

## FOUR NEW ACARINA IN THE FAMILY TARSONEMIDAE

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Mites of the family Tarsonemidae feed on green plants or on fungi. Of the species described below, *Steneotarsonemus paspali* and *S. furcatus* feed on *Paspalum* sp.; *Hemitarsonemus cocosi*, from the coconut palm, has not been found in sufficient number to make it possible to determine its feeding habits; *H. lodici* feeds on several hosts, being most common on *Psychotria undata*.

In the descriptions, I have followed Beer's terminology (1954)<sup>1</sup> except in respect to the transverse apodeme; as this is often separated into two parts, I have treated it as a pair of apodemes. All measurements are in microns. Corresponding measurements of the opposite side of the same specimen or of different specimens sometimes vary more than twenty per cent; in such cases the range has been given. When the measurements are fairly uniform they have been given in averages.

### *Steneotarsonemus paspali*, n. sp.

The male of *S. paspali* runs to *ananas* (Tryon) in Beer's key, but it differs in many characters from his drawings and from his description of this species. It appears to be more nearly related to *spirifex* (Marchal), but differs from Beer's redescription and drawings of this species by the first propodosomal being shorter than the other propodosomals, by the anterior median apodeme being distinct between apodemes I and II, by the inner ends of the transverse apodemes being widely separated, and by other characters. The female differs from Beer's description of this sex of *spirifex* by the widened apodeme I, by the C-shaped rudimentary transverse apodemes, by the capitulum being wider than long and by other characters.

**MALE:**—Body creamy white, length from anterior end of capitulum (including palpi) to posterior tip of genital papilla 200, width 105, widest just anterior to coxae III; capitulum emarginate basad, size and shape variable, generally about 28 long (including palpi) and 30 wide, but in some specimens about 21 long and 21 wide.

**Dorsal chaetotaxy:** Propodosomal setae approximately in line, 14, 15, 55, and 24 long respectively, distance from preceding seta 8, 10, and 20 respectively; hysterosomal setae 22, 7, 13 and 9 long respectively; first (the humeral) fine, the others coarse; first at side of body, about 33 from main body suture; second about in line with and about mid-way between first and third; third about its length anterior to secondary body suture, distance between bases 31; fourth at outer edge of basal third of genital papilla.

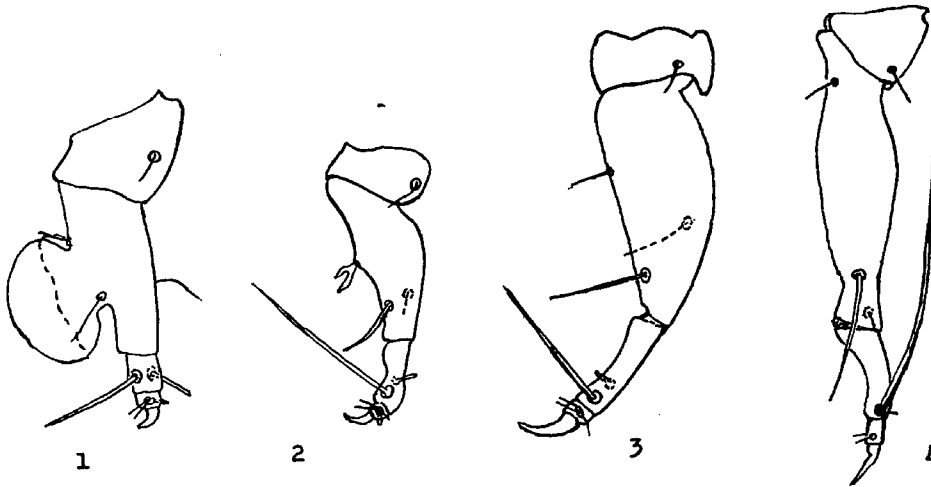
**Ventral chaetotaxy:** First propodosomal 2 long, distance behind apodeme I variable, often unequal even within a given specimen, ranging from against apodeme to 13 behind it; second propodosomal, 4 to 10 long, 11 from midline and 10 behind apodeme II; first hysterosomal situated in curve at anterior end of apodeme III, 22 long, reaching base of second

<sup>1</sup>Beer, R. E. 1954. A revision of the Tarsonemidae of the western hemisphere (order, Acarina), Univ. Kans. Sc. Bul. 36 (pt. II, no. 16): 1091-1387.

hysterosomal which is situated close to apodeme IV at a little more than half the length of apodeme IV from its anterior end, and 7 long.

*Apodemes:* Anterior median apodeme distinct for about the anterior half of the distance between the inner ends of apodemes I and II, continuing indistinctly almost to main body suture; apodeme II short of reaching midline by about one-fifth its length; transverse apodemes slightly bowed, each 20 long, the ends pointing cephalad and the inner ends 30 apart; anterior end of apodeme III curved posteromedially toward anterior end of apodeme IV, but not closing with it; area between apodeme III and IV open at anterior end; posterior median apodeme 60 long, distinct except for distance of about one-fifth its length near its anterior end which terminates, usually in the shape of a trident, slightly behind a point even with anterior end of apodeme IV.

*Legs:* Tarsus I, 10 long, with a long proximal annulated sensilla and seven normal setae; tibia I, 8 long, with two annulated sensillae, a tapering one, and five normal setae; tarsus II, with two annulated sensillae and four normal setae. Leg IV (fig. 1); femur 26 long, expansion 22 long, seta at proximal juncture of expansion 7 long, seta at distal juncture 10 long, seta on anterior margin 10 long; tibia plus tarsus 10 long and 7 wide, ventral tarsal seta 16 long, dorsal rod-like sensilla 9 long; claw 6 long.



Ventral view of leg IV of males. Fig. 1. *Steneotarsonemus paspali*; Fig. 2. *S. furcatus*; Fig. 3. *Hemitarsonemus cocosi*; Fig. 4. *H. lodici*. All drawings to same scale.

*Genital papilla:* Shape variable, usually about 31 long and 27 wide, but in some specimens 30 long and 31 wide, base emarginate; caudal two-fifths constricted.

**FEMALE:**—Body slightly brownish, with faint longitudinal grooves dorsal; 287 long from anterior end of capitulum (including palpi) to end of body, and 119 wide; capitulum 27 long (including palpi) and 34 wide, widest at about middle.

*Dorsal chaetotaxy:* First propodosomal 20 long, second 70 long, 26 from first propodosomal and situated just behind pseudostigmatic organ which

is 18 long (including pedicel 5 long) and 8 wide. Hysterosoma with six pairs of setae, the first two pairs near anterior margin, 16 and 9 long, distance between respective bases 109 and 48; third pair at posterior margin of segment two, 8 long and 60 apart; fourth and fifth pairs at posterior margin of third segment, outer pair at its lateral angle, inner pair 22 apart, both pairs 7 long; sixth pair near posterior outer margin of segment four, 15 long.

*Ventral chaetotaxy and apodemes:* First propodosomal 6 long, situated at about mid-length on apodeme I which is widened; second propodosomal close behind apodeme II, near its middle and 5 long; anterior median apodeme 43 long, not united with apodeme II, indistinct for about a quarter its length anterior to middle and again indistinct posterior to apodeme II; a pair of C-shaped rudimentary apodemes, often with one to three spurs, 6 across, 47 apart and 27 diagonally caudad of coxae II, the open part facing caudolaterally. First hysterosomal 26 long, medial to expanded anterior end of apodeme III, and situated close to its lower angle, second hysterosomal 7 long, situated on apodeme IV near its caudal end, anterior half of apodeme IV indistinct, curved cephalad, not reaching midline; posterior median apodeme absent; a pair of caudal seta 8 long.

*Legs:* Tibiotarsus 27 long with a distal, annulated sensilla, a group of three posteroproximal sensillae, the lower one tapering, the other two annulated and club-shaped, and nine normal setae; tibia II with four normal setae; genu II with two coarse setae and one normal seta. Leg IV, 46 long; subapical seta 27, apical seta 80 long.

**HOLOTYPE:**—Male, Coral Gables, Florida, 5 October, 1955, (D. De Leon) from *Paspalum* sp. Allotype, same data as for holotype and on same slide. Paratypes, 2 females and 2 males, a pair each on two slides, same data as for holotype. Additional specimens were collected 10 October, 1955, Coral Gables, Florida.

*Steneotarsonemus furcatus*, n. sp.

*Steneotarsonemus furcatus* may be distinguished from all other members of the genus by the presence of a coarse bifurcate seta on the posterior margin of femur IV of the male.

**MALE:**—Body brownish; length from anterior end of capitulum (including palpi) to posterior end of genital papilla 166, width 76, widest at coxae III; capitulum 22 long (including palpi) and 23 wide, widest at basal third, base not emarginate; genital papilla cordate in outline, 24 long, 23 wide.

*Dorsal chaetotaxy:* Propodosomal setae nearly in line, 10, 7, 19, and 13 long respectively, distance from preceding seta 7, 7, and 16 respectively. Humeral seta 12 long, situated at about twice its length from main body suture; second and third hysterosomals about 12 long, 9 anterior to secondary body suture, the second near side of body slightly anterior to the third, the bases of third 14 apart; fourth hysterosomal at middle of outer edge of basal third of genital papilla, 10 long; the humeral fine, the others coarse.

*Ventral chaetotaxy:* First propodosomal 4 long, 5 behind apodeme I and 4 from midline; second 5 long, 7 behind apodeme II and 9 from midline. First hysterosomal 11 long, its base situated in curve at anterior end of

apodeme III and touching it; second 4 long, its base situated at about mid-length of apodeme IV and touching it.

*Apodemes:* Anterior median apodeme distinct, extending to a point about even with inner ends of apodemes II; apodeme II short of reaching midline by 4 and with a semicircular expansion on anterior edge near inner end; transverse apodemes originating near sides of body, slightly bowed, inner ends 25 apart; anterior end of apodeme III curving posteromedially and almost closing with apodeme IV; area medial to apodeme IV fully open cephalad; posterior median apodeme distinct its full length, 44 long, terminating at a point about even with anterior end of apodeme IV.

*Legs:* Tarsus I, 12 long with an annulated proximodorsal sensilla and 7 normal setae; tibia I, 11 long with a proximodorsal annulated sensilla, two proximolateral sensillae on posterior side, the upper annulated, club-shaped, the lower tapering and 5 normal setae; tarsus II, 10 long, with 5 normal setae and two proximodorsal sensillae one behind the other, the proximal one annulated, club-shaped, the distal tapering; tibia II, 9 long, with four setae. Leg IV (fig. 2); femur 22 long with a coarse bifurcate seta or process at about mid-length of posterior face, the posterior ramus the longer and stouter, length of process 7; ventral seta of femur 10 long, dorsal seta 4 long; tibia 11 long and 6 wide with a ventral seta 27 long and a dorsal rod-like sensilla anterior to it; tarsus 3 long and 5 wide; claw 7 long.

**FEMALE:**—Body somewhat darker in colour than male; length from anterior end of capitulum (including palpi) to end of body 235, width 112; capitulum 30 long (including palpi), 28 wide, widest at basal third, base not emarginate; tracheal atria apparently sclerotized, usually crescent-shaped.

*Dorsal chaetotaxy:* First propodosomal situated at anterior lateral edge of propodosoma, 13 long; second 17 long, situated posteromedially to pseudostigmatic organ which is 12 long (including pedicel of 3) and 5 wide; six pairs of hysterosomals 7 to 10 long, the first fine, the others coarse.

*Ventral chaetotaxy:* First propodosomal 3 long, 3 behind apodeme I and 5 from midline; second 5 long, 3 behind apodeme II and 10 from midline. First hysterosomal 11 long, situated slightly medial to inner anterior end of apodeme III; second 5 long, situated on apodeme IV near its posterior end; a pair of caudal setae 5 long.

*Apodemes:* Apodeme I, 5 wide, anterior median apodeme narrow, distinct for a distance of 13 from apodeme I, indistinct and widening at inner ends of apodeme II and continuing slightly beyond their indistinct inner ends; transverse apodemes crescent-shaped, 23 across, the outer ends considerably anterior to inner ends which are 26 apart; apodeme III, 18 long; apodeme IV thin, 25 long, bent medially at middle, anterior end curving toward and stopping just short of anterior end of posterior median apodeme which is 24 long, indistinct and slightly expanded at middle third.

*Legs:* Femur I with a narrowly elliptic seta dorsad shorter than width of femur and with two normal setae; genu I, 13 long, with four setae, the proximal one short and coarse; tibiotarsus 20 long, with two large, annulated, club-shaped sensillae, two smaller sensillae lateral to proximal club-shaped sensilla, the upper annulated, club-shaped, the lower tapering, and 12 normal setae. Femur II with a short, coarse seta dorsad and two some-

what longer setae; genu II, 9 long, with two setae; tibia II, 9 long, with four setae; tarsus II, 11 long, with two proximodorsal sensillae, one annulated, club-shaped, the other tapering, and four normal setae. Leg IV, 43 long; sub-apical setae 23 long, apical seta 53 long.

**HOLOTYPE:**—Male, Coral Gables, Florida, 5 October 1955 (D. De Leon) from *Paspalum* sp. Allotype on same slide as holotype and same data. Paratypes, two males and a female, same data as for holotype. Additional specimens were collected 10 October 1955, same locality and host.

This species was found associated with colonies of *S. paspali*.

*Hemitarsonemus cocosi*, n. sp.

*H. cocosi* differs from the three other known species of *Hemitarsonemus* by the first two dorsal propodosomals of the male being sub-equal in length and somewhat less than one-third as long as the third propodosomal, by the relatively short ventral seta of tibia IV, and by other characters.

**MALE:**—Length from anterior end of capitulum (including palpi) to distal end of genital papilla 169, width 91; capitulum 29 long (including palpi) and 24 wide, widest near base; genital papilla 28 long and 26 wide, caudal half constricted, basal outline emarginate.

**Dorsal chaetotaxy:** Propodosomal setae 21, 18, 67, and 10 to 17 long respectively, the fourth finer than the others; distance from preceding seta 9, 8, and 1 respectively, the fourth nearly lateral to the third. Humeral seta 25 long situated somewhat less than its length from hysterosomal suture; the other hysterosomals 14, 17, and 11 long respectively, the second and third pair situated about half their length anterior to secondary body suture, their respective bases 65 and 39 apart; the fourth at basal third of genital papilla.

**Ventral chaetotaxy:** First propodosomal 7 long, its basal ring touching or nearly touching caudal edge of apodeme I, distance between bases 6; the second 8 long, 6 behind apodeme II, distance between bases 23. First hysterosomal 11 to 19 long, slightly nearer apodeme III than apodeme IV and near anterior end of area between apodemes III and IV; second 7 to 13 long.

**Apodemes:** Anterior median apodeme extending to transverse apodemes and indistinct in part nearest inner caudally directed portion of apodeme II; apodeme II with a somewhat semicircular expansion near inner end on anterior margin; transverse apodemes slightly curved and meeting, indistinct towards midline. Area between apodemes III and IV and area between apodeme IV and posterior median apodeme almost fully open at anterior end; anterior ends of apodemes III and IV each in order somewhat closer to main body suture than anterior end of posterior median apodeme.

**Legs:** Tarsus I, 11 long with a club-like, annulated, proximodorsal sensilla, a short, slender mediodorsal sensilla, and five normal setae; tibia I, 9 long, with an annulated, proximodorsal sensilla, a tapering one lateral to it and five normal seta. Tarsus II, 11 long, with an annulated proximodorsal sensilla and three normal setae; tibia II, 9 long, with four normal seta; genu II and femur II each with three setae. Leg IV (fig. 3); femur 31 to 37 long (measured in a straight line from outer distal edge of coxa to outer base of tibia), its dorsal seta fine, 10 to 25 long, proximal seta of

posterior margin 8 long, distal seta 19 long; tibia 22 long and 7 wide, its dorsal rod-like seta 5 long, ventral seta 27 long; tarsus 4 long and 6 wide; claw 10 to 16 long, (measured from its outer base in a straight line).

FEMALE:—Not known.

HOLOTYPE:—Male, Coral Gables, Florida, 16 May, 1955, (D. De Leon) from *Cocos nucifera*. Paratypes, four males, same date as for holotype.

*Hemitarsonemus lodici*, n. sp.

The male of *H. lodici* may be distinguished from the other species of *Hemitarsonemus* by the first propodosomal seta being much longer than the second, and the second being about as long as the first hysterosomal; although tibia IV is scarcely three times as long as wide the mite clearly belongs to this genus. The female may be distinguished by the spiracle being at the base of the second propodosomal seta and apodeme II extending from coxa II to the juncture formed by the union of the anterior median apodeme with the transverse apodemes. The mite appears to be most closely related to *H. peregrinus* Beer.

The females and larvae carry about on their backs a covering made up of particles of organic matter and sand; the males are frequently without this covering. Their feeding appears to be confined to the lower leaf surface.

MALE:—Body diamond-shaped, widest just below the middle, strongly convex dorsally; light amber in color. Length from anterior end of capitulum (including palpi) to distal end of genital papilla 144, width 83; capitulum 30 long (including palpi), 28 wide, widest near base; genital papilla 25 long, 23 wide, basal outline emarginate.

*Dorsal chaetotaxy*: Propodosomal setae 31, 19, 83, and 36 long respectively, distance from preceding seta 2, 10, and 2 respectively. Humeral seta 22 long, 10 to 27 from hysterosomal suture, second, third, and fourth hysterosomals coarse, 35, 15, and 13 long respectively, the fourth near margin of body at side of genital papilla; the third directly anterior to fourth on second body segment near its posterior margin; second about in line with first and third, somewhat nearer the first.

*Ventral chaetotaxy*: First propodosomal 7 long, 3 behind apodeme, distance between bases 16; the second 5 long, 3 behind apodeme II, distance between bases 35. First hysterosomal 4 long, situated in curve near anterior end of apodeme III; the second 6 long, situated at about midlength of apodeme IV, and close to it.

*Apodemes*: Anterior median apodeme extending from apodeme I to transverse apodemes, the caudal two-fifths usually indistinct, especially the anterior part; apodeme II practically parallel with apodeme I, not reaching midline by about one-fifth its length; apodeme III extending to a point about 15 from midline, sub-parallel to apodeme IV which curves fairly evenly from coxa IV to a point just short of midline and slightly anterior to distal end of posterior median apodeme; posterior median apodeme 29 long. In some specimens one or two secondary apodemes or folds extend from apex of coxa III anterolaterally to near margin of body.

*Legs*: Legs slender; tarsus I, 31 long, 6 wide, with a mediolateral annulated rod-like sensilla and five normal setae; femur I with two stout setae ventrad and two normal setae; tarsus II, 25 long, with a proximal,

annulated rod-like sensilla and four normal setae. Leg IV (fig. 4); femur 45 long (measured from outer distal end of coxa to outer base of tibia), 13 wide, proximoventral seta 4 long, distoventral seta 19 to 27 long, dorsal seta 4 long; tibia 16 long, 5.5 wide, ventral seta 44 to 61 long, dorsal seta 2 long; tarsus 4 long, 3 wide; claw 6 long, nearly straight.

**FEMALE:**—Ovate, widest slightly anterior to middle, tapering rapidly posteriorly, strongly convex dorsad; brownish; length 176, 126 wide, about 80 from dorsum to venter; capitulum about 32 long (including palpi), 33 wide. In mounted specimens the anterior margin of propodosoma usually extends well beyond tips of palpi, the first propodosomal on the anterior margin, the second on the anterolateral margin at a point about even with the anterior end of the capitulum when it is fully retracted. In live specimens the propodosoma apparently covers about a third of the capitulum. Spiracle at anterior margin of base of second propodosomal. Pseudostigmatic organ 13 long (including pedicel of 5), 7 wide.

*Dorsal chaetotaxy:* First propodosomal 32 to 40 long, distance between bases 26; second 84 long, distance between bases 48, distance from first 8 to 12. Hysterosoma with three pairs of setae, the first 20 long, situated near the middle of body; second 26 long, near side of body and near caudal margin of penultimate segment; the third 29 long, 16 apart and about on a line with second.

*Ventral chaetotaxy and apodemes:* First propodosomal 4 long, 1 behind apodeme I, distance between bases 17; second propodosomal 6 long, on or close behind apodeme II, distance between bases 48; anterior median apodeme extending to transverse apodemes, often with a knob or a pair of spurs at about midlength, caudal half somewhat indistinct; apodeme II with caudal third indistinct, uniting with anterior median apodeme just anterior to or at juncture with transverse apodemes; transverse apodemes generally distinct, united at midline (the inner ends usually directed slightly forward a short distance before meeting), bent at about their midlengths, the lateral portions extending forward almost to outer posterior angles of coxae II; apodeme III extending anteromedially for about half its distinct length, then more medially, the remaining part expanded, indistinct, and usually uniting with arm of fork of posterior median apodeme; apodeme IV straight to bisinuate, 14 to 18 long, uniting or nearly uniting with posterior median apodeme about 5 behind fork; posterior median apodeme 20 long to base of fork, interrupted at midlength, a V-shaped fork at anterior end, arms of fork about 8 long. First hysterosomal anterior to indistinct part of apodeme III, 3 long, distance between bases 11; second on caudal end of apodeme IV, 4 long.

*Legs:* Tibiotarsus with a distolateral annulated sensilla, a longer, slender, apparently sensory seta adjacent to it and nine tactile setae; tarsus II with a distolateral annulated sensilla and four tactile setae; leg IV, 37 long, terminal segment 13 long, preapical seta 14, apical seta 16 long.

**LARVA:**—Oval, strongly convex dorsad, pearly white, 61 long, 33 wide. First propodosomal 15 long; second 32 long, a seta or a seta-like pseudostigmatic organ 7 long arising beside it. Second body segment narrow, a ventral seta about 4 long, situated just anterior to it near lateral margin of body; a pair of anteriorly directed spine-like setae 7 long, about 7 anterior to secondary body suture, distance between bases 4; two pairs of sub-

equal, dorsally directed spine-like setae about 5 long forming a transverse row on fourth body segment; two pairs of spine-like caudal setae, outer 4 long, inner 7 long.

HOLOTYPE:—Male, Coral Gables, Florida, 21 February, 1956, (D. De Leon) on *Psychotria undata*. Allotype same data as for holotype and on same slide. Paratypes 10 males, 14 females and 5 larvae, same data as for holotype. A few females and larvae were collected from *Pithecolobium guadalupense*, *Dipholis salicifolia*, and *Citharexylum fruticosum*, Coral Gables, 28 February, 1956.

The holotypes of these four species will be deposited in the U. S. National Museum, and paratypes in the University of Florida collections, Gainesville.

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