

## NEW SPECIES OF *FLAGELLOZETES* (*COSMOGALUMNA*) (ACARI, ORIBATIDA, GALUMNIDAE) FROM VIETNAM

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Two new species of the genus *Flagellozetes* (Oribatida, Galumnidae) – *F. (Cosmogalumna) carinodentatus* **sp. n.** and *F. (C.) pseudoareticulatus* **sp. n.** – are described from the bark of different trees in Vietnam. A comparative analysis of the *F. (Cosmogalumna)* group included species with neural ridges on the notogaster is presented.

Key words: galumnid mites, taxonomy, morphology, Cat Tien National Park, Oriental region.

### INTRODUCTION

*Flagellozetes* (Acari, Oribatida, Galumnidae) was proposed by BALOGH (1970), with *Flagellozetes porosus* Balogh, 1970 as type species. The genus comprises three subgenera with 20 species and one subspecies which are distributed in the Oriental, Neotropical and southern Palaearctic regions (ERMILOV & CORPUZ-RAROS 2022). ERMILOV and KLIMOV (2017) presented the generic and subgeneric diagnoses. An identification key to known species of *Flagellozetes* was provided by ERMILOV and CORPUZ-RAROS (2022). Data on distribution and habitats of many representatives of the genus were provided by ERMILOV and KALÚZ (2019).

Among the oribatid mite materials collected in Vietnam, we found two new species of the subgenus *Flagellozetes* (*Cosmogalumna*). The main goal of the paper is to describe these two new species under the names *F. (C.) carinodentatus* **sp. n.** and *F. (C.) pseudoareticulatus* **sp. n.** Both species belong to the group of species with neural ridges on the notogaster; species of this group are similar, therefore, the additional goal of the paper is to present their comparative morphological analysis.

At present, the galumnid mite fauna of Vietnam is insufficiently investigated; six species of *Flagellozetes* (all from the subgenus *Cosmogalumna*) were registered (CORPUZ-RAROS & ERMILOV 2020, KOLESNIKOV & LEONOV 2021): *F. (C.) dongnaiensis* (Ermilov et Anichkin, 2013); *F. (C.) imperfectus* (Aoki et Hu, 1993); *F. (C.) lineatus* Kolesnikov et Leonov, 2021; *F. (C.) ornatus* (Aoki, 1988); *F. (C.) sacculus* Kolesnikov et Leonov, 2021; and *F. (C.) tenensis* (Ermilov, Vu et Nguyen, 2011).

## MATERIAL AND METHODS

**Specimens.** Materials were collected from the bark of trees (*Haldina cardifolia*, *Ochrocarpos siamensis*) in Cat Tien National Park, southern Vietnam. Detailed descriptions of arboreal acarofauna collection and extraction techniques are presented in SALAVATULIN (2019). The collection localities are given in the *Material examined* sections.

**Observation and documentation.** Specimens were mounted in lactic acid, on temporary cavity slides for measurement and illustration. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster. Notogastral width refers to the maximum width of the notogaster in dorsal view (behind pteromorph). Lengths of body setae were measured in lateral aspect. All body measurements are presented in micrometers. Formulas for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus (famulus included). Formulas for leg solenidia are given in square brackets, according to the sequence genu-tibia-tarsus. Drawings were made with a camera lucida using a Leica transmission light microscope "Leica DM 2500".

**Terminology.** Morphological terminology used in this paper follows that of Grandjean (see ERMILOV & KLIMOV 2017 for review and application).

**Abbreviations.** Prodorsum: f = furrow; L = lamellar line; S = sublamellar line; tS = teeth of sublamellar line; N = prodorsal leg niche; E, T = lateral ridges of prodorsum; ro, le, in, bs = rostral, lamellar, interlamellar, and bothridial seta, respectively; Ad = dorsosejugal porose area; D = dorsophragma; P = pleurophragma. Notogaster: c, la, lm, lp, h, p = notogastral setal alveoli; Aa, A1, A2, A3 = notogastral porose areas; m.p. = median pore; ia, im, ip, ih, ips = lyrifissures; gla = opisthonotal gland opening. Gnathosoma: a, m, h = subcapitular setae; or = adoral seta; sup, inf, d, l, cm, acm, ul, su, vt, lt = palp setae;  $\omega$  = palp solenidium; a.s. = axillary sacculi; cha, chb = cheliceral setae; Tg = Trägårdh's organ. Epimeral and lateral podosomal regions: 1a, 3b, 4a, 4b = epimeral setae; PdI, PdII = pedotectum I, II, respectively; *dis* = discidium; cir = circumpedal carina. Anogenital region: g, ag, an, ad = genital, aggenital, anal, and adanal seta, respectively; iad = adanal lyrifissure; p.o. = preanal organ; Ap = postanal porose area. Legs: Tr, Fe, Ge, Ti, Ta = trochanter, femur, genu, tibia, and tarsus, respectively;  $\omega$ ,  $\varphi$ ,  $\sigma$  = solenidia;  $\varepsilon$  = famulus; d, l, v, bv, ev, ft, tc, it, p, u, a, s, pv, pl = setae; p.a. = porose area.

## TAXONOMY

Family Galumnidae

Genus *Flagellozetes* Balogh, 1970

Subgenus *Flagellozetes* (*Cosmogalumna*) Aoki, 1988

Type species: *Cosmogalumna ornata* Aoki, 1988

### ***Flagellozetes* (*Cosmogalumna*) *carinodentatus* sp. n.**

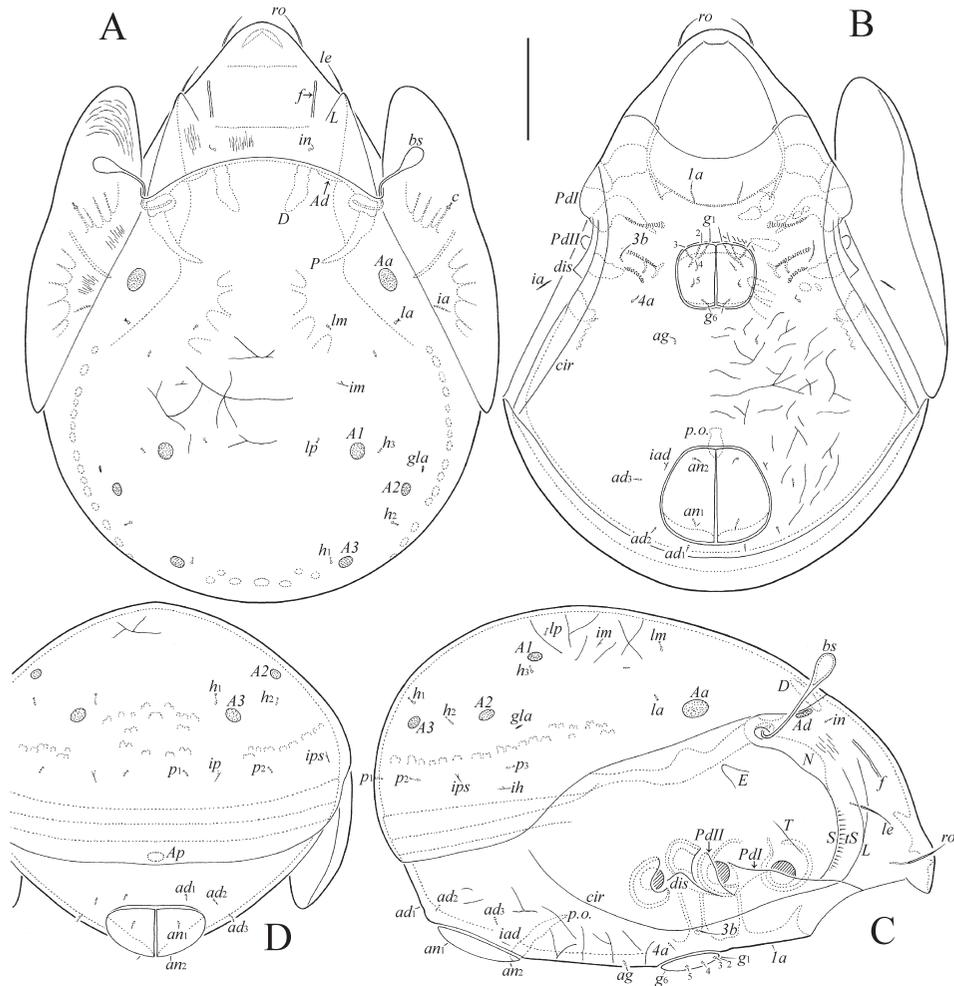
(Figs 1, 2)

**Diagnosis.** Body length: 270–300. Pteromorph slightly striate; anogenital region and centrodorsal part of notogaster with numerous neural ridges. Lamellar line bifurcate mediobasally; anterior part of S-line dentate. Rostral and lamellar setae setiform, slightly roughened; *ro/le* = 1.2. Dorsosejugal and postanal porose areas present. Four pairs of rounded porose areas. Median

pore absent. Lyrifissure *im* located between *lm* and *A1*. Epimeral setal formula: 1-0-1-1. Circumpedal carina long. Adanal lyrifissure located close and parallel to anterior part of anal plate. Leg tarsus I with 19 setae (*v'* absent).

Description of adult. Measurements. Small species. Body length: 300 (holotype: female), 270–300 (six paratypes: three males and three females); notogaster width: 232 (holotype), 217–232 (paratypes). No difference between males and females in body size.

Integument (Figs 1A–C). Body color brown. Surface densely microfoveolate (visible only under high magnification in dissected specimens, 10 × 100). Pteromorph, basal part of prodorsum and narrow region anterior to genital aperture slightly striate. Lateral side of



**Fig. 1.** *Flagellozetes (Cosmogalumna) carinodentatus* sp. n., adult: A = dorsal view; B = ventral view (gnathosoma, legs and right pteromorph not shown); C = right lateral view (gnathosoma, legs and pteromorph); D = posterior view (part or left half not shown). Scale bar 50 μm

body partially microgranulate. Anogenital region and centrodorsal part of notogaster with numerous neural ridges (without small dense cells); ridges in anogenital region numerous and located on the entire surface (except genital and anal plates); ridges on notogaster medium numerous and occupy the area between setal alveoli *lm-lm* and porose areas *A1-A1*. Antiaxial side of leg femora I, II, IV and trochanters III, IV partially tuberculate.

Prodorsum (Figs 1A, C). Rostrum slightly protruding, rounded. Lamellar and sublamar lines thin, parallel, curving backwards; *L*-line bifurcate mediobasally; anterior part of *S*-line with one row of short, distinct teeth. One pair of thin, longitudinal furrows (30) located between mediobasal parts of *L*-lines. Rostral (20–22) and lamellar (17–19) setae setiform, slightly roughened; *le* inserted between branches of *L*-line. Interlamellar seta (2) setiform, thin, smooth. Bothridial seta (56–60) clavate, with long stalk and shorter head rounded distally, sparsely slightly roughened. Exobothridial seta absent. Dorsosejugal porose area (12–15 × 4–6) oval, transversely oriented, located posterolateral to *in*. Dorsophragma distinctly elongated longitudinally.

Notogaster (Figs 1A, C, D). Dorsosejugal suture complete, convex medially. With 10 pairs of setal alveoli (microsetae not observed) and four pairs of rounded porose areas (*Aa*: 13–19; *A1*: 9–15; *A2*: 7–11; *A3*: 11–15); *Aa* located close to pteromorph hinge, anterior to setal alveolus *la*. Median pore absent. Opisthotal gland opening and all lyrifissures distinct: *gla* located anterolateral to *A2*; *im* between *lm* and *A1*; *ip* between *p*<sub>1</sub> and *p*<sub>2</sub>; *ips* between *p*<sub>2</sub> and *p*<sub>3</sub>; *ih* lateral to *p*<sub>3</sub>.

Gnathosoma (Figs 2A–C). Subcapitulum size: 75–79 × 60–67; subcapitular setae (*a*: 15–19; *m*, *h*: 5–7) setiform, slightly roughened; *a* thickest; adoral seta (9–11) setiform, slightly barbed. Length of palp: 64–67; postpalpal seta (4) spiniform, smooth. Length of chelicera: 86–94; cheliceral setae (*cha*: 26–30; *chb*: 19–22) setiform, barbed.

Epimeral and lateral podosomal regions (Figs 1B, C). Epimeral setal formula: 1-0-1-1; all epimeral setae (*3b*: 11–15; *1a*: 7; *4a*: 4) setiform, thin, smooth. Circumpedal carina long, reaching pedotectum I.

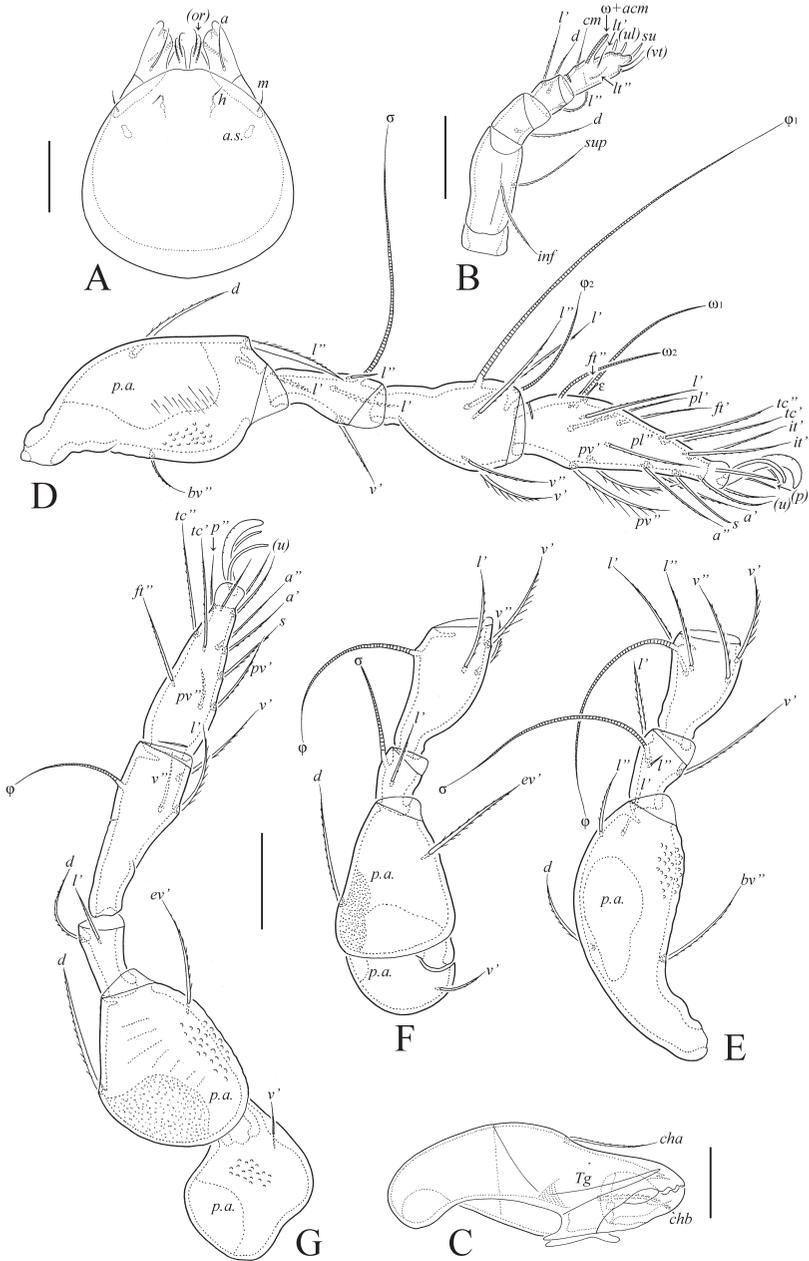
Anogenital region (Figs 1B–D). Genital (*g*<sub>1</sub>: 9–11; *g*<sub>2</sub>: 7; *g*<sub>3</sub>–*g*<sub>6</sub>: 4), aggenital (4), anal (4), and adanal (4) setae setiform, thin, smooth. Anterior edge of genital plate with three setae. Aggenital seta located between genital and anal apertures, closer to genital aperture. Adanal lyrifissure located close and parallel to anterior part of anal plate. Adanal setae *ad*<sub>1</sub> and *ad*<sub>2</sub> posterior, *ad*<sub>3</sub> lateral to anal plate; distance *ad*<sub>1</sub>–*ad*<sub>2</sub> shorter than *ad*<sub>2</sub>–*ad*<sub>3</sub>. Unpaired postanal porose area (7–11 × 4–6) oval.

Legs (Figs 2D–G). Median claw distinctly thicker than lateral claws, all slightly roughened on dorsal side. Porose area on all femora and on trochanters III, IV present, but poorly visible. Formulas of leg setation and solenidia: I (1-4-3-4-19) [1-2-2], II (1-4-3-4-15) [1-1-2], III (1-2-1-3-15) [1-1-0], IV (1-2-2-3-12) [0-1-0]; famulus lateral to solenidion  $\omega$ <sub>1</sub>; seta *v'* on tarsus I absent; *s* eupathidial; solenidion of tibia IV inserted in anterior part of the segment; homology of setae and solenidia indicated in Table 1.

Material examined. Holotype (female) and two paratypes (one male and one female): Vietnam, Dong Nai Province, Dong Nai Biosphere Reserve, Cat Tien National Park, 11°25'40"N, 107°25'34"E, about 130 m a.s.l., bark from *Haldina cardifolia* (height: 0.5 m) (sample: 1-1), 20.06.2021–04.07.2021 (V. M. Salavatulin and A. A. Kudrin).

Four paratypes (two males and two females): the same as for the holotype but other tree of *H. cardifolia* (sample: 8-1) with coordinates 11°25'45"N, 107°25'38"E.

Type deposition. The holotype and six paratypes (preserved in 70% solution of ethanol with a drop of glycerol) are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.



**Fig. 2.** *Flagellozetes (Cosmogalumna) carinodentatus* sp. n., adult: A = subcapitulum, ventral view; B = palp, left, paraxial view (femur, genu and tibia slightly turned ventral); C = chelicera, left, paraxial view; D = leg I, without trochanter, right, antiaxial view; E = leg II, without trochanter and tarsus, right, antiaxial view; F = leg III, without tarsus, left, antiaxial view; G = leg IV, left, antiaxial view. Scale bars 20 μm

**Table 1.** Leg setation and solenidia of adult *Flagellozetes* (*Cosmogalumna*) *carinodentatus* sp. n. and *F. (C.) pseudoareticulatus* sp. n.

| Leg | Tr        | Fe                                   | Ge                                 | Ti  | Ta   |
|-----|-----------|--------------------------------------|------------------------------------|---|--|
| I   | <i>v'</i> | <i>d</i> , ( <i>l</i> ), <i>bv''</i> | ( <i>l</i> ), <i>v'</i> , $\sigma$ | ( <i>l</i> ), ( <i>v</i> ), $\varphi_1$ , $\varphi_2$ | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), <i>v''*</i> , ( <i>pl</i> ), <i>l''</i> , $\varepsilon$ , $\omega_1$ , $\omega_2$ |
| II  | <i>v'</i> | <i>d</i> , ( <i>l</i> ), <i>bv''</i> | ( <i>l</i> ), <i>v'</i> , $\sigma$ | ( <i>l</i> ), ( <i>v</i> ), $\varphi$                 | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), $\omega_1$ , $\omega_2$   |
| III | <i>v'</i> | <i>d</i> , <i>ev'</i>                | <i>l'</i> , $\sigma$               | <i>l'</i> , ( <i>v</i> ), $\varphi$                   | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )  |
| IV  | <i>v'</i> | <i>d</i> , <i>ev'</i>                | <i>d</i> , <i>l'</i>               | <i>l'</i> , ( <i>v</i> ), $\varphi$                   | <i>ft''</i> , ( <i>tc</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )  |

Note: Roman letters refer to normal setae, Greek letters to solenidia (except  $\varepsilon$  = famulus). Single quotation mark (') designates seta on the anterior and double quotation mark (") seta on the posterior side of a given leg segment. Parentheses refer to a pair of setae. \* - *v'* on tarsus I absent in *F. (C.) carinodentatus* versus present in *F. (C.) pseudoareticulatus*.

Etymology. The species name *carinodentatus* refers to dentate sublamellar line (carina).

Remarks. *Flagellozetes* (*Cosmogalumna*) *carinodentatus* sp. n. differs from all representatives of the subgenus by the presence of a row of teeth on sublamellar line. In having neural ridges on the notogaster and in anogenital region, stria on pteromorph, four pairs of notogastral porose areas, long circumpedal carina, bifurcate lamellar line, 19 setae on leg tarsus I, and in the absence of a median pore, the new species is morphologically most similar to *F. (C.) sandori* Ermilov et Kalúz, 2019 from Malaysia. However, the new species differs (in addition to the presence of teeth on S) from the latter by the absence (versus presence) of sparse and minute foveolae on the body and stria on the subcapitular mentum, distinctly longer lamellar setae (*rolle* = 1.2 versus 1.6), the presence (versus absence) of two prodorsal furrows, and by more numerous neural ridges in anogenital region which are located on entire surface (versus mostly between genital and anal apertures).

### ***Flagellozetes* (*Cosmogalumna*) *pseudoareticulatus* sp. n.** (Fig. 3)

Diagnosis. Body length: 330–352. Anogenital region and centrodorsal part of notogaster with few neural ridges. Lamellar line not bifurcate mediobasally. Rostral and lamellar setae similar in length, setiform, slightly roughened. Dorsosejugal and postanal porose areas present. Four pairs of rounded porose areas. Median pore present. Lyrifissure *im* located close and anterior to *A1*. Epimeral setal formula: 1-0-1-2. Circumpedal carina short. Adanal lyrifissure located close and parallel to median part of anal plate. Leg tarsus I with 20 setae (*v'* present).



**Table 2.** Comparison of selected morphological characters of the *Flagellozetes* (*Cosmogalumina*) group with species having neural ridges on notogaster

| Character/sp. | <i>areticulatus</i> | <i>carinodontatus</i> | <i>ekaterinae</i> | <i>kirishimaensis</i> | <i>lineatus</i> | <i>naredoi</i> | <i>pseudoareticulatus</i> | <i>sandori</i> | <i>sumatrensis</i> |
|---------------|---------------------|-----------------------|-------------------|-----------------------|-----------------|----------------|---------------------------|----------------|--------------------|
| 1             | A                   | A                     | A                 | A                     | A               | A              | A                         | P              | A                  |
| 2             | C                   | C                     | F                 | C                     | C               | C              | C                         | C              | C                  |
| 3             | A                   | P                     | A                 | A                     | A               | A              | A                         | A              | A                  |
| 4             | Si                  | Bi                    | Si                | Bi                    | Bi              | Bi             | Si                        | Bi             | Si                 |
| 5             | A                   | P                     | A                 | A                     | A               | A              | A                         | A              | A                  |
| 6             | 2.7                 | 1.2                   | 2.3               | 1                     | 1.4             | 1.6            | 1                         | 1.6            | 1.4                |
| 7             | An                  | An                    | Po                | An                    | An              | An             | An                        | An             | An                 |
| 8             | 4                   | 4                     | 3                 | 4                     | 3               | 4              | 4                         | 4              | 4                  |
| 9             | Me                  | Me                    | La                | Me                    | Me              | Me             | Sm                        | Me             | Me                 |
| 10            | A                   | St                    | St                | Gr                    | St              | St             | A                         | St             | A                  |
| 11            | Re                  | Re                    | Cl                | Re                    | Re              | Re             | Cl                        | Re             | Re                 |
| 12            | P                   | A                     | P                 | P                     | P               | P              | P                         | A              | A                  |
| 13            | 1-0-1-2             | 1-0-1-1               | 2-0-2-3           | 1-0-1-1               | 1-0-1-1         | 1-0-1-1        | 1-0-1-2                   | 1-0-1-1        | 1-0-1-1            |
| 14            | M                   | L                     | L                 | M                     | L               | M              | M                         | L              | M                  |
| 15            | A                   | A                     | A                 | St                    | St              | St             | A                         | A              | A                  |
| 16            | 3                   | 3                     | 2                 | 3                     | 3               | 3              | 3                         | 3              | 3                  |
| 17            | P; Cl               | P; Cl                 | A; Not            | P; Cl                 | P; Cl           | P; Cl          | P; Re                     | P; Cl          | P; Cl              |
| 18            | A                   | A                     | A                 | A                     | A               | A              | A                         | A              | P                  |
| 19            | Me                  | La                    | Me                | Me                    | Me              | Me             | Sm                        | Me             | Not                |
| 20            | A                   | A                     | A                 | A                     | St              | A              | A                         | A              | A                  |
| 21            | Cl; Mi              | Cl; An                | Cl; Mi            | Re; Not               | Re; Mi          | Cl; An         | Cl; Mi                    | Cl; Mi         | Cl; An             |
| 22            | 20                  | 19                    | 20                | 20                    | 20              | 20             | 20                        | 19             | 20                 |
| 23            | 298-315             | 270-300               | 266-315           | 333-368               | 324-330         | 332-340        | 330-352                   | 265-272        | 282-298            |

**Decoding of characters given in Table 2**

1. Foveolate ornamentation (foveolae sparse, small but well visible) on body: A = absent; P = present.
2. Form of bothridial seta: C = clavate (broadly rounded distally); F = fusiform (narrowed distally).
3. One pair of longitudinal furrows on prodorsum: A = absent; P = present.
4. Lamellar line mediobasally: Bi = bifurcate; Si = simple (not bifurcate).
5. Teeth on sublamellar line: A = absent; P = present.
6. Relative length of rostral and lamellar setae: *le/ro*.
7. Localization of setal alveolus *c* on pteromorph: An = anterior to alary furrow; Po = posterior to alary furrow.
8. Number of notogastral porose areas.
9. Notogastral area with neural ridges: La = large, mostly entire surface; Me = medium-sized, broad quadrangular area between setal alveoli *lm-lm* and porose areas *A1-A1* or slightly larger; Sm = small, narrowly transverse area between and slightly anterior to porose areas *A1-A1*.
10. Ornamentation of pteromorph: A = absent; Gr = heavily granulate; St = slightly or heavily striate (or with ridges).
11. Localization of notogastral lyrifissure *im*: Re = *im* between *lm* and *A1* (or between *lm* and *lp*) and equally removed from them; Cl = *im* close and anterior to *A1*.
12. Median pore: A = absent; P = present.
13. Epimeral formula.
14. Length of circumpedal carina: L = long (reaching pedotectum I); M = medium length, directed to setal alveolus *3b* but slightly not reaching it, or only reaching level of localization of acetabulum IV.
15. Ornamentation of genital plate: A = absent; St = striate.
16. Number of genital setae on anterior edge of genital plate.
17. Aggenital seta: A = absent; P = present; Re = *ag* equally removed from genital and anal apertures; Cl = *ag* closer to genital aperture; Not = not applicable (if *ag* absent).
18. Reticulate ornamentation in anogenital region: A = absent; P = present.
19. Anogenital area with neural ridges: La = large, mostly entire surface including adanal region; Me = medium-sized, only between genital and anal apertures; Sm = small, only between aggenital setae; Not = not applicable (if neural ridges absent).
20. Ornamentation of anal plate: A = absent; St = striate.
21. Localization of adanal lyrifissure: Re = removed from anal aperture; Cl = close to anal aperture, parallel; An = close to level of the anterior half of anal plate; Mi = close to level of the middle of anal plate; Not = not applicable (if *iad* removed from anal aperture).
22. Number of setae on leg tarsus I.
23. Body length.

Prodorsum (Figs 3A, C). Rostrum broadly rounded. Lamellar and sublamellar lines parallel, curving backwards; *L*-line slightly thickened, not bifurcate basally; *S*-line thin. Rostral and lamellar setae similar in length (28–30), setiform, slightly roughened; *le* inserted lateral to *L*-line. Interlamellar seta (2) setiform, thin, smooth. Bothridial seta (45–49) clavate, with long stalk and shorter head rounded distally, sparsely slightly roughened. Exobothridial seta absent. Dorsosejugal porose area (15–19 × 7) oval, transversely oriented, located posterolateral to *in*. Dorsophragma distinctly elongated longitudinally.

Notogaster (Figs 3A, C, D). Dorsosejugal suture complete, nearly straight medially. With 10 pairs of setal alveoli (microsetae not observed) and four pairs of rounded porose areas (*Aa*: 17–19; *A1*, *A3*: 11; *A2*: 7); *Aa* located close to pteromorph hinge, anterior to setal alveolus *la*. Median pore present, located posterior to virtual line connected areas *A2*. Opisthontal gland opening and all lyrifissures distinct: *gla* located lateral to *A1*; *im* close and anterior to *A1*; *ip* between  $p_1$  and  $p_2$ ; *ips* between  $p_2$  and  $p_3$ ; *ih* anterior to  $p_3$ .

Gnathosoma. Mostly similar to *F. (C.) carinodentatus* sp. n. except some sizes. Subcapitulum size: 86 × 79; *a*: 19; *m*, *h*: 11; adoral seta: 15; length of palp: 79; length of chelicera: 105; *cha*: 34; *chb*: 22.

Epimeral and lateral podosomal regions (Figs 3B, C). Epimeral setal formula: 1-0-1-2; all epimeral setae (3b: 19–22; 1a: 11; 4a, 4b: 7) setiform, thin, smooth. Circumpedial carina comparatively short, reaching of level of localization of acetabulum IV.

Anogenital region (Figs 3B–D). Genital ( $g_1$ : 15;  $g_2$ : 11;  $g_3$ – $g_6$ : 7), aggenital (7), anal (7), and adanal (7) setae setiform, thin, smooth. Anterior edge of genital plate with three setae. Aggenital seta equally removed from genital and anal apertures. Adanal lyrifissure located close and parallel to median part of anal plate. Adanal setae  $ad_1$  and  $ad_2$  posterior,  $ad_3$  lateral to anal plate; distance  $ad_1$ – $ad_2$  shorter than  $ad_2$ – $ad_3$ . Unpaired postanal porose area (18–22 × 7) oval.

Legs. Mostly similar to *F. (C.) carinodentatus* **sp. n.**, but tarsus I with 20 setae (*v*' present), and famulus inserted between solenidia  $\omega_1$  and  $\omega_2$ .

Material examined. Holotype (female): Vietnam, Dong Nai Province, Dong Nai Biosphere Reserve, Cat Tien National Park, 11°25'40"N, 107°25'34"E, about 130 m a.s.l., bark from *Ochrocarpos siamensis* (height: 0.5 m) (sample: 3-1), 20.06.2021–04.07.2021 (V. M. Salavatulin and A. A. Kudrin).

One paratype (male): the same as for the holotype but tree of *Haldina cardifolia* (sample: 8-3) with coordinates 11°25'45"N, 107°25'38"E and other height (20 m).

Type deposition. The holotype and one paratype (preserved in 70% solution of ethanol with a drop of glycerol) are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Etymology. The species name *pseudoareticulatus* refers to the similarity of the new species and *Flagellozetes (Cosmogalumna) areticulatus* (Ermilov, Sandmann, Klarner, Widyastuti & Scheu, 2015).

Remarks. In having neural ridges on the notogaster and in anogenital region, a median pore, four pairs of notogastral porose areas, short circumpedial carina, and the absence of stria on pteromorph, *Flagellozetes (Cosmogalumna) pseudoareticulatus* **sp. n.** is morphologically most similar to *F. (C.) areticulatus* (Ermilov, Sandmann, Klarner, Widyastuti et Scheu, 2015) from the Oriental region. However, the new species differs from the latter by the comparatively long lamellar seta,  $ro = le$  (versus short,  $ro/le = 2.7$ ), the localization of notogastral lyrifissure *im* (close and anterior to *A1* versus between *lm* and *lp*, equally removed from them) and adanal seta  $ad_3$  (lateral to *iad* versus anterolateral to *iad*), the position of aggenital seta (equally distanced from genital and anal apertures versus located closer to genital aperture), and by comparatively small area with neural ridges in anogenital region and on the notogaster (versus areas with ridges clearly larger).

## DISCUSSION

Representatives of *Flagellozetes (Cosmogalumna)* are forming two large groups of species depending on the ornamentation on the notogaster: 1) with reticulate pattern (11 species); 2) with neural ridges (nine species).

Species of the second group are: *F. (C.) areticulatus* (Ermilov, Sandmann, Klarner, Widystuti et Scheu, 2015); *F. (C.) carinodentatus* **sp. n.**; *F. (C.) ekaterinae* (Ermilov & Friedrich, 2016); *F. (C.) kirishimaensis* (Hagino et Shimano, 2017) (see in HAGINO *et al.* 2017); *F. (C.) lineatus* Kolesnikov et Leonov, 2021; *F. (C.) naredoi* Ermilov et Corpuz-Raros, 2022; *F. (C.) pseudoareticulatus* **sp. n.**; *F. (C.) sandori* Ermilov et Kalúz, 2019; *F. (C.) sumatrensis* (Ermilov, Sandmann, Klarner, Widystuti et Scheu, 2015). They are very similar, therefore, despite the identification key to know taxa within subgenus (ERMILOV & CORPUZ-RAROS 2022), we present below Table 2 including a complete set of morphological differences that will allow more clearly distinguishing species with neural ridges on the notogaster. According to this set, species differ from each other by: ornamentation of body; form of bothridial seta; presence/absence of prodorsal furrows; structure of mediobasal part of lamellar line; presence/absence of teeth on sublamellar line; relative length of rostral and lamellar setae; localization of setal alveolus *c* on pteromorph; number of notogastral porose areas; size of area of notogastral and anogenital neural ridges; localization of notogastral lyrifissure *im*; presence/absence of median pore; epimeral formula; length of circumpedial carina; number of genital setae on anterior edge of genital plate; presence/absence of aggenital seta; localization of adanal lyrifissure; number of setae on leg tarsus I; body length.

\*

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