annelida 5328, 5329.

ETYMOLOGY: Noun in apposition in honor of our field assistant Ali.

HOSTS: Unknown, although blood was found in gastric caeca of some specimens.

REMARKS: *Placobdella ali* resembles *P. papillifera, P. ornata, P. multilineata*, and *P. burresonae* in that all are papillated species of this genus. The highly regular papillation patterns of *Placobdella multilineata* (Yang and Davies, 1984) and *P. burresonae* (Siddall and Bowerman, 2006) easily differentiate the two from *P. ali*. Additionally, *P. multilineata* and *P. burresonae* have weakly developed salivary glands in contrast to those of *P. ali* and most other species in this genus.

A close comparison of the external morphology of *P. ornata* and *P. ali* is hampered by the vague and often contradictory species accounts for *P. ornata*. Both have heavily papillated dorsal surfaces with tubercules bearing full caps of senory papillae (Moore, 1901). The most prominent tubercules of *P. ornata* form three to seven longitudinal series on the dorsal surface (Verrill, 1874; Moore, 1901; Miller, 1929), although Sawyer (1972) suggested that the tubercules are more randomly arranged. Furthermore, *P. ali* has 10–12 longitudinal ventral stripes, whereas *P. ornata* has no organized ventral pigmentation pattern (Verrill, 1874; Sawyer, 1972). *Placobdella ornata* and *P. ali* also are easily distinguished on the basis of their salivary gland morphology. The lateral salivary gland of *P. ali* is bilobed, with the posterior lobe being significantly larger than the anterior lobe. In contrast, the lateral salivary gland of *P. ornata* is bilobed, with each lobe being roughly the same size (Siddall, 1991; Moser and Desser, 1995).

In terms of external appearance, *P. papillifera* is the species most similar to *P. ali* of all of the papillated *Placobdella* species. Both are heavily papillated, with large tubercules forming longitudinal rows. Both have papillated caudal suckers, a posterior bifurcation of the medial turbercular series into paramedial series, and both have striped venters. However, even in these characters there remain substantial differences. The tubercules of *P. papillifera* are simple cones, bearing at most three sensory papillae (Verrill, 1872; Moore, 1952; Meyer and Moore, 1954; Sawyer, 1972). The tubercules of *P. ali* typically bear a full cap of five to six sensory papillae. The medial and paramedial rows of tubercules are restricted to the neural annuli (a2) of *P. papillifera* (Meyer and Moore, 1954; Davies and Wilkialis, 1982); in contrast, the medial and paramedial series of *P. ali* include tubercules on all midbody annuli. The medial row of papillae on *P. papillifera* is replaced posteriorly by two inner paramedian rows at XXIV (Meyer and Moore, 1954). This is also characteristic of *P. multilineata* and *P. burre-*

sonae (Siddall and Bowerman, 2006). The medial series of *P. ali* also splits paramedially in XXIII and XXIV, but then deviates to a pair of outer paramedial rows anterior to the anus in XXVII, a character apparently unique to this species.

Absolute comparison to *P. papillifera* is no longer possible owing to the dried and contracted state of Verrill's holotype (see Moore, 1952 and Meyer and Moore, 1954). Nonetheless, with respect to external anatomical characters, Meyer and Moore (1954) convincingly rediscovered and redescribed *Clepsine papillifera* (sensu stricto—there were four varieties detailed by Verrill, two of which eventually proved to be species of *Helobdella*). The redescription of *P. papillifera* by Meyer and Moore (1954) was based on leeches collected in Manitoba, Canada, and was later corroborated by additional material collected by Davies and Wilkialis (1982). Sawyer and Shelley (1976) detailed a southern variant of *P. papillifera* from the Carolinas, complete with a description of the internal anatomy. They admitted to some reservation regarding the identification (Sawyer and Shelley, 1976: 69), and with good reason. The leech from South Carolina had no distinct rows of papillae (Sawyer and Shelley, 1976) and apparently no middorsal series. Furthermore, the ventral stripes were described as blue, like those of *P. parasitica*, not brown. Regardless of the status of the leech described by Sawyer and Shelley (1976), it can still be differentiated from *P. ali* on the basis of those external characters as well as internal anatomy. The male reproductive ducts of *P. ali* are limited to somites XI and XII only, whereas the sperm ducts of *P. papillifera* (s.l.) descend to XIV. Additionally, the ovaries of *P. papillifera* (s.l.) extend to XX, and the anterior ovarian lobe splits off in XV. The ovaries of *P. ali* are shorter, terminating at XVII/XVIII, and the anterior lobe splits off in XIII.

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