First record of the genus *Lamellarea* (Acari, Oribatida, Lamellareidae) from the Neotropical region

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**Abstract**

A new species of *Lamellarea* (Oribatida, Lamellareidae) is described from hick twigs of southern live oak in Florida, U.S.A. (part of the Neotropical region). *Lamellarea americana* sp. nov. differs from most similar species, *Lamellarea digitata* and *L. forcip* by the ventrally inserted lamellar setae, the number of genital setae, the length of interlamellar setae, and the body size. Remarks on generic diagnosis and distribution of *Lamellarea* are presented.

**Key words:** lamellareid mites, systematics, morphology, distribution, U.S.A.

**Introduction**

The oribatid mite genus *Lamellarea* (Acari, Oribatida, Lamellareidae) was proposed by Kok (1968) with *Lamellarea ardua* Kok, 1968 as type species. At present, the genus comprises five species, all of which are distributed in the Ethiopian region (Subías 2019).

In the course of taxonomic identification of oribatid mites from Florida (U.S.A.), which I received from the personal collection of Prof. Dr. Roy A. Norton (State University of New York, Syracuse, U.S.A.), I found a new species of *Lamellarea* (sixth representative of the genus). The main goal of this paper is to describe and illustrate this new species.

The main diagnostic characters, an identification key, distribution and habitat of *Lamellarea* were summarized by Ermilov et al. (2017).

**Methods**

Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. All body measurements are presented in micrometers. Drawings were made with a camera lucida using a Leica transmission light microscope “Leica DM 2500”.

General morphological terminology used in this paper mostly follows that of F. Grandjean: see Travé & Vachon (1975) for references, Norton (1977) for leg setal nomenclature, and Norton & Behan-Pelletier
(2009) for overview.

The following abbreviations are used in the figures: lam – lamella; tu – tutorium; ro, le, in, bs, ex – rostral, lamellar, interlamellar, bothridial and exobothridial setae, respectively; bo – bothridium; D – dorsophragma; P – pleurophragma; c, la, lm, lp, h, p – notogastral setae; Aa, A2 – notogastral porose areas; ia, im, ip, ih, ips – notogastral lyrifissures; gla – opisthontal gland opening; a, m, h – subcapitular setae; or – anal setae; d, l, v, cm, acm, ul, sul, vt, lt – palp setae; ω – palp and leg solenidion; cha, chb – cheliceral setae; Tg – Trägårdh’s organ; I – pedotectum I; 1a, 1b, 1c, 2a, 3a, 3b, 3c, 4a, 4b, 4c – epimeral setae; g, an, ad – genital, anal and adanal setae, respectively; iad – adanal lyrifissure; cp – circumgastric carina; dis – discidium; po – preanl organ; Tr, Fe, Ge, Ti, Ta – leg trochanter, femur, genu, tibia, tarsus, respectively; pa – leg porose area; σ, φ – leg solenidium; ε – tarsus I famulus; v, ev, bv, l, d, ft, tc, it, p, u, a, s, pv – leg setae.

Description of new species

Family Lamellareidae
Genus Lamellarea Kok, 1968
Type species: Lamellarea ardua Kok, 1968

Lamellarea americana sp. nov. (Figs 1–3)
https://zoobank.org/urn:lsid:zoobank.org:act:65613FE1-C8C5-4AF3-8DD8-1E5D109CE8F4

Diagnosis. Body size 199–207 × 116–124. Prodorsum and notogaster with dense cerotegmental tubercles. Rostrum pointed. Lamellar cusps separated mediobasally, broad and roughened distally, connected medio-distally. Translamella interrupted medially. Rostral and lamellar setae long, setiform, barbed, le inserted on ventral side of lamellar cusps. Interlamellar setae short, setiform, slightly barbed. Bothridial setae club-like, barbed. Tutoria simple. Notogastral setae and epimeral setae short, setiform, slightly barbed. Circumpedal carinae long. Four pairs of genital setae. Anogenital setae short, setiform, roughened.

Description of adult. Measurements. Very small in size. Body length 199 (holotype, male), 199–207 (eight paratypes: five males and three females); body width 116 (holotype), 116–124 (eight paratypes). No clear differences in body size between females and males.

Integument (Figs 1A, 2A). Body light brown. Surface densely striate (well visible only under high magnification in dissected specimens). Prodorsum and notogaster with dense cerotegmental tubercles (diameter up to 4). Anogenital region with sparse, strong stria.

Prodorsum (Figs 1A, 1B). Rostrum pointed. Basal part of lamellae as long as half of prodorsum. Lamellar cusps slightly shorter than lamellae, covering rostrum, well separated mediobasally, broad and roughened distally, connected medio-distally. Translamella interrupted medially. Rostral (24–28) and lamellar (30–36) setae setiform, barbed, le inserted on ventral side of lamellar cusps. Interlamellar (10–12) and exobothridial (8) setae setiform, thin, slightly barbed. Bothridial setae (28–32) with short stalk and large, club-like heads, barbed. Tutoria simple, without rugose branches.

Notogaster (Figs 1A–1D, 2A). Anterior margin slightly convex, posterior margin broadly rounded, sometimes slightly conical medially. Humeral shoulders poorly visible. Nine pairs of notogastral setae (p1, p2, 6–8; others 10–12) setiform, slightly barbed. Two pairs of porose areas rounded (2–4). Circumgastric scissure, lyrifissures im, ip, ih, ips (ia not observed) and opisthontal glands openings distinct.

Gnathosoma (Figs 2B–D). Subcapitulum longer than wide (43–45 × 34–36). Subcapitular setae similar in length (6–8), setiform, slightly barbed. Adoral setae (4) setiform, thin, smooth. Palps (30–32) with typical setation 0-2-1-3-9(10). Solenidion short, bacilliform, pressed to the palparsi surface. Postpalpal setae (2) spiniform, roughened. Chelicerae (45–49) with two setiform, barbed setae, cha (10–12) longer than chb (6–8).

Epimeral and lateral podosomal regions (Figs 1B, 2A). Epimeres with typical setal formula 3-1-3-3. Setae (1b, 3b, 12–16; others 6–8) setiform, slightly barbed. Circumpedal carinae long. Discidia tubercle-like. Pedotecta I represented by large scale.

Anogenital region (Figs 1B–1D, 2A). Four pairs of genital, one pair of anal and two pairs of adanal setae similar in length (6–8), setiform, roughened. Adanal lyrifissures located close and slightly inverse diagonal to anal plates.

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Figure 1. *Lamellarea americana* sp. nov., adult: A — dorsal view (legs not shown); B — anterior part of body (gnathosoma and legs not shown), lateral view; C — posterior part of body, lateral view; D — posterior view. Scale bar 30 μm.

*Legs* (Figs 3A–3D). Claw of each leg roughened on dorsal side. Formulas of leg setation and solenidia: I (1–4–2–3–16) [1–2–2], II (1–4–2–3–15) [1–1–1], III (2–3–1–3–14) [1–1–0], IV (1–2–0–3–12) [1–1–0]; homologies of setae and solenidia indicated in Table 1. Famulus of tarsi I short, erect, slightly blunt-ended, inserted anteriorly to ω₁. Solenidion ω₂ on tarsi I, φ₁ on tibia I, φ on tibia II and IV long, setiform, φ₂ on tibia I slightly thickened, blunt-ended, other solenidia bacilliform. Solenidion ω₂ and seta it” on tarsi I connected.

*Material examined.* Holotype (male) and eight paratypes (five males and three females): U.S.A., Florida, Columbia Country, east of Lake City on SR 250, 1 mile west of route I-10, from thick twigs of southern live oak (*Quercus virginiana*), 12.X.1987 (R.A. Norton).
**Type deposition.** The holotype and two paratypes are deposited in the collection of the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (currently housed with the U.S. Department of Agriculture collections in Beltsville, Maryland); six paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia. Additional material: 14 adults with the same collection data in the personal collection of R.A. Norton. All specimens are preserved in ethanol with a drop of glycerol.

**Etymology.** The species name *americana* refers to the country of origin, USA.

**Differential diagnosis.** *Lamellarea americana* sp. nov. is morphologically most similar to *Lamellarea digitata* Kok, 1968 and *L. forceps* Kok, 1968 from South Africa in having distinctly separated mediobasally lamellar cusps of elongate form, but differs from these species by the insertions of lamellar setae on the ventral side of the lamellar cusp (versus distally on lamellar cusps) and the presence of four pairs...
of genital setae (versus five pairs), longer interlamellar setae (versus very short) and smaller body size (199–207 × 116–124 versus 235–243 × 143–165 in L. digitata, 239–263 × 137–157 in L. forceps).

Figure 3. Lamellarea americana sp. nov., adult: A — leg I, right, antiaxial view; B — femur and genu of leg II, right, antiaxial view; C — trochanter, femur and genu leg III, left, antiaxial view; D — leg IV, left, antiaxial view. Scale bar 10 μm.
Table 1. Leg setation and solenidia of adult *Lamellarea americana* sp. nov.

| Leg | Tr | Fe | Ge | Ti | Ta |
|-----|----|----|----|----|----|
| I   | v’ | d, (l), bv” | (l), σ | l’, (v), φ₁, φ₂ | (ft), (tc), (it), (p), (u), (a), s, (pv), ε, Ω₁, Ω₂ |
| II  | v’ | d, (l), bv” | (l), σ | l’, (v), φ | (ft), (tc), (it), (p), (u), (a), s, (pv), φ |
| III | l’, v’ | d, l’, ev’ | l’, σ | l’, (v), φ | ft”, (tc), (it), (p), (u), (a), s, (pv) |
| IV  | v’ | d, ev’ | σ | l’, (v), φ | ft”, (tc), (p), (u), (a), s, (pv) |

Note: Roman letters refer to normal setae, Greek letters to solenidia (except ε = famulus). Single prime (’) marks setae on anterior and double prime (“) setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

**General remarks**

The diagnostic traits of *Lamellarea* were presented by Ermilov et al. (2017) referring to five pairs of genital setae, insertions of lamellar setae in anterolateral parts of the lamellar cusps and the presence of translamella. However, in *L. americana* sp. nov., only four pairs of genital setae, the insertions of lamellar setae located on ventral side of the lamellar cusps, and the translamella is interrupted medially. Therefore, these morphological variations should be included in the generic diagnosis of *Lamellarea*.

So far, the known oribatid mite species of *Lamellarea* were distributed only in South Africa and Lesotho (Kok 1968; Coetzee 1987; Ermilov et al. 2017). Thus, the present new species from Neotropical U.S.A. is the first representative of this genus found from outside of the Ethiopian region.

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